

**UNIVERSITY GOVERNANCE
AND ACADEMIC RESEARCH**

CASE STUDIES OF RESEARCH UNITS IN DUTCH
AND ENGLISH UNIVERSITIES

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**UNIVERSITY GOVERNANCE
AND ACADEMIC RESEARCH**

Case studies of research units in Dutch and English universities

DISSERTATION

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on account of the decision of the graduation committee

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To my parents
who always believe in me

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1 Introduction

A philosopher is a person who knows less and less about more and more, until he knows nothing about everything.

A scientist is a person who knows more and more about less and less, until he knows everything about nothing.

J. Ziman 1987

1.1 Governance of higher education and research

New governance approaches are at the forefront of discussions on public sector reforms, including higher education and research (de Boer, Enders, & Leisyte, 2007). Rethinking governance has led to new institutional arrangements in coordinating the public sectors (Kooiman, 2000; Mayntz, 1998). Authorities and powers for the allocation of (public) goods and services have been redistributed across the various policy levels. Traditional patterns of power distribution and interaction seem to be vanishing. In many countries, coordination has changed from a classical form of state-dominated regulation in parallel with professional self-governance to forms in which various actors at various policy levels govern the system. This development is reflected in a growing literature addressing the shift from 'government to governance' (de Boer, Enders, & Schimank, 2007). The social science literature shows an impressive list of definitions, concepts, and typologies on governance and the principle modes of coordination of social action. In higher education and research the analysis of governance systems has had a prominent place for more than two decades. Various concepts and models of higher education governance have been developed and extensively discussed, both by researchers and practitioners (Braun & Merrien, 1999; Clark, 1983; Maassen & van Vught, 1994). One way of looking at the shifts in governance in higher education and research is by observing and analysing governmental reforms. Following Pierre and Peters' (2000) state-centric view, governmental reforms may be a good point of reference for the analyses of shifts in governance and their consequences. Such reforms imply changing rules of the game in higher education and research. A new type of institutional environment has been

'created' for most of the involved actors. The interactions among and positions of actors at the various policy levels are changing.

In our study we are particularly curious about the consequences of the shift from government to governance for the practices at the bottom level in the higher education and research system. Do academics experience shifts in governance? How do they respond to the changing nature of their game? What kinds of effect does it have on their research practice? We intend to answer these questions to further our understanding of the effects of governance changes on the daily lives of academics. In this respect the study contributes to earlier research on 'governance reforms' and 'changes in the academic knowledge production'.

Many scholars have explored governance reforms and the rise of managerialism in a comparative perspective in greater detail (Amaral, Jones, & Karseth, 2002; Braun & Merrien, 1999; Currie, De Angelis, De Boer, Huisman, & Lacotte, 2003; de Boer, Enders, & Schimank, 2007; Goedegebuure, Kaiser, Maassen, & De Weert, 1994; Kehm & Lanzendorf, 2006; Kogan & Hanney, 2000). They trace the developments of a shift from 'government to governance' at mainly macro and organisational levels in higher education in different countries and different periods. The major insights of these studies highlight how different higher education and research reforms influence the changes in university governance.

Further extensive body of knowledge is in the studies of changing academic knowledge production and organisation of knowledge, change and stability in identities, disciplines, and autonomy (Becher & Trowler, 2001; Bleiklie & Henkel, 2005; Clark, 1996; D. D. Dill & Sporn, 1995; Enders, 2001; Geiger, 1985; Hazelkorn, 2003; Henkel, 2000a; Rip, 2002; Ziman, 2000). These studies contribute to a further understanding of the changing structures and process within the universities as a result of macro level reforms. In particular, they look at individual and sub-organisational levels to understand the continuity and change in academic activities.

A third example of the studies focusing on the effects of macro level reforms on the micro level includes studies focusing on a particular reform and assessing its impact. For instance, quality reforms spurred a range of studies of the affects of quality assessment on different aspects of academic work at universities. More specifically, they look at the influence on autonomy, accountability, and academic identity (Brown, 2004; de Boer, Enders, & Westerheijden, 2005; Kogan, 1989; Lucas, 2006; Stensaker, 2004; Thune, 2000).

Our study aims to compliment the literature on the effects of macro level reforms on one of the major functions of the academic enterprise - research. We apply a multi-level approach exploring the shifts in governance at the macro level and noting the repercussions at organisational and sub-organisational levels.

1.2 Problem statement

Shifts in governance in higher education and research lead to a different institutional environment for basic research units. This implies changing audiences, rules, norms, and values that govern higher education and research. We assume that shifts in governance in higher education and research aim at influencing universities and their basic research units and want to understand how such processes work. Basically, we want to investigate how the university's basic research units perceive their institutional environments, how they respond to them, and what it means for their research practices. We will investigate these questions in England and the Netherlands; two countries that have higher education systems with clearly different roots, both having undergone public sector reforms but at a different timing and to a different degree. The central problem statement of the thesis is:

What are the effects of the governance models on research practices in university basic research units in England and the Netherlands?

We address this problem statement through the following four research questions:

1. What are the governance models in higher education and research?
2. How do basic research units perceive their institutional environment?
3. How do basic research units respond to their institutional environment?
4. How do these responses influence their research practices?

The overall research problem is addressed by applying a conceptual framework combining resource dependence and neo-institutionalism theories together with the credibility cycle of a research unit. The focus is on understanding and interpreting the complex interaction between a sub-organisational unit and its institutional environment. Both resource dependence theory and neo-institutional theory suggest that organisational responses are to some extent shaped by the environment with which the organisation interacts. Resource dependence theory postulates that it is important for organisations to control their dependencies on resources and reduce environmental uncertainty by exercising power, control, and negotiation. The neo-institutional theory states that organisations survive due to conformity to external rules and norms. A combination of these two theoretical perspectives offers a range of principle responses of actors to the institutional environments. However, to interpret the responses of a basic research unit we turn to the credibility cycle model of the research organisation. The credibility cycle was developed by Latour and

Woolgar (1979) and is understood as a cycle where researchers turn their inputs into outputs that increase their credibility and as a result attract more resources. Always concerned with their credibility cycle, researchers see their institutional environment as instrumental in building their credibility and gaining resources. Such characteristics of researchers play a role in the perception of their environment and may influence their responses to that environment.

Our study focuses on one of the major functions of a university – academic research. Research practices are understood as the practices of academics leading to the advancement of knowledge in a certain field via scholarly inquiry that aims to extend the knowledge base in a systematic way. They are understood in relation to the academic community. This community represents a set of values and norms embedded in a social structure that surrounds researchers. The norms of communalism, universalism, disinterestedness, originality, and scepticism are at the core of the academic community (Ziman, 2000, p. 174).

Research practices are also likely to be influenced by changes in other parts of the researcher's institutional environment. Shifts in governance are not neutral and are among other things supposed to impact the primarily and dominantly self-driven activity of self-governed academic communities. As we see later, institutional change may be enacted to achieve efficiency gains within the academic research system. Such attempts of achieving 'more output with the same or less input' aim to affect traditional operations, criteria of knowledge production, and academic values, albeit not (necessarily) directly. Further, policies increasingly refer to academic research as a possible source of application, innovation, and contribution to the economy of the country. Research priority setting and accountability measures that stress the 'relevance' and problem solving capacity of academic research have gained ground. A more utilitarian perspective on the economic potential of academic research is visible (Ziman, 1994, 2000).

To analyse the effects of changes in the institutional environment on the 'academic workplace', we discern four dimensions of research practices derived from the literature (Clark, 1991; Dilts, Haber, & Bialik, 1994; Elzinga, 1985; Enders & Fulton, 2002; Gläser, Laudel, Hinze, & Butler, 2002; Rip, 2002; Ziman, 2000). In looking at research practices at universities, the dimensions tackled in this study are: problem choice, risky and mainstream research, research output preferences, and the 'teaching-research' nexus. Problem choice is understood as the autonomy of a researcher to choose research themes. The second dimension focuses on the dichotomy between mainstream and risky research. Mainstream research is in our study regarded as the critical mass and the variety pool on which risky research can be built and lead to major breakthroughs. Risky research in this context means a scholarly inquiry with highly unpredictable results. The third dimension is about the choices researchers make about the dissemination of their

research results and which audiences they want to reach. Finally, the teaching-research nexus dimension is understood as the extent to which both teaching and research are linked with each other.

Our study covers three levels: the macro level, the organisational level, and the sub-organisational or shop-floor level. Each level has its own interrelated features and dynamics and includes a nesting effect, that is, what goes on at one level constrains or enables what goes on another. The aim of this multi-level analysis is to analyse the responses of certain basic research units to their institutional environment, assuming that they have nested internal and external components.

We conduct a multiple case study that examines similarities and differences in the responses of selected research units to changing institutional environments at a given moment of time. England and the Netherlands were selected according to the traditional differences in higher education governance models: Anglo-Saxon and Continental (Clark, 1983). We selected medieval history and biotechnology as representatives of distinct research cultures of 'soft' and 'hard' (Biglan, 1973) fields of research in two countries.

The major unit of analysis is the university's basic research unit. These units organisationally embedded within departments, institutes, or research centres of universities have their own administrative, physical, and academic existence. They are regarded as the smallest organisational, 'collective' part of a university. These basic research units have their own organisational behaviour and setting and are supposed to act on the basis of their own interests and those of its individual members.

These research units can be regarded as corporate actors that strive for the preservation of their existence pooling resources together into a separate body (Coleman, 1990). The unit can be seen then as having its own interests and being a semi-autonomous body. This implies it has a 'life of its own', while at the same time it interacts with its institutional environment on which it and depends. In our study we assume that basic research units try to safeguard or increase their credibility to conduct the research activities they prefer.

Given the theoretical points of departure discussed so far, both the resource dependence and neo-institutional theories offer a range of principle responses to the institutional environments. We have argued that the types of responses of basic research units will depend on the level of certainty/uncertainty found in their environment. Environments differ according to the level of certainty/uncertainty found regarding the resources available and the possibility to transfer resources into credits to build reputation following the credibility cycle model. Based on the insights of the theoretical framework we have three expectations on how basic research units will respond to their institutional environment.

1.2.1 *Expectations of the study*

Based on our conceptual framework suggests we proposed three expectations in this study:

1. *We expect that when there is low uncertainty in the institutional environment (sufficient resources are available and are successfully transferred into credits to build reputation) research units will retain stability in their activities and create pro-active strategies to manipulate and influence the environment.*

This expectation is based on the assumption that organisations prefer certainty, stability and predictability. In line with this argumentation, we expect organisations to become more confident in their activities and their further acquisition of resources and legitimacy when uncertainty is low, because they feel less threatened by changes in their institutional environment. Under this condition, the manipulation of 'institutional values and the constituents that express them' may be the likely strategies for achieving organisational goals.

2. *We expect that when research units have high credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), they will symbolically respond by adapting formal structures and creating de-coupling strategies for their activities, thus ensuring symbolic change.*

This expectation is based on the argument that when the environmental context is highly uncertain, organisations will attempt to re-establish the control and stability over future organisational outcomes. This can provide an impetus to create strategies to protect the gained capital, and to 'symbolically adapt' to the external pressures by de-coupling the core activities from the institutional environment. The units that have accumulated high credibility, that is, high reputation, are thus likely to afford little change if any in their core activities even given high uncertainty regarding other resources.

3. *We expect that when research units have low credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), they will comply with the institutional pressures and change their core activities.*

This expectation is based on the theoretical assumption that organisations will attempt to re-establish stability in their environment by 'coping' with trouble. Accordingly, the research units with low credibility will be forced to change their activities as they depend on their resource providers. We expect that they will try to re-establish the stability over organisational outcomes by using compliance strategies.

1.3 The structure of the study

The study consists of three major parts: conceptual, empirical and reflective. The conceptual part includes the theoretical considerations and methodological underpinnings of the study. Chapter 2 presents our conceptual and theoretical framework to study the shifts in governance in England and the Netherlands and the interaction between the institutional environment and the basic research units. The chapter starts with the exploration of shifts in governance in general and then focuses on the models that have been developed in the higher education literature. In the second part of this chapter, we develop a theoretical framework to study the interaction between the basic research units and their institutional environment. We explore how resource dependence and neo-institutional theories can complement each other and link them to the credibility cycle model.

Chapter 3 presents the methodological underpinnings of the study. It starts with the description of the multi-level analysis and the operationalisation of the concepts used in the study. We elaborate upon governance dimensions, perceptions of basic research units, and responses and practices of basic research units. Further, we present the research design of our study, drawing attention to the multiple-case design, case selection, data collection, and analysis. Finally, we explore the possible pitfalls of the study.

The second part includes the empirical Chapters 4, 5, 6 and 7. Chapter 4 describes and interprets the shifts in governance in the higher education and research systems of England and the Netherlands. Chapter 5 provides the reader an introductory overview of the case studies in biotechnology and medieval studies in the two countries.

Chapters 6 to 7 present and interpret the outcomes of the case studies. Each chapter presents four case studies in one country, beginning with medieval studies followed by biotechnology.

The final part of the study, consisting of Chapters 8 and 9, provides interpretation of and reflection on the outcomes of the study. In Chapter 8, we present and interpret the shifts in governance and how they are perceived by the eight basic research units. Further, we compare how the basic research units respond to their institutional environment and what it has meant for their research practices. Here we look at the strategies they developed and revisit the three expectations of the study.

In the conclusion, Chapter 9, we present the major outcomes of the study and answer the questions of the study. We close our study with a discussion and possible avenues for further research.

2 Theoretical considerations: the link between institutional environment and organisational response

This chapter introduces the theoretical considerations for our study on the potential effects of shifts in governance on basic research units in universities. We look at internal and external governance of universities since both are part of the relevant institutional environment of universities' organisational sub-units that is, research units. Internal governance refers to the institutional arrangements within universities (e.g., lines of authority, decision-making processes, financing, and staffing) whereas external governance refers to the institutional arrangements on the macro- or system-level (e.g., laws and decrees, funding arrangements, evaluations). Governance is thus understood as the external and internal coordination in higher education and research that may be of relevance for universities' research units. The potential influence of shifts in governance on the basic research units are theorized with the help of the resource dependence theory and the neo-institutional theory. Additionally, we introduce the concept of the research credibility cycle as a heuristic tool to better understand what institutional environments may mean for the practices of basic research units.

This chapter is structured as follows. Before we address *how* basic research units may respond to changes in their environments we discuss *why* and *what* kinds of changes have taken place. First, we look at shifts in governance in the public sectors in general and in higher education and research in particular. Both external and internal governance arrangements will be addressed by looking at the overall debates around changes in the coordination of public sectors. Generally, these changes have been indicated as a shift 'from government to governance'. Further, we concentrate on the governance literature in higher education and research, on how shifts in governance can be conceptualized in this field, and on how higher education and research are affected by the overall changes in public sector governance. In other words, we study the shifts in internal and external governance to understand the institutional dynamics that took place in order to see what kind of institutional environment has been created for the universities' research units at the point in time our study was undertaken.

We follow this line of reasoning since we assume that the shifts in governance aim at influencing universities and their organisational sub-units. Policy formation and policy implementation are however, two different things in a policy-cycle. Many implementation studies reveal that human behaviour is not as

easily or directly affected as intended and unintended effects have frequently been observed. Due to, among other things, the different levels involved in such a process and the agent's degree of autonomy, implementation may (partly) be blocked or may change policies to a certain extent (Mazmanian & Sabatier, 1983; Sabatier, 1999) Also, it usually takes time before reforms sink in and affect action at the shop floor level. To advance our knowledge we must better understand how social actors perceive their institutional environments, how they respond to them, and what this means for their work practices. For this purpose we presume that two theories, resource dependence theory and neo-institutionalism, will prove useful in conceptualising the relationship between a basic research unit as an organisational entity and its institutional environments.

There is an understanding among social scientists that an organisation does not exist in a vacuum, but interacts with its environment to achieve its objectives; it depends on its environment for critical resources. As Gornitzka (1999, p. 237) notes, two main theories share this understanding: the resource dependence (Pfeffer & Salancik, 1978) and the neo-institutional theory (DiMaggio & Powel, 1983; J. W. Meyer & Rowan, 1977). Both offer propositions to explain the relationship between the organisation and its environment. They see organisations as open systems (Katz & Kahn, 1966) that are interdependent with those elements of the environment with which they transact (Pfeffer, 1982, p. 192). Organisations work to reduce uncertainty and ensure survival (DiMaggio, 1983, p. 3). Both theories note that organisational choice and action are limited by various pressures and demands, and organisations try to survive by creating certain strategies (Oliver, 1991). These two theories can serve as a tool to look at the complex relationships between basic research units and their institutional environments.

To understand what these interactions mean for the basic research units' practices we also wish to conceptualize the dynamics of the research unit itself. Research units are part of scientific communities, and have their own logic and cultures (Becher & Trowler, 2001) that must be taken into account when looking at the basic units in their institutional environments and their responses to change. For this purpose we introduce the credibility cycle (Latour & Woolgar, 1979). This concept helps in making sense of the specifics of the world of science, where reputation is the most important asset of researchers and research units. The credibility cycle and its focus on reputation building and maintenance are important because we cannot expect to understand the responses of basic research units to their institutional environment without incorporating the norms and values of the social actors of which they consist, in our case the researchers. At the end of this chapter the combination of the three approaches leads us to a number of expectations on the responses of basic research units to their institutional environment.

In the following we subsequently develop our line of argumentation in addressing shifts in governance before we turn to organisational theories and the credibility cycle.

2.1 From government to governance

2.1.1 *Introduction*

During the last decades traditional state-centred governing arrangements have been critiqued and replaced by alternative modes of governance (Kooiman, 2000). A broad literature suggests that this shift – driven by economic, ideological, and pragmatic motives (Kickert, 1997; Pollitt & Bouckaert, 2000) – has modified the forms and mechanisms, the location, the governing capabilities, and the styles of governance (van Kersbergen & van Waarden, 2001). These changes from government to governance have sometimes been parallel to the introduction of new public management (NPM) approaches in public sectors with the idea of enhancing the quality of public services in terms of increasing their transparency, efficiency, and effectiveness.

New governance approaches have been at the forefront of discussions on public sector reform, including higher education (de Boer, Enders, & Leisyte, 2007). ‘Less government and more governance’ has become the widely shared credo (Mayntz, 1998; van Kersbergen & van Waarden, 2004) stimulated by a number of inter-related developments (Pierre & Peters, 2000).

- The first and most important reason to reassess traditional governance arrangements has been the economic recession and consequent problems of public expenditures in continuously growing public systems. Many public sector reforms, including those in higher education, are financially driven and are looking for efficiency gains (Pollitt and Bouckaert 2000).
- Second, developments such as globalisation, internationalisation, and Europeanisation have also questioned traditional nation-state centred modes of governance. Literally, ‘games without frontiers’ require new rules and pose new governance questions for actors such as states. Moreover, (new) powerful international actors have entered the scene (the European Union, the World Bank, the World Trade Association or the Organisation for Economic Co-operation and Development) that are promoting changes in the governance of public sectors.
- Third, there has been a certain disillusion with the governance capacities of governments and a related distrust in public sector performance. In

many countries governments have been blamed for not living up to public expectations with respect to resolving societal problems (Pollitt, 1996).

- Fourth, there has been a partly ideologically driven shift towards the market as a promising form of self-regulation in public service provision. Public sector organisations such as universities are encouraged to compete with each other and to 'sell' their services on various markets. This also requires a rethinking of various governance arrangements (Texeira, Jongbloed, Dill, & Amaral, 2004).
- Fifth, the rise of new public management as a new organisational approach for the public sector stimulated the rethinking of governance. According to this approach, public sector organisations should be managed in a more business-like way. Borrowing instruments and methods from the private sector should create organisations in which managers have the right and opportunities to manage (Pollitt, 1996).

Rethinking governance has led to new institutional arrangements in coordinating the public sectors (de Boer, Leisyte, & Enders, 2006; Kooiman, 2000; Mayntz, 1998). Authorities and powers have been redistributed across the various policy levels. In many countries, coordination has changed from a classical form of regulation dominated by a single actor, the state, to forms in which various actors at various system levels coordinate the system ('multi-level multi-actor governance') (van Kersbergen & van Waarden, 2001). Coordination increasingly takes place through interconnected policy levels with a substantial number of actors influencing agenda setting, policy development, policy determination, policy implementation, and evaluation (de Boer, Enders, & Leisyte, 2007).

This development has been reflected in a growing literature that addresses the shift from 'government to governance'. The social science literature shows an impressive list of definitions, concepts, and typologies on governance and the principle modes of coordination of social action. We can find dichotomies between markets and hierarchies; triangles with hierarchies, networks (clans), and markets; or quadrants distinguishing principles of coordination such as the community, the market, the state, and the association (Binsbergen, De Boer, & van Vught, 1994; Bradach & Eccles, 1991; March & Simon, 1958). What most researchers agree upon is that social coordination of modern societies should be analyzed in terms of a composite mix of coordination mechanisms and governance arrangements (Streeck & Schmitter, 1985). As Bradach and Eccles (1991) argue, the studies on social control mechanisms suggest that market, hierarchy, and relational contracting "are useful concepts provided we recognize that they are independent and can be combined with each other in a variety of ways" (p. 279).

We follow this line of reasoning as we address changes in governance in higher education and research more specifically.

2.1.2 *Shifts in governance of higher education and research*

The analysis of higher education and research governance systems has been at the centre of higher education research for decades. Clark's classic 'triangle of coordination' (1983) offers a good starting point for our discussion on the governance of higher education systems and the (supposed) changes. His triangle of coordination of higher education systems includes three axes: the state, the market, and the academic oligarchy. The three corners of the triangle represent, "the extreme of one form and a minimum of the other two, and locations within the triangle represent combinations of the three elements in different degrees" (Clark, 1983, p. 142). Clark refers to the US as a more market-like coordination of higher education, and Sweden and the Soviet Union as examples of a more state oriented coordination (for the list of abbreviations, see Appendix I). The UK and Italy were drawn as examples of an academic oligarchy being the dominating form of coordination.

Clark also stresses the existence of (unexpected) mixes of coordination mechanisms and related actor constellations:

What strange bedfellows we find! In one case, bureaucrats and academic oligarchs work together, to ward off all political forces and to eliminate market interaction. In another, centralisation means that political figures and central administrators join together to control everything as much as possible and to declare professor sand market processes as unworthy coordinators. In still another, decentralisation means not a strengthening of the market but appeasement of academic oligarchs and s strengthening of guild-like forms of linkage. (1979, pp. 263-264)

Following his triangle, higher education systems in continental Europe traditionally were often analysed as being dominated by the state and the academic oligarchy. Universities as part of the public sector were indicated as 'professional bureaucracies' (Mintzberg, 1983) which combined the political bureaucracy and professionals as the most influential actors in the steering of public sectors and their organisational units. In the Anglo-Saxon model the state plays a smaller role, since the academic oligarchy is mostly influential and the "authority distribution has combined faculty guilds with a modest amount of influence from institutional trustees and administrators" (Clark, 1983, p. 127) Traditionally in this model universities are responsible for self-management, each to admit its own students, to arrange its own courses, and to hire its own faculty; in that way it depended more on the market.

Further analytical and empirical investigations focused attention on the changing role of the state in the coordination of higher education and research. In the late 1980s and 1990s, widely acknowledged studies point to ongoing changes in the role of the state for many countries, though such changes did not take place at the same time, magnitude, or pace (Goedegebuure, Kaiser, Maassen, & De Weert, 1994; Neave & van Vught, 1991, Neave, 1988 #289). Maassen and van Vught (1994) propose two very influential models regarding the role of the state in higher education governance: state control and state supervision.

In the state-control model, a government closely regulates and finances higher education institutions. The model is based on the assumption of the rationalist perspective on top-down decision-making. It emphasizes the capacities of governmental actors to acquire comprehensive knowledge and to make the best decisions. It is an approach in which governmental actors try to steer an object by using stringent rules and extensive control mechanisms (Maassen & van Vught, 1994, p. 38). In terms of legitimacy, the state finds ways of intervening and imposing control under the umbrella of steering the nation's economy. Areas of control include access issues, degree requirements, curriculum, the examination system, and the appointment and remuneration of academics (Neave & van Vught, 1994, p. 8). In many countries centralized bureaucratic control by state authorities is accompanied by a strong position of the professional/academic oligarchy (Neave & van Vught, 1994, p. 7) while institutional leadership and management are weak and play a predominantly administrative role.

In contrast, the state-supervision model draws on the cybernetic perspective of decision-making and is based on the principles of monitoring and feedback (Maassen & van Vught, 1994, p. 38). Higher education institutions are responsible for running their own daily functions and management. In this model, the state sees its task as to supervise the higher education system in terms of assuring academic quality and maintaining a certain level of accountability. As Neave and Van Vught note "the state sees itself as a supervisor, steering from a distance and using broad terms of regulation" (Neave & van Vught, 1994, p. 9). From an empirical point of view, the key argument is that many European universities were traditionally steered by tight rules and controlled by the nation states while more and more countries shifted towards some kind of state supervision model accompanied by a growing emphasis on mechanisms of self-regulation, quality assurance, and accountability (Neave, 1988).

Further attention is paid to the meanings of markets as a governance dimension in higher education that is sometimes closely linked to business-like approaches in the management of universities. For countries where the state played a minor role in financing of public (or private) higher education and research and where universities had to find multiple sources of financing by bidding and competing, Clark has introduced the analogy of the market to

describe this kind of coordination via the famous invisible hand: "The market form . . . is a type of interaction in which, in pure form, no one is in charge and matters are disaggregated" (Clark, 1983, p. 30). Such self-regulation via the market as an alternative to the 'rationalist' steering via governmental regulation has found increasing interest in the study of governance in higher education and research (Braun & Merrien, 1999; Teixeira et al., 2004). Among other things, this literature suggests that the use of market-type coordination has found increasing attention among policy-makers in charge of public sectors, including higher education and research. Strengthening competition among universities, academic units, and individual academics; performance-based steering; and cost-sharing in the provision of higher education exemplify the range of market mechanisms that may play an increasing role in the provision, steering, and organisation of universities. It is argued that the introduction of market-type mechanisms in higher education is more appropriately addressed in terms of the emergence or strengthening of 'quasi markets':

Quasi-markets arise when governments fund institutions as if procuring services for their constituents . . . Students may exercise choice in deciding which institution to attend, for example, but the main element of market power is exercised by the state on their behalf. (Massy, 2004, p. 15)

Many governments have been rather active in developing 'market-driven' systems. They have been stimulating competition among actors in the field. Funding research increasingly through competitive-based grants and contracts provides a good example for such an attempt to strengthen competition between research providers in a quasi-market. Obviously, competition has long been a feature of higher education; for example- when it comes to the competition for human capital on the academic labour market or the competition for reputation as a social capital. What distinguishes these traditional forms of competition from more recent developments is their active experimentation with old and new instruments of market-oriented policies that wish to enhance competition as an element in the external and internal governance of universities.

Within the framework of the discussion on the modernisation of the state, further attention is paid to the strengthening of responsibility of administrative, quasi-public, and societal institutions. One important element in this debate on changes in public sector coordination concerns the role of public sector organisations, their leadership, and management. A consequence of the introduction of new governance arrangements is that the university as a corporate actor has increasingly gained importance in exercising collective control. The university was for a long time almost invisible as an independent actor in the higher education policy arena. Institutional leaders and managers

were traditionally referred to as the agents of both the ministry and the academics (see Clark's (1983) description of continental higher education systems). For many, the weakness of the universities derived above all from unsuitable management structures that were unable to exercise efficient organisational self-steering in a rapidly changing environment. Capacities for hierarchical self-steering of universities were thus expected to be strengthened along side growing expectations of self-steering capacities within the sector.

While there are significant differences between countries, e.g., between the Anglo-Saxon countries and the continental European countries, there is a substantive body of (comparative) literature that analyses such governance reforms and the rise of managerialism in greater detail (Amaral et al., 2002; Braun & Merrien, 1999; Goedegebuure, Kaiser, Maassen, & De Weert, 1994; Kogan & Hanney, 2000). One of the prime conclusions of recent comparative studies on new models of internal governance for universities indicates that this new managerialism matters, though in different forms and to a different extent (Amaral et al., 2002; Braun & Merrien, 1999). Overall, new managerialism is perceived as "executive leadership at the expense of the professional role in decision-making and instrumental rationality stressing 'the three Es'¹ and top-down structures, such as centralization and hierarchy" (Currie et al., 2003, p. 98). This goes along with a belief system in which universities are increasingly seen as "tightly coupled systems" instead of "loosely coupled ones" (de Boer, Enders, & Leisyte, 2007). In fact, this line of reasoning re-introduced a fourth governance dimension that had been incorporated in much earlier work of Clark (1979) who spoke of four principles of coordination by bureaucracy, profession, politics, and market. Later, in his study of entrepreneurial universities, Clark (1998) re-introduced the importance of executive leadership at universities as an important player in the game.

Particularly in the last decade, there is also recognition that external actors other than the supervisory state could and should have serious impacts on the goals and directions of a higher education system and its organisational units (Enders, 2002; Neave, 2002). The basic rationale for a certain role of stakeholders, including the government, rests upon a significant reinforcement of the external ties higher education systems and their organisations have with their 'environment'. The expectation to meet demands from business, local industry, and local communities is for example, a constantly emphasised priority in the policies of contemporary Western European governments. Likewise, the ability to devise efficient means of accommodating these demands is held to be a criterion for the success of higher education institutions. This may also be regarded as a

¹ Three Es - economy, efficiency, and effectiveness (de Boer & Huisman, 1999, p. 111).

form of institutional response to the emergence of a 'multi-interest' and complex series of external constituencies (Clark, 1998). The term 'stakeholder' points to a major shift in the roles assigned to those who participate in higher education institutions' decision-making as representatives of 'external society', just as it points to an equally major shift in the obligation of higher education to be accountable to the general public or to agencies acting in its name. This shift implies an active duty incumbent on 'stakeholders' to help negotiate or guide the terms of higher education's response to demands emanating from particular interests.

Overall, the literature thus reflects ongoing changes in governance itself as well as the further elaboration of classical concepts. De Boer, Enders, and Schimank (2007) have made an attempt to sum up these discussions and propose a framework based on earlier work (Enders, 2002; Schimank, Kehm, & Enders, 1999). They discern five dimensions that provide an analytical tool for the study of governance in higher education and research. They argue that these can be present in the governance of each and every higher education system, but that their importance differs across time and location. The authors also argue that these five dimensions offer a perspective to provide an analytical description of shifts in governance. These five dimensions are:

1. State regulation concerns the traditional notion of top-down authority vested in the state. Regulation refers to the promulgation of an authoritative set of rules.
2. Academic self-governance concerns the role of professional communities in determining the course and outcomes of the game.
3. Order in a system can also be achieved through the competition which influences the quality and allocation of goods and services. Competition in higher education refers to a competition between and within universities for strategic resources and for customers of their services.
4. Managerial self-governance concerns hierarchical steering. Here the role of university leadership and management in goal setting and decision-making is at stake.
5. Stakeholder guidance concerns activities directed through goal setting and advice. It concerns the provision of general objectives and procedural rules setting the framework within which actors have room to manoeuvre.

The five dimensions resemble and are built on more traditional work on governance and coordination in the social sciences and higher education studies. The first three mechanisms obviously build on Clark's (1983) classical triangle of state authority, academic oligarchy, and market forces. The fourth and fifth dimensions extend the list of forces and actors beyond Clark's triangle of coordination. They take into account recent discussions regarding the capacities for hierarchical self-steering of universities and the guiding hands provided by

the state and other stakeholders in higher education. Altogether, these dimensions provide a valuable perspective of the external and internal aspects of governance that will be used later to focus our attention in the analyses of shifts in governance.

2.2 Organisational responses to institutional change

In the following we theorize organisational responses to institutional changes which will form the theoretical basis of the empirical part of our study. The already mentioned shifts in governance in higher education and research lead to a different institutional environment for basic research units. This may imply changing audiences, rules, norms, and values that are likely to affect research activities at the shop floor level. To understand certain institutional environments as well as the interaction between a sub-organisational unit and its institutional environment, we need a theoretical tool. Two theories – resource dependence and neo-institutionalism – are useful in this respect. We first introduce the major elements and concepts of these two theories, then we provide the critique encountered in the literature and comment upon the theories' strengths and weaknesses.

We also theorize on the responses of the basic research unit as a sub-organisational unit. It is a part of a larger loosely-coupled and fragmented organisation (a university) and it is acting as a corporate actor with its own interest. It is a semi-autonomous entity. This implies it has a life of its own and at the same time interacts with its institutional environment on which it depends. To comprehend the dynamics at the sub-organisational level and the meaning of the changes for the practices of basic research units, we turn to the credibility cycle and propose a framework for our study followed by our three major expectations.

2.2.1 *Resource dependence perspective*

The resource dependence theory is a well known theory in the social sciences to explain organisation-environment relations and relies on a particular view of inter- and intra-organisational interactions. It departs from an open systems theory in its emphasis to explain how organisations act strategically and make active choices to manage their dependency on those parts of their task environment that control vital resources.

The resource dependence theory (Aldrich & Pfeffer, 1976; Pfeffer & Salancik, 1978) has strong ties to what has been labelled the political-economy model of organisations (Benson, 1975) and the exchange approach (Hasenfeld, 1972; Jacobs,

1974). This theory is implicitly predicated on a rational actor model of decision-making in organisations. Actors' behaviour is based on a calculation aimed at maximizing power and autonomy rather than pure efficiency (Tolbert & Zucker, 1996). As organisations are regarded to act via their management, and managers are seen to act strategically, the theory concludes that organisations also make strategic choices to adapt to their environment. Strategic choice, according to Hall (1999) implies that

...a decision is made among a set of alternatives in regard to the strategy that the organisation will utilize in its dealings with the environment. The assumption is that the environment does not force the organisation into a situation in which no choice is possible. (p. 279)

The organisation faces a set of possible alternatives in dealing with the environment. It must respond in one way or another since its needs the resources from its environment and it is necessary to adapt to environmental uncertainty.

2.2.1.1 Main elements and concepts

In general, the resource dependence theory stresses the dependency relations between organisations and their environment, power positions of different organisations, and strategic alternatives of those in organisational leadership (Pfeffer & Salancik, 1978). The power of an organisation is understood as a measure of the extent to which it can control responses and reduce its dependencies on others for resources (Provan, Beyer, & Kruytbosch, 1980; Thomson, 1967). Dependence is defined as the product of the importance of a given input or output to the organisation and the extent to which it is controlled by a relatively few organisations (Pfeffer & Salancik, 1978, p. 237).

The first assumption in this theory is that no organisation is able to generate all the resources it needs. At the same time not every activity can be performed within an organisation to make it self-sustaining. Consequently, organisations are dependent on their environment for resources. They might be raw materials, finances, personnel, services, or production operations that the organisation cannot or does not perform itself.

Resource providers in the environment are other organisations, see Hall (1999, p. 279). The issue of the availability and accessibility of resources is important here. If there are several providers of a critical resource, the organisation has a choice and consequently is less dependent on one focal resource provider in the environment. If there is a sole provider (a monopoly), the organisation has little power to bargain and its dependency on such a focal organisation is supposed to be very high. To understand and predict the actions of an organisation it is thus also important to analyze its environment in terms of dependencies.

Organisations anticipate, respond, and react strategically to changes in their environment because they want to protect, safeguard, or increase the resources that they need to survive, improve their performance, and decrease uncertainty. One problem is that resources an organisation needs are not always continually available (Pfeffer & Salancik, 1978). They can change. For example, new organisations can enter and exit, the supply of resources may become more or less scarce, labour market conditions may change, new funding rules, or new technologies can be introduced. Such changes may affect the interdependencies of organisations and their environments. If environments change, and we would argue that they constantly do, organisations have to constantly rethink their strategies concerning core activities which may include significantly changing their activities in response to these environmental factors or even closing down particular tasks (Pfeffer & Salancik, 1978, p. 234). Overall, the organisation's dependence on resources implies that an organisation is embedded in social and economic contexts that they cannot deny.

According to the resource dependence theory, the second assumption is that the more dependent an actor is on resources, the less powerful it is. In fact, organisations strive to obtain power, maintain autonomy, and reduce uncertainty in the context of external pressures and demands (Pfeffer & Salancik, 1978, p. 236). They want to limit their dependency.

In the view of Hall (1999), different levels of dependence and autonomy as well as different capacities, views, and levels of actor engagement, explain the variation of strategies to deal with environment among organisations. Organisations attempt to absorb interdependence and to reduce uncertainty: completely, as through a merger, or partially, as through cooperation or the movement of personnel among organisations. In fact, they create bridging strategies to deal with their environment in a proactive way. Organisations will attempt to manipulate the environment to their own advantage (pp. 279-280).

It is possible to discern different ways in which strategic choices are made about the environment. Firstly, actors can create new niches and change dependences themselves. Given that decision makers are active and can make choices about the environmental niche being occupied – more than one kind of structure is suitable for given environments. Organisations can enter or leave niches as they see strategically fit and useful for them. Thus, the third basic assumption of resource dependence theory is that organisational decision-makers have certain autonomy (R. H. Hall, 1999, p. 281). For example, universities and/or their research units facing uncertainty in their environment, (e.g., due to decreasing state funding) are attempting to look for new niches by diversifying their funding base and carrying out research for other contractors, such as non-profit agencies or industry. University leaders and academics try to use their room for manoeuvre to decrease their environmental uncertainties.

The second way in which strategic choices can be made about environments involves attempts to make others dependent on their resources. For instance, organisations attempt to create a demand for their products; they may enter into arrangements with other firms to regulate competition. Organisations in the public sector do essentially the same thing when they expand or fight for their jurisdiction. Organisations seek to reduce their dependency on other organisations. It is to an organisation's advantage to have other organisations dependent on it. Dunford (1987), as quoted in Hall (1999), notes that some organisations even suppress technological development through manipulating patents as a means of controlling resource dependence.

The strategic choices (i.e., organisational responses to changing environments) can be made based on the fact that particular environmental conditions are perceived and evaluated differently by different people. Environmental conditions are important only as they are perceived by key organisational decision-makers that have the discretion to make their own decisions. Different actors can perceive the same phenomenon quite differently. In this regard, the critical question is the extent to which their perceptions vary from "objective reality" of environments (Starbuck, 1976) as quoted in Hall (1999, pp. 281-282).

Given these possibilities for dealing with environments through deliberately creating strategies, resource dependence also points to certain limitations on the availability or feasibility of choices. There may be legal, financial, or economic barriers that may prevent an organisation from moving into a particular area. There may also be internal barriers that deal with the capacities of the organisation itself. If the organisation wants to influence the environment, it has to have the resources and capacity for that in terms of size, prestige, (man)power, or money. It is likely for instance, that a small state college would have less impact on the educational environment and would be more dependent on it than a school such as Harvard University, as the former is less prestigious and has most likely fewer resources as seen by Hall (1999, p. 282). Thus, a new strategy may require new resources that are not available, which obviously limits the capacity for change.

2.2.1.2 Critique

Resource dependence theory captures important aspects of the relationships between organisations and the environment, but it has certain shortcomings as well. First, it adheres to the rational actor model, where actors are utility maximisers. It ignores the operation of social influence processes such as imitation or normatively based conformity, which might mitigate or limit autonomous decision-making (Tolbert & Zucker, 1996, p. 177). In this way, certain influence such as normative conformity or the influence of the institutional

environment overall and institutional pressures upon the organisation are neglected or at least overlooked. This theory overly emphasizes inter-unit power differentials and pays less attention to hierarchical power differences. According to Hall (1999) hierarchical power differences must be considered in any analysis of strategic choice, since such differences can override inter-unit power struggles. Inter-unit power developments may have an important role in determining 'who rises in the hierarchy, "but once the hierarchy is set, the power of the positions at the top of the organization would appear to be most central to the strategic decisions that are made" (R. H. Hall, 1999, p. 280).

Intra-organisational factors are important in understanding how organisations react and interact with the environments. Here the 'political culture' of organisations is important. The power distribution within the organisation is critical in determining the nature of the choices made, thus linking the environment to the choices made through the power process operating within the organisation. The attention on power is required, since the power constellations affect the outcomes of the decision-making processes. Organisational units that have the capability of dealing with uncertainties and contingencies are those that obtain the most power within the organisation (R. H. Hall, 1999, p. 280).

Finally, as critics of the resource dependence theory emphasise, choices are path dependent, that is, previous choices reduce the number of future options. You can not start from scratch in every decision so to speak; previous choices have left their marks that are partly indelible. As Hall and Taylor (1996) note, it means that strategic action is not only "dependent on external dependencies", but on previous decisions as well.

2.2.1.3 Conclusion

Three insights of the resource dependence theory are pertinent in terms of our research. First, the theory is centrally concerned with the extent of organisational dependence on its task environments, where the organisation is constrained by the external dependencies of those who control resources. In this study, the resource dependencies of the basic research unit on its key providers of resources offer the context for studying organisational responses to environmental constraints. The organisational necessity of adapting to environmental uncertainty and coping with different dependencies are of primary importance. We assume that a new mode of governance changes the dependencies between the basic research unit and its environment and consequently this unit will respond in one way or another.

Second, the theory emphasizes that environments are partly negotiated and partially enacted (Pfeffer & Salancik, 1978). Here the active role of a basic research unit as a corporate actor is important; including its participation in decision-

making at the university, within the academic community and at the state levels. They try not only to adapt but also to control resource flows. The involvement of academics in different policy formation and implementation processes can serve here as an example. This insight allows us to understand the creation of strategies in basic research units that would not only help to adapt to the environment, but also actively manipulate the environment.

Third, the theory assumes a dynamic environment, and is thus appropriate for studying change. Shifts in governance are important in the context of our study. Further, the theory draws attention to how actors perceive their environment, interpret it, and how they take their perceptions of the environment into consideration when making strategic choices. Later we return to these assumptions derived from the resource dependence theory.

2.2.2 *Neo-institutional perspective*

A plethora of literature suggests that organisations are deeply institutionalized and that they may resist change (DiMaggio, 1983; DiMaggio & Powel, 1983; J. W. Meyer & Rowan, 1977; W. R. Scott, 1987). Organisations adhere to the myths in their fields; they conform to their institutional environment and adhere to external rules and norms while keeping their technical core untouched. From the neo-institutional theory, organisations respond to changes in their environment via ceremonial compliance; mimicking other organisations in their field while de-coupling their core technical activities from organisational change. In the following subsections we will elaborate upon this neo-institutional perspective.

2.2.2.1 Main elements and concepts

An important aspect of neo-institutional theory is its focus on the role of institutions in society. Institutions are defined in multiple ways depending on the discipline (e.g., economics, sociology, or political science).² Despite this, the point that most definitions³ in fact share is that institutions can be seen as a set of 'rules', both formal and informal, which influence behaviour of political and social actors (Keman, 1997, p. 2).

² There are, in fact, many new institutionalisms – in economics, organisation theory, political science and public choice, history, and sociology – united by little more than a common skepticism toward atomistic accounts and a common conviction that institutional arrangements and social processes matter (Powel & DiMaggio, 1991, p. 3).

³ (DiMaggio & Powel, 1983; P. A. Hall & Taylor, 1996; Keman, 1997; J. W. Meyer & Rowan, 1977; North, 1990; Peters, 1999; W. R. Scott, 2001; Scharpf, 1997; Williamson, 1975)

Here we focus on the sociological strand of the neo-institutional theory in organisation studies. Institutions are central to this theory where they can be perceived as 'rationalized myths'. In every organisational field there are claims of 'best' ways to organize, structure, and manage organisations despite the empirical evidence for such claims (J. W. Meyer & Rowan, 1977). Thus the social evaluation of organisations, and hence organisational survival, can rest on compliance to formal structures (that may or may not actually function), rather than on observed outcomes related to actual task performance as seen by Meyer and Zucker (1989).

The seminal paper of Meyer and Rowan (1977) offers this way of thinking about formal structure and about the nature of organisational decision-making: formal structures have symbolic as well as action-generating properties. In other words, structures can become invested with socially shared meanings, and can serve to communicate information about the organisation to both internal and external audiences in addition to their 'objective' functions. They state that to become socially accepted and to survive, organisations conform ceremonially in institutionalized environments to rationalized myths composed of accepted cultural rules. The environment thus is the main source of legitimacy while legitimacy is the main source which secures organisational survival. Consequently, organisations will seal off their core activities from the institutional environment in order to meet the inconsistent pressures for legitimacy and efficiency. Organisations will thus separate their formal structure from their core activities to avoid internal and external conflicts. The process is called 'decoupling' (J. W. Meyer & Rowan, 1977, p. 356) and is of particular importance in our study since we are talking about professional organisations that are known for being loosely coupled systems (Weick, 1976). In such a system, activities and decisions made at one level do not reflect in a patterned way at another level. Organisations' structural elements are only loosely linked to each other and to activities. Rules are often violated, decisions are often unimplemented, or if implemented have uncertain consequences, technologies are of problematic efficiency, and evaluation and inspection systems are subverted or rendered so vague as to provide little coordination (J. W. Meyer & Rowan, 1977, p. 343).

An interesting insight here is that organisations can 'mimic' change in their task environment while the technical core remains untouched. One of the examples is organisations who fail to perform but still exist successfully; these can be regarded as 'permanently failing organisations' as noted by Meyer and Zucker (1989). Such organisations survive despite evident inefficiencies that logically should cause them to fail. At the same time, they exemplify the persistence of organisations to stick to routines and beliefs even if reality asks for change. Here the use of structure for symbolic purposes is an important notion.

DiMaggio and Powel (1983) assume that organisations exist in 'fields'⁴ of other, similar organisations. Within fields organisations are homogeneous to a great extent because they conform to the same institutional pressures. For example, public universities by and large look similar when compared to other groups of public or private organisations. Neo-institutional theorists view organisational design not as a rational process but as one of external and internal pressures that lead organisations in a field to resemble each other over time. In this perspective strategic choices would be perceived as coming from the institutional environment in which an organisation is embedded (R. H. Hall, 1999, p. 290).

The strong focus on institutions does not automatically mean that actors as strategic players are completely ignored. The importance of actors as strategic players has grown in the later neo-institutional studies. This expanded neo-institutionalism emphasizes the leader's characteristics as a crucial element in the institutionalisation process, especially in times of development, instability, or a decline phase. Organisational leaders that perceive new situations and have enough resources may formulate and enact new strategies which reflect their power position and interests (DiMaggio, 1991; Greenwood & Hinings, 1996; Hensmans, 2003). The role of strategic action within the institutional framework has thus become important for institutional theory (Covaleski & Dirsmith, 1988; Hrebiniak & Joyce, 1985; Oliver, 1991).

Oliver (1991) has made an important contribution in developing taxonomy of possible strategic actions. These include acquiescence, compromise, avoidance, defiance, and manipulation. Acquiescence can take a number of forms such as habit, imitation, and compliance; these range from unconscious adherence to taken-for-granted rules or values to a conscious obedience to values, norms, or institutional requirements. In her view, organisations use acquiescence to enhance legitimacy and social support. However, when organisations face conflicting institutional demands, they tend to follow the strategy of compromise. This means they will attempt to balance, pacify, or bargain with external constituents. According to Oliver (1991) while 'balancing' is the least active role of the organisation where the key is the accommodation of different demands in response to institutional pressures, the most active compromise tactic is bargaining. Here an organisation exacts concessions from an external constituent in its demands. The third type of response to institutional pressures is avoidance,

⁴ By organisational field we mean those organisations that in the aggregate constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organisations that produce similar services and products. The virtue of this unit of analysis is that it directs our attention not simply to competing firms, as does the population approach of (Hannan & Freeman, 1977) but to the totality of relevant actors. (p. 148)

where organisations admit the necessity of conformity and achieve it by buffering themselves or escaping from institutional rules. The tactics include concealment, buffering, and other escape tactics which again range in terms of the level of response. A more active form of resistance to institutional processes is defiance. This includes dismissing, challenge, and attachment as tactics of increasing active resistance. Finally, manipulation is seen as the most extreme level of resistance to given institutional demands and the most active response to these pressures. It is intended to change the content of the pressures and the sources that exert them. Tactics involve co-option, influence, and control. Co-option neutralizes institutional opposition and enhances legitimacy. Influence is more generally directed towards institutionalized values and beliefs while controlling tactics involves specific efforts to establish power and dominance over the external constituents that are applying pressure to the organisation (Oliver, 1991, pp. 152-158).

2.2.2.2 Critique

Critics have pointed to a number of issues that the neo-institutional approaches do not address. First, the approaches have been criticized as “a static, constrained, and over-socialized view of organisations” (Powel, 1991, p. 183). Following Tolbert and Zucker (1996, p. 180), this may be related to the bias towards the ‘stasis’ in the approaches that are used by more phenomenologically-oriented versions of institutional theory. The problem is that an institutional approach has traditionally focused on how actors follow the institutional rules; such questions as how these rules are produced, maintained, and changed have not extensively been studied. Thus, this theory is weak in analyzing the internal dynamics of organisational change. It is silent on “why some organisations adopt radical change whereas others do not, despite experiencing the same institutional pressures” (Greenwood & Hinings, 1996, p. 1023). It denies the autonomy of an actor in making its own choices, within the limits of the existing institutions. In addition, the neo-institutional theory has been criticized for paying more attention to the roots of stability in organisations than to the sources of organisational change, the role of power in organisational development, or strategic behaviour (Covaleski & Dirsmith, 1988; DiMaggio, 1988; Oliver, 1991; Perrow, 1986; Powel, 1991).

2.2.2.3 Conclusion

Three major insights of neo-institutional theory are relevant in terms of our research. First, the theory is concerned with the compliance of organisations to their institutional environment and the mimicking of other organisations in the organisational field. Organisations do so by adhering to the rules, taken-for-

granted assumptions, myths, and routines about what constitutes appropriate or legitimate organisational forms and behaviour. In neo-institutional theory legitimacy is seen as a dominant factor guaranteeing survival and security. In order to gain legitimacy, organisations must find ways to convince other internal and external actors of their functioning so that others show 'confidence and good faith'. Organisations that face changing, conflicting, or inconsistent expectations on what practices they ought to use can maintain legitimacy by adopting designs that mask controversial core activities. Neo-institutional theory thus assumes that a changing institutional environment does not necessarily lead to organisational change but that it is more likely that organisations maintain stability since this is what they prefer.

Second, the term 'decoupling' points to formal organisational responses to changing external demands, while actual practices remain untouched. Decoupling mechanisms are adopted primarily for purposes of legitimacy and are kept separate from core activities. This is relevant for our study as we look how basic research units respond to new institutional environments that result from shifts in governance and explore what happens to their core activities. According to neo-institutional theory we may expect that de-coupling helps research units to keep research practices untouched while environment is changing. The theory also draws attention to the importance of institutional environments that may create new meaning systems for organisations. In our study, shifts in governance may provide such new meaning systems for the basic research units. Interesting questions are if this is the case and how the units respond to this.

Finally, the taxonomy of strategies of organisations employed in responding to institutional environment is a useful tool for our research. The range of strategies includes acquiescence, compromise, avoidance, defiance, and manipulation. The taxonomy ranges according to the level of resistance to institutional demands and the level of activism of organisational response. Acquiescence is the least active strategic action, manipulation is the most active resistance to the institutional environment. Three of these strategies –acquiescence, avoidance, and manipulation - both extremes and the middle ground will be in the forefront of our study. We adapt them in Chapter 3 to the context of the current study.

2.3 The two perspectives compared

Resource dependence and neo-institutional theories both stress that organisations are related to their environment. Both offer some propositions to explain the relationship between the organisation and its environment. They

claim that organisational choice and action are limited by various external pressures and demands, and that organisations must respond in order to survive.

The major points of divergence between the two theories are the following:

- their views on how organisations react to change (which strategies they adopt in dealing with the environment);
- how organisations are capable to react to change; and
- what is conceptualised as the major characteristics of the organisational environment.

In the neo-institutional theory, survival is linked to conformity to external rules and norms; in resource dependence theory it is crucial to control scarce resources and reduce environmental uncertainty by exercising power, control, or negotiation (Gornitzka, 1999; Stensaker, 2004). Overall, it has been argued that resource dependence theory tends to 'over-rationalise' the organisation, while neo-institutionalism tends to 'over-socialise' the organisation. Where one theory puts too much emphasis on the 'rationality', the other focuses too heavily on the 'bounded', that is, actors are limited by their cognition and normative accounts.

Since the 1990s there have been scholars who seek a middle ground between these two theories (Greenwood & Hinings, 1996; Kraatz & Zajac, 1996; Oliver, 1991; Tolbert, 1985). According to them, a fruitful combination of the two theories can be found. Tolbert (2000a) suggests that the institutional environments define the conditions under which dependency relations have effects. Huisman et al. (2002) note "Dependency relations are important, but their importance – and subsequent consequences – is mediated by norms and values of the institutional environment" (Huisman, Nordgard, Rasmussen, & Stensaker, 2002, p. 318).

Greenwood and Hinings (1996) argue that the resource dependence theory complements the neo-institutionalist theory, because market pressures may reconfigure power relationships within an organisation. At the same time, the institutional context "also acts to configure the power and status of groups within an organisation and not necessarily in a manner consistent with market exigencies" (Greenwood & Hinings, 1996, p. 1039).

Finally, both theories complement each other in their diverging views on actors and the conditions of acting. The resource dependence theory assumes an active role of a rational actor, whereas the neo-institutional theory introduces a more passive role of an actor. Both theories however, converge on the capability of actors to create strategies in response to their environment. While actors are motivated to reduce uncertainty, secure resources, and to change from a resource dependence point of view; actors from the neo-institutional point of view are interested in maintaining the status-quo via the common rules, norms, and routines.

2.4 The credibility cycle model of the research organisation

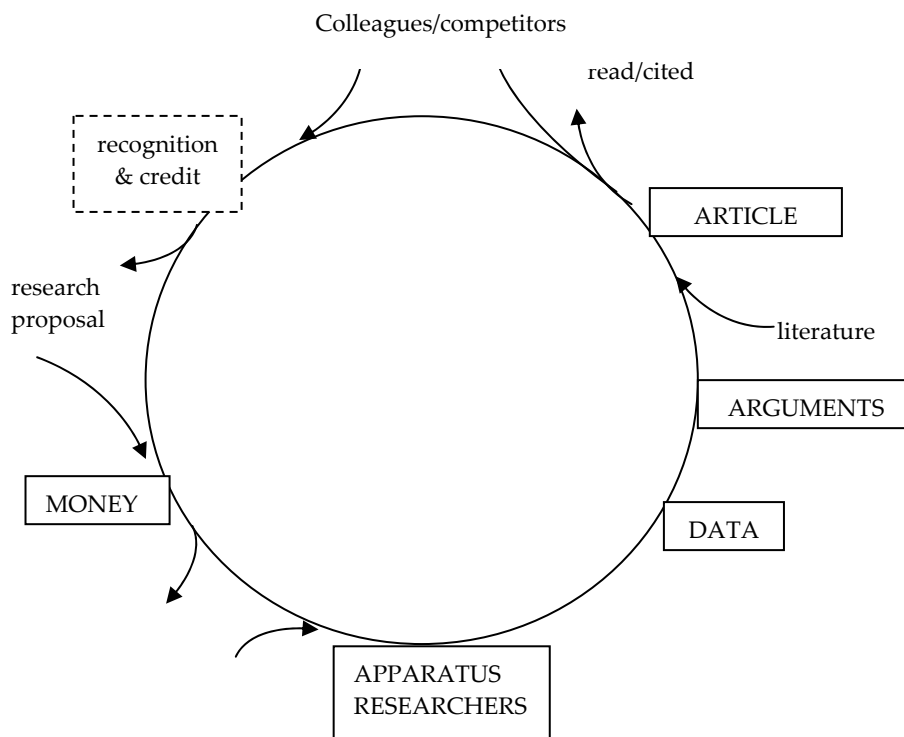
Among others, Greenwood and Hinings (1996) put forward that the specific characteristics of actors (e.g., their interests and values) play a role in the perception of the environment and the selection of strategic responses. This means that we have to take into account the characteristics of the world of research and science if we want to fully understand the motivation for the responses of the basic research units to their institutional environments.

The sociology of science literature has drawn attention to the importance of reputation and credit within the academic community (Garcia & Sanz-Menendez, 2005). Science studies and cultural studies in this field were influential (Edge, 1995). The production of scientific knowledge has been extensively studied in the micro-scale ethnographic 'laboratory studies' literature from the 1970s on. They aimed to explore 'the knowledge that is yet in the process of being constituted' (Knorr-Cetina, 1995, p. 140) focusing on the 'root' where knowledge production took place, the laboratory. Latour and Woolgar's (1979) classical study observes a biomedical laboratory in the United States in order to conceptualize the strategies and activities of researchers in terms of 'a credibility cycle' (see Figure 2.1). Here researchers put equipment, data, knowledge (arguments) into the research process, and the application of these primary inputs results in research products (articles, books, or reports). Articles may be read and cited by peers leading to increased credibility of the researcher, and to money and other resources (grants, tenure). With the aid of these resources, the researcher can start another round of data collection (Latour & Woolgar, 1979; Välimaa & Westerheijden, 1995). In other words, it is a single circle through which one form of credit can be converted into another: research inputs are turned into research outputs, and consequently the researcher's credibility. Credibility can be possessed, exchanged, shared, and finally accumulated or wasted (Latour & Woolgar, 1979, p. 192). The research loop tends to be continuous, in which prestige, recognition, and resource play a major role.

An important contribution of Latour and Woolgar is the notion of credibility where one type of capital (e.g., money, data, articles, recognition) can be converted into another; this is crucial for a scientist to advance. In their view, money, data, prestige, problem areas, and articles are interconnected and are parts of an "endless cycle of investment and conversion" (Latour & Woolgar, 1979, p. 200). They argue that credibility is more than simply recognition or reward for work. Instead, "scientists' behaviour is remarkably similar to that of an investor of capital" (1979, p. 197). For Latour and Woolgar credibility concerns "scientists' abilities actually to do science" (1979, p. 198). Scientists build their stock of capital by making investments that will secure their credibility: "the receipt of reward is just one small part of a larger cycle of credibility investment"

(Latour & Woolgar, 1979, p. 197). The credibility concept can apply both to the substance of scientific production (facts) and to the influence of external factors such as money and institutions. The credibility of a scientist is measured in terms of the trust and reliability others can invest in them: the more this is secured, the quicker the cycle of credibility turns and the stronger the stock of capital held by the scientist becomes (Packer & Webster, 1996, p. 429). Latour and Woolgar's (1979) account of credibility assumes a singular world for scientists insofar as "reward and credibility originate essentially from peers' comments on their and other scientists' work" (1979, p. 198).

Figure 2.1. The credibility cycle as developed by Latour and Woolgar (1979)



Source: Latour and Woolgar (1979), Wouters (1999, p. 205).

Hierarchies are an important factor to force or hinder the working of the credibility cycle. For example, it can impact the ability to choose 'risky' research themes. Those at the top and the bottom of the research hierarchy are not as afraid to take risks (the former has ample reputation resources, while the latter has nothing to lose) than those in the middle range who are the most conservative

and are willing to stay within the mainstream (Morris, 2004; Mulkey, 1979). At the same time, the speed of the credibility cycle also needs to be considered here since diverging to a 'risky' research theme and getting good results can fuel the cycle of credibility much faster than when following the mainstream.

The credibility cycle promotes an internalist view of scientific work and is seen as a quasi-economic model (Hasse, Krücken, & Weingart, 1994; Knorr-Cetina, 1982). The classical Mertonian school of science studies assumed that the science system has developed institutions to govern itself and the focus should be laid on these institutions while studying scientists at work. However, the internalist view of scientific work has been challenged.

There are certain traditional challenges for the scientist as an academic or a research group in an academic environment. First, there is the need to find resources for research. According to Knorr-Cetina (1982), looking inside-out in science has a potential problem when a scientist operates out of the scientific domain where the intrinsic value or credibility of research work does not count unless converted. What really counts is "the convertibility of the scientific work into the locally relevant objectives of actors outside of the scientific community, such as funding agencies" (Lehenkari, 2003, p. 505). A scientist has to exploit one's reputation not just in the science community but also outside of it, for example, obtaining resources from external financial backers.

Second, there is the tension between teaching and research that has been a longstanding issue in the professional lives of academics. Universities press for more teaching due to increased student numbers and at the same time, for better and more research outputs. This can lead to a further conflict of how to reconcile credibility building in research with the university teaching demands since teaching usually does not earn credits as much as research does (Lucas, 2006). Thus this tension has intensified in times of mass higher education (Clark 1996).

Third, the relationship between academics and their local organisational context has been changing. Here an important issue is the transfer of credibility within the academic community into reputation and support within their organisation. This has gained significance since with more management and leadership, more internal competition, more transparency and control there has been a shift from a university as an arena for autonomous academics towards a university as an employer of knowledge workers (Braun & Merrien, 1999).

Fourth, what is credible for one audience is not automatically credible for another and researchers may need to adjust to new audiences and requirements. Etzkowitz (1998) notes the increasingly closing gap between research and its applications that puts pressures on researchers to view their results from a dual perspective:

1. from a traditional research perspective in which publishable contributions to the literature are entered in the 'cycle of credibility';
2. from an entrepreneurial perspective in which results are scanned for commercial as well as intellectual potential (Etzkowitz, 1998, p. 828).

In other words, researchers have to adapt to different audiences when it comes to their research practices. For example, in the study of a patenting culture in science Packer and Webster (1996) find that the social worlds of academic and patent production are different and that scientists have to translate scientific novelty between the two (Packer & Webster, 1996). The key differences are in terms of context, actors, timing, texts, and rewards. Although scientists move between the two 'worlds' or audiences, they need new competencies for patenting, and they also have to confront uncertainties since they face the world that evaluates scientific novelty differently. However, both audiences are integrated into one credibility cycle of researchers because "they have to map it onto their more central activity as professional scientists" (Packer & Webster, 1996, p. 451). Although the idea of increasingly dominant Mode 2 research in the context of application has been debated, it has certainly gained ground in the political discourse on the role of research in society (Gibbons et al., 1994).

All this leads us indeed to a more complex picture of the academic credibility building process. The expanded concept of credibility thus is pertinent since it helps understand that researchers convert the credibility earned in scientific work outside the scientific community:

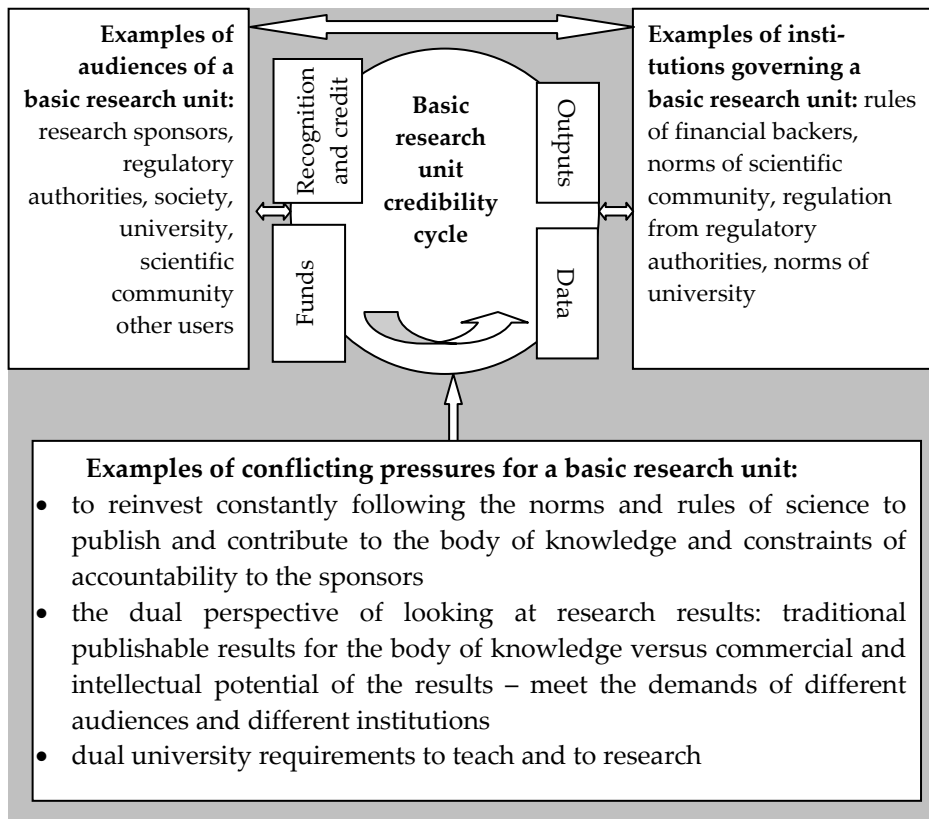
1. Credibility is achieved in continuous and reciprocal negotiations in different discourse systems. It is not stable but dynamic and vulnerable, thus requiring constant renewing.
2. Means required for achieving credibility are diverse and include scientific arguments, material entities, citations, patents, and mass media representations.
3. Creation of credibility occurs in several arenas that interact with each other, such as financial backers, the scientific community, regulatory authorities, and professional and consumer marketing (Lehenkari, 2003; Morris, 2004; Packer & Webster, 1996; Wouters, 1999).

This complexity is represented in the Figure 2.2 below. Looking at it we can see that different audiences (such as the scientific community, research sponsors, university and regulatory authorities) are important for the credibility cycle of basic research units. They exert the rules, norms, values, and beliefs that are also part and parcel of the institutional environment of basic research units. The credibility cycle of a basic research unit is functioning in a multi-layered institutional environment that exerts pressures, which can be constraints and enablers. They comprise:

- the constraints of a research unit as an investor to reinvest constantly while following the norms and rules of science to publish and contribute to the body of knowledge;
- the constraints and enablers of accountability;
- the constraints and enablers of the dual perspective of looking at research results: traditional publishable results for the body of knowledge versus commercial and intellectual potential of the results;
- the constraints from the university to produce research outputs while also manage the increasing teaching loads (Etzkowitz, 1998; Lucas, 2006; Välimaa & Westerheijden, 1995).

Interestingly, this research process cycle is applied to the groups of researchers while they also pay attention to internal stratification within the group where individual credibility is important. Latour and Woolgar (1979) define a group from the point of view of credibility building: "a group can be thought of as the result of the intertwining of several trajectories" (p. 214). Trajectory here refers to the career trajectory of a researcher, which implies moves from one position to another, evaluated by devising a kind of balance sheet which presents individual careers in terms of the credit (cultural capital, social capital, operations) with which they started and the position in which they invested. Thus they interpret group organisation in terms of the accumulated moves and investments of its individual members. The conjunction of participants' trajectories makes up a hierarchy of administrative positions (Latour & Woolgar, 1979, pp. 214-216).

Figure 2.2. The credibility cycle of a basic research unit and its institutional environment



Based on: (Latour & Woolgar, 1979; Lehenkari, 2003; Morris, 2004)

2.5 Basic research units in a changing institutional environment

As we have seen in Figure 2.2 basic research units function within the constraints and enablers of their multi-layered institutional environment that enables them to build their credibility. The scientific community, research sponsors, university and regulatory authorities are important for a basic research unit's credibility cycle as these audiences exert the rules, norms, values, and beliefs that facilitate and possibly obstruct the credibility building process of basic research units. Following the previous discussion on the shifts in governance, we can reflect on the possible impacts of the complex changing mix of the modes of governance on a basic research unit's credibility cycle and its research practices.

We would argue that shifts in governance have a potential to change the credibility cycle of a basic research unit. The shifts in governance towards 'good

governance' and 'better performance' can be enacted to achieve efficiency gains within the academic research system through institutional change. The attempts of achieving more output with the same or less input may affect the credibility cycle of research units in more indirect and potentially unintended ways. Growing competition for external research funding, criteria set up for research assessment exercises of different kinds, changes in workloads, and promotion criteria of academic staff provide examples of institutional changes aimed at efficiency gains that at the same time most likely change the rules of the academic research game.

We assume that researchers in principle want to design their own research questions and keep their professional autonomy as much as they can. However, due to changes in the credibility cycle related to the shifts in governance, other stakeholders may start defining or prescribing research problems and researchers may become affected by this. For example, in the case of research organized on market principles, where research units take up projects supported by external funding bodies including government and private sector firms, the research agendas of researchers may be affected by the priorities of the external funding bodies with their vested interests. At the same time, as seen from the study of scientist careers in government research establishments (Ziman, 1989), the credibility cycle can be a constraint for a group of scientists to shift their directions of research, since they risk making their current credibility irrelevant.

Further, the speed of the credibility cycle may increase under new governance arrangements. For example, there may be no time for risky lines of research since there is the urgency to get results, to be accepted by peers, and to publish as soon as possible before some other group publishes the same kind of results. Additionally, the possibilities of speeding up the cycle are not equal for all disciplines and all research groups; competition brings in the notions of 'winners and losers' in different fields of research and stratifies the system even further cross-disciplinarily and cross-institutionally. Such adverse selection may be aided by specific policy goals that accompany shifts in governance.

While looking at the influence of shifts in governance on basic research unit's credibility cycle it is important to keep in mind that there are complex dynamics between the academic community and users of research. This can have a certain impact for encouraging basic research units to carry out risky research or to stay within the mainstream. While a policy agenda supports excellence and innovation, authorities in fact may restrict it with certain instruments (such as priority setting, and/or strategic funding) and may foster mainstream research. Very often, external funding bodies require deliverables; even at the proposal stage they expect researchers to foresee the outcomes of the project.

Further, we argue that shifts in governance may encourage researchers to shift towards multiple audiences in their institutional environment, since 'relevance' is

added to the traditional notion of 'excellence' in research. Traditionally, the academic community has been the most important audience for basic research units where the norms of science have been the most important institutions. With shifts in governance however, other audiences, such as regulatory bodies and industry, among others, may become very important for basic research units. Therefore, besides the self-driven academic choices, output preferences may depend on the audiences that provide for research financially as well as support it ideologically. The financial dependency on external sponsorship as observed by Becher and Trowler can lead to "political and commercial intervention" (Becher & Trowler, 2001, p. 177). This can mean growing accountability measures, asking for deliverables outside the traditional outputs in a particular field of research. In turn, this may impact the credibility cycle as credibility has to be built for multiple audiences, not only for the academic community.

Finally, with the shifts in governance, teaching and research nexus may change at universities, which means, there may be changes facing the dual university requirements to teach and to research. The separation of functions is a part of the policies that aim at encouraging more intra-organisational efficiency and effectiveness by separating personnel categories as well as organisational units with the help of separate funding for research and teaching. This could contribute to the separation of the two activities and indeed slowing down or speeding up the research credibility building process for basic research units. The possible impact would depend on the extent to which the research units will have to separate the two activities and spend time on teaching rather than research.

Although we will elaborate of the above potential impacts in Chapter 3 even further, we can now conclude that there may well be a fairly close relationship between the shifts in governance and the credibility cycle of the basic research units. The question still remains to what extent a basic research unit will follow traditional rules and norms of science and build its credibility solely in the scientific world, ignoring the demands of changing institutional environment? Or will they feel the urge to respond to other audiences since they affect the path of the credibility cycle? The resource dependence and neo-institutional theories could contribute to the explanation of the responses of basic research units to their changing institutional environment.

As found from the two theories and the observations of Latour and Woolgar (1979), basic research units can face a potential array of institutional constraints and opportunities coming from their institutional environment. They constantly have to manage their capital to get things going by complying with the rules of the game of a scientific community as well as external financial backers as seen in the neo-institutional theory (DiMaggio & Powel, 1983). They also have to justify their use of resources and confidence which they had borrowed, being accountable and dependent on their resource providers. In the case of having

high credibility, basic research units may be proactive and influence the focal resource providers as the resource dependence theory postulates (Pfeffer & Salancik, 1978). In other words, they have to reduce their uncertainty and manage their dependencies. Both theories suggest that research units will attempt to reduce environmental uncertainty strategically responding to the changing environment. The response will vary in the level of resistance to the institutional pressures from the environment (Oliver, 1991).

To explore the responses of basic research units to these changes in institutional environment, a concept of uncertainty coming from both resource dependence and neo-institutional theory is helpful. Environmental uncertainty is predicted to be a significant dimension of context that affects organisations' conformity or resistance to institutional demands and expectations as noted by Oliver (1991). Pfeffer and Salancik (1978) define environmental uncertainty as "the degree to which future states of the world cannot be anticipated and accurately predicted" (p. 67). According to the seminal article by Oliver (1991) the proponents of both theories suggest that uncertainty will interact with multiplicity, "insofar as multiple, conflicting constituent pressures tend to exacerbate uncertainty" (Oliver, 1991, p. 170). She argues that organisational decision-makers have a strong preference for certainty, stability, and predictability in organisational life. Building on these definitions we conclude that perceiving uncertainty in the environment can be an important source of motivation to act in a certain way. The uncertainty in the context of our study as one of the consequences of the shifts in governance would thus mean that the perception of insufficient resources available for a basic research unit would undermine the building of its credibility cycle and threaten its reputation building process.

Organisations, and in our case, basic research units, will respond by creating strategies depending on the level of perceived uncertainty in their environment. In the next sub-chapter we present how we expect basic research units to respond to changes in their institutional environments.

2.6 Expectations

Given the theoretical points of departure discussed so far, we assume that basic research units as part of an open system will respond to changes in their institutional environments. We also assume that these environments have been changed due to shifts in governance. Both resource dependence and neo-institutional theory suggest that organisational responses are to some extent shaped by the environment with which the organisation interacts. The resource dependency view holds that organisations adapt to their resource dependencies

through interpretation of the external constraints and altering the situation confronting the organisation. They can even manipulate the environment. The neo-institutional perspective emphasizes how organisations conform to norms and beliefs in their institutional environments symbolically, but do not alter their core activities (they de-couple). A combination of these two perspectives offers a range of principle responses to the institutional environments. Specifically, organisations may respond in different ways ranging from passive acquiescence to active manipulation of external demands which differ according to the level of resistance and adaptation to institutional changes (Gornitzka, 1999; Oliver, 1991). We have argued that the types of responses of basic research units will depend on the level of certainty/uncertainty found in their environment. Environments differ according to the level of certainty/uncertainty found regarding the resources available and the possibility to transfer resources into credits to build reputation following the credibility cycle model. Based on the insights of the theoretical framework we have three expectations on how basic research units will respond to their institutional environment:

1. *We expect that if there is low uncertainty in the institutional environment (sufficient resources available and they are successfully transferred into credits to build reputation) research units will retain stability in their activities and will create pro-active strategies to manipulate the environment and influence it*

Both theories maintain that organisations prefer certainty, stability, and predictability in organisational life (DiMaggio, 1988; DiMaggio & Powel, 1983; Pfeffer & Salancik, 1978; Zucker, 1977). The dependencies are predictable when there is low uncertainty; there is no need to take action and influence the environment to 'guarantee' enough credibility. At the same time, since reputation building within the credibility cycle is secured due to low uncertainty in the institutional environment, they become more confident in their activities and their future acquisition of resources and legitimacy because basic research units do not feel threatened. Under such conditions the manipulation of "institutional values and the constituents that express them" may be the likely strategies for achieving organisational goals (Oliver, 1991, p. 171).

2. *We expect that if research units have high credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), research units will symbolically respond by adapting formal structures and creating de-coupling strategies for their activities, thus ensure symbolic change.*

Oliver (1991) argues that when the environmental context is highly uncertain, organisations will attempt to re-establish the control and stability over future organisational outcomes. Here institutional conformity can protect from

environmental turbulence. Organisations are also more likely to imitate other organisations in the context of uncertainty (DiMaggio & Powel, 1983) which means they can symbolically respond by adapting their formal structures. Some attempt to buffer themselves from the vulnerabilities of operating in an unpredictable environment by stockpiling inventories or attempting to forecast trends. (Pfeffer & Salancik, 1978; Thomson, 1967) also noted that uncertainties will be concealed by delegating them to the backstage. Additionally, the credibility cycle regulates basic research unit's cultural capital and exerts pressure on research choices and strategies (Latour & Woolgar, 1979; Ziman, 1989). The units that have accumulated high credibility and a good reputation are likely to afford little change if any in their core activities even if there is high uncertainty regarding other resources. This can provide an impetus to create strategies to protect the gained capital on one hand, and to 'symbolically adapt' to external pressures on the other. While symbolically adapting to the changing environment of high uncertainty, they will buffer their core activities (i.e., create de-coupling strategies for their activities).

3. *We expect that if research units have low credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), research units will comply with the institutional pressures and change their core activities.*

As in expectation 2, organisations will attempt to re-establish stability in their environment by coping with trouble and mimicking other organisations in the highly uncertain environment (DiMaggio and Powell 1983). However, the groups that have low credibility will actually have to change; they cannot afford not to comply with new dependencies, they do not have enough academic capital (Latour and Woolgar 1979, Ziman 1987). They will try to re-establish control and stability over organisational outcomes by creating compliance strategies and actually changing their activities.

3 Methodological Considerations

This chapter provides the methodological considerations and research design of the study in three parts. First we introduce the methodology of the study in general in the light of its multi-level aspect. We then discuss the operationalisation of shifts in governance, responses of basic research units, as well as the research practices. Finally, we address research design issues, such as the selection of cases, data collection and analysis followed by a discussion of the limitations of the study. The conclusion draws attention to the central points of our methodological considerations and research design. In the following we elaborate on the major components of our study derived from the theoretical framework. Then we discuss the research design and address our case choices and how we obtained empirical data.

3.1 Multi-level analysis

The study has a case study design where we look at basic research units' responses to their (changing) institutional environment. According to Gläser (2002, p. 24), researchers "perceive institutions at different levels of aggregation and respond to them." Individual, organisational, regional, national, supranational, and global levels are used in social science studies. Each level has its own interrelated features and dynamics. They have a nesting effect; what goes on at one level constrains or enables what goes on at another (i.e., a mutually interdependent system). As Morris (2004) notes, exploring the cross-level effects and the mediation mechanisms can yield additional information about how a system operates as a whole and help explain the options and actions at one particular level. This conceptualisation is helpful in understanding the influence of reforms in the external and internal governance of the activities of basic research units at a university.

Our study covers three levels: the macro level, the organisational level, and the sub-organisational or shop floor level. The aim of this multi-level analysis is to analyze the responses of certain basic research units to their institutional environments, assuming that the environments may have nested internal and external components. One might argue for instance, that state policies may directly affect the unit's credibility cycle, and simultaneously influence university policies that in turn may have other effects on a research unit's operation and credibility.

3.2 Operationalisation

There are three components of this study. The first deals with shifts in governance in different higher education and research systems. Five governance dimensions introduced in Chapter 2 are of particular help to operationalise and analyse the complex processes at the macro and organisational levels of higher education and research systems. The second component is to explore the perceptions of researchers (or the research unit, see earlier comments) of their institutional environment. Third, we are interested in seeing how basic research units respond to their institutional environment and what that means for their research practices. We will operationalise the unit's responses by looking at strategies research units can undertake. The theoretical models of resource dependence and neo-institutional theory combined with the credibility cycle are used for this purpose. By research practices we mean problem choice with respect to research topics, research output preferences, risky and mainstream research, and the distribution of teaching and research activities (referred to as the 'teaching-research' nexus). The following elaborates on each of the three components.

3.2.1 *Dimensions of governance*

Our conceptual discussion in Chapter 2 led us to the five governance dimensions, as discerned by (Braun & Merrien, 1999; de Boer, Enders, & Schimank, 2007; Schimank et al., 1999)}, that together form a configuration that reflects a mode of governance towards higher education and research. The five dimensions are state regulation, stakeholder guidance, academic self-governance, managerial self-governance, and competition.

State regulation concerns the traditional notion of top-down authority vested in the state. This dimension refers to "regulation by directives" (Mitnick, 1980); where the government prescribes (in detail) behaviours under designed circumstances. Regulation refers to the promulgation of an authoritative set of rules. It primarily entails the use of legal rules, involving the specification of conditions under which activities may be undertaken. It implies controlling an actor's behaviour through monitoring, standard setting, inspection, warranty approval, certification, arbitration, and so on.

Academic self-governance concerns the role of professional communities in determining the course and outcomes of the game. Collegial decision-making within universities and the peer review-based self-steering of academic communities are classic examples of how academics can control their own work. Here the roles of academics in the running of the university through the Senate or faculty boards, or on an individual base would be important. In addition, the role

of professional communities in funding decisions of sponsors and in assessing not only of individual academics and their publications but other research groups and organisations also needs to be taken into consideration.

Competition is the third dimension of governance. Order in a system can also be achieved through competition for scarce resources. Such competition influences the quality and allocation of goods and services. In higher education very desirable and competitive resources are money and academic prestige. Competition for university funding to attend conferences, competition for publications in top quality journals, competition for external grants, and competition for a permanent position can all be regarded as examples.

Managerial self-governance concerns hierarchical steering within universities and the roles of institutional leadership outside the universities. Here the role of university leadership and management in goal setting and decision-making is at stake. Elected or appointed management positions, management oversight of the budget allocation to academics, and the strategic planning of research coming from the management could all be indications of managerial self-governance. As with academic self-governance, managerial self-governance is not just restricted to the university's internal affairs. University leaders have their own arenas outside the university and can influence the higher education and research agenda via such networks.

Stakeholder guidance concerns activities directed through goal setting and advice. It concerns the provision of general objectives and procedural rules setting the framework within which actors have room to manoeuvre. In public higher education the government is likely to be an important 'stakeholder', but is certainly not necessarily the only player in this respect. Within a frame of laws the state may delegate certain powers to other (national) agents. Participation of external stakeholders in the university boards or representation of stakeholders in external funding bodies providing grants for research could serve as examples.

We assume that a configuration of governance is made up of a specific mixture of the five dimensions at a particular point in time. We use these dimensions as a heuristic tool to focus and organise our analysis of the changes in the institutional environments. The multi-level character of these dimensions will guide us in capturing the complex dynamics of the governance reforms in the respective countries. The five dimensions structure the descriptions of the shifts in governance in English and Dutch higher education and research systems, as presented in Chapter 4.

3.2.2 *Perceptions of basic research units*

The second component of the study is to explore how basic research units perceive their institutional environments. Resource dependence and neo-

institutional theories propose that responses of organisational units will (partly) be based on their perception of a (changing) institutional environment, the relevance of certain institutional features, and their meaning for opportunities and constraints. To explore the responses of the research units in the next sub-chapter we first turn to perceptions of the institutional environment.

From the neo-institutional theory point of view, changes in the institutional environments can create new meaning systems for organisations. Shifts in governance may provide new meaning systems for the basic research units to which they have to respond. From the resource dependence perspective, the environment may be perceived, interpreted, and evaluated in different ways by relevant actors within the organisation (R. H. Hall, 1999, p. 281). The role of the decision-makers is crucial here while other organisational members may have a stake in such a process as well. It is thus important to see what the similarities and differences are in the perceptions of the basic research units' environments. The perceptions will be understood as the opinions, evaluations, or judgments of various kinds concerning the audiences and institutions that surround basic research units in everyday work. For example, perceptions of uncertainty, such as judgments about low and unstable flows of resources coming from financial backers and their changing rules will be instrumental to understand the motivation of researchers' responses. This leads us to the third part of this study, examining the responses of basic research units to their institutional environment and what that means for their research practices.

3.2.3 Responses and practices of basic research units

The third component is to explore research practices of basic research units in response to changing institutional environments. To do so we first need to look at the responses of basic research units.

3.2.3.1 Responses

Based on the theoretical framework, we operationalise basic research units' responses through strategies created and implemented in response to changes in their institutional environments. Based on both theories, responses and strategies can range from passive compliance and conformity to external rules and norms and interests and desires of stakeholders, and from symbolic compliance to proactive manipulation and negotiation of the environment, such as making other organisations dependent on their resources (Oliver, 1991).

According to the neo-institutional theory, basic research units adhere to the myths and ceremonies of their institutional environment; i.e., they conform and mimic other organisations in their field. Oliver (1991) refers to such responses as

the strategy of acquiescence, which ranges from the tactics of passive habits to more active compliance to institutional pressures. In this study such adherence to the myths and ceremonies will be called a compliance strategy. It will mean conscious or unconscious obedience to values, norms, or institutional requirements that govern research units' operation within a given field of study.

Another possible response according to the neo-institutional theory is decoupling, where organisations seal off their core activities from the institutional environment in order to meet the inconsistent pressures for legitimacy and efficiency. Oliver (1991) points here to the avoidance strategy, where organisations admit the necessity of conformity and achieve it by buffering themselves or escaping from institutional rules. That means they separate their formal structure from their actual activities to avoid internal and external conflicts (J. W. Meyer & Rowan, 1977, p. 356). We call this strategy symbolic compliance. An example can be participation in official research evaluations symbolically adhering to their rules and writing the requested strategic research plans, while simultaneously doing the same type and amount of research as before without any significant change in its content.

From the resource dependence point of view, it must be acknowledged that a research unit can also play a proactive role. The role of a basic research unit as a corporate actor is important, since it participates in decision-making at the university, in the academic community, as well as in the regulatory bodies. In other words, it does not only adapt, but also can control and manipulate its institutional environment to some extent (Pfeffer & Salancik, 1978). Here the unit's strategy of manipulation is imminent. It can be seen as the high level of resistance to an institutional environment and the most active response to the institutional pressures since it is intended to change the content of the institutional pressures and the sources that exert those (Oliver, 1991). Examples of the manipulation strategy can be seen in diversification of the research outputs and resource providers or participation in the decision-making bodies of different audiences.

In our study we first look at the basic research unit's compliance to the rules and norms of their academic community as well as the rules and norms coming from other audiences, such as university management, external regulatory bodies, and financial backers as well as the type of compliance (conformity or symbolic compliance). These would include publication and other output generation strategies, strategies to obtain external funding and maintenance of the secure funding base, strategies to ensure 'do-ability' of their projects and involvement in collaboration activities, and strategies to stay in the same area of research (Morris, 2004, p. 19). To check for the attempts to more actively influence the institutional environment, we look at basic research units' involvement in different policy formation and implementation processes, memberships in different decision

making bodies external to the basic research unit, mergers or cooperation with other basic research units in the university, or strategic alliances with industry and foreign partners.

3.2.3.2 Research practices

Research is inseparable from the world of science, where “the institutional goal is the extension of certified knowledge” (Merton, 1973, p. 270). We understand research as a scholarly inquiry that aims at extending the knowledge base in a systematic way (Hazelkorn, 2003; Ziman, 2000). This includes contributions towards understanding and working on theoretical and practical problems; as well as activities that support research, such as creation of post-graduate student courses, supervision, and research training undertaken in the university setting.

Looking at the characteristics of research we find a plethora of distinctions about what constitutes research. The key dichotomy identified in the literature is between basic, fundamental, exploratory, pure, curiosity-driven, or academic science; versus applied science, directed research, mission oriented research, commissioned research, contract research, and technological development (Ziman, 1989). These distinctions between basic and applied however, are not crystal clear. A category somewhere in-between can be distinguished, for example the notion of strategic research; where basic research is partially motivated by long-term utilitarian considerations (Rip, 2002). As Ziman (1989) notes, it is difficult to find pure basic research with no application in mind since “a striking characteristic of most contemporary science is that the knowledge base is seldom more than a few steps, at least in principle, from the market place” (Ziman, 1989, p. 8). However, what traditionally makes research credible is its acceptance and approval by the academic community. As Merton states: “The ethos of science is that affectively toned complex of values and norms which is held to be binding to the man of science” (1968, p. 605). In other words, research practices should be understood in relation to the academic community, which represents the set of norms embedded in the social structure that surrounds science. The norms of Communalism, Universalism, Disinterestedness, Originality, and Scepticism are the core of it as derived from Merton (Ziman, 2000, p. 174). However, Mertonian science was never completely ‘pure’ since the interests of governments and bureaucracy in the utility of science were always present to some extent (Elzinga, 1985).

Today the policy agenda accompanying the shifts in governance towards ‘good governance’ and ‘better performance’ is not necessarily neutral to the understanding of Mertonian science as a primarily and dominantly self-driven activity of self-governed scientific production communities. As we see later,

institutional change may for example, be enacted to achieve efficiency gains within the academic research system. Such attempts of achieving more output with the same or less input do not directly aim to affect traditional operations and criteria of knowledge production. They may however, affect the credibility cycle of research units in more indirect and potentially unintended ways. Growing competition for external research funding, criteria set up for research assessment exercises of different kinds, changes in workloads, and promotion criteria of academic staff provide examples of institutional changes aimed at efficiency gains that at the same time most likely change the rules of the academic research game. Further, policies increasingly refer to university research as a possible source of application, innovation, wealth, and job creation. Research foresight activities, research priority setting, and accountability measures that stress the relevance and problem solving capacity of academic research have gained ground including a more utilitarian perspective on the economic potential of academic research (Ziman, 1994, 2000). In this context, Ziman (2000) notes a shift towards more professional norms among researchers; namely proprietary, local, authoritarian, commissioned expert work (2000, p. 174).

Such changes in the context of knowledge production have stimulated debates on their potential and factual impact on the credibility cycle and the research practices of academics. Here the stages of the research process are pertinent (Välilä & Westerheijden, 1995, p. 387) as well as the interplay between research units, their academic communities, and other external stakeholders and audiences as depicted in the discussion of the institutional environment of the basic research unit's credibility cycle. Thus, by looking at the responses of basic research units to the changing institutional environment, we will be able to better interpret what changes in the institutional environment mean for their research practices.

Bearing in mind the various and overlapping dimensions of research practices identified in the literature (Clark, 1991; Dilts et al., 1994; Enders & Fulton, 2002; Gibbons, 1984; Gläser et al., 2002; Neave & Goedegebuure, 2001), we concentrate on four of these dimensions in looking at research practices at universities: problem choice, risky and mainstream research, research output preferences, and 'teaching-research' nexus. In the following we describe each in more detail.

Problem choice

Traditionally, professors in universities had the autonomy to choose research themes on the basis of their idiosyncratic preferences. This autonomy renounces external influences, but cannot totally exclude them. Researchers call it 'academic freedom'. Here the scientific norm of originality requires freedom to undertake research of one's own choosing (Ziman, 2000, p. 170). This could provide huge variety in the pool of research. To be credible, science traditionally strives to produce knowledge that serves only its own interest. Although it is not possible

to achieve complete social objectivity since scientists are part of societies with their collective interests and cultural values in their non-scientific lives, the norm of disinterestedness is at the forefront of the scientific lives. This means that research should not be influenced by external considerations such as economic, political, religious, or other social interests. Scientists within this normative framework in principle do not care about the social problems; they solve first and foremost all intellectual puzzles without reference to their practical significance and contribute by producing “valid knowledge that sometimes turns out to be useful” (Ziman, 2000, p. 161).

It is claimed however, that the ethical code supporting the norm of disinterestedness cannot stand up to external pressures to exploit the increasing “instrumental power of science” (Ziman, 2000, p. 162). Although the assumption has prevailed that research problems arise from the research process itself, individual freedom has always been constrained to a certain degree by “material circumstances, historical opportunity, epistemic conviction, and above all, communal doctrine” (Ziman, 2000, p. 204).

When talking about influences on the problem choice, some interesting observations can be made. First, the influence on inputs is where external interests can be vested with the help of material incentives. Even with traditional problem choice where the solutions would contribute to knowledge regardless of practical application, there is always a possibility of eventual utility of the research results when choosing from the academic community pool of research questions that have not been yet solved. In the view of Ziman (2000), research is definitely affected by external interests. The question is the extent of influence and if external constituents make research their tool (Ziman, 2000, p. 171). He takes the argument even further stating that in the current reality of research organized on market principles, where research units take up projects supported by external funding bodies including government and private sector firms, the research agendas of researchers are affected by the priorities of the external funding bodies with their vested interests. For example, in the case of the UK, research councils favour projects with wealth-creating prospects; or with practical medical, environmental, or social implications (Ziman, 2000, p. 173). Another example is provided by Adams (2000) who claims that with declining public funding, university laboratories became more dependent on the nature and utility of their research and consequently shifted their research priorities. Industry becomes more important in setting the research agenda in such a situation (Adams, 2000, p. 82). In other words, external constituents can be important in problem choice.

When looking at the problem choice, it is important to look at the process of the formulation of problems, the participants, and what considerations researchers bear in mind. In other words, to what extent do researchers follow the

self-interest of academic ethos, or the academic community ethos, and to what extent do they adhere to norms of external users and make strategic choices about what kind of research to pursue? Or, to what extent are research topics framed and dictated by external actors? We assume that researchers in principle want to design their own research questions and keep their professional autonomy as much as they can. However, due to changes in the credibility cycle related to the shifts in governance, other stakeholders may start defining or prescribing research problems and researchers may become sensible for this.

We operationalise problem choice by looking at who is influencing the formulation of research areas. For example, research topics can be chosen following formal and informal requirements of the department; or priority setting (programmes) from external funding bodies, the academic community, or industry. These could include attending conferences where the academic community shares research ideas or dependency on the third party funds with conditions related to themes, contract research with the government or other possible users in society, and faculty or basic unit research programmes and strategic agenda settings. And of course individual academics can pick the research areas 'completely' by themselves.

Mainstream and risky research

Every research field consists of a broad mainstream that is legitimized by incremental progress. Sometimes it is understood as 'safe' research, where a researcher does not take too much risk of not producing research results since most of the ground has been already covered and only a small addition is achieved towards the bulk of knowledge in the field. However, many 'real' discoveries come out of serendipity and are challenging mainstream research. This means pursuing a more risky research perspective, which also can be called unorthodox or innovative research (Ziman, 1987, p. 52).

This is not to say that mainstream research should be undervalued or does not lead to discoveries. Mainstream research is the basis, the critical mass, and the variety pool on which risky research can be built and lead to major breakthroughs. Thus, it is very important for researchers to contribute to the mainstream and maintain it as this can be the source of innovation in the long run. Discovery is the major motivation for a researcher, since it is part of the academic ethos (Ziman, 2000). Here the autonomy of researchers is crucial since it allows maximum creativity and "enhances the possibility of unforeseen breakthroughs" (Geiger, 1985, p. 55).

Following this line of reasoning, we can assume researchers themselves are inclined to carry out risky research to rapidly increase their credibility and make a substantial leap in the credibility cycle instead of doing incremental research. This is of course provided they have adequate intellectual capacity and other

resources needed. However, since it is risky research and outcomes are uncertain, researchers could lose credibility as well.

The world of science has a self-steering mechanism based on its own incentive system linked to scholarly (usually disciplinary) advancement, peer review, and academic rewards. Research advancement largely depends on the cohesiveness of these instruments (Geiger, 1985, p. 69). However, when it comes to risky research leading to innovation, strong disciplinary ties might be a restraint rather than a facilitator. Researchers can be the guardians of the status quo and this is “inborn in the academic communities” (Becher & Trowler, 2001, p. 97). For example, this can happen when the evaluation/review boards are comprised of established scientists in the field, who may not be willing to support innovative research, but would be more interested in funding particular investigations and institutions (Elzinga, 1985, p. 205). In this case, the conservatism of the world of science might be a risk for innovation. At the same time, this coexists with the ‘radical chic’ of academia, where research fields may create their own path-dependencies, schools of thinking, and fashion (Becher & Trowler, 2001). For instance, one of the buzzwords in today’s research is interdisciplinarity. This means, the research problems are formulated and tackled not only within the bounds of an established discipline, but also in “the contexts of application” (Ziman, 2000, p. 209).

Academics expatiate on the virtues of interdisciplinarity, conjuring up visions of a community of scholarly saints, marching forward together under the banner of a final theory. (Ziman, 2000, p. 210)

Despite the disciplinary ties and academic conservatism, multidisciplinary team work has been acknowledged and encouraged especially by the funding agencies in certain research fields, as there is a belief that interdisciplinarity will spur innovation.

The role of different governmental funding bodies and their agenda on innovative research is worth mentioning. With the proclaimed advancement of knowledge production in societies, the importance of knowledge has been stressed at all policy levels. As Elzinga (1985) notes, this translates into the link between research and decision-making authorities on different levels (Elzinga, 1985, p. 207). The argument is that while a policy agenda supports excellence and innovation, external funding bodies in fact may restrict it with certain instruments (such as priority setting, and/or strategic funding) and may foster mainstream research. Very often, they require deliverables; even at the proposal stage they expect researchers to foresee the outcomes of the project. Arguably, one cannot programme discovery; room for serendipity, including the possibility to ‘fail’ in terms of outputs, needs to be available for researchers. They need to be

able to take time off to look more closely into some opportunity that came their way, and “to balance the risk of finding nothing against the possible reward for making a significant discovery” (Ziman, 2000, p. 218). In the context of shifts in governance, this can lead to mixed messages from the public authorities towards excellence and programmed research; academics may be too vulnerable to risk losing their credibility and would opt for carrying out mainstream research.

While looking at the influence of shifts in governance on basic research unit’s credibility cycle it is important to keep in mind that there are complex dynamics between the academic community and users of research. This can have a certain impact for encouraging basic research units to carry out risky research or to stay within the mainstream (Geiger, 1985, p. 67).

We investigate mainstream and risky research by looking at the research programs and projects that basic research units are involved in, self-estimates of researchers, and opinions of their peers whether or not they choose risk-averse approaches in their research.

Research output preferences

Research output preferences are the choices researchers make about their products. That is to say which products do they produce and which audiences do they serve? Here in particular we are interested in the role of the academic community (discipline), society, financial backers, industry, and regulatory bodies in determining output preferences.

The traditional communication medium in academia has been written material, either in the form of books or journal articles through which the scholars exchange their findings with others such as peers in the scientific community.

Certain mediums are preferred within specific disciplines that usually have established recognized practices in this area. Becher and Trowler (2001) have, for example, noted that in history the most prestigious outputs were books, while for ‘hard’ sciences the major outputs were articles; books only accounted for a small part of written output (Becher & Trowler, 2001, p. 111). Book reviews were important in history while they mostly do not exist in the ‘hard’ sciences which have thematic surveys of particular topics. Here the cited papers are discussed in factual terms. In each discipline, a certain medium has different status. There is a pecking order among journals and book publishers. Scholars are concerned with the impact factor of a particular journal – indicating the potential influence a particular article can make in that discipline. Some disciplines use impact factors of journals to decide where to publish. The differentiation also can be traced in the use of citations as impacts. Citation is “the inclusion in academic writing of formal and explicit references to the work of other authors” (Becher & Trowler, 2001, p. 114). Although it is a feature of every discipline, the purpose and function

of citations can differ as well. For example, citation counts can be a determinant of prestige among authors.

The shifts in governance may bring certain considerations for output preferences of researchers. Besides accelerating growth in knowledge, intensification of academic work, and the audit of research outputs, they may increase the competition according to traditional disciplinary standards. This builds the pressure to “accelerate research output and have imposed demands on academics’ time and lead researchers to decide whether to ‘publish or perish’” (Becher & Trowler, 2001, p. 113). Moreover, this could have implications for the traditional media of scholarly exchange, such as more emphasis on international, peer reviewed articles. The pressure on time might restrict long-term outputs such as books.

Historically researchers were relatively free to decide on research outputs of scientific inquiry in their “ivory tower” (Geiger, 1985, p. 55) and scientific work contributed to the world of science by broadening its horizons. Although a push for relevance is prominent in the current policy rhetoric, traditionally university researchers also had to serve certain audiences. Relevance pressure in research came from governments and scientific communities (Elzinga, 1985, p. 201). Similarly, according to Gibbons, the influence of bureaucracy on research outputs is not a new phenomenon. As he notes, the utility of science has been one of the major arguments to develop it throughout history. There has been always a certain utilitarian perspective on research and scholarship (Gibbons, 1984, p. 96). Recent higher education and research policies have put this quite high on the agenda and policy makers search for means to actively promote the relevance of research and scholarship for innovation, economic and social wealth, and job creation (Clark, 1991, pp. 107-108). Ziman (2000) takes this distinction further stating that ‘context of application’ introduces ‘trans-epistemic’ factors such as human values and social interests. This context produces knowledge not organized around theoretical issues, and not directly “subject to clear rules of coherence and credibility” (Ziman, 2000, p. 210). According to Ziman, what he calls ‘post-academic science’ concentrates on reliability in specific applications (Ziman, 2000, p. 211). Thus, the question of what determines research output preferences depends on the multi-actor environment, where in addition to academics other constituents become important, such as industry and broader society. Therefore, besides the self-driven academic choices, output preferences may depend on the audiences that provide for research financially as well as support it ideologically. The financial dependency on external sponsorship as observed by Becher and Trowler can lead to “political and commercial intervention” (Becher & Trowler, 2001, p. 177). This can mean growing accountability measures, asking for deliverables outside the traditional outputs in a particular field of research, striving for more socially applicable outputs that can

even be “at the expense of those areas of enquiry whose direction is determined by predominantly epistemological considerations” (Becher & Trowler, 2001, p. 177).

Obviously, there is a link between the types of research output and the distinction between basic and applied research⁵. In recent literature there are claims that such a distinction has “almost disappeared” and fluidity has come into the picture with the decreasing functional distinctions between universities, public labs, and industrial and other private research (Rip, 2002, p. 46). More than that, it is labelled as “outmoded” and “obsolete” (Hackmann, 2003, p. 120). This development leads to a phenomenon which can be seen as a combination of both fundamental and applied research; strategic research.

Strategic research denotes a type of fundamental research that combines relevance (to specific contexts) and excellence (the advancement of science as such) and has become apparent, at least in the fields of biotechnology and chemistry (Rip 2002). Hackmann (2003) after surveying policy documents in a number of European countries found that strategic research “features prominently” in the policy agenda, but it is not the case when it comes to interviews with the relevant actors. Her findings reveal that the distinction between fundamental/basic and applied research is still popular among scientists themselves, though the notion of strategic research is also emerging.

Thus, the audiences researchers serve may influence the type of outputs. This means that they also to some extent determine the research products and the communication medium towards these audiences. It is important to look at the variety of outputs in specific fields of research to grasp the stability and change in output preferences. We therefore operationalise research output preferences traditionally linked to a particular field of research, such as publications in peer reviewed journals, books, invitations to lecture or be a guest speaker at renowned institutes, prizes, and awards. Further, for other outputs (especially linked to applications), we look at publications in popular journals, public speaking, patents, licensing, volume of contract research, short-term employment contracts to work on commissioned research, the number and diversity of contractors,

⁵ To Ben-David fundamental research is “that research which produces contributions to knowledge in a field cultivated by a recognized community of scientists” (Ben-David, 1968, p. 17), while applied research results exclusively “in the solution of practical problems.” According to him they are not mutually exclusive. In our understanding, fundamental and basic researches are synonymous. Basic research in line with Ben-David’s definition means contribution to theoretical, empirical, or methodological notions of advancement of various disciplines and is geared to the academic community, or to a specific field of research. Applied research links to research utility while solving some practical societal problems. Usually it is carried out with the concrete application in mind and may be linked to industry or another external donor.

cooperation with outside audiences, and co-publication with industry (Ziman, 2000, p.173).

Teaching-research nexus

This dimension is not concerning research practices per se but the dual function of most academics being active in research as well as in teaching, and the related debates on the teaching-research nexus.

According to Wittrock (1985) both teaching and research appear in contemporary discussion and in the comparative and historical record. According to him, most debates on higher education and research assume a close link between teaching and research in universities; historically, this connection is uncertain and conditional (1985, p. 15). Recent policies increasingly question the functionality of a strong teaching-research nexus.

From a historical point of view we can differentiate between three principle models or types as regards the relationship between teaching and research. First, the pre-Humboldtian model is exemplified by the French system of higher education where research and teaching are separated in different institutions (Schimank & Winnes, 2000). The pre-Humboldtian idea was institutionalised in a division of universities and research institutes as far back as the 18th century. Research was carried out separately from teaching and was deemed to be mainly a researcher's own scientific inquiry (Schimank & Winnes, 2000, p. 404).

Second, the modern idea of an interrelated unity of research and teaching stems from Wilhelm von Humboldt's 19th century university ideal. This ideal emphasized the integration of teaching and research with a heavy assignment of research to universities and a blending of teaching and research in the professorial role (Clark, 1983, p. 98). The university in the Humboldtian concept did not exist "primarily for students or even faculty" (Clark, 1996, p. 100). Professors and students were linked through research in "a common search for truth, in the form of new knowledge" (1996, p. 100). This combination of teaching and research was declared as an important tenet of scientific education and is seen as one of the major reasons for the success of the sciences and the scientific output of German universities in the 19th century (Henningsen, 2006, p. 98). The Humboldtian type is thus distinguished as a unity of teaching and research in a situational differentiation of the two tasks as it is institutionalised in Germany (Schimank & Winnes, 2000). Further the third post-Humboldtian pattern is characterized by "a differentiation of roles and/or organizations and/or resources for teaching and research" although both roles are expected of academics at a university (Schimank & Winnes, 2000, p. 398). This pattern goes further than the Humboldtian type in terms of differentiation between the two activities as if to some extent found in the UK.

The proponents of the nexus see the synergy possible by combining teaching and research. According to Geiger (1985, pp. 54-55), the significance of the nexus can be distinguished at three different levels. First, it is intellectually useful for researchers to teach so they get acquainted with material wider than just their own research; teaching also requires new impetus and knowledge from research. Additionally, teaching supplies professional opportunities for researchers since positions in universities have traditionally been created mainly for teaching purposes while these positions also provide opportunities to do research. Finally, a distinctive feature of universities is their research training function for doctoral students (and post-doctoral junior researchers), where teaching and research are intrinsically intertwined (Geiger, 1985, p. 54).

Although the Humboldtian ideal is still alive in some countries in the policy discourse (Schimank & Winnes, 2000), the changing higher education and research systems in the last half century have increasingly moved these two university functions towards separation as the conditions for the existence of the nexus were markedly altered. First and foremost, the mass higher education and the accompanied growth of higher education sectors encouraged the differentiation among types of institutions, across study programmes within universities and within the most advanced level of university study as indicated by Clark (1996). In addition, the scarcity of resources for higher education facing unprecedented expansion had certain effects for research. As Schimank and Winnes note, the threats research faces are marginalisation and emigration (Schimank & Winnes, 2000). Researchers increasingly are expected to spend time on acquiring external research funding. At the same time, a research drift has taken place as "each major discipline, each major cluster of an academic field, and especially the research enterprise at large simultaneously intensifies and diversifies" (Clark, 1996, p. 103). Research requires more concentration of resources that are difficult to maintain in traditional university settings. University research increasingly moves in different directions out of traditional university settings (Clark, 1996, p. 103).

The separation of functions is also a part of policies that aim at encouraging more intra-organisational efficiency and effectiveness by separating personnel categories as well as organisational units with the help of separate funding for research and teaching. For example, in the UK the research assessment policies have increased differentiation among universities, including departments where research became "the prime motivator and mover" to the detriment of teaching (Lucas, 2006). Such policies contribute to the already complex balance between teaching and research (Henkel, 2000a; Lucas, 2006; McNay, 2003). Moreover, the massification of higher education can also be important for the teaching research nexus since higher teaching workloads may influence it further towards separation.

The nexus is complex and continually changes. We conclude that there is a continuum of the teaching-research relationship: at one end these two activities are separated structurally (different organisational settings) and conceptually (different activities), embodied in job descriptions stating staff, located at one unit, has to teach and to do research, while at the other end they can hardly be 'distinguished' from one another.

We operationalise the teaching-research nexus by personnel categories of academics, division of time for these two activities, separate evaluation of teaching and research, and the percentage of income from both activities as evaluated by basic research units themselves and as formally defined in their contracts and other documentation.

After the operationalisation of the key variables of our study the following section addresses the research design of the study.

3.3 Research design

3.3.1 *Multiple-case study design*

We have conducted a multiple case study that looks at similarities and differences in the responses of selected research units to changing institutional environments at a given moment of time across two fields of research and two countries. According to Yin (2003) a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. It is a particularly useful design when the research questions deal with what, how, and why questions and where an investigator has little control over the events. A researcher would use the case study method when aiming to cover contextual conditions believing that they might be highly pertinent to the phenomenon of study (Yin, 2003, p. 13). The above conditions apply when we study the effects of the governance models on research practices in university basic research units. What and how questions are central in our study since we explore what kinds of governance models can be found, how basic research units perceive and respond to policy reforms, and how this affects their research practices.

An important decision in terms of the kind of case study is: do we select single or multiple comparative case study designs? Yin notes that, both single and multiple-case designs are variants within the same methodological framework (Yin, 2003, p. 46). Pauwels and Matthyssens (2004) put forward an important argument to opt for multiple-case design at the risk of losing depth of a single case design. They argue that multiple cases help "to create more theory-driven variance and divergence in the data, not to create more of the same" (Pauwels &

Matthyssens, 2004, p. 129). Moreover, the multi-case design allows for comparisons among cases. Here diversity is important; "...the study of patterns of similarities and differences within a given set of cases" (Ragin, 1994, p. 113). Yin (2003) also notes that multiple case studies can be understood to produce more compelling evidence and result in a more robust study. In our study a multiple-case design is appropriate as we explore similarities and differences in the responses of basic research units to multi-level reforms. In our study, a case is a basic research unit at a public research university.

The basic research unit can be regarded as a corporate actor. A corporate actor has autonomous action capacities beyond its members. For reasons of joint action interested parties invest and pool resources into a separate body, which then is entrusted to act (for a specific set of goals) on behalf of its members and their interests (Coleman, 1990). Once created however, corporate actors do not remain mere agents – they develop self-interests and gain autonomy (Schneider, Dang-Nguyen, & Werle, 1994). Corporate actors establish a will of their own. They at least strive for the preservation of their existence; often they also try to expand their activity domains and competencies. In our case we assume that basic research units try to safeguard or increase their credibility to conduct the research activities they prefer. Treating research units as corporate actors means that these units can directly participate in decision-making. They are (parts of) a formal organisation, they have a real 'constitution', and purport both the interests of their members and more autonomous member-independent interests (Flam, 1990, p. 6).

Thus, the basic research units are organisational settings that have their own existence within a university and actively act as organisational sub-units. Becher and Kogan (1992) propose a well rounded definition of basic research units:

By basic units we mean the smallest component elements which have a corporate life of their own. Their identifying characteristics would normally include an administrative existence (a designated head or chairman, a separately accounted budget); a physical existence (an identifiable set of premises); and an academic existence (a range of undergraduate training programmes, usually some provision for graduate work and sometimes a collective research activity). (1992, p. 147)

In our study, the unit of analysis will be research groups within departments; institutes or research centres that have their own administrative, physical, and academic existence. These basic research units have their own organisational behaviour and setting and are supposed to act on the basis of the unit's interests and those of its individual members. Further, we assume that this interest is directly related to the unit's credibility.

3.3.2 Case selection

In a multiple case study design each case must be carefully selected so that it either “(a) predicts similar results (a literal replication) or (b) predicts contrasting results but for predictable reasons (a theoretical replication)” (Yin, 2003, p. 47). Others call the latter the logic of “theoretical sampling” (Eisenhardt, 1989; Glaser & Strauss, 1967; Pauwels & Matthyssens, 2004). Three criteria have been used in our study to select the basic units of public research universities in Western Europe based on theoretical sampling. We select contrasting cases to account for different institutional environments according to aspects such as country, discipline, and estimated quality of research. First, the selected countries differ in terms of shifts in governance in higher education and research based on the governance models discussed in Chapter 2. The countries in this study are England and The Netherlands. Also, the academic disciplines or ‘tribes’ may have an impact on the research identity of a basic research unit and its responses to change (Becher & Trowler, 2001). The selected disciplines are supposed to vary in several respects. We selected biotechnology and medieval history for this study. The third criterion is the perceived or estimated quality of the research, which relates to reputation (credibility). The estimated quality ranges from ‘middle/high’ to ‘very high’.

3.3.2.1 Country Selection

The selection of the countries is based on the differences in the shifts in governance in England and the Netherlands. Both countries were and are active in restructuring the university sector system. However, the starting point was different since both systems were based on different higher education governance models: the Anglo-Saxon (state supervision) and the Continental (state regulation) model. Shifts in governance also took different routes and led to different combinations of governance dimensions. The historical-institutional context and the national styles of governance influence the way in which governance reforms are implemented in these countries and how they affect research. Whereas England is generally seen as a more extreme case of the shifts in governance and an early adopter of rather fundamental managerial changes, the reforms occurred in a somewhat lighter and later fashion in the Netherlands (Kehm & Lanzendorf, 2006; Kickert, 1997) .

The higher education and research system in England developed in the 1980s into a prime example of top-down public managerialism (Braun & Merrien, 1999). Its three main features – business-like management, client-orientation and ‘market-like’ competition – have been explicitly reflected in official government policy (Kickert, 1997). During the 1980s and early 1990s the government gradually changed from essentially bottom-up allocation decisions to top-down

specifications of priorities, strategic directions, and managed research (Morris, 2004, p. 57). Here the increasingly important role of the research councils should be mentioned.

In the Netherlands, shifts in governance emphasized steering ensuring stakeholder participation inspired by ideas of cybernetic self-organisation in society (Dent, Van Gestel, & Teelken, 2007; Pollitt & Bouckaert, 2000). Debates on the limits of government steering (Kickert, 1997, p. 736) has continued not only in scientific circles but also played an important role in administrative and political circles in the 1980s which led to a more pronounced managerialisation in the 1990s (Pollitt & Bouckaert, 2000). Research policies however, were seen to “emanate from bodies which are fully representative of the scientific community as well as of government and research user interest” (Morris, 2004, p. 56). Given the differences between the two countries (see especially Chapter 4), we find it justified to concentrate on these two countries.

3.3.2.2 Selection of the fields of research

It has been decided to choose the cases in two contrasting fields of research to address the variety of “tribes and territories” (Becher & Trowler, 2001). Medieval history and biotechnology are selected as representatives of distinct research cultures of ‘soft’ and ‘hard’ sciences (Biglan, 1973). Also, the former can be seen more as a Mode 1 type of research while the latter more as a Mode 2 type of research (Gibbons et al., 1994). Even when the distinction of these fields of research is undoubtedly superseded and exaggerated, it cannot be denied that many cultural and organisational differences exist between them.

Biotechnology is considered to be a typical Mode 2 field of research as noted by Gibbons et al. (1994) in their study of the relationship between policy and developments in academia. Its supposed characteristics are fluidity; discovery in the context of application; problem oriented transdisciplinary knowledge organized more loosely in changing teams; applying relevance criteria for research; and networking with corporations and their research units, hospitals, and non-university public research institutes (Rip, 2002, p. 46). Medieval history can be seen as a typical Mode 1 field of research. Mode 1 research is seen as a traditional knowledge production in academia. It is basic research oriented, disciplinary embedded, uses (disciplinary) colleagues as the primary reference group and universities as the primary institutions for conducting research. In the view of Gibbons et al. (1994) these two modes of production are not mutually exclusive; they co-exist. The empirical grounds of this argument are still under investigation. However, Mode 2 knowledge production is becoming more and more heard in the policy debates since the argument is put forward that Mode 2

will be among the winners while Mode 1 will remain among the losers in the current knowledge economies (Schilling, 2005).

3.3.2.3 Case selection: the basic research unit

The third aspect in the selection of basic research units is the estimated quality of the research group itself. Here we want to distinguish between 'high achievers' and 'middle achievers'. The assumption is that (past) performance of the basic research unit that is, its credibility may have an impact on its reaction towards changing circumstances. One might argue for instance, that middle achievers must respond to institutional changes to survive or that they see shifts in governance as a means of closing the gap with the high achievers. Or to put it the other way round, high achievers have the possibility to ignore external changes, at least to some extent. Using partly pragmatic considerations, the two basic research units per disciplinary field of research and per country will be selected in the following manner.

First, we select the basic research units within universities with the understanding that they will differ in terms of the research performance/quality. Second, we select public research universities that have the research fields of medieval history and/or biotechnology. This meant looking at 'old' universities in England and comprehensive universities in the Netherlands. The 'new' university sector in England and the HBO-sector in the Netherlands were not taken into consideration since their focus is more on teaching than on research and we wanted to ensure the comparability of basic research unit's context.

We followed the same case selection strategy in both countries. We identified the units by looking at the available public rankings and national research evaluation results to inform our choices. First, we identified the basic research units in medieval history. Since it is a representative of Mode 1 research, medieval history basic research units were supposed to be highly departmentalised and a clear distinction can be made when determining different research groups. In England we followed the strategy of looking at the RAE 2001 results in History and from there produced a list of basic research units available in the country and applied our case selection criteria which narrowed our choice to medieval history basic research units in 'old' universities. In the Netherlands, we looked at the Graduate School of Medieval Studies reports, as well as the national evaluation results and made a list of basic research units in the medieval studies. Here it should be noted that medieval history in the Netherlands was mostly encountered as part of medieval studies. In the end we applied our selection criteria to the generated list.

Following certain considerations, we attempted to locate basic research units in both fields. Depending on the estimated performance of the basic research

units in medieval history and biotechnology we first picked universities with a high quality medieval history research group and a high quality biotechnology research group. Second, we chose universities that had relatively low performing research groups in both fields of research. We produced a table showing ‘matching’ basic research units in both fields as well as ‘stand alones’. The biotechnology basic research units also had to satisfy the basic criteria of comparable size and different research quality. If no such groups were available in the respective universities with the selected medieval history groups, we turned to additional sources of information to locate ‘stand alone’ biotechnology research groups. This was achieved with the help of data from national reports on biotechnology, especially looking at the distribution of major biotechnology clusters in the two countries. We then produced two lists for medieval history and biotechnology groups and merged those lists. The combined list had four categories: 1) universities with high achievers in both disciplines, 2) universities with middle achievers in both disciplines, 3) universities in between (i.e., one high and one low score) and 4) universities having only one group in one field of research (stand alones). In the English case two matches of both underperformers were indicated, while there were no matches for both excellent performers; thus we turned to the ‘stand alones.’ For further selection we used random selection. Finally, we verified the quality of the basic research units by approaching the experts in the field of medieval history and biotechnology as well as checking the citation index. In the English context we picked two biotechnology and two medieval history basic research units in four different ‘old’ universities. In the Dutch case we chose two basic research units within one comprehensive university. We named the basic research units: A1, B1, C1, D1, E1, E2, F1, and F2 where the capital letters mean a particular university and the number means a group per university. For example, E1 is a biotechnology group in the university E, while E2 means a medieval history group in the university E. The following Table 3.1 provides the overview of the selected cases.

Table 3.1. The cases of the study

Field of research	England	The Netherlands
Medieval history	University A, Case A1 (weak case)	University E, Case E1 (weak case)
	University B, Case B1 (strong case)	University F, Case F1 (strong case)
Biotechnology	University C, Case C1 (strong case)	University E, Case E2 (strong case)
	University D, Case D1 (weak case)	University F, Case F2 (weaker case)

3.3.3 *Data collection*

The logic behind data collection is to use multiple sources of evidence under the rationale of triangulation (Yin, 2003). The study used different sources of data: documents, literature, and semi-structured interviews. The macro level data was collected from 2003 to 2006 covering the period since the 1980s. This part of the data collection included major higher education and research policy documents in England and the Netherlands as well as policy studies of that period. During the same period of time the meso level data was collected which included relevant university documents; such as strategic plans, financial reports, research policy development plans, and evaluation reports.

The elements of the conceptual framework were operationalised in the interview protocols (Miles & Huberman, 1994). Interview protocols were different for researchers, university middle and top managers, and governmental policy makers. The key questions for researchers were related to the major questions about stability and change in their institutional environment- such as funding, research evaluation, and management, how they perceive the stability and change, how they respond, and what that means for their daily research practices. A cross-section of members was interviewed in each basic research unit. The sample included professorial and lecturing staff, research fellows, and post-doctoral researchers on contract. The interviews were used in the analysis of the case studies in England and the Netherlands at the micro level.

We are also interested in obtaining the views of the university middle and top managers. Their interview protocol covered the topics of university research policies, implementation at the faculty and departmental levels, their perceptions of the shifts in governance, and how they affect their university. Their responses were compared with what the governmental policy makers said about their policies not only in official notices and strategy documents, but also in a number of interviews. Policy maker interview protocols dealt with shifts in governance in their country focusing on higher education and research policy change since the 1980s. The views of university managers and policy makers provide complementary information for the literature and document analysis at the macro and meso levels. This information was also used to cross check the results of the document analysis (see Appendix III for the examples of interview protocols).

With the consent of the interviewees, the conversations were audio taped and lasted from 35 minutes to 1.5 hour depending on the availability of time and saturation of data obtained. Anonymity was assured. The interview protocols were used in all interviews. Field notes were taken during the interviews and after to record the impressions of the conversations, the setting, as well as possible observations about the interview context. Interview tapes were transcribed verbatim and coded for relevant concepts. The categories were

derived both from the interview protocol as well as from themes emerging from the corpus. NVivo software was used for this purpose.

Interviews were taken in March - June 2005 in England in October 2005 - January 2006 in the Netherlands. Contact was established with the university top management via a letter. Top management was asked if the university was willing to participate in the study. This was followed up by telephone contact with the relevant managers/their secretaries. All universities approached except one agreed to participate in the study. We replaced it with another 'old' university that was second priority on the list. The second step of communication was to contact the head of basic research unit by a letter and follow-up telephone conversation. Researchers were selected after discussion with the heads of basic research units or from self-nominations in response to email requests.

A total of 77 interviews were carried out: 16 in four basic research units in England and 16 in four basic units in the Netherlands, as well as 9 with the top and middle university managers in England and 11 with top and middle university managers in the Netherlands. 17 further interviews were collected with researchers related to the basic units, the policy makers and administrative staff of universities in England and 8 similar interviews in the Netherlands to gain further insights into the context of the higher education reform in both countries. Altogether six public research universities were visited.

The interview data was complemented with information drawn from observations; field notes; and gathered policy documents including internal memoranda, letters, university strategic documents, research and teaching quality reports, and budget data. Further evidence was found through internet web-pages, media reports, and on-site filled-in questionnaires by the leaders of basic research units. The questionnaires contained a set of performance indicators of research capacities: personnel categories of academics for research and teaching, distribution of time budget, financial flows in research and teaching, number of publications, licenses, patents, volume of external funding, co-publication and other cooperation with practitioners, variety of sponsors for research projects, priorities in the university research programs, and university problem choice guidelines (see Appendix IV).

3.3.4 Data analysis

Using the perspective of Marshall and Rossman (1997), who see qualitative data analysis as "a search for general statements among categories of data" (Marshall & Rossman, 1997, p. 111) and the procedures outlined by Holliday (2002), the raw data was brought together on the basis of their similarities into categories. This was achieved with the help of coding that discerned subject matter and meaning (Luborsky, 1994). We started with descriptive and topic

coding and ended with analytical coding (Richards, 2005). Further we started with open coding and proceeded with selective coding. This was achieved by creating broad categories, then relating them to subcategories. In this way a dense systematic analysis was made. When the core categories were decided, we related all of them to each other and the major core. At a later stage, the totally unrelated minor categories were discarded as irrelevant (Strauss, 1987 [2003]). A peer review and structured analysis were used to enhance the validity of the data categorisation by coding and of the interpretations (Strauss & Corbin, 1990). To increase reliability we did coder consistency tests for consistency over time and among colleagues (Richards, 2005). For the sake of parsimony, citations that best represented a category or opinion presented by the majority of the interviews were used (cited interviews were numbered in Arabic numerals as shown in the Appendix II). Special indication was provided when a unique minority voice was presented. The category headings were the basis for the data analysis (Holliday, 2002, pp. 99-100). Under each heading, extracts of data are taken from the corpus, put together with discussion, and used as evidence for the ongoing argument. During the analysis of different categories we created distance from the data by raising theoretically oriented questions about items in the data and thought in terms of the propositions of the study about the conditions and consequences of the changes in the institutional environment to basic research units' responses (Strauss, 1987 [2003], p. 162).

3.3.5 *Limitations*

3.3.5.1 *Sample size*

Due to the limited period of the study (2003-2006) and opting for its feasibility, we limited ourselves to two countries, two fields of research, and two case studies per field of research per country. We are aware that this will not provide a basis for generalizing our findings for the fields of research or for the countries included; we do not aim at generalisation. The approach we take aims at an in-depth study of what is happening in the basic research units selected in relation to the macro-level and meso-level reforms. Interviews with various researchers of the basic research units were a primary source of information for our in-depth studies. We complemented the missing information with other primary sources of evidence, such as questionnaires filled in by the heads of basic research units, policy and university documents, and national and university evaluation reports. We followed the principle of satiation of information, thus when more information was needed we contacted additional interviewees at different levels.

3.3.5.2 Selection of cases

The scarcity of precise and up to date information, and the complexity of biotechnology basic research units' structures, impeded the selection of the cases in England and the Netherlands; though there was rather extensive information available on the Internet. Although in the English case we could rely on the RAE 2001 results to a certain extent in selecting the cases, there was the problem of which units of assessment to use while looking at biotechnology: biology, chemistry, engineering, or materials? We opted for biological sciences and were aware that this was only the first step of selection. It was not until we contacted university's management and heads of basic research units that we could determine whether the group was indeed doing biotechnology. Similarly, although we looked at the history unit of assessment in the RAE 2001, we could not be sure that medieval history in that department was of the same quality as other periods in history and it was not until we contacted the basic research units and turned to other reports that we could discover where they stood in terms of research quality.

The picture was even more complex in the Dutch context, since there is no national research evaluation that would lead to league tables, and therefore no shortcut to find out the estimated research quality of different research units. We relied on peer assessment and advice from the university managers, which have their own bias. This lack of information was particularly acute in selecting the biotechnology cases, which resulted in selecting two cases being less different in research quality than expected beforehand. The main difference was however, that one was more centrally connected in the major national biotechnology networks, while the second was more at the periphery. This limitation is taken into consideration in the analysis and comparison of the particular cases.

3.3.5.3 Validity: Construct, Internal and External

Though the concepts of validity and reliability developed within the quantitative tradition require strict procedures, they can still be employed within the qualitative study as hallmarks to check if the information is adequate. According to Judd, Smith, and Kidder (1991, p. 29) validity is the degree to which the allotted instruments convincingly measure, explore, or describe the phenomenon in hand. There are three validities that were taken into serious consideration in the current study. Construct validity refers to establishing correct operational measures for the concepts being studied (Yin, 2003, p. 34). This study relied on literature for definitions and provided them when appropriate. Construct validity is usually a pitfall using a case study design (Yin, 2003, p. 35). To increase the construct validity, the study used multiple sources of evidence and discussed the controversial definitions. We have been careful in exploring the

same constructs in different sources of data. Furthermore, the macro and meso level analyses were reviewed by the experts in the field from England and the Netherlands. If there was no clarity of construct in the interviews, the interviewees were approached by email to verify the meaning of a specific construct. Internal validity is “the extent to which conclusions can be drawn about the causal effects of one variable on another” (Yin, 2003, p. 34). In the current study we propose expectations that point to causal relationships between the characteristics of the institutional environment (uncertainty and credibility) and researcher’s responses. Thus, a threat for internal validity can be seen. Contrasting cases based on the variation in the institutional environment that do not necessitate in-depth prior field work are chosen to cope with this threat. In our data analysis, we were sensitive to the differences between the basic research units and contextualized the comparisons.

Moreover, we used the triangulation technique to enhance the validity of interpretation. Four types of triangulation can be distinguished according to Patton (1990): 1) checking the consistency of findings from different data collection methods (methods triangulation), 2) triangulation between different data sources within the same method (data sources triangulation) 3) using multiple experts to review findings (analyst triangulation), and finally 4) using multiple perspectives or theories to interpret the data (theory triangulation) (Patton, 1990, p. 464). We used data sources and methods triangulation extensively in the study. In each basic research unit we compared the different data gained through interviews, documents, evaluation reports, questionnaires, and literature to nuance the interpretations presented in Chapters 6, 7, and 8. In some cases we checked preliminary interpretations with more respondents and analyst triangulation was used to some extent since colleagues commented on the analyses. In addition, we compared the views inspired by different theoretical perspectives.

Finally, external validity was observed throughout the study. This concerns the extent to which research findings can be replicated or generalized. Yin (2003, p. 34) defines external validity as “establishing the domain to which a study’s findings can be generalized.” We do not attempt to generalize but think that our study can deepen understanding of changing institutional environments and basic research units’ responses and bring forward some analytical generalisation. We attempted to set the parameters as clearly as possible and present the findings in a systematic way. Moreover, we were careful in our interpretations that are limited to the cases to ensure the external validity.

3.3.5.4 Reliability

Reliability is concerned with the degree to which the analysis or findings can be repeated by another researcher. Kirk and Miller define it as the “extent to which a measurement procedure yields the same answer however and whenever it is carried out” (1986, p. 19). A systematic error is the crucial threat for reliability; thus, the study had to be thoroughly planned ahead. In the current study, accuracy was followed at the stage of data collection by referring to truthful materials. Semi-structured interviews enhanced reliability. Within the qualitative research design it is difficult to fulfil the demands of identical measurements. However, we documented and described the research actions during the research process, and notes were taken at the data collection stage. Experts from England and the Netherlands were invited to comment on the macro level policy reform analyses. The interview protocol was pre-tested on three persons who held positions similar to the eventual interviewees. Minor adjustments and corrections were made. During the data coding process, peers were asked to code the same text to increase inter-coder reliability.

In terms of interviewing, the fact that the linguistic and cultural background of the author was different from those interviewed could have been a threat in the sense that the author may not have been able to register what was the meaning of the answers. However, knowledge of English and Dutch helped to understand the materials in these languages. It should be mentioned that half of the Dutch interviews were carried out in Dutch by a Dutch colleague. The reading and analysis was done by the author who lived in both countries for an extensive time period before the data collection and stayed for a prolonged period during the data collection. In the end, the peer review from the local English and Dutch experts was used to verify the meaning of ambiguous phrases and expressions, especially the translated texts from Dutch to English.

4 Shifts in governance in higher education and research systems of England and the Netherlands

In this chapter⁶ we present the shifts in governance in two higher education and research systems pertinent to our study: England and the Netherlands. We start this chapter with a description of the main actors and policy developments in England, followed by a discussion of the shifts in governance in this country. For this purpose we use the five governance dimensions introduced earlier: state regulation, academic self-governance, competition, managerial self-governance, and stakeholder guidance. Next, in a similar way we present the changes in higher education and research in the Netherlands. In the concluding section we compare the developments and policy changes in the two countries.

4.1 England

4.1.1 *The main actors in higher education and research system in England*

Salter and Tapper (1994, p. 129) describe the state-university relation in England as a hierarchical three-level system. The first level sets out the general parameters for the development of higher education and research. This is done by the government (the Cabinet, the Council for Science and Technology, and Parliament), specialized commissions, and the relevant government departments (the Department for Education and Skills and the Office of Science and Technology at the Department for Trade and Industry). The second level is the management of the system, allocating funds and monitoring accountability. The goals of the system are decided at the first level. How these are attained is largely left to this second level in which the Higher Education Funding Council for England (HEFCE) as well as the research councils (see below) play a central role. On the third level, the universities have autonomy to act within the boundaries of what is decided on levels one and two. There is of course consultation and

⁶ This chapter is largely based on my work in the project "Comparative Study on Management and Self-governance Models" supported by the German Research Foundation (DFG), see (de Boer, Enders, & Leisyte, 2007; Leisyte, de Boer, & Enders, 2006).

lobbying between the levels, but the predominant direction of the policy-process is top-down (Theisens, 2003, p. 42).

The two most prominent ministries in the higher education and research sector are the Department for Education and Skills (DfES) in England, and the Department for Trade and Industry (DTI). There has been a clear division of responsibilities for higher education and research between them. The DfES is responsible for planning and monitoring education services in England. Though the UK does not have a research ministry, the steering of the research councils is assumed by the Office of Science and Technology (OST), now in the DTI.⁷ The OST also coordinates research policy across government, and runs the 'Foresight' programme⁸. OST's move from the Cabinet Office to DTI in 1995 exemplified government's push for research relevance to industry and the economy (OECD, 2001, p. 19). A Secretary of State, who is also a member of the Cabinet, heads each of the Departments. The Secretaries of State are appointed by the Prime Minister and are accountable to Parliament for controlling and giving direction to the UK's public education and research system.

Besides providing basic funding for universities, HEFCE also bears responsibility for the development of higher education and is a key actor in coordinating the periodic Research Assessment Exercise (RAE). HEFCE also has a resource planning function in the English higher education system. It advises the Government on the sector's needs, ensures that higher education institutions are financially healthy and that the quality of their academic programmes is adequate (HEFCE, 1999, pp. 2-3).

Research councils are important organisations for universities at the national level. There are eight UK research councils each established by the Royal Charter. Their statutory control is exercised by the DTI and supported by the Director General of Research Councils within the OST. They fulfil the objectives set out by the 2003 White Paper 'Realising our Potential: A Strategy for Science, Engineering and Technology' and function as executive, non-departmental public bodies that provide strategic thematic guidelines for research and provide major research project funding for academics at universities. They advise the government and the university sector in most fields of research. Each of the research councils is governed by a council whose members (representatives of academia, business,

⁷ The DTI is responsible for the management of the government's science budget, that is, the budgets of the research councils and R&D activities in universities which are funded by organisations other than the councils.

⁸ Following the 1993 White Paper, a new (for the UK) policy: Technology Foresight was central to the government's strategy to meet the need to exploit more effectively the potential of UK science and technology. Its main goal was to provide "a conceptual framework and a process through which emerging key technologies and markets could be identified and the determination of priorities for the public funding of science systematically informed" (Henkel, 2000b)

and industry) are appointed by the Secretary of State for Trade and Industry. The Secretary of State is answerable to Parliament for the council's activities. Research councils are important funding bodies for research and they use RAE results as criteria for distributing the funds. In addition to research councils, charities and industry should be mentioned since they account for just over 25% and 9% of financial support for university research (HESA, 2005).

The Quality Assurance Agency for Higher Education (QAA) is another important second level actor which is jointly funded by higher education institutions and the funding councils. The major aim of the QAA is to assess education quality in the universities that are funded by HEFCE and other funding councils. From 1993 – 2004 universal subject-based assessments of the quality of teaching were carried out under the auspices of, first a sub-committee of the funding council, and then the QAA. These subject-based assessments turned into the quality audits and today the QAA focuses on evaluating universities' own quality assurance mechanisms (Henkel & Kogan, 2007; QAA, 2005).

Universities defend and pursue common interests through representative organisations such as the former Committee of Vice-Chancellors and Principals (CVCP) of the UK, which was 're-branded' into Universities UK (UUK): an overarching membership association which unites the interests of 121 higher education institutions, including all the UK university institutions and some higher education colleges (Theisens, 2003).

The 77 English universities range in size, mission, subject mix, and history. They include traditional universities, former polytechnics, and those higher education colleges which were granted university status in 1992. The Further and Higher Education Act 1992 created a unitary higher education system (HEFCE, 2004; UUK, 2002, p. 45). For the 'old' universities the 1992 Act meant less autonomy, while for the former polytechnics it meant increased opportunities for self-steering (Thomas, 1996, p. 35). Despite this end of the binary divide in 1992, the differentiation between universities remains a clear system feature. Rankings and league tables are popular as differentiation in the system was stimulated by the national teaching and research quality assessments for more than a decade (Kogan & Hanney, 2000). Thus there is a distinction of 'old' and 'new' universities, in other words between traditional universities and former-polytechnics.

The 'old' universities were all established as universities before 1992. In general terms, the 'old' universities provide teaching, research, and services to communities.

Most of the 'new' universities are also dedicated to teaching and more applied research with the general aim of being regional centres of higher education linking industry with business. Next to this traditional higher education system, the Open University was set up in 1969 and is now the major provider of part-time

degrees in the United Kingdom. It is an autonomous institution, and is able to award degrees like other universities.

Universities in England have been established in four 'waves'. The first wave was Cambridge and Oxford. In the nineteenth century the so called Redbrick universities followed, catering to a new market of students and employers as a consequence of the industrial revolution. The third wave of universities was established in the 1960s, again to cater to a growing demand in society for higher education. The final wave includes the former polytechnics given university status in 1992. The universities established in the first two waves were created by Royal Charter; the universities established later are based on Parliamentary Statute. Whatever the legal basis, each university is self-governing. Any amendment to institutional charters and statutes is made by the Crown acting through the Privy Council on the application of the universities themselves. Each university determines which degrees and other qualifications it will offer. With one exception, the University of Buckingham, all universities are publicly funded and legally independent bodies.

At the institutional level the rules of authority distribution within higher education institutions vary according to university type. The 'old' universities adhere to a collegial decision-making mode while the 'new' universities have more features of a managerial mode of decision-making. The participative decision-making with an emphasis on the academic guild values at 'old' universities initially seems to be opposed to the values of managerialism at the 'new' universities where efficiency, value for money, and results seem more prominent (Bargh, Scott, & Smith, 1996, pp. 27-28).

There are also differences observed between 'old' and 'new' universities in the relationship between academics and executives. As McNay (1999) notes, the 'old' universities have a stronger rooted tradition of the academic guild and higher collegial decision-making structures than the 'new' universities, where in fact the Vice-Chancellor has enough power alone to hire and dismiss professors and lecturers as well as dismiss students (McNay, 1999, p. 4). With the unification of the system however, the governance structures of 'old' and 'new' universities have become increasingly similar in terms of strengthening the central leadership and management, at least theoretically.

In 'old' universities, the Vice-Chancellor is the overall head of the university and has a somewhat restricted role. He can be appointed from outside the university. The supreme governing body is the University Council which includes staff, students, and elected lay members. The Council determines matters of general policy and is not involved with the day-to-day running of the university. Its powers, however, are considerable. For example, in the 'old' universities only the Council can expel students for disciplinary reasons. In determining academic matters, it is the responsibility of the Senate to decide on

further developments in academic affairs. In the 'new' universities, such decisions are largely in the hands of the Vice-Chancellor. Though the pre-decision rests with the Vice-Chancellor in the case of 'new' universities and the committee (Senate) in terms of the 'old' universities, the overall responsibility in both cases still lies with the major governing body, the Board of Governors or the Council respectively.

The charters of 'old' universities state that officers (Vice-Chancellors, Pro-Vice-Chancellors, deans, directors of different administration departments) should be appointed by universities. Overall, the rules of appointment are specified in the university statutes. The managers' responsibilities are not specified in 'old' universities' charters. Therefore, it is usually the responsibility of certain committees to define the managers' duties. A similar trend in the system of appointments of officers is laid out in the government provisions for the 'new' universities. For example, the designation and appointment of senior posts can be done by a committee that includes a Vice-Chancellor and a member of the Board of Governors. In both cases, Vice-Chancellors and other officers are accountable to respective committees for the good order, efficiency, and general management of institutions (Stephenson, 1996, pp. 82-83).

4.1.2 *Higher education and research policies since 1980s*

Since the beginning of regular state funding for universities through the University Grants Committee (UGC) in 1919, the relationship between government and the universities in England has gone through three phases. The first was characterized by a dominance of academic self-governance with government keeping itself at the distance. In this phase, the academic guilds had strong power. It lasted until 1964 when the 'binary divide', the establishment of polytechnics, apart from the university sector was introduced. In Halsey's view, the expansion of higher education had to be achieved through polytechnics (Halsey, 1992, p. 111). The second phase, currently happening, has been one of increasing state intervention, first directed predominantly at the 'new' universities, but then extended to 'old' universities as well. The policies geared towards larger participation and expansion of higher education institutions can be noted as especially visible examples in this respect.

Finally, the third phase, concurrent with the second, is characterized by a decisive move towards state induced market-dominated governance configuration that begun with the Thatcher reforms of the 1980s. Since, the system has been trimmed rigorously towards increasing competition for resources, strengthening managerial self-governance within universities, and increasingly important external guidance by the state and other stakeholders. At

the same time these policies towards more self-regulation within the system have been initiated and to some extent regulated by the state.

4.1.2.1 Higher education policies

From the academic communities' point of view, the first period is frequently seen as a sort of 'golden age' in terms of the relationship between universities and the state (Williams, 2004, p. 243). In higher education matters, universities were the dominant actors. The University Grants Committee (UGC) was an autonomous body that served as a buffer between the Treasury, which provided funding, and the recipient universities. It was responsible for advising the government on how and to which universities funding should be allocated. This body consisted largely of academics; civil servants were not involved since they were not thought of as experts and had to be prevented from directing academics how and what to do (Stevens, 2005). University governance in this period was collegial, and university management was weak. There was relatively easy access to tenure, with strong protection of tenure once acquired. The views of business and other outsiders did not affect the teaching and research agendas too much; it was first and for all an academic matter. Universities were elitist, nationally-oriented institutions, though some had strong civic roots. They were high in academic quality, with major contributions to research, and had strong pastoral care of students. At that time only about two percent of the college-cohort attended university. As Stevens (2005, p. 12) puts it, "It was a cosy arrangement" for academics.

However, after the mid-1960s the control of public expenditure became an important government concern. The questions that came to the fore concerned social justice, breaking the barriers of social class, and developing a more skilled class of technicians. Broadening participation became a key issue. The so called 'Greenfield universities' were created in different regions in England, such as East Anglia, York, Kent, Warwick, Lancaster, Essex, and Sussex (Clark, 1998). The restructuring of UK higher education happened in the 1960s under a Labour Government, spurred by the Robbins report published in 1963. In fact, two major government policies were pursued: sector expansion (widening access) and the establishment of new forms of higher education (such as the creation of polytechnics in 1965). The binary structure was born as a consequence. Higher education expansion from the 1960s onwards took place mainly in the polytechnic sector (Thune, 2000, p. 85). However, it was not until the late-1980s

that the Age Participation Rate⁹ reached 15%. The university sector still remained by and large elitist for a long time compared to some other countries.

Governmental intervention increased with the expansion of the sector and there was a growing concern about what was 'produced'. However, there were also substantial barriers against ministerial intervention in universities' affairs. After the Conservatives assumed power in 1979, thorough scrutiny and radical reforms in higher education (as in other public sectors) began. Government intervention changed towards a state induced market-oriented model, which indicates the third phase of relationships between universities and the state. From 1980s onwards a series of white papers, indicating government's interest and interference, have been published dealing with higher education and research.

Three main issues on the government agenda at the time were financing, quality, and governance structures. The central government's aim was to produce, within the framework of mass higher education, an economically efficient system and increasing participation rates to international standards, all without diminishing quality.

Between 1980 and 1987 policies have had a strong financial focus. The strategy was to cut public expenditure through substantial decreases in public funding, and encourage competition and private initiatives. Universities were under pressure to install management principles in the name of economy and efficiency (Cave & al., 1997). The government sponsored initiatives to modernize university management systems, taking into consideration the recommendations of the Jarratt Committee (1985). This committee largely criticised the university committee structures and the slowly dispersed decision-making processes.

The White Paper 'Higher Education: Meeting the Challenge' (DfES, 1987) offered a continuation of the higher education restructuring where the key idea was bringing higher education closer to the private sector with a growing concern on what was produced. This White Paper was followed by the 1988 Education Reform Act, whose key characteristics were the abolition of local control of the polytechnics and higher education colleges. The Act also established new funding councils on each side of the binary line. The University Funding Council (UFC), which replaced the UGC, became a statutory agency in which the majority of the members were non-university representatives (P. Scott, 1995; Thune, 2000). Moreover, the Act abolished tenure for new appointees and those promoted. It was presented as a measure to enable universities to "rid themselves of poor teachers and non-performing researchers" (Stevens, 2005, p. 59). As Jackson points out (1999, p. 98), there was the government's initiative to change

⁹ Postsecondary age participation rate designates the relative portion of people in a nation who, from the total segment of the population of ages 18-23, pursue opportunities for postsecondary education.

employment practices, resulting in “the so-called abolition of academic tenure, and the move towards selectivity and targeting in research.” In general, an idea that public funds are allocated in an exchange for the universities’ services was prevalent in the political discourse of the time.

After three years the Conservative Government issued another White Paper (DfES, 1991), ‘Higher education: A New Framework.’ This resulted in a new act, The Further and Higher Education Act (DfES, 1992), which again reshuffled higher education by converting the binary system into unitary.¹⁰

The labels and structure of the governmental bodies responsible for funding universities also changed.¹¹ Because of increasing worries about the quality of higher education after the system expansion and the reduction of resources, in concordance with the new funding councils a new arrangement of external quality assurance was introduced and given legislative force. Next on the reform agenda was a growing emphasis on quality control both in teaching and research. Considerable weight was put on external quality measures in research and the increased efficiency of institutions as measured by various performance indicators (Slowey, 1995, p. 24). Evaluation was used as an instrument for change in the governance of the public sector (Henkel, 1991). The UGC started the Research Assessment Exercise in 1985 as an instrument of both research selectivity and accountability (Kogan & Hanney, 2000). Since then all units wishing to receive public infrastructural funding for research must submit themselves to this periodical assessment. However, it has not been linked to the teaching quality assessment done by the QAA.

The external pressures for accountability, efficiency, quality, and standards in higher education and research did not stop in the 1980s. In 1997 the Government commissioned the National Committee of Inquiry into Higher Education to write a report. The result, ‘Higher Education in the Learning Society’, is better known as the Dearing report. The major goals of the Dearing report did not differ explicitly from the Robbins report of 1963. Both emphasized “advancement of learning”, “shaping a democratic society” and “promoting the general power of mind” (Lord Dearing, 1997; Lord Robbins, 1963).

In terms of institutional management, and governance, the major change signalled in the Dearing report concerned a shift in emphasis on external stakeholder participation in the governing bodies of universities, including students, staff members, and a majority of lay members. It urged for a clear role of Councils at universities and stressed the growing need for accountability to

¹⁰ Thirty-two polytechnics and two higher education colleges gained university status and the right to award their own degrees.

¹¹ The two funding councils for the binary system were substituted by three regionally divided funding councils; one of them was the HEFCE.

public bodies; performance of institutional governance and management with the help of externally decided benchmarks and performance indicators was regarded as important.

According to the report, the university's governing body (i.e., the Council or the Board of Governors) should systematically review its objectives and performance. Several recommendations from the report asserted that in cases of non-compliance government sanctions should be instituted, such as a decrease of public funding from HEFCE. All these recommendations were endorsed by the national government and the funding councils (Lord Dearing, 1997). This shows the attempt to move further towards governmental involvement in the coordination of higher education.

One of the main recommendations was to foster the cooperation between universities and businesses/industry. The government noted in its response however, that there was no clear government endorsement to establish an Industrial Partnership Development Fund. A clear line of argumentation was presented to encourage universities to seek funding from the private sector for research activities. There was a clear statement in the Dearing report that "the aims of a university should include benefiting the economy and society at local, regional, and national levels" (Smith, 1999, p. 156). In this way, the economic relevance of higher education was again explicitly stressed.

An echo of these reforms is visible in New Labour policies since 1997. Though the traditional social agenda of equal opportunities and fair access has been apparent, many education policies can be considered extensions of the Thatcherite education agenda. The issues on the policy agenda in recent years in England still have a rather neo-liberal feel: raising student fees, performance-oriented funding, excellence in teaching and research, strengthening institutional management and leadership, and contribution of higher education to the country's economy.

The importance of management in universities is further emphasized in the 2003 White Paper 'The Future of Higher Education' (DfES, 2003) and HEFCE's Strategic plan (HEFCE, 2003b). The 2003 White Paper is detailed in nature and looks like an operational document rather than a strategic one (King, 2004, p. 23). The HEFCE plan endorses the government's 2003 White Paper propositions to enhance higher education leadership, management, and governance.¹² According to HEFCE's 2003/08 strategic plan, universities are autonomous institutions and they decide best how to lead and manage their activities (HEFCE, 2003b). The overall government policy is to provide support to universities by equipping

¹² This HEFCE agenda resembles the well known issues seen in the Jarratt report as well as the Dearing report.

them to respond to the challenges from competition and changes in the policy environment. More concretely, the government policy aims to develop a new accountability relationship with the higher education sector. This is based on increasing stakeholder confidence to promote a more sustainable approach to rewarding and developing staff and to help institutions develop a more demonstrably fair and supportive environment for their staff. There is a strong belief that management will be vital for the higher education system which faces expansion and change while trying to retain its competitive advantage.

4.1.2.2 Research policies

As with higher education policy, one of the major concerns in research policy in the 1980s was how to decide on research priorities in light of scarce resources. The squeeze of resources was caused by increased costs and the exponential growth in scientific opportunities (Hanney, 2000, pp. 16-17).

The first science White Paper since 1972 was issued in 1993. It followed the creation of the Office of Science and Technology (OST) in 1992. The 1993 White Paper 'Realising Our Potential' stressed the relevance of the exploitability of research results for economic ends and the importance of research as a driver of market competitiveness (DTI, 1993). According to Minister of Science William Waldegrave, the most important aspect of the 1993 White Paper was building a structure for interaction between scientists, industrialists and teachers. It was an attempt for bridging the cultural and organisational divides. The Technology Foresight programme was identified as a key element in this White Paper. Its main purpose was to harness the UK's strengths in science and engineering for the creation of wealth (Hanney, 2000, p. 26).

A somewhat similar agenda was maintained in later policy documents. According to the Dearing report, one of the major topics on the research agenda was the need to search for matching funds for research through the creation of strategic alliances between universities and companies. Dearing took a perspective from both outside and inside the university. Generally, the report saw the universities more as subject of external regulation by the state, given the demands for state funding. However it also had a strong agenda for increasing the amount and proportion of private funding, either through students or business and industry, which means for universities encouragement of competition for resources.

In 1998 the New Labour government published a trade and industry White Paper, 'Our Competitive Future: Building the Knowledge Driven Economy.' Here again the link between the economy and higher education as knowledge producer was strongly emphasized. The foreword to the White Paper, by Prime Minister Blair, opens with the recognition of the new economy that is dependent

upon “knowledge, skills, and creativity” (DTI, 1998). Investments in capabilities, education, science, and the creation of an enterprise culture largely reflect the ideas of the Dearing report, where a vision of Britain as a ‘learning society’ was presented. Thus, the 1998 White Paper again conceptualized education and science as part of the economic sub-sphere of society, and subjected it to economic decision-making, rather than social and cultural argumentation (Thune, 2000, p. 92).

In addition the government identified three key elements of research and innovation policy in the 2001 White Paper ‘Excellence and Opportunity – a science and innovation policy for the 21st century’. First it aimed at enhancing excellence in science by investing in basic scientific research and bringing in matching investments from foundations and corporations. It also wanted to extend opportunities for innovation by correcting market failures and enhancing public/private partnerships. Finally, it aimed to inspire more consumer confidence and promotion of public understanding by creating a transparent framework for integrating scientific advice in policy (DTI, 2001). Here we can see attempts to foster further competition for resources as well as a willingness to integrate academics in policy-making although in the advisory role.

After a prolonged period of financial backlog for universities, the UK government recognized the contribution of science to productivity and growth since the Comprehensive Spending Review of 1998 and 2000 when it increased the Science Budget by 7% in real terms (HM Treasury, 2002). Moreover, the government is planning the largest sustained growth in spending on science for a decade. Government investment in research will continue to rise over the current Spending Review period (Henkel & Kogan, 2007). One can see the echo of this standpoint in HEFCE’s agenda, which suggests that research in the UK is fundamental to the development of knowledge, understanding, and wealth creation. At the same time, the logic of performance-based funding (i.e. rewarding excellence) has been maintained and fostered, as seen in the HEFCE’s 2003-08 strategic plan. HEFCE plans to work with universities to develop a system for assessing research that not only informs the funding agencies but also demonstrates the power of national research and helps institutions to identify and foster excellence (HEFCE, 2003b, p. 21). This agenda can be confirmed by the possible changes in research assessment practices after the RAE 2008.

4.1.2.3 State regulation

External regulation by the state on higher education and research in England was limited until the 1980s. Low administrative involvement occurred in England with the existence of the UGC; since it was not part of any governmental department, it had only a small number of ‘borrowed’ staff and was mainly

controlled by university people (Clark, 1983, p. 119). In the 1960s and 1970s the Department of Education and Science was established, the UGC was relocated with the government and instead of working directly with the Treasury it began to work with the Department of Education and Science. Gradually, the top political circles and the legislature became more “determined to have explicit national policies in higher education and to use the Department of Education and Science and the UGC as central instruments to carry out those policies” (DfES, 1992). Since the 1980s state intervention into higher education sector has increased. The UGC was replaced by the University Funding Council, which became a statutory agency with own staff. The relationship between universities and the UGC was increasingly one of accountability. Although the dominant motive of the day was liberalisation of higher education and bringing in quasi market competition under the Thatcher reforms, what we have seen since then is a rise of a more developed regulatory framework. Drawing on King’s (2004) summary of these developments, the unification of the system (from binary to unitary) in the early 1990s “helped to ‘import’ the stronger governmental regulatory frameworks” (King, 2004, p. 20). The major characteristic of the 1980s political climate was increasing accountability to the government. In the 1990s there was an even sharper turn away from academic, or elite, self-governance and culture “to more transparent and numerical forms of public evaluation and democratic holding-to-account” (p. 20).

Originally, ‘old’ universities in England were by and large independent from the government. Today universities are still autonomous bodies, but as Hall (1996) notes, a large proportion of their funding comes from the government or other public bodies. This does not only increase accountability for the universities, but affects “the amount of externally imposed change institutions are compelled to accommodate” (A. Hall, 1996, p. 92).

Over the last ten years, in focused areas that are politically salient and/or fashionable, one can observe an increased regulatory role of the state in English higher education, such as evaluating teaching and research quality or prescribing budgeting rules.

The public purse is a powerful lever for change; its importance is heightened by the new managerial agenda of performance management and target setting. As a basis for performance-oriented financing, the state prescribes how the quality and thus the funding of universities’ activities should be measured, especially in the assessment of teaching through the QAA. The scale of the quality assurance effort in England has been impressive both for teaching and research. In terms of external regulation by the state, the QAA responsibility of the teaching assessment in universities offers a good example. There is an academic audit process to assess quality assurance mechanisms in all academic institutions. The audit developed into a process of assessing teaching quality in the majority of

subject fields in every institution, where universities have no choice but to participate. Most importantly, many of these quality assurance endeavours have been followed by financial measures, such as performance-based state funding (D. D. Dill, 2004, p. 2).

The important instrument here is the RAE. It has two main purposes: 1) to support the funding councils' resource allocation models and 2) to provide comprehensive and definitive information on the quality of UK research in each subject area. The RAE is essentially a peer review process financed by HEFCE. The key in the assessment is who is involved in defining the review criteria. The question is how much latitude do academic reviewers have to go beyond the formal mandate they are given by the funding council. So far the RAE has been a more voluntary procedure, where universities can choose whether or not to enter the assessment. Without participating however, a university is unable to get state funding for research as the research funding is allocated according to the results of the RAE. It can be interpreted as a regulatory mechanism. As Harvey and Knight (1996) argue, the development of quality policy and practice in the UK has been "a pragmatic procedure guided by political imperatives" (p. 38). The major goal has been the ideological commitment to public sector accountability. In other words, the government has imposed a value-for-money framework on quality monitoring and universities must account for the resources that they receive from the state. The government further assumes that more accountability will increase quality.

In terms of university budgeting there has been a move towards more formulaic approaches in the form of profit and loss accounts for budget centres at universities. It is not new as such, but means more pressure on the extent to which coefficients in an internal funding model should reflect those adopted by HEFCE.

Moreover, there is a 'value for money investigation' on the part of HEFCE, since it requires universities to have a principal officer from the university Council accountable to the House of Commons/funding council about the transparency of funds usage. The university also must appoint an audit committee to make sure there are checks and balances of the usage of funds from the state (Sandbach & Thomas, 1996, p. 60).

In research, universities' funding is in practice dictated according to the results of the RAE (Thomas, 1996, p. 35). For example, departments with low RAE grades will no longer receive funding from HEFCE for supervising research students. Clearly, such measures will affect a number of 'new' universities that will have to find alternative sources of funding, for example international students or industry collaborations. Otherwise they have to cut costs or even closing down their research programmes and facilities. Again, this implies more pressure and control on universities by the central state funding agency. As seen from the above

examples, there is increasingly more detailed external regulation by the state in higher education and research sector.

4.1.2.4 Academic self-governance

This section examines both the role and power of the academic professionals in external and internal university governance. From the policy developments we perceive a mixed picture in both areas.

Historically, academic self-governance was strong in England. The University Grants Committee (UGC) was staffed with academics and made grants, not payments for services, as it was exempted from parliamentary audit and worked with the Treasury not the Department of Education and Science (Stevens, 2005). After 1964 the UGC was brought under the aegis of the Department for Education and Science but retained its dominant role in university funding. In practice universities could be sure that each year they would receive an amount of money that was more or less historically based (Theisens, 2003). However, the UGC gradually started to have a directive stance in the mid 1970s; the UFC came into being in 1988 and things changed even further. Then it was no longer the domain of the Dons to make decisions about funding their universities.

Traditionally, defining research quality was the natural realm of academics. Academic work was assessed in a peer based manner. Reviewing journal articles, helping set up research programmes, and involvement in research council decision making were traditional roles for academics. When the government designed the system of performance-based research funding, an intensive debate started on who should be responsible for defining research quality. The discussion took place between universities and academics on the one hand and funding councils on the other. Academics today still sit on the RAE panels and in the Councils and Boards of different governmental bodies. Peer review was strengthened and thus the role of the academic profession is still strong in running the RAE. Peer review was once an ad hoc event for those academics who wanted to publish in a peer reviewed format or apply for peer reviewed grants. Today being a part of the RAE peer review has become a systematic and regular exercise for everybody (King, 2004, p. 21). The outcomes of this exercise also gained in importance because they are made public and are directly linked to funding. At the same time, the power of peer review was compromised because of the inclusion of other stakeholders and their final say in funding from governmental bodies.

Academics in internal university governance still play an important role, although many academic leadership positions have become more managerial. For example, very few Vice-Chancellors come from the private sector or civil service: most of them are ex-academics (Bargh, Boccock, Scott, & Smith, 2000).

Management teams include registrars and finance directors, but usually the members of a management team are mainly academics. However, they are increasingly appointed for a fixed term in office and their recruitment procedures often involve head-hunters (Bargh et al., 2000). This implies that the recruitment criteria and procedures are not necessarily in the hands of peer academics, but in the hands of career professionals. With the radical reforms of the Thatcher government, the requirements of the government and funding councils could also be traced in the leadership practices of Vice-Chancellors, which arguably reduced the security of the academic oligarchy; or as some claim, even threatened their autonomy, academic values, and culture (Smith, 1999).

Structural changes have taken place within the institutions related to the devolved financial responsibility through faculty or departmental cost centres. Though universities treat their departments as independent self-governing and self-sustaining units, some observe a lack of trust between different university decision-making levels (Stephenson, 1996, pp. 86-87). Moreover, there is quite frequently a lot of formal compliance with basic checks and balances as laid down in charters, university statutes, and ordinances; particularly when it comes to senior staff appointments and promotions, budget setting, and strategy determination. Other structural changes affecting academic self-governance included the control procedures (formal and informal performance review through target setting inside universities) and the use of external monitoring mechanisms for internal management purposes. These changes bring certain restrictions and accountability to academics, thereby reducing academic self-governance at universities. It has been a challenge for academics, since most of initiatives had "a fair measure of hostility amongst their academic peers" (Slowey, 1995).

Interestingly, as seen in the findings of Fulton's (2003) study of 12 UK universities, university academics still have a strong sense of academic identity. This has not dissipated even for those academics who take up management roles, since commitment to teaching and research, as well as adherence to disciplines remains rather strong. The study showed that the organisational cultures did not change much in this respect. Fulton's research indicates that academic self-governance has adapted to new demands through subtle practices of negotiation and collegial-like persuasion (Fulton, 2003, pp. 166-167). For example, the committee structure is still an important check in the university system. What has changed is that "more and more decisions are de facto taken outside the formal structure" though they have to be legitimized by the committees since the university is obliged by law to act within the powers and structures laid out in its charter and statutes (Stephenson, 1996, p. 87). Despite governance reforms, the committee structure for academic affairs has been retained in universities and offers a voice to academics. In practice, such a structure is important for

legitimizing the decisions taken by university leadership. Nevertheless, nowadays the real power for financial and strategic decision-making increasingly rests in the hands of university management.

4.1.2.5 Competition for resources

Competition among universities, departments, and academics for resources such as funding, reputation, and staff has always played a certain role. Most of the reforms of the late-1980s and 1990s in England involved a movement towards more pronounced market orientation. Since fully privatizing higher education was considered inappropriate, 'quasi-markets' have been introduced. The core of this approach was the belief that the government can fund universities as if procuring services (Massy, 2004). In this way the government has encouraged quasi-market competition between universities and disciplines. Competition became institutionalised in state funding mechanisms and brought system-wide effects, such as further stratification of the universities.

In this subsection we distinguish between external and internal competition. While external competition refers to the competition for resources between universities or competition among peers in the same field for the research council funding, internal competition refers to the effects of state-induced competition at the organisational level, such as competition between departments or other organisational sub-units.

Public research funding is still one of the most important sources of income for universities, both because of its size and because it comes in the form of a block grant. This means that universities are free to use the funding as they see fit. As a result of the state-guided, performance-based approaches, the research funding system has, however, become more selective and competitive. External competition has become increasingly fierce; a much higher number of universities now bid for the same pool of funding, including both poor and rich institutions. Since the 1980s HEFCE's activities have been based on the notion of "the state as an investor in and a procurer of higher education services for which institutions competed to supply" (King, 2004, p. 23).

The scale of performance-based distribution of available public resources in England has been impressive (in comparison with other European higher education systems). The outstanding example of this is the Research Assessment Exercise (RAE) and its link to research funding.¹³

The concentration of funding in relation to RAE results has changed and increased the competition for resources between both universities and departments. After the 1996 RAE exercise funding supported the general

¹³ Conducted every four or five years since 1986, the most recent one was in 2001.

improvement of research quality; after the 2001 exercise HEFCE became more selective in funding by focusing on research excellence (Morgan, 2004). In the most recent exercise, the percentage of higher ranking units (rating 4 and above) has increased from 43% in 1996 to 65% in 2001 and lower rated units (1 or 2) decreased from 24% to 6% (OECD, 2001, p. 14). The first four ratings on the seven-point scale attract no HEFCE funding,¹⁴ while the highest rating of 5* attracts over three times as much funding from HEFCE as the fourth highest rating for the same volume of research activity (Roberts, 2003, p. 4). As a result most of the research funding is concentrated at the top research universities. Increasing selectivity and concentration of funds is most likely to continue since the 2008 RAE will concentrate research funding in the highest scoring subjects, leaving behind in Sir Howard Newby's words the "squeezed middle" (Beerkens et al., 2004). The major policy lines of the RAE therefore build on research departments' strengths, funding the best, and resulting in fierce competition among universities and separate departments. Though the RAE was instigated by the state in the name of quality, in fact it promoted further stratification among universities. It was strongly supported by 'hard' scientific elite (Kogan and Hanney 2000 p. 94). The effects of publishing the outcomes of the RAE result in building reputation, naming and blaming, and comparing universities and university sub-units. The understanding of quality is new compared to the traditional system where academics had an implicit understanding of each others reputation.

The state-induced competition clearly leads to 'winners and losers'. Some critics argue that the competition rules are unfair since the rich institutions get richer and this leads to even stronger stratification. For example, most of HEFCE research funds still go to the top 25 research universities. It seems that the system is self-selective and designed in such a way that a 'new' university can hardly, if at all, compete with an 'old' research university in terms of funding.¹⁵ For example, in 2002/2003, one third of England's total research grant went to Oxford,

¹⁴ The panels in the last two RAEs in 1996 and 2001 produced grades on a seven point scale (1, 2, 3a, 3b, 4, 5 and 5* – five star). However, 80% of the researchers whose work was assessed were in submissions receiving one of the three top grades (4, 5, and 5*), while 55% were included in submissions receiving one of the top two grades (5 and 5*). The amount of discrimination provided by the exercise is therefore less than the length of the rating scale would suggest. (see: www.rae.ac.uk)

¹⁵ In 2001-02, 75% of HEFCE research funds went to 25 higher education institutions. With government encouragement, HEFCE distributes an additional 20 million pounds for departments that achieved a 5* rating in both the last two RAEs. These departments later were called 6* departments as introduced in 2003. They received additional funding for 6* status. Some subjects/universities have no 6* but quite a few of the pre-1992 research intensive universities have several 6* departments. (HEFCE, 2003a)

Cambridge, and London institutions; nearly two thirds went to 'old' universities; and only 5% to 'new' universities (Morgan, 2004, p. 471). Among other factors, this asymmetry is due to the results of the RAE, which generated numerical quality indicators used as multipliers in funding formulae (Smith, 1999, p. 159).

Moreover, with the research policy agenda of pushing for excellence since 2001 White Paper 'Excellence and Opportunity- a science and innovation policy for the 21st century' (DTI, 2001) the research councils' project funding is important when talking about competition for resources. Building on excellence in this context means among other things a more competitive allocation of resources for the same number of universities. Following this logic, the project grants of research councils are very important for universities since they contribute substantially towards their research funds - in 2003/2004 30.7% of all research at higher education institutions was funded by research councils (HESA, 2005). Thus, the changes in the mode of project based funding of research councils towards more competitive thematic funding schemes can certainly have implications for academics.

Here the issue of newly introduced full economic costing is important. The Royal Academy of Engineering review (2003) is one of the documents that started the debate about this controversial issue. According to the review, there is a lack of clarity in the purpose of HEFCE support for university research in the context of the increase in third-party funding through charities, industry, and the EU. This lack of clarity has resulted in a funding gap, since universities are not encouraged to charge the full economic costs and non-research council sponsors do not see the need to pay higher overheads than those paid by the research councils (2003, p. 17).

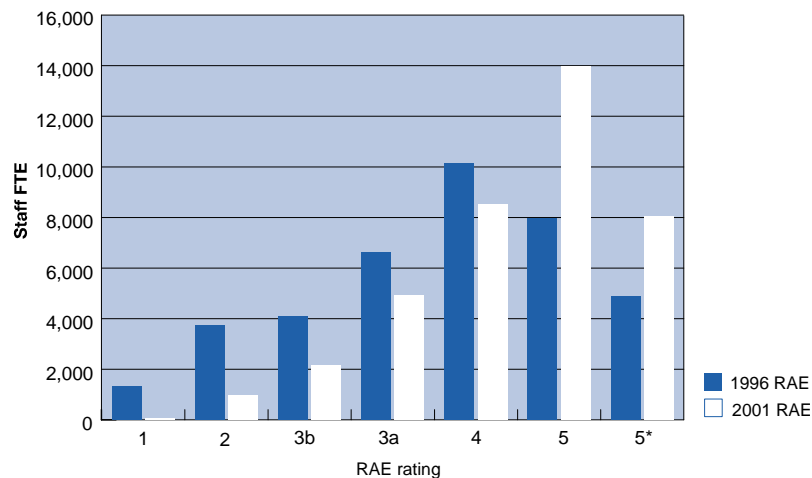
However, this funding gap has been changing. Following the 10 year Science and Innovation Investment Framework 2004-2014, there is the intention to pay close to 100% of the full economic costs of projects by the beginning of the next decade, taking full account of capital funding streams. Research councils are ready to pay 80% of the project costs while the rest will have to be matched from the universities or from other sources (DTI, 2005). This means an increase in funding for research – research councils have been given more funds to implement this policy initiative. At the same time, other research funders will be expected to support full economic costs from somewhere, which leaves the fate of the dual support system uncertain and funding from charities in an ambiguous position. Here the role of other stakeholders will be important, especially those providing matching funds to meet full economic costs.

Finally, the drive towards university-industry/business collaborations of various kinds and levels has meant that universities are functioning increasingly in quasi-markets. Competition in such context brings the question of the pursuit

of intellectual property and the promotion of scientific entrepreneurship (Henkel, 2005).

Besides competition for funding and reputation the struggle for research excellence affects research staff distribution. A major goal of governmental policies was to concentrate research excellence in successful research centres (HEFCE, 1999, p. 24). This goal has been achieved. With the performance-based funding the search for excellent staff intensified and became more structured. A change in research staff numbers is seen in the research universities. After the 1996 RAE excellent researchers were moving from research centres marked 3 and 4 to those of 5-point rated centres. It is becoming more common, or more outspoken, to search and compete for excellent staff. The competition holds true not only for individual academics, but for whole research groups as well. Fifty five percent of the research-active staff after 2001 works in the top-rated 5 or 5* departments (see the following Figure 4.1); a substantial growth compared to 1996 (HEFCE, 2003a, p. 24).

Figure 4.1. Research-active academic staff (FTE) in English institutions, by RAE rating



Source: HEFCE 2003a.

Looking at internal competition, we can see that internal competition for funding has had profound effects at universities. University management has increasingly and actively undertaken structural strategic changes and has encouraged academics to apply for external funding. McNay (1999) notes that the main effects of the RAE at the institution level is tighter policy, better management and more administration, transfer of funds from higher graded to lower graded departments, and thus a redistribution of funding earned by excellent departments. In the view of department heads the RAE exercise was

used as “a lever stimulating major strategic review across the institution” (McNay, 1999, p. 196). Staffing policies were indicated as the main area of review. Competition for staff has been increasingly important at this level as university management started to take up strategic staffing initiatives and restructure research staff organisationally. There were also structural changes: a move towards big schools and super faculties, differentiation between research centres with staff focusing only on research, and departments organising undergraduate teaching.

4.1.2.6 Managerial self-governance

One of the elements in government policies over the years contains the wish for a more centralized university decision-making system in order to speed up internal decision-making processes. In this respect the Jarratt report of 1985 should be mentioned. After analysing the effectiveness of universities the report recommended to improve the management at universities by streamlining its decision-making structures and to give more powers to the central university management. They saw universities more like corporate enterprises, where the governing bodies act as boards of directors and the Vice-Chancellor is seen as the chief executive. This means that the individual units at a university are subsidiary and accountable to the central management (CVCP, 1985).

In response to the Jarratt report of 1985, patterns of change spread across the traditional universities: better mechanisms for strategic planning were put in place, there was more transparency in financial matters, and clearer management lines with fewer committees (Stephenson, 1996). As Williams (2004) puts it “Committees were pruned, finance offices became larger and more powerful, central management teams were established, primitive computerized resources allocation models were developed” (Williams, 2004, p. 235). As a result of the Jarratt report universities moved strongly towards corporate management structures (Henkel 2000a). This shift towards increasing importance of central university management meant more attention for academic recruitment and university structures, and thus led to more managerial and administrative work.

In terms of management roles, Vice-Chancellors began to act as chief executives and started to build senior management teams around themselves (Bargh et al., 2000). Outside the institutions, they participate in the lobbying groups that unite different types of universities, such as the Russell Group. Overall, all Vice-Chancellors participate in the Universities UK group where they actively anticipate, respond to and influence the higher education and research policies.

The role of deans and heads of departments have become more visible and prominent. This new responsibility of faculty and department leadership not only

implies responsibility for procuring consumables and equipment expenditure, but also greater responsibility for managing staff resources. For example, a dean or a department head can reward a department that scored very high in the last RAE by supporting new appointments at that department from the faculty/department budget (with the approval of the central university level regarding appointment of senior staff members). The idea is that a manager at the departmental level can directly influence and control the costs, at least in theory. The availability on performance information enables leadership to steer the department. For instance, as (Morey, 2003) argues, the research ratings “have made the research outputs of individuals, departments and universities more transparent and public and have resulted in a growing power of universities to frame the activities of academics” (p. 79).

Further, a distinct culture of target setting and strategic planning within universities is visible, which translates into action plans and targets between the central university administration and the faculty deans, between faculty deans and heads of departments, and finally between heads of departments/department research coordinators and individual academics. This means that universities are pushed to operate more as a whole. Examples include guidance from the central university level to deliver information on quality to the QAA and for the RAE or the need to make central management decisions to maximize student inflow to universities.

Obviously there have been problems associated with the strengthening of management at universities. One common problem for managers in public professional service organisations is that of double binding, being an academic as well as a manager. They find themselves in a role that is not only difficult in itself, but which is also subject to concerns about possible compromises on traditional academic values since they are both academics and managers at the same time (Slowey, 1995, p. 27). Role conflicts easily arise in such a context. One of the major facilitators for mitigating this issue has been the increasingly common practice to recruit senior managers from outside the university. Accounts given by senior manager-academics however, show that the new managerial agenda is drawn upon to legitimise introduced changes, especially organisational reordering and the development of new forms of financial discipline and performance monitoring. What is really new is the external legitimation for change for the manager-academics as seen from the data collected on 16 UK universities (Deem, 2003, p. 66).

University senior and middle management have been implementing policies while responding to the external pressures of budget cuts and quality demands. As Slowey (1995) found out in 10 case studies, manager-academics try to respond to pressures in a positive way. However, in trying to mitigate their worst effects

on universities' academics, they were serving as a sort of mediator between outside pressures and internal traditional academic values and work modes.

As Deem (2003, p. 66) underscores, middle-managers have less scope for introducing radical organisational change but can and do work hard at changing individuals, research, and teaching activities and try to introduce 'team spirit' into their departments. Henkel (1997, p. 137) argues that the overall structural changes did not represent a simple and straightforward centralisation of power in academic institutions. There were parallel moves to decentralise, such as devolved budgets to departments. In other words, a new feature of management, centralized decentralisation based on the assumptions that creative peripheries need strong central values and strategies, had gained importance (Henkel, 2000a, p. 27).

The challenges that universities had to face were more complex than the management of scarce resources. They were "the twin pulls of the state and the market" (Henkel, 2000a, p. 54), including the management of conflicting pressures from management for control and management for innovation, centralisation and decentralisation, managerial and academic values, and reduced and enhanced autonomy.

4.1.2.7 Stakeholder guidance

Stakeholder guidance in higher education and research policy has been strengthened in the last decade in England. The following provides several examples of stakeholder guidance in higher education and research.

First, HEFCE's funding model can be read as a performance contract between an important stakeholder (the state) and the universities. The key criteria in the formula for teaching funding are student numbers and subject-related, student-related, and institution-related factors. The funding agreement is constructed in broad terms and negotiated between universities and the HEFCE. Universities can vary their recruitment strategies as long as the weighted volume of activity is maintained within certain limits. HEFCE's research funds, however, are distributed selectively to universities that have demonstrated their strength in research according to national and international standards (Theisens, 2003, p. 33). Here the role of the RAE is important. In some respects the research assessment can be seen as a state regulatory instrument; a state-induced procedure for research funding decisions. At the same time it is a voluntary procedure, whereby each university can decide if it wants to participate and whom to include in the research assessment. So it can be argued that it can also be seen as an example of state guidance. Universities are invited to make submissions in a standard format to as many RAE units of assessment as they want. There is no limit on the number

of staff submitted as research active, although comparative information on the proportion of staff submitted as research active is publicized.

The thematic mode of the research councils' funding that exists next to a responsive mode¹⁶ can be an example of goal setting by stakeholders. This means that researchers have to match the thematic priorities in order to obtain grant funding; this exemplifies the qualitative guidance of research in England. Research councils guide not only through ex ante appraisal of research proposals but also through post hoc evaluations of research outcomes. At the project and programme level, the peer review system grades the scientific quality of research by evaluating final research reports. The OST monitors whether such processes are in place and oversees the overall situation (OECD, 2001, p. 13).

Another instance of external guidance is the Technology Foresight programme identified as a key strategy in the 1993 White Paper 'Realising Our Potential' (DTI, 1993). The government intended to use Technology Foresight to achieve two means: 1) providing a solid basis on which government could set priorities for the funding of science, and 2) achieving a key cultural change in terms of interaction between the scientific community, industry, and the government (Hanney, 2000, p. 26; Henkel, 2000b, p. 28). As Hanney (2000) notes, Foresight can be seen as a response to several major problems that had been confronting science policy makers for years. In particular, it addressed "the alleged failure of industry in the UK to exploit adequately the discoveries made in British laboratories and the need to concentrate resources on research areas that were thought to be most promising" (Hanney, 2000, p. 16)

The same 2003 White Paper set the goal that included the funding of 20 knowledge networks where universities work together with business to attract additional sources of university funding. This can be seen as another initiative of goal setting by an important stakeholder and paymaster, the state. To support this initiative HEFCE launched a new fund to enhance leadership, governance, and management in higher education: £10 million were to be allocated over three years towards funding projects that would encourage and share good practice (HEFCE, 2003b, p. 35). Again, clear targets were set forth to achieve the policy aims but the implementation process itself was not prescribed in detail.

At the organisational level, we can see the expression of stakeholder guidance in terms of participation of lay members in university decision-making. Lay

¹⁶ Responsive mode funding is funding in response to research proposals rated on the basis of their scientific excellence by a peer review process. University research thus supported ranges from 'blue sky' research to development research. The former is normally funded in pure 'responsive' mode; that is, funding in response to unsolicited research proposals in any area relevant to the mission of the research council. The latter is funded by thematic schemes that respond to applications for research grants within thematic areas identified by the research council (OECD, 2001).

governors play a role in the present university governance system. In the 'old' universities, the basic principle was that the Council involves a majority of members who are neither staff nor students (except Cambridge and Oxford universities). Their counterparts in the 'new' universities, the independent members, also have a primary role in membership terms. It is a statutory duty for governors in 'new' universities to make sure that at least half of the Boards of Governors' members are independent (Bargh et al., 1996, p. 71).

Though lay members have to constitute the majority of the governing Council (except Oxford and Cambridge, where four and two external members respectively are appointed), staff and students have historically had more power and the academic guild traditions have been quite strong within these universities. However, today lay governors are also responsible for setting of budgets, and determining strategies (Stephenson, 1996, p. 87).

The most visible expression of external guidance however, is mainly attributed to the need for greater research performance in terms of the next RAE results. It is translated into goals for individual academics in quantitative terms as having four excellent publications ready for assessment as well as being otherwise active in research. The definition of what is excellent research is in the hands of the RAE panels that consist of academics and practitioners in respective fields. Interestingly, disciplinary associations and other external stakeholders do have a say in nominating panel members and they participate in the consultation process about the criteria and working methods of the RAE panels.

4.2 The Netherlands

4.2.1 *The main actors in higher education and research in the Netherlands*

Egalitarian principles are rather fundamental to the structure of Dutch society and its public sectors. The variety in the quality of teaching and research is (supposed to be) relatively small, due to among other things the fairly strong nature of government regulation and a general focus on equality. Quality differences appear across disciplines and departments, not institutions, as a consequence of the quality assurance systems. League tables or other rankings are still uncommon though this is gradually changing. Only in the last five years has stratification along these lines become something of an issue. In this section we summarize the Dutch higher education and research landscape by presenting the main actors and their profiles. As in England, different policy levels can be discerned: governmental, intermediary, and institutional levels.

At the governmental level the main players are the Cabinet, Parliament, and several ministries. In the last 25 years a few times the composition of the coalition cabinets have significantly changed, as has Parliament. The political climate has dramatically changed, particularly since the start of the new millennium. The political climate in the 1980s and 1990s was much more stable. In these last two decades, for instance, only two persons were minister of OCW: minister Deetman from 1982 to 1989 and minister Ritzen from 1989 to 1998.

Higher education, research, and R&D are divided among several ministries (and within ministries); there is a clear compartmentalisation. R&D or technology policy falls, for instance, into the realm of the Ministry of Economic Affairs whilst higher education and research belong to the Ministry of Education, Culture, and Science (MOCW). Other ministries, somehow related to higher education and research are those dealing with agricultural and healthcare issues. Within MOCW, higher education and science policies are to a large extent treated as separate subjects. The boundaries between the policy arenas however, are increasingly under pressure. By stressing the need for innovation to secure the nation's welfare, the Ministry of Economic Affairs is more visible these days in the traditional world of higher education and research and penetrates policy areas that were traditionally dominated by MOCW. At the governmental level various intra- and interdepartmental working groups also address issues that are directly or indirectly influencing higher education.

There are many intermediary organisations at the national policy level: interest groups, national committees, advisory bodies, a research council, and representative bodies. The Netherlands Organization for Scientific Research (NWO) is the most important intermediate organisation in the area of fundamental and strategic research. It is a legally founded artificial entity in public law and its authorities and responsibilities are laid down in the NWO Act. Among other things, it plays a role in allocating public research funds. Its budget mainly stems from MOCW; it has to account to the minister of OCW. NWO promotes scientific research at universities and institutes through grants and research programs. Basically, researchers apply for program-related subsidies defined by NWO or for the Open Competition program where researchers select their own topic. There are personal grants stimulating individual researchers – such as the Innovation Research Incentives Scheme (*Vernieuwingsimpuls*) – as well as grants facilitating (international) cooperation and investments of large-scale facilities.

NWO's organisation is complex and not very transparent. In addition to a general board and management staff, the research council has various units, among them eight divisions (discipline-based), two foundations (e.g., Science for Global Development), three temporary task forces (e.g., Netherlands Genomics Initiative), and nine research institutes (e.g., Institute for Dutch History). The

eight divisions have their own boards made up of academics. They are responsible for executing NWO's funding task. They are to a considerable extent autonomous; they design for example the council's research programs for their discipline.

There is also the Royal Netherlands Academy of Arts and Science (KNAW). Besides playing a role in judging the quality of scientific research, the Academy advises the government and the university sector, solicited and unsolicited, in all fields of science. It wants to be the 'voice of science' as expressed by its 200 members, selected and highly-qualified academics, and its 250 'resting' members (academics over 65 years). It intends to improve national and international scientific collaborations. It is also an umbrella organisation for 17 research institutes in the humanities, social sciences, and life sciences.

Other important advisory bodies in higher education and research matters are the Education Council (*Onderwijsraad*) and the Advisory Council on Science and Technology Policy (*Adviesraad voor Wetenschaps- en Technologiebeleid* - AWT). The first is an independent body consisting of 19 educational experts that advise and give recommendations to the Minister, Parliament, and local authorities. The AWT is a strategic advisory council, made up of a maximum of 12 members drawn from the world of research and industry, not representing any vested interest. The Council advises the cabinet (in particular the ministers of OCW and Economic Affairs and Parliament) on science and technology policies, knowledge developments, and innovation issues.

We should also mention the more general advisory bodies that occasionally give their opinions on higher education matters: the Socio-Economic Council (*Sociaal-Economische Raad* - SER) and the Advisory Council on Government Policy (*Wetenschappelijke Raad voor het Regeringsbeleid* - WRR). Analogous to the drift of the Ministry of Economic Affairs, the role of these more general advisory bodies seems to be growing. Higher education and research are seen as two of the cornerstones of modern societies. While such a view is not new, it has increasingly aroused many stakeholders' interests. There is also the Innovation Platform, set up in 2003 and chaired by the Dutch Prime-Minister. Its mission is to enhance the innovation capacity of the country – the innovative society – to make it one of the most important knowledge-based societies by 2010. The key terms of this platform are excellence, ambition, and entrepreneurialism. Since its start the Innovation Platform has initiated 17 projects together with participants from all leagues and levels in society: policy makers, experts, captains of industry, professionals, and professors; usually resulting in 'recommended actions'.

Finally, at the level of intermediary bodies we must mention the organisation that represents the universities. The universities defend their common interests through their representative organisation, the Association of Universities in the Netherlands (VSNU), one of the main actors in the national policy network with

respect to higher education. It has four tasks: to promote the universities' common interests, to provide a forum for discussion, to provide services and information, and to serve as an employer's association.

The third level we distinguish in this section is the institutional level. Dutch higher education is organised as a binary system consisting of 13 universities and (in 2006) 44 institutions for higher vocational education (or universities of applied sciences: *hogescholen*).¹⁷ There is also an Open University (OUN) and a number of other state-funded and non-funded institutions providing further education.¹⁸ The main aims of *hogescholen* and universities are formulated in the national Higher Education and Research Act of 1993. Whereas the aims of the *hogescholen* mainly relate to the application and transfer of knowledge with respect to specific professions, the universities' aims also refer to the autonomous performance of scientific research activities and their responsibility for providing a number of official services to society. This study focuses on universities.

Within the egalitarian Dutch culture that was mentioned earlier, the 13 research universities in the Netherlands do not represent a single, institutionally homogeneous group. Each university has to some extent, its own profile with respect to program offerings, student population, and the like. If we distinguish them by their historical origins, it is possible to identify four different groups: four old, classical universities; three private, religious but state-funded universities; three technical universities plus the agricultural university of Wageningen; and two (relatively) new universities.

It was not until 1960 that universities became legally independent (artificial entities in public law). Prior to 1960 they were still regarded as a branch of the national government. Though legal status and institutional autonomy are interrelated concepts, we do not want to create the impression that Dutch universities did not enjoy substantive autonomy before 1960. Universities had an enormous amount of procedural freedom, particularly when it came to research.

The internal governance structure of universities is stipulated in the national law (WHW 1993). The sections of this WHW that refer to the universities' internal governance were significantly changed in 1997 (usually referred as the MUB-act).

¹⁷ The two sectors have different historical roots. The binary system has become an abiding policy issue in Dutch higher education debates and has been under discussion since the late 1980s. The Bologna Declaration of 1999 created further doubt about the long-term adequacy of the current binary system.

¹⁸ Besides the 13 traditional research universities, there is a limited number of small 'designated institutions' that are part of the university sector: a university for business administration, four institutes for theological training, and a humanistic university as well as several international education institutes. These are formally part of the higher education system (e.g., the degrees they issue are recognized), but are usually not included in the educational statistics and only to a limited extent are they influenced directly by overall higher education policy.

This MUB act creates uniformity but also leaves room for universities to make their own decisions in this respect. Particular choices and the methods of operation are laid down in university bylaws and ordinances. The general picture is as follows. Nowadays the key strategic decision maker at the central level of the university is the Central Executive Board (*College van Bestuur*), made up of a maximum of three persons, among them the Rector. This central executive board is supervised by the supervisory body (*Raad van Toezicht*), consisting of five lay members, appointed by the minister of OCW. The supervisory board appoints the members of the central executive board. The university council, a third governing body at the central level, is mainly an advisory body although it has some additional powers. Half of the seats of the university council are held by student representatives, the other half by staff representatives. Dutch universities have no separate Senate that represents the academics. Faculties are run by deans, or alternatively by executive faculty boards chaired by the dean. They are appointed by the central executive board and are among other things responsible for the faculties' strategic decision making and the way the faculty is organized. Other governing bodies at the faculty level are the faculty council (an advisory body that represents students and staff), program directors or program boards (heading the faculty's teaching programs), program committees, scientific directors, and chairs. Moreover, both at central and faculty level, there usually are strategic advisory councils consisting of lay members (e.g., research advisory council with people from industry). Generally, faculties have schools for teaching and institutes for research. Such research institutes may be intra- or interfaculty institutes as well as university or national institutes or schools.

4.2.2 *Higher education and research policies since 1980s*

4.2.2.1 Higher education policies

The Dutch national government has traditionally played an important role in the coordination of the higher education system. Until the end of the 1970s the coordination of Dutch higher education and research was a mixture of external regulation by the state and academic self-governance. It was a closed system and society at large had neither a serious voice nor evident interest. External regulation however, was not a simple 'top down' decision chain with the ministry at the pinnacle. Because of the specific nature of Dutch policy-making in general consensual decision-making among technocrats was common. Especially in the 1970s Dutch higher education had an almost impenetrable consultative structure (van Vught, 1987). Social planning through government intervention was

increasingly regarded as an instrument with enormous potential in areas of policy development and policy implementation for the modern welfare state.

From the middle of the 1970s the potential for the national government to design society through the use of comprehensive planning was for various reasons increasingly called into question. Evidence demonstrating that strong and detailed regulation did not produce the intended outcomes was rapidly growing and there were complaints about the fiscal problems due to persisting economic recessions.

In this depressing setting, Dutch higher education and research were expected to contribute to the recovery and restructuring of the national economy. As underscored by de Boer et al. (2007), it was felt that the higher education sector had become too estranged from the rest of society. The entire public sector, including the universities, was too much inward looking (de Boer, Enders, & Leisyte, 2007).

Thanks to the rise of neo-liberal powers, new views 'became harsh realities'. At the beginning of 1978 a centre-right cabinet came into power. The policy in this period was rather straightforward and by Dutch standards, not very consensual. According to the government sometimes rather painful decisions had to be made to clean up the public expenditures. In retrospect, the late-1970s and early-1980s heralded a new era in the public sector, including higher education. In restructuring the Dutch public sector, retrenchment policies were used, trying to adjust the collective expenditures. Many changes that occurred in the 1980s and 1990s have their roots in this period. Many of them would most probably not have taken place without the perceived need to cut public budgets. The key changes in higher education around 1980 were to a large extent resource-driven.¹⁹

At the time, 'remedial' or 'corrective' policies, as they were called to disguise their real aim of realizing cutbacks, dominated the higher education and research landscape. In fact it was the first time the national government seriously developed a vision on the national coordination of (basic) research and took specific measures to program university research. The government introduced, for example, the principle of conditional research funding with the aims to enhance the magnitude, efficiency, and quality of research. This principle of conditional funding meant that the government would only grant (a proportion of) academic research on the basis of research programs that were positively appraised by external, disciplinary-based committees. It implied that academics had to cooperate in designing coherent programs. In fact, this can be regarded as

¹⁹ This does not mean that budget restrictions were the only reason that would lead to changes in the relationship between the national government and the universities (Maassen, 1996).

the first market-type form of coordination in Dutch research: from this point on institutions had to compete for research grants.

According to the government, further interventions were necessary for restructuring the university sector in such a way that new relationships between the government and the universities could successfully be established. Decisive restructuring, including financial cutbacks, were seen as a prerequisite for deregulating and devolving central decision-making powers at some later stage. Other examples of the corrective policies were the introduction of the two-tier degree structure for universities (1981), the reallocation of programs and departments (1981), the mergers of the *hogescholen* (1983), the restructuring of the personnel structure (1981), and a second reallocation and retrenchment operation (1986). All were directly aimed at offsetting specific mistakes of the past (Teichler, 1989, p. 171).

In hindsight, the mid-1980s was a time of fundamental changes that would have lasting effects on university sector coordination. It was also a time of confusion, not only due to the fundamental changes themselves, but fuelled by sometimes-conflicting signals and policies. Teichler (1989, p. 170) observed, for instance, "representatives of the Dutch ministry of education and science [that] tend to emphasize two principally distinct, but historically somewhat overlapping phases of the governments' higher education policies in the 1980s." There were also the government's corrective policies simply commanding the university sector to change. In 1985 the government introduced the concept of 'steering from a distance', in which firm beliefs about the virtues of regulation, planning mechanisms, and government coordination were meant to set 'the boundary conditions within which the higher education system is to operate.' (Goedegebuure, Kaiser, Maassen, Meek et al., 1994, p. 196)

The underlying rationale of the new steering philosophy expressed the national government's belief that this was how they would have the power to determine the major directions of the Dutch university sector more effectively than in the past. Though it is difficult and possibly wrong to draw a sharp distinction between the corrective government policies of the early-1980s and the facilitating policies of the second half of that decade, 1985 should be seen as a turning point in Dutch higher education with respect to the coordination of the university sector. The policy outlined in the 1985 white paper 'Higher Education: Autonomy and Quality' (HOAK) and the ensuing legislation²⁰ has had far-reaching consequences for the authority distribution in Dutch higher education and research (Goedegebuure, Kaiser, Maassen, Meek et al., 1994, p. 196). Many

²⁰ The new steering philosophy published in the HOAK white paper was codified in the Act Higher Education and Research. This Act was put into effect in 1993.

'HOAK-ian' views are these days still observable in governmental initiatives to reform the sector.

In the HOAK white paper the minister presented an explicit vision on Dutch higher education where the national government should not be the system's social planner but instead fulfil the role of catalyst, coordinator and (financial) facilitator (de Vijlder & Mertens, 1990; Maassen & Van Vught, 1988). According to the HOAK, the government should try to keep its distance by taking the sector level²¹ as the point of departure for steering. Institutional autonomy should be enhanced (deregulation) and universities were expected to become more adaptive to their environments. It was argued that all this would have positive effects on the quality of the primary processes.

The changed role of the government according to the HOAK philosophy can be regarded as a shift from an interventionary to a facilitatory state (Neave & van Vught, 1991).

The 'facilitative policies' consisted of a mixture of:

- Reduction of direct supervision and control of administration and the use of resources,
- The development of semi-structured interventionist policies, whereby a relatively tight frame exists, but freedom is left for decision-making on the part of the institutions, and
- The establishment of a system of positive and negative sanctions based on a mixture of criteria and procedures, whereby goals are partly defined by the government, partly left open to the diversity of rationales underlying academic evaluation, partly determined by institutional policies, and partly determined by the market (Goedegebuure, Kaiser, Maassen, Meek et al., 1994, p. 210).

Detailed input control was replaced by checking afterwards whether the self-regulation of the higher education system led to acceptable outputs. One might argue that institutions were given more institutional autonomy if they were able to show that they 'delivered' high quality education and research.

The move from directive policies towards 'steering from a distance' did not imply lesser efforts from the government to determine the major goals of the university sector. First, according to the Dutch Constitution the government has ultimate responsibility for higher education; hence it could not simply turn its back on higher education. Moreover, the government was still in the position to

²¹ The university sector is divided in eight sectors such as nature, economics, agriculture, and social sciences. Over the years this demarcation has appeared to be rather soft. It has been under discussion several times, for instance, during the design of the national higher education bill in the late-1980s and the early-1990s. And several 'experiments' have occurred (such as the gentlemen agreements between the minister and the universities (*hooflijnenakkoorden*; see e.g., (de Boer, 2002).

affect the outcomes of the university sector by determining the rules of the game (setting the framework). Third, one of the means for operationalising the new steering philosophy was the design of a new planning cycle in which the national government played an important role (setting the policy agenda).

Within this new steering philosophy the desire to streamline the production of knowledge in accordance with social and economic goals remained and actually gained importance over time. Science should serve national (economic) interests more directly; universities were increasingly expected (or as some academics might put it 'forced') to contribute to the nation's welfare. The programmatic nature of science was increasingly stressed. The researchers' monopoly to dictate the research agenda was no longer perceived as valid. The internally defined criteria for research were complemented by externally defined criteria. The research agenda and policies should be determined on the basis of these two perspectives (Blume, Spaapen, & Prins, 1985; Hazeu, 1989; van Rossum, 1987). The notion of externally programmed research agendas was generally rejected by academics; in their view, creativity and serendipity could not be externally controlled (de Boer, Enders, & Leisyte, 2007).

During the preparations of a new national bill for higher education in 1992 the minister argued that a 'selectively interfering government' was a more appropriate description for the new steering approach towards higher education in the Netherlands than 'steering from a distance'. His notion was not meant to bring the state back in but to stress that the government most certainly did not intend to be sidelined. Apart from setting the parameters for the university sector the government would only intervene if deemed necessary. The government still felt responsible for the quality of Dutch higher education and research as required by the constitution, but tried to meet this objective in a different way. The shift towards a stakeholder society with a government trying to steer selectively continued in the 1990s. Various new policies aimed to strengthen institutional autonomy, while at the same time the government did not hold back from intervening.

In the national strategic higher education and research plan of 2000 (MOCW, 2000) governmental deregulation and self-regulation of the higher education sector were still being stressed. The national government made clear its intention to continue along the same 'HOAK-ian' lines: enhancing institutional autonomy and strengthening market orientation (MOCW, 2000, p. 36). In the same document the minister also briefly suggested that the future relationship between the national government and the universities should be characterized more as contractual (MOCW, 2000, p. 37). After 2004, further deregulation, enhanced institutional autonomy, and increased accountability are still buzzwords. The wish to reduce the number of rules – a key policy objective of the Dutch Cabinet – can for instance be found in the proposal to limit the rules for the internal

university governance to an absolute minimum. The government intends to exercise its powers in relation to institutions' outputs and the societal consequences of the universities' performances.

In 2005 MOCW published the 'Legislation Note' (MOCW, 2005), which argued that after fifteen years the national higher education act of 1993 needs such a thorough revision due to fundamental changes in the higher education world that it justifies a completely new Act. The underlying rationale of this and related white papers seamlessly fit the HOAK philosophy: government steering from a distance while granting the universities substantial institutional autonomy. The government wants to encourage the universities even further to act as societal entrepreneurs. Universities should become real corporate organisations, being prompt in responding to the needs of the economy and the labour market. What once was academic governance turns into corporate governance. In 2006 a new bill was drafted. It seeks to remove all restrictions on the capacity of universities to behave as if they were business firms (de Boer & Goedegebuure, 2007). It also stressed that groups with stakeholder interests should play a more prominent role in setting their directions; this is referred to as horizontal accountability. In 2007 however, a new cabinet came into power and, at least for the moment, it seems that the bill will not be put into practice.

4.2.2.2 Research policies

In the 1970s, the aloof attitude of both government and society with respect to research were changing and the Dutch government made its first real attempts to intervene in the world of university research. Academic research was increasingly expected to help find solutions to social problems. After some tentative initiatives²², the first white paper that had a serious impact was published in 1979 (the Policy Document University Research or BUOZ-paper). It was here that the government's appetite for research affairs was first stimulated. The BUOZ-paper revealed several problems at the time such as the university being an ivory tower and shortcomings of academics in accounting for public money. It stated that public research should increasingly become 1) (nationally) programmed, 2) more transparent and in harmony with social needs, 3) evaluated in terms of quality and 4) accounted for. Since the 1979 BUOZ-paper several initiatives aiming to increase the internal efficiency of science production have been taken in the last

²² In 1966, for instance, the Council for Advice for Research Policy (RAWB) was established. Also in 1966, the first 'Science Budget' document was published (as an Appendix to the Budget Statement of MOCW). Next, in the early 1970s, several research policy documents were published, organisational changes were introduced at universities and at MOCW, and a ministerial office for science policy was installed (Blume et al., 1985). These initiatives have hardly been effective, at least not in the short run.

25 years. This section roughly presents some of the key changes in the state's research policies.

There is for instance the introduction of the system of conditional funding in 1982, trying to program academic research to some extent. The government would only grant (a proportion of) academic research on the basis of research programs that were positively appraised by external, disciplinary-based committees. Although this instrument was seen by many as an intrusion on academic freedom, academics were still able to exercise their powers since their expertise was required to draw up the national programs and assess the proposals. As a policy instrument, conditional research funding has failed to re-allocate research funds, but it certainly has restructured the Dutch research landscape (de Boer & Goedegebuure, 2007). All research submitted for assessment was grouped into programs: these research programs became a lasting characteristic in the Dutch research system, initially covering a significant percentage of all the universities' fundamental research and later practically all university-based fundamental research (Jeliazkova & Westerheijden 2004, p. 329). As Jongbloed (2006) notes, it has pushed the universities to focus much more on generating research output:

In other words, the universities were encouraged to justify the public research funds granted to them. An unintended effect of the conditional funding system was that it contributed to the idea that, for academics, research is the most important part of a university's activities and the main determinant of an academic's career (p. 13).

The policy instrument of conditional funding was terminated in 1993, the same year the instrument of the research assessment was introduced. International committees of independent experts are supposed to examine the university's research programmes every six years under the auspices of the VSNU. Ten years later, the assessment procedure has been modified to reduce the administrative workload. Today universities themselves – the central executive board – have to organize the research assessment. Although the universities have substantial autonomy in this respect, they agreed to adhere to a uniform approach: the Standard Evaluation Protocol (SEP) jointly designed by the KNAW, NWO, and VSNU. These SEP-based research assessments take place every six years. In practice, the university management uses the outcomes of the research assessments to make strategic decisions, which means that the obtained information is used to carefully select areas of excellence (Jongbloed, 2006).

In the 1990s the government's involvement with university research was further increased. The need to make strategic choices because of scarce means, international developments, and recognition of the economic potential of

university research explains the government's interest. Since the late 1990s 'picking winners' has increasingly become the strategy: strategic choices for promoting excellence. The minister of OCW promulgated in the midst of the 1990s the so-called depth strategy (*dieptestrategie*). The strategy to 'excel through targeted investments' (SER 2003) was to substantially fund a small number of research schools for a five-year period. In 1998, six top research schools were selected. This strategy of funding only the happy few has met much resistance and was for that reason discontinued.

Moreover, the government has tried to further enhance competition, for instance, through transferring funds from the first to the second money flow (i.e., from basic lump sums to competition-driven funding). Not all of these efforts have been successful. The universities—through the VSNU—have blocked some ministerial policy initiatives in this direction since they were afraid of facing cutbacks (de Boer & Goedegebuure, 2007).

The government's fight to promote excellence in university research continued in the new millennium. This is well illustrated in the government's 2004 Science Budget, titled 'Focus on excellence and added value'. The central policy themes of this Science Budget (MOCW) are: focus and concentration, knowledge for business activities, human resources, and quality. Besides excellence, the increase of the relevance of university research (one of the aims of the 1979 BUOZ-paper) was one of the prominent objectives in the 2004 Science Budget. One of the underlying worries concerned the awareness of a gap between the discovery of new knowledge and the pragmatic use of such knowledge. To overcome this problem the Dutch minister proposed to enhance the scale of research activities (clustering, concentration, and consortia) and to increase the valorisation²³ of pure knowledge. The whole knowledge chain (from basic research to the application and the marketing of it) should increasingly be taken into account by universities. There should also be more involvement in research matters of industry and other users, and more attention on research beyond the boundaries of the traditional disciplines.

Although the valorisation discussion was initially about the sciences, more recently the AWT argued that valorisation should be discussed in a broader context, including the humanities and social sciences (AWT, 2007). They argue that knowledge may not only have economic but social value as well. They would like to see that valorisation explicitly becomes the third mission of Dutch

²³ The term 'valorisation' has become very popular since the publication of the 2004 Science Budget. A narrow description of valorisation concerns the transformation of (basic) research into economic value. A broader description refers to a process that enables the use of scientific knowledge in practice; making research results suitable so that the likelihood of using such knowledge increases (AWT 2007).

universities. This task should be funded as a separate part in the budget and should be a distinct part of the university's research assessments.

Another characteristic of the research context concerns attempts to connect academic research more strongly to economic development, or increase the responsiveness of universities to economic and societal needs (Jongbloed 2006). The government has initiated a number of grant schemes through the Ministry of Economic Affairs to foster science-industry partnerships. They began in 1981 with the Innovation Oriented Research programme. This program provides competitive grants available to innovative technological research projects and invites academies to develop a more applied research agenda. Another important arrangement was created in 1997: the development of the Technological Top Institutes (TTI's). These are public-private partnerships created to encourage closer research cooperation in a restricted number of areas. Finally, the Bsik-grant ('Knowledge and Research capacity'), introduced in the 1990s and using the receipts of natural gas exploitation, aims to strengthen the research infrastructure in the Netherlands by giving competitive grants to public-private consortia that conduct research in selected priority fields such as genomics and life sciences, micro systems, and nanotechnology to name a few.

Research policies of the Dutch government over the last 25 years have more or less persistently pursued the goals of the 1979 BUOZ-paper. Several initiatives have been taken to further rationalise research programming, increase transparency, introduce quality assurance measures, and increase accountability. Moreover, there has been a growing emphasis on competition, innovation, valorisation, and partnerships with industry. Though not all initiatives have had the intended effects, there is no doubt that the landscape within which Dutch university researchers' work has changed.

4.2.2.3 State regulation

External regulation, usually exercised by the state, has been in retreat in higher education and research in the Netherlands. This can be illustrated by various policies meant to enhance the universities' institutional autonomy. Universities have more opportunities today to select their own students, make up their own internal financial allocation schemes, or have more authority in the area of personnel. Moreover, they own their own property since 1995. However, as we will argue later in this section, it is too simplistic to say that state regulation has gone down. The picture is more nuanced. But let us first give an example of governmental reforms and initiatives that are meant to reduce state regulation.

Personnel policy demonstrates a clear case of devolving authorities from the national government to the universities' intermediary body and the individual universities themselves. Traditionally the Ministry of Internal Affairs determined

the basic salaries and working conditions of all employers of the public sector, including those in higher education. Academics and non-academics were civil servants. This, however, started to change around 1990. For example since 1987 the universities have had the power to appoint professors without interference from the central government (de Weert, 2000, p. 106). Today the recruitment and appointment of staff have been further devolved toward the faculties, with the exception of professors appointed by the central executive body of the university.

Since the late-1980s employment conditions in the Dutch higher education and research system have undergone a transformation from a public to a more private type. The outcome of this process is an institutional framework in which universities sit at the bargaining table to negotiate with the trade unions about pay, salary increases, and conditions of service. The buffer organisation of the universities—the VSNU—represents the universities in negotiations with the labour unions about almost all terms and conditions of service. In fact, the VSNU is the official employers' association. The agreements result in a collective, national agreement. Next to negotiations at the national level, bargaining also takes place at the level of the individual university. Universities have some leeway to determine their own conditions. Today all academics and non-academics are university employees.

Whereas the government as such is no longer a player in the bargaining process, it still shapes employment conditions and salaries by determining the total budget for the labour agreement. This execution of power by the purse is a good example of external guidance by the state, which arguably fits the HOAK notion of 'steering from a distance' rather well. At the same time it creates room for 'market-based' behaviour as De Weert concludes (de Weert, p. 129).

Just as with regards to personnel policies state regulation seems to be in retreat in other policy areas as well. This however may be deceptive. Many changes regarding enhancing institutional autonomy refer to procedural matters. Procedural autonomy is the power of a university to determine the means by which its goals and programmes will be pursued (Berdahl, 1971, 1990). It concerns the *how* of academe. Dutch deregulation policies in the form of devolving authorities to the university level over the last two decades have created more freedom for universities to make their own choices in terms of procedural matters. However, state interference seems to have grown in terms of substantive autonomy - the power of a university to determine its own goals and programmes (the *what* of academe). New forms of accountability, in the form of quality assurance requirements and increasingly more performance-based reporting, counterbalance greater freedom on procedural matters. This distinction is important if we follow Berdahl's assumption that governmental actions that impact substantive goals affect the heart of academe much more than actions in the area of procedural autonomy. The net result of more procedural and less

substantive autonomy is hard to judge, but obviously it is too simplistic or even wrong to just argue that state regulation has been decreased.

This observation of remaining state regulation despite concurrent and clear indications of deregulation is supported if we take into account the notion of organic autonomy, which refers to the right of universities to determine their own academic organisation. In 1997 the legal prescriptions for the internal organisation of university life was substantially changed (introduction of the 1997 MUB-Act, see also the section on managerial self-governance). Compared to its predecessors, this MUB-act gave universities more leeway to make their own choices in terms of its internal governance; indicating less detailed state regulation. At the same time, the internal governance structure is still legally imposed; a sign of continued state regulation. Over all, the number of rules set by the Dutch government is still impressive and the national government is still imposing elements of reform via laws and decrees (Boin, Huisman, van der Meer, & Toonen, 2002; de Boer, Goedegebuure, & Huisman, 2005).

4.2.2.4 Academic self-governance

There are good reasons to believe that the opportunities for academic self-governance have declined. Other players such as national agencies and university management have more powers to participate in strategic research decision making. However, academics still control resources (knowledge) that are highly sought after by others. We illustrate our argument about a somewhat mixed portrayal of academic self-governance by discussing the developments in quality assurance policies and changes in internal university governing structures.

Among others, the HOAK white paper (1985) introduced the idea of quality assurance as a policy instrument in the steering philosophy of the national government. In exchange for more institutional autonomy, more accountability was regarded as necessary. In the first years after the publication of the HOAK paper, the discussion focused on the structure of quality assessment for teaching and research. The government expected institutions to play an active role in the establishment of the new quality assurance system.

Thus the Higher Education Inspectorate would be responsible for the governmental evaluation; for example by installing expert committees to conduct periodic site visits. Different options were passionately debated by the national government, the intermediary bodies, the higher education institutions, and individual actors. The minister and the universities agreed that the VSNU as the universities' representative should play a coordinating role with respect to the quality assessment. The VSNU managed to force a quality assurance system in which the government's role (i.e., the Inspectorate) and external stakeholders

were marginalized. The academics were playing the leading part in the new quality assurance game.

In the 1987/1988 academic year, quality assessment of teaching was introduced as a pilot project. The procedures, discussed under the umbrella of the HOAK were borrowed partly from the procedures for conditional funding of research and experiences from the United States (Jeliazkova & Westerheijden, 2004, p. 330). The quality assessments of research 'began' in 1993 after the demise of the program of conditional funding of research mentioned in section 4.2.2. In 2003, a new national evaluation system for publicly funded research was introduced as developed by VSNU, NWO, and KNAW.

Thus, the quality assurance system in place in the Netherlands since the late-1980s is a clear example of academic self-governance to a very large extent. One can speak of how 'external' academic self-governance (i.e., not the individual academic inside the university but 'academe as a collective') is still largely influential. Here the position of the government is rather distant. Apart from the role academics still play in assessing their work (peer review driven evaluations as well as reviewing each others work in terms of articles and papers), academics are also very active in the national research council and other organisations that develop and advise on research programs. And research applications are (of course) judged by peers. This role was, for example, visible in 2003 when the six Dutch top research schools (*toponderzoekscholen*) were evaluated. This procedure consisted of a self-evaluation, external peer review, and a final review by an internationally-composed committee. Research excellence, promoted and largely funded by the government, is appraised by academics. Thus, in many instances the peer review system is still up and running.

For quite some time the central administration of the universities has been kept aside. Quality assessment outcomes were supposed to be used by the basic levels of the universities rather than the central managers. Quality improvement was more important than quality control. This however, started to change in the 1990s. University 'managers' were increasingly using the results of the quality assessments to manage universities. Not so much for making big decisions to reform education or research but more often as one piece of information among others, legitimizing in many cases tacit knowledge about quality of units which could be applied to many types of decisions (de Boer, Enders et al., 2005). More recently university management has begun to play a more active role in quality assessment procedure in the sense that, according to the SEP-protocol, together with the research institutes director (or board) it is responsible for the organisation of the research evaluations.

We would argue that at the end of the day quality assurance still points in the direction of (collective) academic self-governance. But the very fact that the rules of the game concerning quality assurance were recently changed emphasizes and

illustrates the government's prerogative in this respect; the change in the quality assessment schemes and the introduction of accreditation was not proposed by academics. And the current evaluation and accreditation structure involves many non-academics (the implementation of an institute's research quality review is jointly organized by the board of the KNAW, the board of the NWO, and the central executive board of the university). Thus, we see a mix of academic self-governance and external regulation.

By the same token we can interpret the effects of the competitive-based grants from the research council. NWO has become more outspoken over time. Their grants are prestigious; most universities have put internal premiums on acquiring grants from research councils. One might argue that academics become, for instance in terms of their academic prestige, increasingly dependent on research programmes of a national agency. On the other hand, the role of academics remains strong through the peer-reviewed competition for grants. In these competitive games individual researchers may have the feeling they have lost control to a large extent but as a collective, academics still have a strong voice.

Within the universities many important powers have been taken from academics. Moreover, academics have to account for their actions much more than in previous times. The days when academics were treated as 'untouchables', particularly concerning research matters are absolutely gone. Prior to 1970 the senate, faculty, and the chairs embodied academic self-governance. The senate, made of all full professors, decided on academic matters. This academic self-governing body was abolished in 1970 and replaced by a university council with representatives of various constituencies. Academics, particularly at the departmental level, were generally speaking still in control with respect to academic matters. Whereas the government has devolved many of its authorities to the universities since the mid 1980s (see also the section on 'state regulation'), we witness tendencies of centralisation inside the university due to among other things the reshuffling of powers as a consequence of the 1997 Act on internal university governance. One might speak of 'centralised decentralisation' (Henkel, 1997). In a formal sense, academics – as well as students – lost many of their possibilities to decide on teaching and research as representative bodies at the university, faculty, and departmental (*vakgroep*) levels were stripped of significant powers on the primary processes. In the past these representative bodies, particularly at the departmental level where academics clearly had the upper hand, were strong in decision making on academic affairs. After 1997 this level was formally abolished and most of the powers previously assigned to the representative bodies were now transferred to the faculty's management (dean, vice-deans, and institute directors). The reforms initiated a shift in control over primary processes from the prerogatives of individual professors to the collective setting of teaching and research agendas in line with faculty priorities and

strategic plans, under direct stewardship of the dean. In this respect and compared to its predecessors, the MUB can be regarded as an attack on academic self-governance.

Some academics however, particularly the most prestigious ones, are still very capable of effectively voicing their opinions, individually as well as via committees. As De Boer's (2003a) empirical study demonstrates, senior academics are still able to largely play the game according to their own rules. Thus, we would argue that within the universities we can no longer speak of traditional academic self-governance. But it would certainly be wrong to state that they are sidelined.

4.2.2.5 Competition for resources

Competition has always been the name of the game in universities. Of course we refer in such a case to matters such as reputation, prestige, and excellence. Here we mean the competition for scarce resources or market-based competition (referring to a different ideology or set of rules) concerning among other things research and teaching funding and personnel. This competition for research and teaching money and staff can take place outside and inside the universities. For example, externally institutions compete for (excellent) students or academics rival for research grants. Internally, academics, units, or departments 'fight' each other over budgets or vacancies. There are different kinds of competition at various levels in the higher education systems.

There are again several examples of increased competition in the Netherlands in recent years. Generally speaking we see that universities are 'encouraged' to compete for students, research grants, and (in the near future) for staff. The competition for students can be illustrated by the 'voucher concept' originally proposed in the late-1980 that expresses the notions of a demand driven system. A student receives vouchers that he can hand in for following educational modules. Each voucher has a certain value, paid by the government to the institution. Moreover, students are financially important to universities because a proportion of the university's budget depends on the number of graduates. More recently, learning entitlements, elaborating on the voucher idea, have been put forward, but due to a cabinet change (in 2007) the status of learning entitlements are unclear.

Competition for research funding has grown and can be seen in the national budget model. Parliament determines the budget for the university sector as a whole, and subsequently distributes this budget across the individual universities according to a formula which makes up the first flow of funds. It is partly based on performance; the number of the degrees awarded, the number of first-year students, and the numbers of doctorates are used as performance indicators.

Generally, in the first flow of funds, a lump sum is given to the universities based on the ratio between the teaching and research load of one to two. Although performance is rewarded, most of the research component is allocated under the heading of strategic considerations. It consists of fixed allocations per university, based on historical reasons. Since this part dominates the allocation, the funding is less performance driven than it may look at a first glance.

There have been plans to base research allocations on the quality of a university's research and an assessment of the relevance of such research for society. However, this plan was never realized partly because of the potential consequences in terms of reallocations between universities and the ensuing unemployment benefits. Another important reason was that a reshuffling of research funds was regarded as a major intrusion on the university's autonomy. For more than 15 years the universities have been successful in avoiding any relocation within this component, although some (relatively new and expanding) universities have sought to get a larger allocation. Therefore, unlike for the teaching component, the major part of the research component is still distributed mainly on historical grounds.

The focus on rewarding excellence research nevertheless continues to be an important policy goal. It has been observable since the early-1990s with the establishment of the research schools. These consist of researchers and PhD students from different universities that work in the same field. They have been used as an instrument for the integration, concentration, and proliferation of research. Since 1999, the Minister has allocated funding to a limited number of research schools regarded as excellent (one of the funding components). Six schools, all in the natural sciences, received extra funding for a limited period. The Minister makes the selection after consultation with the NWO. Although the Minister planned to extend this 'depth strategy' to the social sciences and humanities, he abandoned this policy and introduced the Innovation Research Incentives Scheme (*Vernieuwingsimpuls*). 'Picking winners' has in other words been the underlying strategy of the national government; strategic choices for promoting excellence.²⁴ Recently the Social Economic Council (SER) called the depth strategy 'excel through aimed investments.' (SER, 2003) The Dutch research area is regarded as too small to have high achievers in each and every field. Such strategic prioritizing is another indicator of increased competition, both for universities and its academics.

The view of competitive-driven research funding has also been propagated by proposing to transfer funds from the first flow (line budget) to the second

²⁴ The '*dieptestrategie*' –the strategy of funding only the happy few- has nevertheless been discontinued because it met too much resistance. The six top research schools were however positively evaluated and may therefore continue to receive governmental support.

(competitively allocated, distributed by the research councils with the assistance of peer reviews). This issue has been on the political agenda for a number of years. The expectation for coming years is that the funding of universities will increasingly be competition driven. The ideas of focus, excellence, and mobility affect the national policies and the separate (consortia of) universities. The central policy themes of the last Science Budget document (MOCW, 2004a) leave no doubt about the state's ambitions: focus and concentration, knowledge for business activities, human resources, and quality.

We should also mention the growth of the third stream funding over the last two decades as an indicator of increased competition (third party funding for teaching and research). Both in teaching and research, universities are increasingly trying to sell their services in real markets. The revenues from these sources have grown over the last decades and today make up about 25% of the universities' budgets. In fact, no single Dutch university would survive these days without this income source. However, by entering new markets universities have faced new competitors. Private providers of teaching programmes or consultancy firms partly work in similar areas. And with the liberalisation of the public sectors the entry into traditionally closed markets such as higher education has become increasingly easier. In the Netherlands it is especially the Ministry of Economic Affairs that investigates the possibilities of breaking down legal barriers. They promote the open sector in which the borders between private and public are erased (de Boer, Enders, & Leisyte, 2007).

Regarding personnel we also witness more competition, or at least potential competition. With respect to this resource, competition is not as visible as with funding. The Dutch academic labour market is changing, pointing in the direction of scarcity and 'smaller pools to fish from'. There is for instance:

a tendency to include other than purely academic qualifications in academic recruitment. Other qualifications, especially for senior university staff, include managerial abilities and the capacity to attract external research funding. (de Weert, 2000, p. 114)

This means that the number of suitable candidates is declining. Moreover, shortages of doctoral students and female staff have been reported, particularly in the sciences. The ageing of academic staff will most likely worsen the situation, as it may lead in the near future to insufficient numbers of successors (Committee van Vucht Tijssen, 2000; van Dijk & Webbink, 2000). Increased competition for academic staff is likely to intensify, particularly if we realize that more performance driven systems fuel competition.

In a more competitive environment, individual career policies, differentiation in salaries or reward structures, and increasing numbers of temporary employment contracts have become serious options for discussion.

To some extent, similar to the national level, we witness more competition within the universities. The outcomes of quality assessments may not be directly linked to budgets – as in the UK – internally this information is used to support strategic decision-making (de Boer, Enders et al., 2005). At many universities policies have been developed to reward high achievers, because among other things institutional management wants to position and profile their institutions to be more competitive on a regional, national, and global scale. Internally performance driven allocation models are used; another indication for emphasizing and provoking competitive behaviour among academic units (Jongbloed & van der Meulen, 2006). Personnel policies are used for rewarding some units and punishing others (by creating new posts and not refilling old ones). Although internal competition doubtlessly has a long history, there are clear signs that in the Netherlands in the last decade the competition between faculties and units has increased as a consequence of more performance driven policy rationales of university management.

4.2.2.6 Managerial self-governance

In comparison with the past, managerial self-governance in the form of exercising powers inside and outside the university by managers has become more important. This is partly due to the fact that in the past institutional management was nearly absent. Today many authorities have moved down from the national government to institutional management (e.g., in finance and personnel matters). The tasks, responsibilities and expectations of institutional management have grown.

The increased importance of managerial self-governance is probably best illustrated through the changes in the internal governance and management structure of universities (de Boer & Denters, 1999). Central institutional management was traditionally very weak in the Netherlands. Prior to the 1970s Dutch university governance was by and large comparable to the ‘continental mode’ where state bureaucrats and academics held the major power and dominated internal decision making-structures and processes (Clark, 1983). Authorities of academic and non-academic affairs were clearly separated in different bodies. This co-existence of external regulation by the state and academic self-governance was called the *duplex ordo* (de Boer, 2003a). At the universities the nation state was represented by a board of curators responsible for upholding laws and regulations, administrating the university’s finances, and

for personnel policies. The other pillar in this pre-1970 structure was the senate of full professors.

As a consequence of the unprecedented growth in participation and demands for (more) democratic participation, a new Act of University Governance (*Wet op de Universitaire Bestuurshervorming* - WUB) was put into effect in 1970. The WUB abolished both the senate and the board of curators and replaced them with a system of functional representation through university and faculty councils. Academics (professors and other academic staff), non-academics, and students were all given the right to elect representatives to these legislative bodies. In addition, a limited number of lay members representing the general public were appointed. The governance structure of the universities in the 1980s and early-1990s can be described as a system of 'mixed leadership': decision-making was to be on the basis of 'co-determination' (Currie et al., 2003; de Boer, Denters, & Goedegebuure, 2000; de Boer & Huisman, 1999).

In the HOAK white paper (1985) and related documents the Minister was very clear that institutional management had to be strengthened if universities were to be successful in a competitive world. Moreover, the drawing up of institution-wide strategic plans was legitimating a more active role of the central management. The formal authority distribution within the university, however, did not substantially change though the balance of power gradually tilted in favour of the universities' executives (de Boer, 2003b). The real change in formal responsibilities within the universities would take place a decade later.

In 1997, the Dutch Parliament passed the act on 'Modernising University's Governance Structures' (MUB) which marked the end of an era of participatory modes of internal university governance. It abolished the system of co-determination by executive board and representative council and the system of power fusion. Instead, executive leadership was strengthened and powers became more concentrated. The representative bodies where academics, non-academics, and students held seats became advisory instead of decision-making bodies and were thereby stripped of their main authorities. Most powers regarding academic and non-academic affairs have been attributed to the executive positions at the central and faculty level. The new governing bodies involved a system where executive and legislative powers were concentrated. All members of the crucial governing bodies —the supervisory body (*raad van toezicht*), the central executive board (*college van bestuur*), and the dean (*decaan*) were to be appointed by the body from the 'upper level'. A new vertical system based on appointments replaced the old system in which representatives had a strong voice in decision-making. The Act promoted efficiency and effectiveness in university decision-making and was in line with the overall governmental steering strategy that aimed to enhance institutional autonomy.

The 1997 Act can be typified in terms of (vertical) integration, coherence, hierarchy, centralisation, and concentration of powers; all terms that fit the credo 'give managers the right to manage'. The introduction of the MUB is an outstanding example of a shift towards managerial self-governance.

In practice this does not automatically sideline academics; they still have a role to play (de Boer, 2003a; de Boer, Goedegebuure et al., 2005). It would be wrong to underestimate the influence of academics in institutional decision-making. Empirical evidence suggests for instance that deans – the embodiment of 'managerialism' – still want to protect their academics and realise quite well how dependent they are on these professionals. Sharing decision-making power when it comes to research issues is therefore still common. Nevertheless the mutual relations between the academic manager and the academics have somewhat changed since formal powers can be used if deemed necessary and most actors are likely well-aware of this.

Another example of increased managerial self-governance is changes in quality assessment. In the 1990s officially 'validated' information about quality differences among units in the higher education institution made it possible for academic management to make, and publicly uphold, decisions that went beyond the easy option of declaring that everyone was equal. In other words, through the newly created visibility of academic performances, institutional leaders at the central and faculty level of Dutch universities were able to strengthen their negotiation position vis-à-vis academe. In that sense, quality assessments were a lever that made other existing management tools within the universities really usable (Westerheijden, 1997, p. 405). Their deepest impact may therefore well have been that they led to a change in the self-conception of the university managers from ceremonial figures incapacitated by the egalitarian culture to 'doers' who could actually steer their unit (Westerheijden, 1997, pp. 408-409).

Managerial self-governance may not only have an internal component, but just as academic self-governance, an external one as well. Unfortunately we have no clear indications to what extent institutional leadership plays a coordinating role at the system's level and to how this role has changed. The university Rectors and chairs of the central executive body have their circuits and meet frequently but their impact is hard to interpret.

We would argue that managerial self-governance has increased. However, the leeway for universities' central administrators is bounded. 'Empowered' institutional managers can not decide and act at their own discretion with respect to research agenda and policies of their institutions (AWT, 2003). The AWT argues that the university's central executive boards have little room to manoeuvre when it comes to research. Decisions on research policies are usually (still) taken at basic levels of the university. Moreover, many research programs have a long time horizon (regularly the same period of a professorship). Finally,

the principle of matching funds limits the strategic manoeuvring of the central administration.

Generally speaking, the consequences of increased managerial self-governance within the universities point to a rationalisation of organisational processes. There is a stronger focus on goal setting, profiling, and measuring performances (de Boer, Enders, & Leisyte, 2007). There is a stronger programming of activities; evaluation assessments have become an important management instrument. Academics are increasingly pushed to account for how they spent their time; management by objectives – usually in the form of soft contracts – has become rather common.

4.2.2.7 Stakeholder guidance

A consequence of the changing role of the government and other changes in the higher education context is that other actors actively step in to guide higher education and research. The impact of external parties on research has been present since the 1980s. An early example of 'bringing society in' is found in the early-1980s with the introduction of conditional funding for research. By setting the conditions for research the government intended to rationalize the nation's research. But despite their efforts, the academics' powerful position remained intact for a long time. One of the side effects of the endeavour to rationalize the national research agenda by means of national programs was that they were used to protect researchers from outside interference. National research programs, if they reached the basic levels of the university at all, had the tendency to be broad and vague. They left ample room for manoeuvre for academic researchers. Moreover, within the new structure many traditional mechanisms such as peer reviews remained in place. As a consequence, academics were still at the heart of programming public research, and thus discipline-based criteria still played a significant role. There was still a structure of academic self-governance within the parameters set by external stakeholders: continuity and change at the very same time.

In 1993 the policy of conditional funding was ended and succeeded by a system of quality assurance (with internal self assessment and external peer review). In hindsight, however, it certainly had an impact in the sense that it provided others with valuable information about research performance usually only known to academics. Institutional managers received comparable data from the rationalisation processes that they could use to manage their institution and justify strategic decisions.

In 2003 many Dutch researchers held the opinion that research themes in the Netherlands were determined by non-academic parties to a significant extent (NOWT, 2003, p. 154).²⁵ Though this external interference is perceived as real, and to some extent accepted, many researchers still have the feeling that research will flourish if they are 'left alone'. Researchers still cherish their professional autonomy concerning the selection of research themes (de Boer, 2003a; NOWT, 2003)

Another example concerns the introduction of the 1987 planning cycle, in which the national government and the universities, as the principal actors, set the policy agenda for higher education and research by means of a dialogue. The distinguishing feature of this dialogue was the bi-annual publication of strategic policy plans from both the national government and the individual universities. In these strategic documents, the national government and the individual universities were supposed to respond to each other's opinions, views, and ideas. This 'dialogue on paper' was not effective in every aspect. Recently the Advisory Council for Science and Technology Policy (AWT) concluded that there is hardly any dialogue on research policies between the universities and the minister. The perception is that the minister is only casually responding to the universities' strategic plans and annual reports. Also interesting to note is that other parties are explicitly invited to respond to the views and opinions of the Minister. All sorts of interest groups, advisory councils, and intermediary bodies take this opportunity to express their views on higher education and research in the Netherlands. Among others, industry raises its voice along these lines.

In 2006, the Minister put forward a bill for a new higher education act (MOCW 2005b). In this bill, the Minister advocates a steering principle of what he calls 'vertical supervision and horizontal accountability'. Vertical supervision refers to the strengthened line-management in universities; horizontal accountability refers to the (moral) obligation of universities to create opportunities for external stakeholders (e.g., students, local communities, employers, parents) to express their views and influence university policies. Universities have to account for their activities not only to the government and their peers, but to society as well. Such new accountability measures can be seen as an effort to increase stakeholder guidance. By horizontal accountability stakeholders should play a much more prominent role in setting the directions of a university. Due to the newly installed Cabinet in 2007 however, the bill has been mothballed.

²⁵ According to 50% of the researchers, external parties determine 25 to 100% of the research themes. In the view of the other 50%, the external parties determine at maximum 25% of such themes (NOWT, 2003, p. 154).

Finally, stakeholder guidance can be seen in the involvement of external members in internal university governance. The 1997 Act on internal university governance (MUB) created a new body at the top of the university. This supervisory board is entirely made up of external actors (i.e., high profile persons coming from industry or former politicians). These persons 'from the outside' are meant to buffer against the state and to represent the society at large. At present the role of the supervisory board is unclear. Many inside the university don't know much about what the supervisory body does (de Boer, Enders et al., 2005). The minister seems nevertheless intent on increasing this body's role (MOCW, 2005). Another example of outsiders inside the university is the 'expert councils' that advise, for example, on research matters. Such expert councils are not legally obligatory; several universities, at both the central and the faculty level, use these councils as soundboard for developments in their environment. They have been around for some time but their numbers and impact seem to have increased.

We would argue that in the Netherlands stakeholder guidance has gradually grown. Although the ministries of OCW and Economic Affairs still regulate parts of the sector, they increasingly use strategic goals and agenda setting as means to steer the university sector. Moreover, it is not just the ministries but other organisations that interfere in these processes. For several reasons (funding, legitimacy) universities cannot deny the expectations of these stakeholders. One way of 'bringing stakeholders in' concerns the composition of university governing bodies; another concerns a stronger emphasis on horizontal accountability.

4.3 Conclusion

Shifts in governance form part and parcel of an overall restructuring of the university sector in England and the Netherlands. The point of departure for the reforms was different for each country since the two systems are based on different higher education governance models. In England, exemplifying Clark's Anglo-Saxon model, the state did not directly interfere in university matters although it supported them financially. Main powers rested in the hands of the academic oligarchy; universities were independent organisations. In the Netherlands, traditional university governance clearly resembles Clark's Continental higher education model where state bureaucrats and academics held the major powers in the overall coordination of the system. Universities were characterized as professional bureaucracies. The shifts in governance have taken different routes and have led to different combinations of the governance dimensions that we address, although there are similarities as well. The historical-institutional context and the national styles of governance influence the way in

which governance reforms are implemented in these countries and how they try to affect university governance and research practices. Whereas England is generally seen as a more extreme case of the shifts in governance and an 'early adopter' of rather fundamental governance changes, the reforms occurred in a somewhat lighter fashion and later in the Netherlands.

In both countries, we can see similar and different factors that fostered the governance reforms. Both the British and Dutch governments also tried to redefine their roles vis-à-vis the higher education and research sector. We see the lack of funding, or at least the levels of worries about public expenditures, for the expanding higher education and research systems as a common feature. Public funding declined or stagnated in the 1980s despite increasing student numbers. The governments found it increasingly more difficult to finance the higher education expansion. They expected universities to find ways to work more efficiently and to find other sources to fulfil their tasks with less public funding. In England the Conservatives took power in 1979 and aimed at curbing the autonomy of universities and cutting down the expenditures. They 'liberalised' the sector with quasi-market reforms and at the same time increasingly prescribed the rules of the game to universities to make them perform better. This meant increasing scrutiny of performance. The higher education and research system in England developed in the 1980s into an example of top-down public managerialism that threatened professionalism. During the 1980s and early 1990s the government in England gradually changed from essentially bottom-up allocation decisions to top-down specifications of priorities and strategic directions. This was carried out under the rationale that professions need to be managed. The climate gradually changed in the 1990s, where the state adopted a more guiding role under the New Labour government. Target setting in higher education and research sector was imminent.

In the Netherlands, by contrast, after the fiscal problems and discontent with detailed regulation before 1980s, the centre-right cabinet began retrenchment policies in 1978 to cut the costs which included the idea of national research programming, increasing transparency, quality evaluation, and more accountability. In 1985 the Dutch government introduced the concept of 'steering from a distance' which meant, on paper, the state was setting the framework for universities by increasing their autonomy whereby the state did not interfere in their daily business. The Dutch political climate remained rather stable for another decade and the idea of enhancing institutional autonomy continued to lead to several reform policies. The Dutch approach was more concerned with consensus in decision-making and the self-steering capacities in the higher education and research system itself. After long debates in scientific, administrative, and political circles in the 1980s a more pronounced

managerialisation was introduced in the 1990s in the Netherlands, although in a 'softer' version than in England.

Reviewing the five dimensions of governance, we conclude this chapter by comparing the developments in the two countries. We first look at how state regulation has changed, then proceed with academic self-governance, competition for resources, managerial self-governance, and stakeholder guidance.

State regulation

External regulation by the state has increased in England and gradually decreased in the Netherlands: the directions of this governance dimension are not the same. This does of course not mean that there is more state regulation in England than in the Netherlands these days. External regulation by the state of higher education and research in England was limited until the 1980s. In higher education matters, universities were dominant in the system's coordination and the power of academic Dons prevailed. In England, strengthening the regulative capacities of the state in higher education has been part and parcel of the reform process. Governmental intervention increased with the expansion of the higher education sector and a growing concern about what was 'produced'. After the Conservatives assumed power, a series of white papers have been published that increasingly saw higher education and research as a part of the economic sub-sphere of society. Universities have come to be seen as public service institutions which are told by the government how to fulfil their tasks. State regulation was strengthened by funding and quality reforms where the dominant motive has been increasing accountability. The state currently prescribes more processes for universities focusing on areas of special political interest, such as measuring quality of teaching and research, using 'adequate' coefficients for accountability to HEFCE, and prescribing financial monitoring structures in universities.

In the Netherlands, we have witnessed reforms that are to some extent comparable to the English case. Also in the Netherlands the government has imposed accountability regimes (introduction of quality assessment systems in teaching and research) and has changed the internal governance structures of universities to improve their role as 'service providers'. At the same time, many policies and initiatives have been taken to devolve authorities to other levels and actors in the system, including the institutional level. Enhancing the university's autonomy has been one of the overarching goals of state policy in the area of higher education. One might argue about what the net effect in the Netherlands is. We would argue that state regulation, as it has been defined earlier, has been reduced to some extent. There are clear indications of deregulation. At the same time, the number of rules set by the state is still impressive, and the state is still in the position to steer higher education via laws and decrees (Boin et al., 2002).

Academic self-governance

Historically academics in both countries had strong powers in the internal and external university governance. A change has brought in a mixed picture. As regards the internal governance of universities, the role of academic governing bodies as well as the powers of individual academics/chair holders have been weakened. As regards the external governance of universities, the role of professional self-regulation especially via peer review has rather gained in importance.

Looking at the internal governance in English universities, at face value the position of leaders and managers has been strengthened at the expense of the powers of academic self-governance and individual chair-holders. Academics do not have a decisive voice anymore in the non-academic matters. The committee structure is still in place but they do not make strategic decisions as these are in the hands of university management. In such a context academics have to comply with decisions and activities framed by various layers of directives, strategies, and action plans devised by department, faculty, and top university management. At the same time, empirical studies show that academics have cleverly adapted to new circumstances and are through negotiations still able to voice their interests. Fulton (2003) concludes that in many respects the organisational culture did not change too much. Particularly in academic matters shared decision-making is still common. When we look at external governance a complex picture emerges. We can witness a growing role of the academic profession via quality assurance and evaluation procedures. Academics sit on the RAE panels and in the councils and boards of different governmental bodies. At the same time RAE guidelines are discussed with external stakeholders and final funding decisions are made by the governmental bodies – thus, external academic self-governance has its limits.

Within the Dutch universities important powers have been taken away from academics. Universities are compared to the past more run by academic leaders and managers. These new leaders and managers have, again in comparison with the past, gained more possibilities to run their institutions. However, they remain dependent on their professionals in many respects. Academics, and particularly the most prestigious ones, are still very capable of effectively voicing their opinions. In terms of external governance, peer systems are very important and are offering academics the opportunity to influence strategic decision making in higher education. Particularly in the area of quality control and research programming is professional expertise providing academics a key role.

Competition

Competition for resources has increased in England and the Netherlands partly due to the major reductions in state funding for higher education and research and partly due to the expansion of the systems. Competition is more pronounced in the English higher education and research system since the major state allocations are performance-based, while in the Netherlands the core state research funding is largely based on an historical track-record.

In England performance-based funding was introduced based on the results of the RAE. The inclusion of former polytechnics into the university sector in 1992 contributed towards an even larger increase in external competition for the same pool of state funding. Further, the competitive allocation of research councils funding have contributed to increasing competition for research money. As a result of competition and especially due to the selectivity effects of the RAE a stratification of universities appeared where most research funding is concentrated at the top research universities. This also increased the competition of excellent staff between different universities. Finally, more selective state funding increased internal competition within universities for scarce resources.

In the Dutch higher education and research system we witness increased levels of competition in teaching and research. Competition for staff has also changed since university staffing policies professionalise and universities increasingly take pro-active strategies to recruit staff. The state has actively tried to create a more competitive-driven higher education system. University budgets are (partially) dependent on student numbers, so universities 'fight each other' in the recruitment of students. Competitive research funds, be it from the national research council, the European Commission or other third party funders, have become increasingly important. This does not only include the competition of researchers (or universities) amongst each other, but also the competition with private providers. And in terms of competition we should also refer to the growing competition within university, e.g. competition for new staff posts, facilities or the distribution of research grants and premiums on the internal market. The information from quality assessments provides university management the means to make strategic decisions (on teaching, research, personnel, infrastructure), and to create 'internal markets'.

Managerial self-governance

Both in England and the Netherlands traditionally managerial self-governance was weak. For the last 25 years governments in both countries increasingly aimed at strengthening institutional leadership and management at universities. Power structures and decision-making rules and processes have been changed, trying to make decision-making structures and processes more

efficient and effective via means that have to some extent been borrowed from corporate enterprises. Nevertheless, the leeway for institutional management is bounded, and as mentioned before, academics are still important and cannot be completely sidelined.

In England the government was very clear about the need to strengthen the managerial capacity at universities. Its goal was to centralize decision making powers in order to improve efficient functioning of universities. This shift towards a more profound role of central management in universities implies more power to the Vice-Chancellors who act as chief executives and of the university's middle management (more powers for deans and heads of departments).

In the Netherlands managerial self-governance has become more important as well. Through a number of regulations the position of leaders and managers has been strengthened, at the expense of representative governing bodies. The tasks, responsibilities, powers and expectations of institutional management have obviously grown. One of the consequences of increased managerial self-governance within the institutions is a strong desire for rationalising organisational processes. Nevertheless, particularly when it comes to research policy matters the role of institutional management is still modest. There is absolutely not a "control and command" structure.

Stakeholder guidance

Stakeholder guidance of higher education and research has increased in England and the Netherlands. In both countries there is a strong policy tendency to include society and industry in the higher education and research sector. For a long time, and may be even today, higher education and research are seen as rather 'closed systems'. Many initiatives have been taken to open up these systems and to jointly set strategic priorities and directions. Obviously the English and the Dutch government play this stakeholder role in the sense of strategic direction setting. Instead of using directives telling universities what to do in a given situation, universities are 'encouraged' to contribute to national targets without being told how this must be done. In both countries there have also been initiatives to increase lay membership in internal university governance. The Dutch supervisory board, completely made up of external members, is a clear example of this. In England university councils have also a number of lay members.

5 Basic research units in Biotechnology and Medieval Studies

As described in Chapter 3 we focus our analysis on research units in biotechnology and medieval history; fields that are supposed to have different value systems and *modus operandi* (Becher & Trowler, 2001). This chapter presents the disciplinary environments of the basic research units in more detail. We first introduce the fields of research in general, followed by their specific characteristics in England and the Netherlands. We present the policies pertinent to the field, introduce the major actors influencing it, and conclude with certain organisational characteristics of our selected cases within their university environment.

5.1 Biotechnology

Biotechnology is a relatively young sector that has boomed over the last three decades.²⁶ Modern biotechnology²⁷ may date from the development of gene splicing techniques. The new technology experienced a honeymoon in the 1970s and 1980s, during which many of its scientific pioneers and innovators concurred with speculation over the dramatic benefits for human health and welfare to be realized in the coming decades.

The field of biotechnology has certain characteristics that are important in understanding the way it is structured:

1. Biotechnology is a complex field because it relates to more than one scientific field and more than one area of application. The disciplines of physics, medical sciences, technical sciences, and agricultural sciences

²⁶ One might argue that biotechnology is a very old field (agriculture). The selective breeding of plants and animals has been done for a long time. However, with the 'global introduction' of molecular biology a new age has arrived. In this memo we mean 'modern' biotechnology.

²⁷ Biotechnology is defined in various ways. The term was coined as early as 1919 by a Hungarian engineer Karl Ereky and has been developing together with the rapid advances in the field. The most encompassing definition is probably formulated by the UN "Convention on Biological Diversity": "Biotechnology is any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use. See <http://www.wordiq.com/definition/Biotechnology>

coagulate. Biology and chemistry may be at the heart, but at the same time medicine, informatics, or engineering all play a significant part. This means that biotechnology research is always multidisciplinary, related to varied fields of application ranging from the pharmaceutical industry to agriculture.

2. The number of stakeholders playing an active role in biotechnology is large: the government (e.g., for the public sake: health and economic reasons), the society (e.g., for moral issues), the public knowledge providers (e.g., universities), and private knowledge providers and users (e.g., multinationals and SMEs). They all seem to have good reasons for being engaged in biotechnology matters.
3. University scientists in biotechnology are very important because this field requires professional experts trained at universities. University academics can be associated with new biotechnology firms, since these firms need more experience with R&D and perform applied and basic research. Both established corporations and smaller firms depend on academic scientists for relevant expertise. In this way, universities are only a base, or a part of the whole biotechnology organisational structure.
4. The main sectors regarding biotechnology are health care, pharmaceuticals, agriculture, food, and the environment.
5. Scientists plunge into a new world of molecular techniques and more sophisticated technologies.
6. Product development in biotechnology is more difficult than in other areas because the development phase is long, many products are not components but aimed at end-users, and there are stringent regulatory procedures (especially in the field of pharmaceutical applications).²⁸
7. In this field of research, the trajectory from basic research to applications and commercial activities seems to shorten. There is nevertheless a rather limited 'innovation capacity' that is, the transformation from new fundamental insights to new products or processes. The long way towards valorisation of research, also in the area of biotechnology, is regarded as one of the shortcomings.
8. Knowledge seems to be relatively quickly outdated; new significant insights rapidly follow each other, which among other things require

²⁸ During the 1990s, calls for restraint or even abandonment of some aspects of biotechnology came to the fore. Individuals and interest groups increasingly voiced concerns over respect for human and animal rights. Mixed in with the ethical debate, there were growing concerns about the risks of more tangible damage to health, welfare, and the environment. In general, biotechnology developments have been high on the political agenda in both EU and national policies (EU Commission, 2002, p. 7).

continuous investment in equipment. Combined with the interdisciplinary nature the body of knowledge is rapidly expanding, demanding different kinds of expertise (Enzing, 2000; Freeman & Barley, 1990; Houwink, 1989; Kenney, 1986; Orsenigo, 1989).

Barley et al. (1992) uses ten types of organisations to describe the biotechnology community. Four carry out research in biotechnology:

- Dedicated biotechnology firms established primarily to pursue biotechnological research and development in areas of commercial promise;
- Universities that carry out basic or applied research in biotechnology either through their academic departments or centres dedicated to biotechnical research;
- Private or public research institutes that conduct research in one or more areas of biotechnology;
- Diversified corporations in the chemical, pharmaceutical, energy, and agricultural industries that either conduct R&D on biotechnology or fund research by dedicated biotechnology firms, universities, or research institutes.

Thus, a large part of the biotechnology community consists of researchers that form a scientific-technological community in which scientific problems and commercial applications are combined. This is where knowledge transfer occurs between universities and firms; networks play an important role here, frequently supported or facilitated by governments (including the EU). To understand the biotechnology community it is important to understand the multiple links between firms, universities, and research institutes in biotechnology. Thus, collaborations (e.g., public private partnerships) are vital for this field of research and the concentration of such networks can be seen as clusters²⁹ of biotechnology.

Biotechnology has been at the centre of attention of European governments. It is however, not only economic relevance but also moral issues that drive political attention and action in this area. As the general argument goes, the framework can no longer rely on scientific authority as the sole arbiter of standards and judgments in the field. Of necessity, the nature of governance in biotechnology must move from an elitist model where science can act as the authoritative source for risk regulation to one where the understanding of risk is politically negotiated through a plurality of perspectives. Science is one of the constituent parts of the political discourse, a contributor rather than the dominant player. The following presents the policy debates regarding biotechnology in England and in the

²⁹ Clusters are defined as “geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions, such as universities, standards agencies, and trade associations, in particular fields that compete but also cooperate” (Lord Sainsbury, 1999, p. 9).

Netherlands and maps the major actors in this field of research in both countries. These will serve as a context for the presentation of biotechnology basic research units.

5.1.1 *Biotechnology in England*

Biotechnology in England is a vibrant field of research which rose in importance at the end of the twentieth century with the development of techniques for structural analysis and genetic interventions. The British government has acknowledged the significance of this field both economically and politically. From the economic point of view, government policies aim at fostering the contribution to the economy harnessing the potential of innovations in this field. Politically however, they also had to be involved in a debate with a range of stakeholders and society at large meeting the demands of potential ethical threats.

Governance of the biotechnology sector in England has been changing. In the 1990s biotechnology policies were rather incremental in nature. But when genetically manipulated food became a public issue, this changed more or less all of a sudden: there was strong political action and a rather comprehensive policy was formulated in a short period of time. The 1999 review of the advisory and regulatory framework for biotechnology recognized that existing arrangements were too fragmented, difficult for outsiders to understand, lacked transparency, did not clearly take on board the views of all potential stakeholders or border ethical and environmental considerations, and were insufficiently flexible to respond to the fast moving nature of biotechnology developments (OST, 1999). The political task facing the new framework is the management of tensions between the two functions: the discussion with the public at large and the facilitation of industrial progress. While the first function may require more governance in terms of standard setting, monitoring, and intervention (i.e., risk control), the second may require less or may be better served by mechanisms of self-regulation.

A consensus was reached in the late 1990s between the UK government and independent analysts. The key conclusion was that the benefits of biotechnology could be realized only with the help of an informed debate that reflects the concerns of different stakeholders. The government opened up the proceedings of its expert advisory committees and increased the advisory network on biotechnology.

To this end, two new commissions were established at the governmental level to serve as strategic advisory bodies:

1. The Human Genetics Commission to advise on genetic technologies and their impact on humans; and

2. The Agriculture and Environment Biotechnology Commission to advise on all other aspects of biotechnology except food.

They function alongside the existing Food Standards Agency, which controls the safety of genetically modified foods.³⁰

Besides these agencies and commissions, another important intermediary body was established to provide funding for biotechnology research at universities and research institutes. One of the OST research councils was dedicated to finance biotechnology research. Since 1994 the Biotechnology and Biological Sciences Research Council (BBSRC) has become the leading funding agency for academic research and training in the biosciences at universities and institutes throughout the country. It aims to invest more into science in universities, fund students and infrastructure better, and wants universities to be more transparent and accountable to them. The BBSRC annually invests around £336 million into biosciences.³¹ Other funding bodies such as charities, the Wellcome Trust, the Cancer Research Campaign, and the Imperial Cancer Research Fund are also important.

Looking at the production level, ten major biotechnology clusters can be identified in England. They are dispersed geographically and concentrated around major universities and university science parks. For example, the key strength of the North West Biotech Cluster is the existence of eight universities in the region with their science parks. The major ones have medical schools, veterinary schools, and bio incubators in the Manchester and Liverpool universities. This region alone employs one quarter of the pharmaceutical workforce in the UK.³²

The study of biotechnology clusters in the UK (1999) has shown that the key factor for the development of a successful cluster is a strong and leading scientific base; in other words, strong research led universities. Leading edge science in the view of Sainsbury report includes basic, applied, and clinical research and academic entrepreneurs who provide the "lifeblood of biotechnology clusters" (Lord Sainsbury, 1999, p. 4). The research strengths of England in biotechnology are spread across a number of regions. The distribution of biotechnology companies and active research at universities is concentrated in East Anglia (Cambridge), and South East England (Oxfordshire and Surrey). The estimates of Sainsbury's study shows that Oxford and Cambridge each have 50 or more specialist biotechnology companies while other regions have far less. Most mature companies are located in Cambridge, Oxford, London, and the South East (Lord Sainsbury, 1999, p. 14). This is helpful to identify the universities and the

³⁰ See <http://www.i-bio.gov.uk>

³¹ See <http://www.bbsrc.ac.uk/about/Welcome.html>

³² See <http://www.bionow.co.uk>

basic research units for our analysis. We concentrate on two research universities that are located in biotechnology clusters, though in two different geographical areas. The following subsection presents two biotechnology basic research units in England in their immediate university environment.

5.1.1.1 Biotechnology in C1

This research group in life sciences focuses on structural biology. It is one of the four research areas within the department of biosciences that scored 5* in the RAE 2001. This department is one of the 14 departments in the science faculty in a comprehensive research university in England. University C is middle sized in terms of student numbers and staff and comprises seven faculties.

The university

The university aims at retaining high standards of excellence in research and being a research-led institution of international standing. Its mission comprises boosting its research, teaching, and knowledge transfer. The university has presence in the region and works in partnerships with the industry through international and national companies, government agencies, and charities. University C has strengthened its management during the last decade and has had strong leadership since the early 1990s. Human resource management is very important at this university.

In terms of structures, the university's top level management consists of the court, a council, and a senate. The Vice-Chancellor is appointed by the council after the council receives the senate's advice. The Vice-Chancellor is the chief academic and executive officer of the University. He is assisted by four Pro-Vice-Chancellors. The university court is a large body that serves a number of official and unofficial functions. The court is an overseeing body which considers the activity reports of the university council and senate on university activities and checks the financial accounts of the university. The council is the governing and executive body of the university with responsibility for the university's property and finances; it also oversees teaching and research as well as appointments, tenure, and removal of the university staff. It represents the university in all negotiations for obtaining grants from public bodies and establishes budget centres. The Senate is the governing body of the university in academic matters, such as student progress and defining the organisation of faculties. All three bodies can appoint standing committees for a specific purpose for as long as they see that fit.

The faculty

The science faculty is one of seven faculties. It is the largest, comprising fourteen departments. The faculty is governed by the faculty board which comprises elected members of the academic staff and students. The responsibilities of the board include overseeing the study and research programmes, reviewing student progress, and reporting to the senate on the academic programmes. It has no formal function towards research. The board elects the dean. The dean holds office for one year and is subject for re-election. He is an ex-officio member of all committees of the faculty board. The dean does not hold the budget for research. This responsibility is devolved to the departmental level. The main role of the dean is overseeing the study programmes. The faculty also has a research director appointed by the central university administration and whose job it is to facilitate the collaboration between different departments.

The department

The department of biosciences has been evaluated as excellent in the RAE 2001. It also received the top score in the teaching assessment and is one of the largest departments in university C. Overall it presents itself as a leading centre in interdisciplinary research in molecular life sciences in the UK. In 2005, it had four major research areas with 38 FTE scientific staff and 122 FTE PhD students.

It represents biochemistry, genetics, microbiology, and cell biology; on average in the department 50% of work time goes to research, 30% to teaching. The rest is spent on administration; 10% on acquisition of projects and another 10% on other tasks. The department maintains a significant programme of research-led teaching, with approximately 100 students per year enrolled. The head of department is the budget holder and is accountable to the central university level. The present head of department has been in this appointed position for the last decade.

The department has a tradition of collaborative research between research groups in different research areas. It is involved in both basic and applied research although most time is spent on basic research. The promotion of interdisciplinary research is an essential element of the departmental strategy. There are a number of short-term and long-term visitors in the department from institutions worldwide who come for training, collaborative research, or sabbatical purposes. Interdisciplinarity is also seen in the joint publications.

The department of biosciences has been successful in attracting external funding; most funding comes from OST research councils, with a substantial amount from charities, UK central government bodies, and the EU. Its staff is represented in major funding bodies and scientific organisations.

The basic research unit C1

The research group C1 concentrates on X-ray protein crystallography in structural biology. It consists of six senior researchers who each have a separate laboratory. They work together with the post-docs and PhD students on structural genomics/proteomics and interface with bioinformatics. The unit C1 uses techniques of X-ray protein crystallography, nuclear magnetic resonance spectroscopy (NMR), cryo-electron microscopy (cryoEM), and bioinformatics to explore systems of fundamental and medical importance in atomic detail. The equipment was largely acquired through funding from the BBSRC, the EPSRC, the Wellcome Trust, the Royal Society, the Wolfson Foundation, and the EU.

The research quality of this group is recognised internationally, as it is part of the 5* department of biosciences. The excellent quality of research is based on the publication record, the breadth of research, international recognition, and collaborations. The staff is involved in teaching and research, publishes extensively in different refereed journals and collaborates within the department, other groups and faculties of the university C, and many research groups in UK as well as abroad.

5.1.1.2 Biotechnology in D1

D1 is an interdisciplinary research group focusing on biomaterials in the science faculty in a comprehensive research university in England. The core staff of the group is affiliated with different departments such as chemistry, biology, and engineering and received scores of 4 and 5 in the RAE 2001. The science faculty is one of the three faculties in the university D, which is middle sized in terms of its student population and staff.

The university

University D aims to be in the top ranks of UK universities, seeks research excellence, and emphasizes its research-led profile. Its strategic orientation towards the promotion of high quality research culture and teaching, performance targets, and achieving a balanced budget and strong links with the region and strategic alliances has been in place since 2001. The university has a strong ambition to improve the RAE scores during the next exercise.

The university management structures and processes have changed since 2001 towards more centralisation, strategic planning, and monitoring. Routine internal assessment has been an important management tool to monitor performance. In terms of management structures, the council is the governing body of the institution and sets the strategic planning framework; it has a number of committees. The academic board is responsible for the academic work of the institution. It is supported by faculty boards responsible for the development of

programmes of study, monitoring the quality of teaching, and encouraging research activities. The top management consists of the Vice-Chancellor and Pro-Vice-Chancellors responsible for teaching, research, and the budget.

The faculty

The science faculty is coordinated by a Pro-Vice-Chancellor responsible for the budget. The faculty comprises eight departments. The dean has a rather limited role as he does not hold the budget; he is responsible for teaching. The science faculty aims at promoting interdisciplinary research. An example can be the presence of the cross-departmental interdisciplinary research institute based in this faculty.

The science faculty has its own graduate school responsible for the graduate teaching programmes. Altogether the eight departments have over 300 full-time PhD students and just over 100 post-docs. All departments have active MSc teaching with over 300 MSc students.

Basic research unit D1

The group's research concentrates on biomedical materials and cell and material technology. The unit D1 is embedded in the science faculty. It is a cross-departmental research institute which carries out interdisciplinary research and has teaching only in terms of PhD students. Researchers are also affiliated with different disciplinary departments where they have teaching commitments. After 2001, the teaching-research ratio changed from research-only positions to academic positions with up to 40% teaching requirement. Their research is predominantly applied; a considerable part of their research is carried out with industrial partners. The group also actively collaborates with other departments, especially cell and molecular biology and medicine. The research group consists of 14 FTE senior scientific staff based in different departments. There are around 20 PhD students. Research areas include physics, chemistry, biology, material science, mechanical engineering, and bioengineering.

The basic research unit D1 has the facilities for research financed both from external funding bodies and the university. It receives funding from the BBSRC, the EPSRC, private businesses, and the EU. Researchers are involved in numerous consultancy activities and the facilities of the unit are also used for contract work. Their research performance has been evaluated in different departments, ranging from 4 to 5 in the RAE 2001. The staff has published in refereed journals and collaborates within the departments, with other faculties, and outside research groups.

5.1.2 *Biotechnology in the Netherlands*

The ambition of the Dutch government is to be one of the main players in the field of genomics and bio-informatics. It has stimulated and encouraged biotechnology since the early 1980s. The Dutch government considers biotechnology a key technology and wants to strengthen the knowledge infrastructure in this area (Tweede Kamer, 2000). Similar to England, the government realizes not only the economic benefits of biotechnology but the potential dangers and the resistance or hesitation within (parts of) society. Therefore, the Dutch government wants to further stimulate the sector in the Netherlands but also try to guarantee the safety, the transparency of decision making, the freedom of choice of citizens, and ethical acceptance (Dakhorst & Enzing, 2000).

The government's perspective is illustrated by the view of the Ministry of Economic Affairs, which is increasingly becoming a significant player in the field of research. The scenarios for life science areas of application show that the ultimate future economic impact for the Netherlands will be determined to a large extent by the problem areas and incentives in the dynamic innovation system. Previous Dutch innovation policy has already tackled various incentives and problem areas. The Dutch life sciences innovation policy was initiated in the 1980s with strong, focused incentives for life sciences research and the transfer of knowledge. In the succeeding decade, emphasis was placed above all on creating favourable preconditions for business activity. Partly on the basis of a comprehensive benchmark with countries abroad, an action plan was set up at the end of the 1990s which resulted in the BioPartner programme. This programme began in 2000, encouraging new entrepreneurship and creating a specific infrastructure to support life sciences starters. In 2001, with the creation of the Netherlands Genomics Initiative (NGI; *Nationaal Regie-orgaan Genomics*), a large (financial) impetus for the Netherlands was given to the knowledge base. The NGI works according to a new organisational model – a national authority – for genomics research, and also pays attention to social embedding and knowledge transfer. In 2002 a start was made in identifying the imperfections in the dynamic innovation system of life sciences. The midterm review of 2005 was largely enthusiastic about NGI's performance, among other things as regarded the significant number of collaborations. New centres of innovation and research clusters have been developed and many programmes and projects have been introduced (with respect to genomics see for example www.genomics.nl).

The Dutch government stimulates biotechnology research through financial incentives. The Ministry of Economic Affairs is very important here. In the period of 2001-2007 it will contribute €205 million for strengthening the knowledge infrastructure of the life sciences in the Netherlands and will offer €86 million for

subsidies through the BSIK programme. Additionally, it aims at reduction and simplification of rules, strengthening international networks, and clear communication to society and encouragement of entrepreneurialism. Each of these plans is followed with financial incentives.

Other important actors stimulating biotechnology research are the National Research Council (NWO) or *Senternovem*. The 'Innovational Research Incentives Scheme' (*vernieuwingsimpuls*) is an example of NWO's financial incentives to the development of biotechnology. It intends to facilitate opportunities for excellent researchers in different stages of their careers—there is for instance a person-based subsidy for young researchers and starting professors.

At the production level, the proportion of biotechnology in Dutch university research was estimated in 2000 just over 5 percent (Tweede Kamer, 2000, p. 7). There are public and private research institutes and companies that focus entirely on biotechnology, whereas others focus only partly on biotechnology. Dutch universities are actively engaged in biotechnology and the quality of research groups is generally assessed as high. The visitation reports of the VSNU and KNAW show that there are some excellent groups at different places and with respect to different sub-areas.

5.1.2.1 Biotechnology in E2

The research group E2 focuses on functional genomics (molecular genetics). The group got four times the maximum score of '5' in their latest research review (1998-2004) and is therefore rated as 'excellent'. It is one of the thirteen research units of an interfaculty research institute. This research institute is one of the eight faculty research institutes of the science faculty. The university is one of the oldest and biggest in the country in terms of student and staff numbers and is a traditional comprehensive research university.

The university

University E aims at retaining its national and international reputation as a leading research university. It fosters interdisciplinary approaches in teaching and research. It offers a broad range of teaching programmes including over 60 Bachelor's, more than 140 Master's, and sixteen research master's programmes. In research, emphasis is on collaboration with business and the government. Altogether University E has 10 faculties, 13 research schools, and 16 graduate schools.

In terms of management structures, the university's central governing body is a three person central executive board whose members are appointed by the supervisory board. The Rector Magnificus is a member of the central executive board and chairs the committee of deans. As the university's central decision

making unit, the central executive board is responsible for setting the budget, administrative regulation, annual reporting, and institutional planning. The university's supervisory board comprising five lay members is among things responsible for the supervision of the central executive board. The members of the supervisory board are appointed by and accountable to the Minister of Education, Culture, and Science.

The Committee of Deans has an advisory role and is composed of the deans. Another advisory body at the central level is the university council, with elected representatives from university staff (50%) and students (50%). This university council used to be one of the most important decision making bodies but since the creation of a new law on internal university governance in 1997 their powers have been diminished.

The faculty

The science faculty is one of the ten faculties of the university. Faculty leadership is in the hands of a faculty executive board, made up of five persons with the dean as a chair. This board is accountable to the central executive board. It is counterbalanced and supported by a number of committees (e.g., for teaching and for research) and by governing bodies such as the faculty council, comprising nine staff representatives and nine student representatives. This representative council has mainly advisory powers.

The science faculty has three graduate schools: information sciences, life sciences, and natural sciences. In total 13 Bachelor's and 23 Masters programmes are offered. Each of these schools, run by an executive board, offers several bachelor and master programmes. In addition, the science faculty offers a limited number of highly selective top master programmes.

Research at this science faculty is conducted in eight (inter) faculty research institutes. In addition, researchers and research groups also participate in different local institutes and 17 national research schools (e.g., in the areas of theoretical physics, astronomy, materials science, pharmacy, or biotechnology). The research group E2 is part of an interfaculty research institute nationally recognized by the Royal Netherlands Academy of Arts and Sciences (KNAW).

The interfaculty research institute

The institute has the ambition to perform high level research in the field of life sciences (biomolecular sciences). In 2005, the research institute had thirteen research groups, with 31 FTE scientific staff members, about 44 FTE post docs, well over 100 FTE PhD students and about 51 FTE non-academic staff members. The research institute is run by a Director, a board, and a small coordinating office. The institute has a tradition of collaborative research and a strong reputation in protein structures, biochemistry, molecular biology, genomics, and

microbiology. The research is primarily basic and curiosity driven. At the same time, this in nature basic research forms the institute's basis for applied-oriented research programs. Academics of the institute are also involved in training and teaching. PhD training is seen as important and for this purpose, among other things, the institute coordinates a PhD supervision program.

The research institute has three sources of funding: from the university through the science faculty (direct basic funding), from national science foundations and governmental organisations (competition for grants), and from the industry or other public organisations (contract research with external organisations such as national and foreign companies, the European research programs, or Dutch ministries).

All research in the area of the life sciences was assessed in 2005. According to the international peer review its research lines are in general well established, with very good levels of scientific outputs. The relevance of the research is generally seen as very high and well positioned relative to competing international organisations. Societal impact is seen in the translation of research into spin-offs or industrial research and production.

The basic research unit E2

The group's research concentrates on a number of aspects of the molecular biology of Gram-positive bacteria of considerable industrial interest. Their research is both fundamental and application-oriented. A major line of research for the next years will be in the field of functional and comparative genomics, in collaboration with industry and other research institutes. Various bioinformatics tools have been implemented and novel software has been developed in-house (e.g., supported by grants from the national research council), such as dedicated utilities for genome visualisation. The research group is comprised of two professors, eight post-docs and 13 PhD students (AiOs).

The research quality of this group is rated excellent by an international peer review: it got the best scores in all four evaluation categories (quality, productivity, relevance, vitality, and feasibility). The excellent quality is based on the publication record, the breadth of research, and international recognition and collaborations. Collaboration levels are high, external grants are successfully obtained and many PhD studies are completed. Ongoing research activities are solidly rooted in experimental methods.

5.1.2.2 Biotechnology in F2

The research group F2 focuses on innovative mass spectrometric methods with an emphasis on the structural characterisation of proteins and protein complexes. It is located in different departments (chemistry and pharmacy) and

consequently affiliated with two interdisciplinary research institutes. Both departments and institutes are part of the science faculty. The university is one of the oldest and largest universities in the country in terms of student and staff numbers and is a traditional comprehensive research university.

The university

University F aims at maintaining its very good reputation of high research and teaching quality, improving its management and financial stability. It offers 48 Bachelor's and 175 master's programmes and has seven faculties. The university houses a lot of biotechnology research and is well connected to the region in this field.

The university is governed by the central executive board, the university's most important decision making body at the central level. This three person body, including the Rector Magnificus, is responsible for the university's administration and management. The central executive board delegates some of its tasks to the seven faculty deans. It is accountable to the supervisory board, consisting of five lay members. This supervisory board monitors major developments within and outside of the university and oversees the financial policies of the university. The central executive board is constantly in consultation with the elected university council, where both staff (50%) and students (50%) are represented.

The faculty

The science faculty comprises six departments: chemistry, pharmacy, biology, mathematics, computer sciences, physics, and the affiliated research institutes. The mission is to be the top science faculty in the country which fosters interdisciplinary research and excellence in teaching and research. It hosts around 100 research groups. The total number of students is about 3,500 and there are about 2,000 staff employed.

It is headed by a management team consisting of the dean, vice deans for different areas, and a faculty director. During management meetings (*Bestuursoverleg*), the dean discusses the faculty policies with the department heads, the director, and a student representative. Another important governing body at this level (besides several standing committees) is the faculty board. It consists of 12 staff members and 12 students. It has mainly an advisory role regarding teaching, research, and personnel management.

Departments of Chemistry and Pharmacy

The departments of chemistry and pharmacy are organized in roughly similar ways. They are mainly responsible for teaching; research is concentrated in research institutes, research centres, or separate research groups. The two

departments are headed by a management team where the department head appointed by the dean works together with directors for teaching and research. The departmental boards have an advisory role to the management team.

Interdisciplinary Research Institute in Pharmacy

The mission of the interdisciplinary research institute is to carry out top quality basic research in six different areas in pharmaceutical sciences. It is also active in research training, participates in three accredited research schools, and has its own PhD training programme. In 2004 all of its research programmes were evaluated and rated very good and excellent in their research quality, productivity, and relevance. It is deemed to have brilliant prospects. The institute has been very successful in partnerships with industry; academics in the institute were successful in establishing their own companies. It is not only at the forefront in research: its PhD research training has been also highly evaluated. The basic research unit F2 is affiliated with one of the institute's research areas.

Interdisciplinary Research Institute in Chemistry

The institute has a strong focus on structural biology. It has advanced technology funded by the NWO. The founding of the centre of excellence in the areas of mass spectrometry and proteomics gave a boost to the mass spectrometry facilities. The deteriorated financial situation in the chemistry department has meant no new PhD positions and a cut in the university-supplied bench fees. This is alarming, since university funded PhD positions account for nearly 40% of PhD resources. Altogether the interdisciplinary research institute has 10 research groups.

Basic research unit F2

The research group works in proteomics; they develop and use high technology methods for separation, quantification, and structural characterisation of proteins.

The group consists of 50 people which equate to 24 FTE. They are seven senior scientists, comprising three professors, 16 post-docs, 17 PhD students, and seven technical staff members. The head of F2 is appointed in and accountable to both departments, while other members of staff have appointments in one of the two departments.

The basic research unit collaborates with cell biologists, bio-informatics, and organic chemists from academic groups and companies. It uses innovative strategies for research and the state of the art equipment of mass spectrometry and proteomics facilities.

The research quality of this group is rated 'very good' by an international peer review. It received very good scores for quality and productivity and excellent scores for relevance and feasibility. The researchers have been active in publishing in international refereed journals and obtaining external research funding; international recognition, innovative potential, and scientific output were seen as very good.

5.2 Medieval history

The study of the Middle Ages is a traditional sub-disciplinary field of history that investigates a particular period which arguably covers the period from Christianisation to the Renaissance, roughly from 400 AD to 1700 AD. Medieval history investigate a broad spectrum of political, social, economic, and cultural phenomena of the Middle Ages. Examples of this variety are history of monarchies, religious history, maritime history, history of arts, history of thought, history of gender relations and women, and history of law.

Medievalists use primary sources such as diaries, letters, speeches, acts and documents, objects of art, furniture, and buildings. Archives are very important to them. They also study secondary sources derived from analyses of primary sources. The use of information technology becomes more important in order to preserve the archival data sources (Goetz & Jarnut, 2003).

Medieval history is also at the core of medieval studies as a multi-disciplinary field that may also comprise disciplines such as law, political science, linguistics, arts, philosophy, or theology. Medieval history can be an example of a debate about the norms and content of inter-disciplinarity were the subject-specific affinities of different areas meet. This debate comes from a search for legitimacy of medieval history. Modern research questions require the integration of disciplines and special fields of study as well as new approaches to 'old' subjects.

Although the study of the Middle Ages has traditionally been a lone scholar curiosity driven research, this approach is changing. As the idea of utility of research becomes more prominent, medieval historians start to relate to current phenomena and can claim societal relevance with their research. For example, the study of 'hoodies' in English society are related to Robin Hood and other figures from 15th century England (Wainwright, 2005). The relevance of the Middle Ages and its studies allows researchers to satisfy the demand of historical background knowledge by scholarly treatment of topics. Moreover, with the developments of technology, internationalisation, and globalisation of societies, research on transnational issues might gain importance (for example, comparative studies). Despite these changes, the disciplined treatment of the archive remaining at the centre of the field requires a range of technical skills –bibliographic, linguistic,

palaeographic, and historiographic – rather than theories (Henkel, 2000a). In the following subsections we present policies relating to medieval history in England and the Netherlands. We also map the major actors in this field of research in both countries. These serve as a context for the presentation of the basic research units in medieval history.

5.2.1 *Medieval history in England*

The RAE 2001 panel on History viewed the state of the discipline of history very positively. According to their conclusions, certain areas of history research are very viable today; early medieval history is such a productive field. The history of the crusades produces for instance “impressive work” (History Panel, 2001, p. 4).

As seen from the descriptions of the structure and environment of different history departments in the RAE 2001, previous RAE enhanced structural changes allowed for mergers of different departments or schools, or cooperative clustering of research excellence, though sometimes somewhat “artificial groupings of staff on broad chronological or thematic lines, with little sign of collaborative activity” occurred as noted by the History assessment panel (History Panel, 2001, p. 2).

In the second part of the 20th century historical studies broadened the substantive concerns. As noted by Henkel, the growth of social history challenged the dominant political history. Recurring themes have become important apart from the topics defined chronologically or geographically. Moreover, the definition of historical sources widened. The boundaries between history and other fields, such as cultural studies or film studies became blurred (Henkel, 2000a, p. 192). This also meant new techniques of inquiry, such as computing methods.

The RAE history panel expressed some concerns regarding the application of computing methods to history. At the same time, it was acknowledged that the use of modern technology is helping to make evidence widely available, and that it made important forms of analysis possible.

The development of history in England is shaped in different ways through major funding for research and teaching, professional exchanges, and memberships in professional societies for humanities and social sciences in general and for history in particular. The Higher Education Funding Council for England (HEFCE) funds universities in general through a formula where student numbers are important. For history departments, this is the primary source of income. Fee paying students should also be mentioned here, since they also contribute substantially to offset the teaching costs.

Important sources for research are the Economic and Social Research Council (ESRC) and the Arts and Humanities Research Council (AHRC). Though the

former provides more substantial support, both are important players in the development of medieval history research. Medieval history has no explicit place in the ESRC strategy, but medievalists can apply for funding for projects that fit the strategic areas. The AHRC provides funding to medieval history in two ways: through individual applications (Responsive-mode schemes) and thematic programmes (Strategic initiatives). Medieval history is specified in one of the eight panels of Responsive-mode schemes, where medievalists can apply for funding for research grants, research leave, resource enhancement, and innovation awards. Additionally, different charities provide for substantial amounts of funding for specific types of medieval history research, which can be comparable to the funding from the research councils. Major charities that contribute to medieval history research are the British Academy and the Royal Historical Society. Medicine related medieval history can be supported by the Wellcome Trust (History Panel, 2001, p. 2).

At universities, medieval history research is carried out in the history departments of 23 Old universities. Among these the size of the research unit, type of teaching programs, research quality, its national and international standing, and the type of organisational structure at a given university greatly varies. Medieval history research in England is usually carried out within a department of history, within a faculty of arts or a faculty of social sciences, or both combined. In some cases, history comprises a faculty in itself.

Researchers are either single scholars in this field, chairs in medieval history, or grouped in bigger research clusters such as Centres for Medieval Studies. Some departments have teaching programs in medieval history for undergraduate and MA degrees. Others are oriented more towards research training and focus on research degrees such as several MPhil and PhD programmes in addition to undergraduate degrees. The research reputation varies across the research clusters as it is seen from their activities in different research projects, conferences, publications, and most importantly, RAE 2001 results.

5.2.1.1 Medieval history in A1

The research group A1 in medieval history has a broad range of interests that span from early to late middle ages with a focus on medieval cultures. It is an integral part of the history department, one of the fourteen departments in the arts faculty of University A. The university is mid-sized in terms of its student and staff numbers. It is a research-led comprehensive university.

The university

University A aims to be an internationally competitive research-led university with excellence in teaching and research and emphasizes strategic partnerships

with other universities to achieve this. The key goal is to increase research performances in the next RAE 2008 with the help of building on research excellence, effective management, increase of research time, fostering interdisciplinary research, and focusing on human resource development.

In terms of its management structure, the university's top level management consists of a number of committees. As in most 'old' English universities, the council is formally the top decision making body on all matters, while the senate is the body that mainly takes care of academic matters of the university. These two bodies have a number of committees pertinent to different spheres such as resources, planning, education, and research. The role of the research committee is very important since its decisions facilitate specific kinds of research within different faculties. It is chaired by the Pro-Vice-Chancellor for research and develops a schedule of key research themes which will become priorities in terms of resources. The Vice-Chancellor is the appointed senior executive of the university and is supported by a senior executive team which consists of four Pro-Vice Chancellors responsible for different areas such as research, education, personnel matters, and the budget.

The faculty

The faculty of arts is one of six faculties in university A. The aim of the faculty is to carry out excellent and original research of international importance in the arts and humanities, maintain excellence in teaching, and be involved in regional cultural life. Its goals are also to improve research quality in order to achieve better grading in the next RAE 2008, although it has an overall very good reputation based on the RAE 2001 results. The arts faculty is one of the largest in the university A. Its departments cover a wide range of arts and humanities subjects. It also has a graduate study centre and a language centre.

A new faculty structure was introduced a couple of years ago following a university management decision. The role of the faculty management became more important for resource allocation to departments. The dean is the highest academic authority in the faculty, a budget holder that oversees the faculty budget and is responsible for research/education planning. He is elected annually by a faculty board. He chairs different committees at the faculty level and represents the faculty on all high-level university committees. Together with research directors, deans help identify, build up, and maintain the capacity in research in the faculty. They are assisted by research directors. The position of a research director is a three year term in addition to the faculty member's normal duties. They report to the dean and work closely with the central university management responsible for research and finances.

According to the university research strategy, research directors together with deans propose a core group of consolidated intra- and inter-faculty research

themes to the university research committee in which the university already has or can attain world-class critical mass. The faculty research strategy emphasizes five research themes which would encourage collaborations and interdisciplinary work and strengthen faculty's research output. These themes are proposed and developed by different members of staff and concentrate on the research strengths of departments in the faculty.

In terms of financing research, the faculty provides limited financial support to its members of staff. Staff members can apply for funding at the faculty research fund and the faculty conference fund. The general rule is that members of academic staff can apply for funding if they contribute to their department's profile in the RAE.

The department

The current history department is the result of a merger about a decade ago. The fields of research of the department are roughly divided into two periods: medieval history and modern history. Now it comprises 26 FTE members of staff, over 300 undergraduate students and more than 20 postgraduate students. It has three interdisciplinary research centres, including one in medieval history. The departmental management mainly follows the faculty research strategy. The key goal is to improve the research grade in the next RAE by developing and building on the research strengths of the department.

The department is led by the department head and the deputy head responsible for research. They are supported by a number of committees. The role of the head is to oversee and manage the study and research activities, resources, staff, and infrastructure of the unit. The specific role of a deputy head for research is to encourage the academic staff to meet the research performance requirements related to the overall strategy of the faculty and the university. Thus, yearly staff appraisals and monitoring in the department are done by the department head and the deputy head for research together.

In 2005 the department was preparing for a departmental review as a part of the university internal review procedure. The staff members have received awards for their research and publications and have been awarded fellowships and scholarships from the AHRC, the ESRC, the Leverhume Trust, and the British Academy. The two faculty over-arching research themes have been secured by this department and one is in medieval studies.

Basic research unit A1

The group's research varies from early to late European medieval history. In particular individual researchers within the group work on the history of the church and aristocratic society in Europe, late medieval ecclesiastical and intellectual history, paganism and magic, maritime history, and the social history

of ideas in Western Europe. There are 11 members of staff who concentrate on medieval history; nine are full time.

The researchers follow their individual lines of research producing books and articles in national and international refereed journals. However, they belong to the same research group since they participate in the same faculty's over-arching research themes of medieval cultures, in a series of seminars and conferences. They collaborate with other departments and universities, especially in the context of the MA programme in medieval history which is linked to the centre for medieval studies. Full-time members of staff spend their time on teaching undergraduates and postgraduates, carrying out research and being involved in administrative activities. Teaching loads have been increasing, so the department hires short-term replacements. Usually staff applies for outside funding for research leave and for research projects. In 2005 the group had two externally funded research projects.

5.2.1.2 Medieval history in B1

B1 is a research group focusing on medieval history within the history department. The research of the group covers early and late medieval history. The history department is one of the nine departments and schools in the faculty of arts. The department scored 5* in 2001 RAE. The faculty of arts is one of the three faculties in a middle sized comprehensive research university in England.

The university

University B is a comprehensive research-led university that aims at excellence in teaching and research contributing to developments internationally, nationally, and regionally. It went through a restructuring and centralized its decision-making in recent years.

A newly established university management team chaired by the Vice-Chancellor and including all the deans, Pro-Vice-Chancellors, and senior officers, is responsible for the strategic direction of the university. The Vice-Chancellor is the chief executive officer who coordinates the management of resources and provides leadership for university. The deans nowadays are appointed instead of elected and became budget holders in 2000. In this way they play a key role in prioritizing the use of resources and act as a link in the development of plans at university and departmental levels. A new post in the top management was created: the Deputy Vice-Chancellor, appointed for up to five years by the council. His role is to manage and oversee the development of the university strategy and to prepare for the next RAE 2008. He is a member of the university management team and the university's strategy board.

In terms of management structures, the university's top level management consists of a number of committees and other decision making bodies. As in most 'old' English universities, the council is the governing and executive body of the university responsible for the university's property and finances. It represents the university in all negotiations for obtaining grants from public bodies and establishes budget centres. The council has eight committees dealing with issues such as university finance. The senate is the governing body of the university in all academic matters. It has seven committees dealing with teaching, research, and other academic matters. With the help of a research committee, university top management fosters monitoring of research performance in the university.

The faculty

The arts faculty is made up of nine departments and schools responsible for undergraduate and postgraduate teaching, and research. It has undergone substantial reorganisation with the closure of two departments. The faculty strategy is to encourage its members to increase research performances in the next RAE.

Faculty leadership is in the hands of the dean who is appointed for five years. He is supported by deputy and associate deans. The dean represents the faculty in the university management team and other university committees. Specific responsibilities include financial and strategic matters including planning, staffing, research, and teaching matters. The dean, appointed by council, is the budget holder and is accountable to the Vice-Chancellor with respect to the overall budget of the faculty.

The department

The department focuses on research from different historic periods, ranging from early middle ages to the present day. It has been recruiting young staff with research potential and acquiring new specialties in regional history, British imperial history, and modern European history. Medieval history is one of five research clusters. The research strategy of the department is to increasingly exploit the archival and early printed book resources of the university. The department participates in collaborative work with other research institutions in the region and in the country. In the last RAE 2001 it received 5* and its ambition is to retain this standing of excellence.

It employs 26 FTE staff, three assistants, and 13 PhD students. Most of its funding comes from research councils and charities.

The department is embedded in the arts faculty. It has research associations with other departments through centres and seminars. Research management is in the hands of the department's research committee, which advises the board chairman on the department's research plan. Planning is facilitated by teaching

and research groups, corresponding to the department's research areas. The department is favourably seen by the top university management, additional appointments have been secured, and a new MA training programme has been approved.

Within the department all new staff has specified reductions in teaching loads during their first three years, to assist maintenance of their research and publication record.

Basic research unit B1

Unit B1 is embedded in the history department, faculty of arts in university B. It is one of the five research clusters in the department. B1 consists of six members of staff – two professors and four lecturers. The cluster undertakes collaborative work in seminars, conferences, publications, and projects. The work of the four professors has been evaluated during the RAE 2001 (two professors retired after that and have been substituted by junior staff) and received the top RAE grade. The areas of interest of B1 are: the early Middle Ages; late medieval English social, economic, political, and military history; and the late medieval church. Full-time members of staff in B1 spend their time teaching undergraduates and postgraduates, carrying out research, and administrative activities. This includes MA in medieval history. B1 researchers collaborate with medievalists from other departments through the medieval studies centre. B1 has been coordinating two externally funded projects that include cooperation with other medieval history researchers in England. The researchers have actively been producing books, book series, and articles in national and international refereed journals.

5.2.2 Medieval history in the Netherlands

The study of the Middle Ages as a special branch in history research is a rather recent phenomenon in the Netherlands. When the first Dutch universities were established, history, let alone medieval history, was not a popular subject (Rinzema, 1997). History was not even a subject in its own right: general history was part of 'the classics', whilst Dutch history fell into the realm of Dutch humanities (Santing, 1997). This was probably due to the fact that the formation of the Dutch nation-state largely took part in the 16th and 17th centuries and not in the Middle Ages; the 'Golden Age of the Republic' was the main focus of attention and the 'dark middle ages' only played a marginal role. It was not until

the WW II period that things really started to change.³³ After deliberations during the WW II period to reorganise the field of history teaching and research and do justice to the various sub-disciplines, in 1946 J.F. Niermeyer was the first professor appointed to study the Middle Ages. As Santing (1997) notes,

...his teaching commitment (*leeropdracht*) shows that medieval history had finally become a mature specialisation that was seen as deserving to have its own regular chair. It had taken almost one and a half century before the study of the Middle Ages fully matured in the Netherlands. (p. 159)

After this first chair in medieval history several other appointments followed. In the 1980s and 1990s the sub-discipline developed into interdisciplinary-oriented medieval studies.

In the last decennia the number of teachers and researchers in medieval history has rapidly grown. Various departments have been established at several Dutch universities focusing on medieval history. These departments developed their own profiles, which after some time called for restructuring. As a consequence, the newly established national research schools played an important role. Today the Netherlands Research School for Medieval Studies units contains (nearly) all researchers involved in research concerning the Middle Ages. This concerns not only medieval historians but other medieval-related research as well. Therefore, when we speak of medieval history in the Dutch case studies we also include research in medieval studies.

The policy developments in the Netherlands since the 1980s have influenced the organisation and existence of medieval history, as well as most other humanities in the country. A national visitation committee in 1998, under the auspices of the Association of Dutch Universities (VSNU), evaluated history as a sub discipline of arts (*Visitatiecommissie Letteren*, 1998). According to committee's observation, there have been interesting developments at the policy level pertaining to medieval history. The introduction of the new governing structure for universities (the MUB Act of 1997) made a distinction between teaching departments and research institutes which meant new conditions for the organisation of teaching and research. Further, the policy towards centres of excellence that led to reorganisation combined with the decreasing student numbers in the 1990s meant budget cuts for the arts faculties. In such cases the faculties had to make special arrangements with the central university management, which increased their dependence on university management. The

³³ This is not to say that there were no studies with respect to the Middle Ages. There are many examples of individual efforts and studies in this area since the 17th century. However, as a 'consistent' sub-discipline it hardly existed.

visitation committee's advice was to diversify the funding base with the help of external funding bodies and decrease the dependency on central university management. Finally, the third important policy development concerned changes in the organisation of research. For example national research schools were established since the 1980s, research was partially 'conditionally funded' and a new structure and personnel policy was set up with respect to PhD 'students'. As a consequence research tended to drift away from the department into institutes and the national research schools. In the 1990s a significant portion of research was taking place in the national research school in medieval studies (the Netherlands Research School for Medieval Studies). Some, such as a Visitation Committee in 1998, observe a potential tension between the research policies of the individual universities, faculties, or departments on the one hand and the policies of the national research school on the other. The faculties reported in 1998 however, that they felt no such tension (Visitatiecommissie Letteren, 1998).

The Ministry of Education, Culture, and Science is an important and influential actor as it funds teaching and research (via the university and the national research council NWO). The role of university management has to be stressed here, since the allocation of funding is an internal university matter. Further, NWO plays an important role: it facilitates medieval history research through its research division for humanities. This division is responsible for the execution of the funding task of NWO in the humanities and encourages among other things research in the area of history (other areas are for example archaeology, theology, philosophy, and literature). Moreover, the humanities are engaged in other interdisciplinary research programmes of NWO. The allocation of the research funding is partly based on individual applications and partly on thematic programmes. Medieval history has no explicit place in the NWO research programme, but can apply for funding for projects that fit the general research themes.

Finally, the national research school is an important collaboration effort between research groups involved in Middle Ages studies. These national research schools have to be accredited by the KNAW. It is important insofar as it provides training and research for PhD students as well as opportunities to collaborate for researchers. Currently, six universities and 17 faculties participate in this school that provides a national programme for PhD students and a national research programme which clusters the research groups of the six universities. It brings historians together with other researchers from humanities such as literature, musicology, philology, art history, and theology.

In the Netherlands, in most universities medieval history is usually located in the arts faculties. Other faculties can be involved as well. Researchers from law, theology, and philosophy can be involved in research projects and programs that focus on the Middle Ages. Usually, medieval history is part and parcel of 'history'

and not organized in separate departments. Within such a department one might find chairs of medieval history. Medieval history research is located at several levels in different manners within the Dutch higher education system. In the following pages, we describe the basic research units in medieval history, taking the university as a point of departure.

5.2.2.1 Medieval history in E1

The basic research unit E1 mainly concentrates on late medieval history and carries out research under the themes of the research institute. At the same time, the research group is a part of the department of history. Both the research institute and the department belong to the arts faculty, one of the 10 faculties in university E. The university is one of the oldest and largest in the country in terms of student and staff numbers and is a traditional comprehensive research university.

The university

University E has already been introduced.

The faculty

With about 5,000 students and 700 staff, the arts faculty offers just over 20 Bachelor's and just over 20 Master's programs. Moreover, it offers five research master's programmes. The teaching program in history is very prominent. History is one of 20 teaching departments. Besides teaching, it has two multidisciplinary and one disciplinary research institute. It also takes part in national research schools in different arts disciplines. The faculty is governed by a faculty executive board (*faculteitsbestuur*). This board consists of three members, appointed by the central executive board, and one student representative. The dean, who serves a four year term, chairs this faculty executive board. The faculty executive board is a rather powerful decision making body within the present university. It is responsible for the faculty's management, the supervision of the teaching and research quality, draws up the faculty budget, allocates staff, and contributes to the university's strategic decision making. Other governing bodies at the faculty level are the faculty council (*faculteitsraad*) and committees such as the 'Education Committee' (*opleidingscommissie*). The faculty council consists of nine elected staff members (two-year term) and nine elected students (also a two year term). This faculty council has mainly advisory powers, though it has to approve (*instemmingsrecht*) changes in the faculty ordinances (*faculteitsreglement*) and changes concerning the teaching and exam regulations.

The research institute

All linguistic and historical research is housed in the institute for cultural research, one of the three institutes in the arts faculty. All medieval history researchers are members of this institute. Their research is multidisciplinary in nature. For that reason, the institute is divided into four research themes. The multidisciplinary approach expresses itself in two ways: cooperation between different medieval disciplines and cooperation with colleagues focusing on adjacent periods. Apart from programmatic determined research projects there is still room for individualistic based research.

The research institute is governed by a director and its advisory board who are accountable to the faculty management.

Basic research unit E1

The group of medieval history researchers mainly concentrates on late medieval history, investigating images and texts as culture and context. These are two of the four themes in the research institute. The group also belongs to the history department and is a member of the National Research School for Medieval Studies. They are involved in teaching and research. Altogether, the group consists of 20 senior academics, two post-docs, and eight PhD students. Since the themes in the research institute are cross-disciplinary, there is substantial collaboration between medieval historians, art historians, and linguists. Researchers carry out research individually, and publish books and articles mostly in the national refereed journals. Most of their research is basic in nature.

5.2.2.2 Medieval history in F1

The basic research unit F1 carries out research in early medieval ages in Europe. It is a part of the history and culture research institute located in the arts faculty. The faculty is one of the largest in university F and comprises five teaching institutes and two research institutes. The university is one of the oldest and largest universities in the country in terms of student numbers and staff and is a traditional comprehensive research university.

The university

University F has been described earlier.

The faculty

The arts faculty is one of the largest faculties in university F.³⁴ It provides about 17 Bachelor's programmes and several kinds of Master's programmes (in total over 50), such as 'regular' masters, two-year educational masters, and two-year research masters. Unique in the category of the research masters are two so-called 'prestige masters', one in medieval history. The number of enrolled students is about 5,000 and about 500 staff are employed. The faculty's teaching and research focuses on arts, history, language, and culture conducted by five teaching institutes and two research institutes. One teaching institute is in the area of history. There are six departments in the institute of history, among them medieval studies, comprising six academics. In the pre-MUB structure (i.e., before 1997) this institute was the department of history. In addition to teaching, the faculty also has two research institutes; one focuses on history and culture.

The faculty is governed by the dean, supported by a faculty management team (vice deans for teaching and research and a director). The dean is appointed by and accountable to the central executive board; the members of the management team are appointed by the dean. The faculty management team has the overall responsibility as regards teaching and research quality, the budget, administrative matters, and the faculty's strategic orientation. One of the other governing bodies is the faculty council, made up of 12 staff representatives and 12 student representatives. They have foremost an advisory role and some special rights concerning reorganisations and changes in faculty ordinances.

The institute

The history and culture institute has eight project groups, one of which concentrates on medieval cultures. The institute fosters multidisciplinary research and facilitates it by helping to attract external funding. The medievalists in the institute have founded a centre for medieval studies which brings together researchers working on different aspects of the Middle Ages. Currently, some 50 medievalists participate in the centre, representing a broad variety of disciplines, methods, and approaches. The collaboration between historians, art historians, literary historians, musicologists, and archaeologists led to interdisciplinary initiatives in the field of medieval history. The institute was reviewed in 2004 by the university management and received the top score. It employs around 100 FTE and is very active in attracting external funding. As a result, 30% of their income comes from the second and third money flow.

³⁴ In 2006/07 significant organisational changes have been taking place in the faculty. The portrayal refers to the situation when the interviews were taken at the end of 2005.

Management of the institute consists of a management team assisted by an advisory council. The management team is accountable to the faculty dean. Important matters concerning research are discussed in the research committee where the research programmes are proposed.

Basic research unit F1

Research group F1 mainly concentrates on the early middle ages, religious medieval history, and medieval literacy. It belongs to one of the eight programmes of the research institute. It consists of 8 FTE senior academic positions, 4.5 FTE post-docs and 11.3 PhD students, which make up about 25 people in addition to PhD students.

It has been active in acquiring external projects from NWO specific programmes. Researchers with permanent positions teach part-time, while the post-doctoral staff on the research fellowships from NWO do not have teaching obligations. The group carries out mainly basic research funded by external funding bodies and have extensively published books and articles in national and international refereed journals. The group participates in the MA programme in medieval studies.

In the next two chapters we will address the perceptions, responses and practices of the eight basic research units. In Chapter 6 we present the English cases with the activities of two biotechnology and two medieval history groups. In Chapter 7 the focus is on the Dutch research units in both fields.

6 Perceptions, practices and responses of basic research units in England

This chapter presents and analyses the interview data derived from the case studies of research units in medieval history and biotechnology in England. First, we look at how researchers in these units perceive and assess their institutional environment. Second, we elaborate on the responses of the units to their institutional environment and discuss possible effects on their research practices. Finally, we summarize our insights as regards their perception of the institutional environment, academic responses, and research practices.

6.1 Medieval history in England: cases A1 and B1

6.1.1 Brief characteristics of the two groups

The last Research Assessment Exercise (RAE) described both research units as distinct clusters in medieval history. A1 was ranked lower and B1 was ranked higher in this research assessment in 2001. Due to the outcomes of the RAE, A1 saw a decrease in funding because vacancies (through retirement) were not filled with new staff and a reduced number of staff was required to teach increasing numbers of students. Recently, the group managed to get new posts after proving that their research areas are in line with Faculty priorities. In contrast, vacancies in research unit B1 have been released and filled with new members of staff. The group expresses dissatisfaction with funding however, since their position has not improved even though they received a top grade in the last RAE. Instead, further subsidies deriving from the RAE were used to cross-subsidise other units of the university. Both groups have a regional focus; B1 collaborates more with other regional universities, while A1 is more of a stand alone. Most members of staff in both groups primarily see themselves as researchers who also need to teach, which is a burden and even a threat to their research time. Their teaching is not necessarily related to their research. Teaching does not play a role for their recognition and status, since it is neither important for the RAE nor for the universities' senior management. Researchers in both groups also see themselves spending more and more time on administrative tasks.

6.1.2 *Perceptions of the institutional environment*

This section elaborates on the researchers' perceptions of their institutional environment. We build on and compare the opinions of the individual researchers, looking for possible convergence or divergence within each group as well as between the two cases of A1 and B1.

All respondents note that the institutional environment has been changing in recent years. To trace these developments and the current situation we explore change and stability in the institutional environment as perceived by the respondents from the research units. We draw upon a list of themes from our interview schedule and order these themes according to their overall importance or relevance for the research groups. These themes comprise research evaluation, funding, university management, pressure to perform and work intensification, and cooperation and competition in the field of study; the major themes of the interviews.

6.1.2.1 Research evaluation

Researchers from both groups are very explicit and outspoken about the importance of evaluations for their standing and funding. Research evaluations also directly or indirectly influence other aspects in their institutional environment such as the behaviour of university management or research sponsors, staff development and recruitment, or the increasing pressure to perform according to evaluation criteria.

All researchers in A1 and B1 mention the RAE as a central element in their institutional environment. A1 sees the RAE as a formal external assessment, which scores universities on "how far they can prioritize research and necessarily downplay teaching" (8). This exercise has dominated the discussions in scoring the quality of university research and also contributed to the debates about the funding of the research group and performance monitoring coming from the management. This was partly due to the fact that in the UK the RAE is connected to the allocations for research funding which is distributed through the central university level.

The RAE has stimulated internal monitoring of research activities of both groups on a regular base. These internal evaluation exercises fulfil a function in the preparation of the next RAE and provide ongoing information on the development of the performance of groups and individuals to the university management and the academic staff. The main deliverable for such internal research evaluations is research output, such as books and journal articles, which is monitored with the help of annual reports to the department. B1 notes that this annual monitoring of research activities among staff started after the introduction of the RAE and that everyone has to participate in it:

That all changed because of the research assessment exercise, then the whole department needs to go forward for its submission and you really can't afford anyone holding the rest back. (3)

B1 also notes that the university is "very preoccupied with the monitoring, the quality, and volume of staff research" (4). A1 in a similar way has a number of regular internal evaluation procedures where the management evaluates their research performance.

Research evaluation influences A1 and B1 in a number of ways, some perceived it as problematic, some as positive. For instance, the encouragement to concentrate on certain output leads to working mainly towards publications that count for the RAE; this is not very welcomed by researchers.

There are indications for both groups that senior and junior researchers see the RAE and the internal monitoring quite differently. For example, a junior respondent in A1 takes such evaluations, their rhythm and procedures more or less naturally; they are part of his understanding of what academic work is all about:

For my generation then in the kind of mid 1990s it was less of a problem ... this is what we were growing up with, this is what we knew, this was quite the way things work. You knew you would have to spend a lot of time trying to apply for project money, filling out forms, doing audits and all this sort of stuff. And so for us it was less of a problem and I think that probably, you know, it's so built into the culture now that we- that no one can become an academic now without realizing this is what the reality of academia is going to be. So I think culturally the change happened here in the early 1990s. (5)

Senior academics in the two research units usually take a more distant or critical stance when it comes to research evaluations. Some look at it more or less as a waste of their time and a push for publishing articles instead of books (7). At the same time, the pressure to perform is greater for younger researchers than for seniors who have accumulated prestige and standing within the field. As one professor notes:

My position is different from most because I am a professor, so I am at the top. Anybody assessing me at the department is going to be more junior which will make them nervous. And also I am a very popular historian, so it seems self-evident that what I am doing has some impact. So I have an annual review in which I am supposed to discuss my research, but nobody dares to discuss my research with me. Everyone suggests that it's going very well and I have played the game. ...Now, as a junior member of the department my position would be very, very different. I would have meetings with the head of department; I'd

have meetings with somebody, deputy head in charge of research, who is the semi-human individual in charge of making sure that everybody researches wonderfully. (7)

6.1.2.2 Funding

Research funding is an important topic for all respondents since it is not only directly linked to their credibility building within the academic community, but also to their credibility in the eyes of university management. There are diverging perceptions of the funding situation between the two groups. A1 researchers are negative about the availability of external funding since they think that competition for grants has increased while the level of funding has not changed. B1 researchers think that external funding for research has increased and are positive overall about the way research councils work and the level of funding they provide. Although researchers in B1 also admit that there is more competition for funding, they still believe that there is more external funding available for medieval history, and are quite positive about this development:

In terms of what is available in funding and how institutions like ours interact with research councils, again the picture isn't all bad. There is a lot of money out there, and the research councils are quite ready to be persuaded to part with it if you've got something interesting and well worked out to put before them. So yes, a more structured in some ways, a more bureaucratic picture than the one that was in place 10 years ago, but one that contains opportunities as well as obstacles for the researchers. (2)

As we saw in Chapter 4, overall funding for the arts and humanities changed with the creation of the new research council, the AHRC. This council secured a more prominent position for the arts and humanities among the research councils. A1 is sceptical about this development that is perceived as a change in labels (7), while B1 is positive about a better visibility of the humanities at the macro level as well as better funding levels (4).

This positive attitude is not surprising given the top RAE score of B1 in 2001 which secured certain direct funding as well as the credibility of this group in the eyes of external sponsors. As a result, B1 also benefited from support by the university management, for instance, in securing the replacement of the retired staff with a new generation of academic staff.

In contrast, researchers from A1 are more critical about external grants, their growing role, and growing competitiveness. They have more problems partly due to the problematic ranking in the RAE. Thus they have to manage in a more competitive environment to get external funding for research leave from a

research council as well as to earn money from services and projects for the community. This is positively received by university management and helps to build the credibility of the research unit:

What people are doing is chasing funding more, because it is now recognized that if you obtain a research grant, or if you obtain funded research leave, it doesn't just enable you to do research or to take leave, it also makes you look good in itself and makes the department look good. (7)

In turn, this helps overcome financial problems due to internal cuts from the RAE results. Moreover, they managed to get internal support from the university which gave them a new senior staff position; they 'played the game' and participated in an interdisciplinary faculty research theme.

The emphasis on 'looking good' and earning credibility in this way is also traced in B1 (2), while in A1 researchers note that today they earn their credits in different ways and they call it the 'cultural change':

I personally find public funding a nuisance. But the culture has changed so much in the last five years and this is the kind of thing in which you are interested, that there is now a gesture politics, in which it seems almost as important that you should have got a big research grant from the government, than you should publish the book. (7)

They realize that financial support traditionally perceived as a means to produce academic output has nowadays become an end in itself that indicates the performance of groups or individuals. A1 in general stresses the change in research culture, since researchers are expected to apply for external research funding; either buying out teaching or getting funded research projects (6). The professor in A1 admits that public money helps the department to "reduce the deficit at the department's finance" (7). The reward for 'looking good' from the funding point of view helps secure new staff positions even in the low performing unit in the RAE, as A1: "at one blow that has made up half of our staff losses since the money was cut" (8).

Drawbacks of external funding

Both groups talk about the drawbacks of external funding though this is more of an issue for A1 than for B1. Both are concerned about the high overheads that go to the central university administration. B1 used to get some of these resources back, but this has stopped and the head of the department regrets this development. Moreover, institutional management pushes the group to go for external funding bodies that carry high overheads, a development not welcome by the group. (3) A1 researchers are more assertive about other drawbacks of

external funding including “unpredictable and competitive money for research leave” (8) and research applications (5), money available for “not very creative things in research”, such as “glorified lists of charters of a given king”, (8) and higher university overheads which leave the project staff with rather low salaries. A1 is forced to confront competition more for external funding due to their lower grade in the RAE and there is a stronger push from the management to secure external grants as compared to B1, which is in a more secure position.

The dominant concern related to funding in both groups is associated with the increase of external and internal accountability measures in both teaching and research. This means more bureaucracy in the everyday activities of the researchers. This change is reflected by a professor from A1:

The volume of work is increasing all the time; it’s a serious problem because the buzzword here is accountability, which means that you must fill in three forms representing what you do, whereas ten years ago you filled in one, and twenty years ago you filled in none. (7)

Most researchers are not enthusiastic about this development, which in the words of a junior researcher from B1 was “fiercely enforced”. In both groups researchers talk mainly about accountability to external funding bodies and the university management. In their view, there is a clash between the accountability measures and a researcher’s working style and identity in medieval history. External funding bodies expect researchers to work as ‘accountable scholars’ and that clashes with the identity of a ‘loan scholar’ who is free to carry out research of his/her own preference (1). A junior researcher notes that researchers are creative in order to match expectations for accountability and protect academic work and identity:

I guess that’s probably through quite shrewd sort of political manipulation. No, not manipulation, it sounds bad, but people who know how the system operates, and how to operate within that system as it were. Basically the academics want to work as loan scholars and funding wants us to work as accountable scholars and I think that there are ways that people find to fit those two things together. (1)

Part of this is learning about the built-in vagueness and flexibility of accountability measures. A junior researcher from B1 for example, is surprised that external funding bodies do not bother to check if the real output of a research project matches the outcomes predicted in grant proposals. Thus, as long as visible output is produced, it is acceptable to the funding bodies (1).

For A1 the rise in accountability also means developing the new skills required. The head of the department in A1 perceives external funding bodies as

more strict about academics following their procedural rules (6). This implies that researchers have to develop new skills to understand financial sides of their projects. Moreover, the increase in accountability results in a loss of trust as underscored by a professor from A1:

Everything is more supervised than before. We are filling in forms about the behaviour of our students; our students are always filling in forms about our behaviour. That's why I don't have my students to tea any longer or a party of wine at my house the way I used to. When you are afraid of spying upon reporting the people around, you don't have them around your house. (7)

The loss of trust goes hand in hand with an increased regulation of the academic profession: "We have gone in twenty years from being the least regulated profession in the UK to the most regulated profession. So it's a very big change" (7).

Funding for medieval historians has changed due to the overall change in the funding of the research councils as well as the different performance of basic research units A1 and B1 in the RAE. This change was largely unwelcome by both groups. Funding related concerns included high overheads and a concern about their work content, especially the requirement for relevance coming from the management and external funding bodies. Basic research units were not pleased with the increase in accountability, especially increased bureaucracy and the loss of trust between academics, students, and managers. At the same time there were positive aspects of gaining new skills and flexibility in accountability for external research grants. Overall, according to the respondents the competition for funds and accountability to funders such as research councils and management have increased. In general, external funding has become an expectation built into the work of medievalists and this is perceived as a big change from past practices.

6.1.2.3 Management

Another important theme noted by all respondents and appearing throughout the interviews in A1 and B1 is associated with role of the university research management. Both universities realized the importance of the RAE and established research output monitoring processes as part of their strategic planning. Management also implemented other measures to stimulate applications for external funding and increase the research output according to the criteria of the next RAE. As expressed by an A1 researcher "my department forces us all to apply for public money, it looks good that we do it, and we win it; that shows what a great department we are" (6). Another researcher from A1 notes the link to the results of the last RAE:

It will still be made very clear by the university that we can stand this [grade 4] for one RAE, but they expected us to change our outputs...become more focused on research by the time of the next RAE. And that involved doing a number of things; it involved partly reviewing our undergraduate teaching to make it less staff intensive. (5)

A similar opinion was expressed in B1 where target setting for the RAE is a prominent objective of the management and where performance is related to career prospects within the department:

Nevertheless the pressure in the department can be quite considerable and it's a number of different kinds. Clearly every institution has its pecking order and everyone is kind of looking over their shoulder to see what their colleagues are doing and how much they are publishing and when you're given a set of benchmarks that you have to meet, a set of targets that we have for the RAE, then everyone looks a little bit more anxiously over their shoulder see what other people are doing. But beyond that there are more kinds of institutionalised structures in the university and in the department. Clearly the department is under pressure for our research rating since our money stands out very considerably and our position within the university, our labour job bargaining power, and our reputation also fall under the pressure coming from the university. (2)

This opinion is shared by a professor in B1 who notes that the department and increasingly the university as a whole relate the financial benefits to the research performance which means that both department and university management are 'preoccupied with the monitoring, the quality, and volume of staff research.' (4)

All respondents are preoccupied with the monitoring procedures, filling in the forms, and participating in the yearly evaluations. A1 is more concerned with these routine practices than B1. A1 admitted that it makes sense to follow the procedures and 'play the game' in order to 'look good' so that the department as well as the university 'look good' as well:

I decided I was going to play the game that the department now wanted, so I did everything the department wanted. And as a result I ended up very popular with the department. (7)

A professor in A1 indicates that the Vice-Chancellor favours the department since it has been working hard on 'looking good' (7). A1 has explicit strategies of how to increase its credibility within the department and the university even though results from the last RAE were not satisfying. This is done following the mentality of ticking the boxes (5) to account for public funding: "account to the government ultimately for the public money we are getting. As the Vice-

Chancellors say we get so many millions of pounds every year, and it's up to us to justify it." (7). Such a message boils down all the way to the individual researcher who has "to constantly justify the existence" to different levels within the university (8).

In B1 however, there is less sense of pressure in this respect. Annual research performance monitoring is described more or less as a friendly chat with the departmental research committee. Researchers are not too concerned about it and do not attach big importance to it. However, they have to participate in it as a department (3).

Personnel policies

The results of the monitoring feed into the personnel policies where better research performance results in the RAE means refilling of old posts and possibly new staff posts while bad results will bring the group trouble. The major difference between the groups in personnel policies is indeed related to the results of the 2001 RAE.

Appointment policies come from the faculty level in A1 and are based on the RAE results, which makes it difficult for A1 to bid for permanent new staff posts due to their grade 4 in the 2001 RAE. (6). B1 faces much less of a problem to get support from the departmental management in filling its vacant positions due to the very good RAE results. The awareness of the importance of the RAE for personnel matters is very high in both groups. The risk of which researchers are aware in case they under-perform in the next RAE is that they can end up with even fewer staff and more teaching, or they can be closed down or restructured:

If we underperform, like some departments do, if the department got a 3, if it doesn't do better than the 3 I think it will be closed down, or absorbed. I think in a big department the implications would be if you underperformed I don't think the people would be necessarily be sacked but people who leave wouldn't be replaced and so cumulatively, for example, I think we are fine, when I was here we peaked at about 25-26 and now we are running at about 19-20 members of staff. But our teaching hasn't diminished. We have got more students. So departments that underperform end up with fewer and fewer members of staff and weak members of staff will be placed under pressure to take early retirement. (8)

Moreover, the professor in A1 notes the contradiction in the management policies of appointment and funding that are related to the RAE results:

Our department was taken down a grade at the national research ratings five years ago because we had too many young cheap staff who we appointed in order to make money. But they haven't produced any publications yet, so that

made us look bad and we lost a lot of money; as a result we turned ourselves into a piece of machinery for pumping up research. (7)

Senior respondents from B1 admit that the importance of research performance creates a challenging environment for younger staff although their institutional environment is nowadays very supportive compared to the past. Today, the department management has a mentoring system which supports the junior staff in "...getting their first book out, finding publishers, making sure that those plans are in line with the highest levels of achievement are struggling aside" (4). A1 seniors also mentor the junior staff and write research grant proposals together (5, 6).

In this situation, each unit has different experiences in recruiting new staff. Although A1 did not receive a high grade in the last RAE, it complied with the university policies to apply for external funding and actively participated in a faculty research theme. This has resulted in an appointment of a new professor in medieval history (8). They are 'playing the game' of central university management and improve their personnel situation:

The Vice-Chancellor has no personal power to help the department. But his praise of the department has been an encouragement to those in the middle to help us. And this is the reason why for example, we have three new members of staff coming this autumn, three new jobs. (7)

B1 has no need to prove itself internally since it has high credibility due to the top score in the last RAE. Researchers note that they get new staff members, "young staff with extremely promising potential research profile or senior staff with a strong research profile" (3). Since it is a well performing department it can also sponsor research leaves and travel to conferences (2). Leaves became more frequent and full time since more emphasis is put on research:

And at the staff of 26 we currently this year have 6 members of staff on effectively full-time research leave. It would have been unthinkable 28 years ago. In addition to that, there is a regular entitlement for members of staff. (4)

Both groups also report potential sanctions from the management in case of unsatisfying performance. Vacancies may not be filled as reported above for A1. This university has also created a policy for more teaching-only posts (5) for under-performing academics. This policy differentiates research active and non-active staff and puts a higher teaching load on the latter. This is perceived as a threat, especially by the junior researchers who need a strong track record in research for their further career. Finally, researchers are well aware that policies of a 'golden hand shake' and early retirement, non-prolongation of fixed-term

and teaching-only contracts can influence their individual position as well as of the position of the group in case of under-performance especially in the RAE. Researchers from A1 indicate that there may be extreme cases of being restructured or even closed down.

According to a junior researcher, the consequences of not producing in B1 are also serious since a researcher can lose his or her job (1). Still a professor notes: "the university is not particularly proactive in such matters" (4). Although there is some anxiety in this respect among researchers, it is still theoretical as it is not a university wide policy as yet. In this respect, B1 has less anxiety about losing their job or ending in teaching-only position than A1.

Speaking of future prospects, A1 hopes to improve their research performance in the RAE and also bring more academics into the department (6). B1, along the same lines, hopes to retain its top grade and ensure the secure personnel situation in the department (3).

Besides the threats and opportunities in the future, researchers are concerned about management's incentive mechanisms for staff promotion. The key challenge for researchers is changing performance criteria and trying to keep up with them. Incentive mechanisms are meant to facilitate better performance and include research leave for staff, promotion, or new posts. In A1 respondents state that the promotion relates to being able to acquire external funding for research projects and leave, and having good research outputs: books and journal publications (8). Strong research performance is also crucial for a start up tenure position that leads into a permanent job. In B1 it is expected that a junior researcher goes to one or two postdoctoral projects before securing a permanent position (1). For senior staff, the promotion depends also on the assessment of central university management. Thus the incentive system for senior researchers is the performance-based pay structure (4). The performance is evaluated on research output, such as journal articles or books:

I think it is probably true in history that the promotion structure, which of course is not a department but a university thing, has been there essentially for the production of monographs. I don't know anybody who's promoted to senior lecturer for example, without at least one monograph. (4)

Opinions about management policies

Opinions on management vary between the two groups. B1 is more critical and reluctant toward the management than A1 that is largely 'playing the game'.

In general, management policies in A1 are perceived as given and researchers think that they have to comply; to a large extent, they do. All respondents mention the Vice-Chancellor in this context. Faculty and department

management are seen as important as well. Overall, researchers are cooperative with management. Juniors think that management policies and impact are a normal part of academic life; seniors follow the rules by producing outputs as required. As noted above, management plays a crucial role in securing the group and new professorships despite its poor ranking in the last RAE. The head of the department in A1 notes a more top down management approach of the university: "I think it's much more directive now, our leaders are pushing us in a direction that we should want to go anyway" (6). In general, the role of management is defined as a supervisor of the quality and efficiency of research outputs: "Management, they see their role to move the pieces on the ball in such a way that they will deliver the maximum amount of good quality stuff" (8). Management also restructures the faculty so that a more centralized approach can be used to cut administrative costs.

In B1 the researchers are clearly dissatisfied with the management policies. Their frustration is mainly due to the perceived lack of acknowledgement from within the university regarding their very good research performance. This applies to the lack of budget disposal as well as the lack of autonomy. The head of department of B1 notes:

The university takes all our money that we earn. That's actually serious, is the perception. I think there's also the perception that the university is intrusive in that it makes totally unnecessary demands in administrative terms; it keeps demanding information that it probably already has in another section. And broadly I think that the university regards the department very favourably and is priming itself because the Times come out, the league tables and puts history second of all UK university departments. So the VC would be very proud and say look, what a wonderful history department I have. Whereas we think, oh no, he doesn't know what we do. ...for various reasons because we felt we got the wonderful research rating and we're not getting the financial reward that we should have received, and the university is regarded with a great deal of scepticism. (3)

Intrusive management is evaluated negatively also due to high overhead policies and growing accountability measures. Moreover, B1 is convinced that the existing incentive mechanisms actually do not work; instead of getting more money, the university management is subsidizing other departments. This opinion is also shared by a junior respondent who notes the cross-subsidizing of more expensive departments as not a fair deal:

Now it doesn't always equate to the amount of funding we get and so on because the university is trying to balance all sorts of different departments. Some are more expensive than others, so in a department like ours, it's a nice

means of getting lots of students in. Aside from that money is off to departments where research is more expensive than ours, like particle physics and that kind of thing. (1)

6.1.2.4 Competition and cooperation

According to the respondents, competition for resources is a dominant theme. They perceive a growing need to compete for external funding and this is getting tougher. Researchers increasingly compete for research leave, research project grants, and travel funds. As a consequence of increase in competition, fewer people manage to get funding for research leave in A1 (7). In addition, competition for the staff posts has increased as mentioned in A1:

Both in career and institution terms, competition for the slices of the cake at all levels, arts as against everything else, departments within the arts faculty, who gets the post, and in the absence of a clear research strategy until the last couple of years, every time a new post was available at the department it became a sort of feeding frenzy where every subject area would be invited to submit in a sense an application, yes, we need another 20th century professional, we need another medievalist. And I was always in despair of this sort of things in which every time there was a possibility the post just became an opportunity to win. (8)

Though most of the respondents in A1 do not appreciate this changing environment (6,7,8), one junior researcher (5) admits that he likes increasing competition for resources and this change is needed for his department:

There were lots of people in 1970s that just did absolutely nothing. And it was even almost anticompetitive culture in our department...I think a measure of competition and target setting is actually quite good. It can have negative consequences, but it has some I can see, some definite benefits, which I think sometimes people aren't willing to admit. (5)

The department head thinks that competition is the object of management control: "...we managed to control any unhealthy competition" (6). Another effect of competition for a junior respondent from A1 is the low success rate of externally funded applications: "A lot of projects mean then it's a lot of funding, but they only fund 15% of the applications, so projects highly rated are not funded" (5). He finds this disappointing.

In both A1 and B1 there is little internal cooperation among historians as noted by both junior and senior respondents (1, 3):

As far as medieval history is concerned...obviously, much research is a matter of individuals and doing their own thing. Not really a great deal of collaboration. (3)

At the same time, both groups point to their personal national and international networks that have always played a certain role. Such networks and external cooperation have become more important within the framework of cooperative research projects funded by external grants. While both A1 and B1 are involved in such collaborative projects with other universities and participate in conferences, the majority of their researchers still work on individual research projects.

In most cases, cooperation is related to the demands of university management to cooperate internally and to external funding. In the Faculty of A1 various measures have been undertaken to introduce major research themes and bring researchers from different departments together in these thematic research clusters. This goes along with a push to apply for external research grants. As respondent 8 reports, the university presses for collaborative projects:

But I can see how from a politics' point of view, I think the university is increasingly expecting us be engaged in that sort of collaborative venture and its rhetoric... is very hostile to what we pejoratively now call the lone scholar, which is you mustn't be in a sense self sufficient and do your own thing and the more you are involved in collaborative projects, ideally, externally funded collaborative projects, the more you are in a sense pressing the buttons as far as the university is concerned. (8)

The head of department of A1 notes this as a change for the better because "we are talking to each other much more than we did before" (6). He admits that this is not an easy process and though the faculty themes do bring different groups together, researchers are still very protective of their own themes: "So there are still the tensions and the protecting one's own turf a little bit even within these larger faculty themes" (6). But he is optimistic, since in his view historians can adapt quickly to the culture of writing grant applications and in that sense, cooperation:

It's proved to be very useful in building up contacts across the departments; ultimately somebody has to take the burden of filling in the forms and that has tended to be the historians also applying for grants, we seem to have embedded that in our culture anyway so we can adapt to that. (6)

Still, this does not result in carrying out common research projects or publishing together.

Similarly, B1 starts to think in terms of cooperation encouraged by the university management and the department. They feel pressure to look good and bring in funding from big collaborative projects:

In recent years more and more sources of funding of that kind have become available and again there has been increasing encouragement from the research councils and as a result from our own institution to find ways of collaborating with scholars elsewhere because it brings money in, it looks good in research terms, and it raises our research profile. (2)

Therefore collaborative projects are the ones that not only bring in money, but also raise the credibility of the department, and thus are perceived as important. But such projects do not come easy, since cooperation is not engrained in their culture. As noted by a B1 researcher it is more 'modernist colleagues' who are keen to cooperate within the department rather than medievalists (2).

Overall, there is some scepticism towards these forms of cooperation especially among senior staff that do not see this as part of their academic ethos and the way they were trained (7). They prefer to work as individual scholars. Junior researchers are more likely to admit that it is sensible to cooperate in research through project work and that the colleagues in the field are getting more used to this kind of work via externally funded projects:

The money is certainly out there for doing that, and again this is something that scholars in the arts and humanities are I think becoming increasingly wise to use. (2)

Despite these slightly changing attitudes towards cooperation, all of the respondents in B1 and in A1 think that most of the work in medieval history is still done individually.

From a structural point of view there are attempts by the university's management to establish grounds for cooperation as well as facilitate it by the applications for external funding. Although researchers respond to management by playing the game in cooperating in externally funded projects, researchers in the groups remain largely traditionalist in terms of individual research as opposed to cooperation.

6.1.2.5 Pressure to perform and work intensification

Both groups report increased pressure to perform due to policy changes towards more managerial approaches, the RAE as well as increasing student numbers. They do not welcome this development. Researchers think that the atmosphere at work has become "unrecognizable even from the early 1990s,

absolutely unrecognizable" (8). They live in a more monitored research environment where performance pressure is felt by everyone (2). Respondents link this pressure to changes in their institutional environment related to the broader shifts in governance. The most dominant factor is the RAE which requires them to publish a certain number and quality of articles and books. This influence is nested with the demands of management to perform. University research management is strategic about the RAE as both groups go through an internal monitoring procedure within the department where they talk about their research performance on an annual basis. As the head of B1 notes:

External pressure to perform has changed because of RAE. When I started there was nothing of this sort. There was an expectation of producing research, nothing more than that. And now there is a clear expectation that you should be producing four good outputs: one sort or another over the four year period. That expectation is changed. (3)

The head of A1 also agrees that the pressure to perform is more explicit and consequences for not producing the required number of publications are severe: "God help you if you haven't got your four international quality pieces of work" (8). Besides publishing, the need to apply for external funds is visible (5,7) as well and contributes to the increasing pressure.

Talking about performance is a routine and important thing for researchers in A1 since pressure is very explicit when it comes to promotion. Even if they are not producing, they have to look good, attend conferences, and promise the publications to their management, even if it is not realistic (8). This 'looking good' behaviour is called 'gesture politics' (7) and can be seen as a strategy to offset the pressures to perform. Researchers are conscious of earning credit points – "producing research, winning research grants, getting noticed" (7) for their own promotion prospects. Senior academics who are not as interested in promotion talk just as much about performance and publications 'playing the game' even if they do not like it (7,8). This creates a situation where researchers are conscious and strategic about the ways to look good in the eyes of their university management.

B1 similarly senses the pressures to publish and apply for grants. Additionally, B1 respondents note the pressure to perform in terms of expanding collaborations with other researchers and doing more project related work. A junior respondent from B1 sums it up:

There is more pressure to apply for outside funding, more pressure towards a more collaborative kind of research on the model of the natural sciences or social sciences which again is linked to the need to acquire outside funding and the allure of big, expensive, well-funded projects that will make space for a

number of researchers, so more cooperation, closer supervision, shorter and in some ways more limited research projects. And the pressure to publish, publish, publish. (2)

This pressure is again linked to the RAE, since collaborative projects bring in external funding which provide financial resources and reputation to produce outputs for the research evaluation. This goes along with a development in which researchers see themselves as manager academics directing research rather than carrying out research (2).

In general, researchers in B1 are well aware of the increasing pressure to perform at various frontiers. They are however, less concerned since they see themselves protected by their high research credibility earned within the last RAE.

The pressure to perform has increased in both units due to the nested effects of the RAE and related management measures which encourage research groups to apply for grants, publish books and articles, buy in teaching, and establish collaboration. Many researchers do not perceive this as a natural part of their mode of work; senior staff tend to be more critical about this development than junior staff.

6.1.3 Research practices and responses

6.1.3.1 Problem choice

The selection of research topics in both groups is predominantly driven by the dynamics of their own research inquiry, where the process of individual reflection and consultation with the wider academic community is central. Both senior and junior researchers converge on this matter in B1: "I think the system is still free enough to allow great changes. Nobody is going to mind if I suddenly start working on financing Latin America in the 19th century, provided I can carry on producing the output on that" (1). There is a system in place to ensure good outputs are produced, but when it comes to research themes there is a lot of independence from the management in B1:

The overwhelming majority of staff research is simply done in terms of the choice of members of staff as to what to pursue and the department involves itself to the extent that it has a regular annual monitoring of staff's research output and research plans. And clearly its concern is chiefly that the research should be of the international calibre, the international level, rather than having

any particular interest in what form, what particular subject the researcher addresses. (4)

There is some pressure from the management in terms of the definition and management of research projects while “deciding what it is we want to do still lies with us as individuals” (2). Here the pragmatics of the researcher is working, where he tries to combine the freedom of choice of topic and keep his employer happy (2).

In A1, the policy of the whole group is to pay more attention to academically driven research problems. They strategically participate in the faculty multidisciplinary research themes to earn credibility in the eyes of the faculty management and get the new staff positions as well as to put their own topics on the faculty agenda. In other words, they are proactively influencing the development of faculty themes. The department head still firmly believes that research should be idea-driven rather than guided by funding bodies’ demands:

There is an intellectual commitment in the department to move forward, to moving the university forward, but it’s not simply chasing the money, that’s what we are afraid of to some extent, that our research will, if we are not careful, be resource rather than idea-driven. (6)

Other respondents in A1 note as well that they do not see a lack of room for manoeuvre in deciding what to research. A professor in A1 is able to look at a completely new area:

I can’t find a green liberal metaphor for this, but it is rather like being the first whaling ship to enter the Arctic; all the whales are around you to pick young prey... or a less horrific image, walking into the new gold fields in Australia as the first person to walk there apart from natives and picking up lumps of gold everywhere, instead of having to refine the gold that has been recycled. (7)

However, in both groups there are indications that researchers need to follow certain considerations when choosing topics for externally funded projects. Such strategic considerations have to do with the application to funding bodies for grants, where certain areas of research are more likely to be funded. Therefore, researchers have to make choices about how to fit into the priority area of the funder without compromising their own research interests too much. Research topics are thus not entirely driven by the academic agenda of the researchers, but are influenced by funding priorities and the perceived likelihood of getting funding for certain themes.

B1 considers carefully as a group what to apply for and has a strategy of how to improve research proposals to secure external funding. Their considerations

include not only the kinds of research questions that could be requested but also “how we might package what we are proposing most effectively in a way that will attract the interest of outside funding bodies” (2). This careful consideration is not without reason. The experience of a senior respondent shows that the topics of the research projects funded by the funding bodies are related to the priorities of those bodies (4).

In A1 there are indications of similar influences on problem choice when it comes to funding bodies. For example, while applying for project funding for three years, a junior researcher admits:

I wouldn't possibly immediately have chosen [the research topic] although it's actually very much connected; it's not central to my research. And so it's influencing....market funding has influenced what my future research expectations would be over a period extending about 2 to 3 year period. I would actually have to say, ok, I will be concentrating on something which I might not concentrate or probably would not concentrate otherwise. (5)

This junior researcher regrets that he had to compromise on his research topic: “I'd like to have chosen to do something else which will interest me a bit more” (5). Similarly, a professor from A1 is not satisfied with the restraints coming from the funding bodies. He reiterates that applying for external funding is “exhausting and limiting”, since the external funding bodies have many rules and restrictions:

I've saddled myself with a research project with huge number of rules and restrictions attached that limit me and make my ability to research much less. And when these three years are over I am not going to do it again before another ten years, I should be free again, and have a much better research basis. (7)

A1 emphasizes that they follow practical consideration of the likelihood of funding while applying for the research projects; they employ the strategy of using specific topics that may fit the priorities of the funding bodies:

I think the funding bodies...influence enormously what actually gets done because ultimately any time you might have four or five equally kind of good projects which ...selection you think, good projects which you could look at, and you'll say ok, those four give good projects, they've got lots of intellectual merit but I don't think a realistic way of getting funded-- whereas this project will actually tap into and this has a good chance to get funded, so I'm going to go with that one. I think actually the funding bodies still actually have an effect on what's going to come out because ultimately [one has to]...go after the money.' (5)

Obviously funding is very important to both research groups while they try to balance the demands of the funding bodies and their own research interests and agendas. This partial compliance to the rules of the game of project funding is a strategy used by both junior and senior researchers.

An alternative response to the pressure for external funding is the strategy of diversification. A professor from A1 exclusively follows his own research interests while applying for external funding. (7) His strategy is diversifying his funding base and being popular enough to have his own 'industry' which brings in money – that is to participate in different TV shows, documentaries, and talks. This is a way to earn money for research that is not heavily taxed and provides some means to carry out research that he likes. He calls it entertainment business as seen in this extended quote:

History and archaeology are hugely popular with the public. And there has been a tremendous growth of programs on them. Its starting to subside because they got over-funded, overstretched; there are too many bad programs on archaeology and history, some of which I helped to make. But that is alright, my sources are very diverse, at ground level that means that village history society appears every year at this locality. If I wanted to, I could spend the year going from one local society to another speaking mostly to retired people. But people with grey hair have big wallets, because there is lots of spare time and cash. That's another way of increasing the income while entertaining people. (7)

Both groups perceive themselves as mainly driven by their own research agenda while they are quite strategic about applying for external funding and deciding which projects to pursue. While A1 has more of an individualistic approach, B1 follows a group strategy. All respondents are pragmatic in selecting the concrete topics to maximize the success of their applications. B1 has a regular procedure where the research committee of the department takes on the role of the reviewer to scrutinize each project application and advise how to improve it (3). In A1 applying for grants is an individual process where the researcher takes into consideration what is more likely to be funded and goes for that topic (5).

In terms of problem choice, researchers mainly balance between their own research agenda and the research priorities of the funding bodies. They do so by following compromise strategies – following their own research lines and at the same time selling their research interests according to the priorities of the external research funders. Both groups 'package ideas' and go for specific topics that are likely to fit into priority areas. A similar strategy can be found with respect to the requests of funding bodies to establish collaborative research projects and the interest of the researchers to maintain individualised research practices. These strategies are sustained by departmental policies supporting proposal writing

and submission in an institutionalized way via internal advice and self-evaluation. In this way they try to enhance the likelihood of funding as well as the viability of research projects. After 'playing the game' both groups try to carry out research of their own interest in ways that fit their traditional working styles. In other words, both groups de-couple the formal structure that conforms to the changing rules of the game while they try to maintain their academic freedom in terms of problem choice and working styles. Our cases show that this strategy is by and large successful partly due to the flexibility built into the funding and control schemes of research sponsors. Researchers try to deviate from their core interest as little as possible. We also find evidence that groups actually do have to compromise on their problem choice to some extent, especially junior researchers. Finally, there are instances of pro-active manipulation strategies used in both groups. A1 aims to gain visibility and credibility in the eyes of university management by participating in the multidisciplinary faculty themes. The group proposed its own theme following the given criteria. In this way, A1 could influence the faculty theme. B1 was active in negotiations with the university management about replacing retired staff with junior staff.

6.1.3.2 Mainstream and risky research

The dominant opinion in both groups is that they carry out mainstream research. Both groups indicate two major reasons for avoiding high risk research: future career prospects within the academic community and fundability of their research projects.

Regarding career prospects, senior and junior respondents argue that it is safer to stay within the mainstream. For example, respondent 1 from B1 notes that being a young researcher he should not take big risks since he has to build up his credibility by producing the required amount and quality of publications and only then would be able to take more risk:

I think the system as it is at the moment leaves little scope for taking big risks and going into things like that. Suppose I want to suddenly start working on this comparison between modern peasant economies and medieval ones. It would be too big a risk certainly in my position because I couldn't guarantee that the outputs were going to be accepted by any scholarly journals. Because it's just something that hasn't been done before and would be so unfamiliar that a referee might say this is just a load of nonsense...So I think that at my stage in the career doing something like that would be potentially suicidal in terms of job security and so on. In that sense taking risks is difficult. (1)

His strategy is to produce the required number of publications for the next RAE as soon as possible, "to wiz those out as quickly as possible and then to

concentrate on something that is a little bit different and a little bit more risky” (1). He relates this strategy to the stage of his career.

The commonly held opinion by senior academics is similar to those of the juniors which implies that a more established senior academic can afford to take more risks due to their seniority. A senior from A1 went for a new topic for which there is not much interest in the academic community. Still he sees it as a long-term investment and enjoys it:

It is a risk because there is much less interest in these new topics. And my own career has not developed as fast since I began looking at them. But it enables me to produce new schools of research students and I enjoy it. So after a while if it does work, if the gamble pays off, then I find myself the leading figure in an interesting new field. (7)

There are many risks attached to such a strategy. An alternative strategy that he could have followed would have been to stay within the old fashioned area within the mainstream:

Its rather like being a political party that seems in danger of disintegration and people defecting to a new party that split off from it, so it is often sensible there to stay with the old party which has the machinery and the basis and perhaps the new party will fall to pieces leading you to take a top job in a new government. I would have done that as a strategy if it weren't for the fact that I am genuinely so curious about the new fields. (7)

The idea of staying within the mainstream due to career prospects is generally supported by seniors in both groups advising younger respondents. For instance, the head of the department in A1 advises his staff to stay within the mainstream relating it to a threat to future career possibilities when specializing on an “esoteric research theme” (6). In other words, the junior should not risk the credibility building process at the beginning of the career with a risky research theme as this can slow down the career development process.

Another reason to stay within the mainstream is related to the acquisition of externally funded research projects. The key concern is maximizing the possibility to receive funding. In the case of A1, a junior researcher stresses that the choice of projects is according to their fundability – thus researchers would not risk choosing a strange topic that would not fit the priorities of the funding bodies. Moreover, researchers in A1 have to make sure they can ‘sell’ the projects, that they are do-able (5).

A similar opinion is shared by a respondent in B1 who indicates restrictions of funding agencies that ask for deadlines and deliverables, which do not allow more risky themes to take place:

Projects are more and more sharply defined from outside, they have to be finite, and you have to have a timescale for publication. You have to ... almost be able to say what your conclusions are going to be before you start the project, a bit strange when you think of that as the original research. I think the pressures of external funding and external audit are conducive to a tamer, more timid, or less adventurous kind of research that I was encouraged to do when I was doing my PhD. (2)

In his opinion, externally defined projects lead to a risk averse strategy and asserted twice that “research has been damaged and pushed in less adventurous directions by the very close monitoring that we have” (2).

While applying for external funding, researchers in both groups stay mostly within the mainstream areas of research to ensure that they have a chance to receive funding. This is especially true with researchers who have little credibility because they are junior staff and/or belong to a group that ranks low in the RAE. Individual senior researchers or a group with high credibility use strategies of symbolic compliance such as taking on riskier themes while maintaining the funded projects on the safe side. In effect, they balance between risky and mainstream areas of research.

6.1.3.3 Output preferences

Medieval historians mainly do long-term research, where outputs are oriented towards the academic community, and academic inquiry is for the sake of inquiry.

University management and external funding bodies encourage ‘justifying’ medieval history research. This can be seen in the requirements of the research councils and the policies aiming at the research relevance described in chapter 4. Moreover, in the view of a respondent from A1, medieval historians have to “justify themselves harder since they are not as well funded as the hard sciences” (8):

The discipline itself has been required to justify its existence within the overall package of what universities do, quite as rigorously as some people might fear; in the rhetoric of certain politicians medieval history is the ultimate symbol of irrelevant research. (2)

Since traditionally medievalists are not used to mainly serve audiences other than the academic community, claiming public relevance in their research is a worrying trend to most respondents. The majority of respondents in A1 and B1

think that medieval history should be appreciated for what it is; there is no need to have public applicability and relevance:

I think it is a perception shared by many medieval historians that we ought to just be funded for what we do just because that is what we do and that is fine and therefore the funding ought to be coming in; there is very little attempt made to make it relevant, to explore the significance of that. (1)

Thus a culture of traditional research is very strong in this field where public applicability is still quite a foreign concept.

A1 stands out as a group that has adapted to the requirements despite such worries. A professor from A1 is an example of how a medieval historian claims public relevance and uses it to his own advantage. He uses public relevance to earn money and in this way achieves his academic freedom. He and his colleagues in A1 see an applicable public output in services to community such as public speaking. However, the problem related to this activity is that it is something that the university does not recognize or count for the RAE (5, 7). Still, some respondents are involved in such activities since it contributes to their visibility as well as the department's financial situation. In A1 a professor describes such activity somewhat cynically as entertainment.

Researchers in both groups feel the pressure from the academic community for 'impact and visibility' as well as by department which closely monitors where and how staff is publishing. For example, they are encouraged to ask themselves if the conference paper will result in a publication (2). And although the major outputs are still books, there is a shift towards producing more journal articles partly due to the requirements of the RAE manifested through internal research evaluation. Researchers evaluate this shift in different ways – some researchers do not attach particular importance to it. However, there are some distinct examples of negative and positive evaluations. Both senior and junior researchers from A1 and B1 (2,3,7) are not happy about the shift towards more short-term research outputs, since it results in the disappearance of books, especially those that were comprehensive volumes with many years of work:

I think there is a strong case for saying that there is pressure to produce things that you know are going to be published; and published relatively quickly rather than necessarily the kind of explorative experimental more open projects that some of us would like to be pursuing. (2)

A junior researcher from B1 is more optimistic: "there is still scope for scholars to produce those bigger works, I think it just might be a little more difficult" (1). Still, producing long-term outputs is indispensable from their academic culture in medieval history as described in Chapter 5, thus researchers try to balance both

requirements by creating publishing strategies. These usually include considerations of what type of outputs, where, and when they produce. For instance, in A1 one researcher very explicitly describes his seal-off strategy of promising outputs to his department that he knows will not be produced:

There is a plan to which we all work but it's necessarily very provisional and contingent. I can say to my deputy, in five years time I will submit a manuscript on this or the other, but I know that it's not going to really happen. But you are sort of encouraged to talk out what you are doing because everybody else is so why won't you? (8)

Strategies for publishing

In both cases departments have strategies for publications that aim to score as high as possible. The policy is to advise junior researchers on the selection of publishing houses. In accordance with this individuals have their personal strategies. All respondents attach great importance to publishing their research outputs, planning their publishing, and aiming at top publishers and the best journals. For example, for a junior researcher in B1 publication is part of a careful long-term plan:

I plan it very carefully. I'm trying to work out exactly what I can produce in what sort of time. ...Strategy is quite important and I discuss that with much more senior people more experienced with that than me and they try to sort of help me to work it out. (1)

The key strategy here is to plan the articles for the next RAE, then publish them as soon as possible so that there could be some time for other research (1).

The planning of publications in A1 and B1 takes into consideration the impact factor of these outputs. In A1 the head of the department reports advice on good publishers to juniors; they in fact have a list of ranked publishers as well as journals (6). The junior researcher in A1 also pointed out that "you earn more brownie points" if you publish in the most prestigious place. (5) Similarly, B1 researchers are very careful where to publish:

I think everyone here is very anxious about getting things published in the right places. A lot of us maybe now think harder about it than we would have done perhaps five or ten years ago...where we place things for maximum impact and visibility, particularly with regard to the academic audience and above all with the research assessment exercise in mind, there is very much a pecking order of academic publishers and academic journals. (2)

In both groups, the key motivation to go for the highest impact is related to the research evaluation and the need to earn credibility in the eyes of the university management. This is not always in accordance with their motivation. Professors in B1 indicate that academics should publish out of their own motivation and on the topics in their research interest which would be accepted by publishers and useful for their career. (3, 4)

Time to produce outputs

Both basic research units draw attention to the reduced time to produce outputs. This is mainly attributed to the influence of the RAE, the university management, and the funding patterns of external funding bodies. All respondents share the opinion that as a result of the above mentioned factors a shift from long-term research outputs towards short-term research outputs can be observed. Senior researchers see long-term research as writing a comprehensive book where a researcher invests 20 years or so, while the junior researcher sees a three to four year funded project as long-term research. Short-term research for senior researchers is a project of three months, a case study, or a 150 page book written in three years, while for a junior researcher it is a paper presented at a conference that takes a couple of weeks.

A professor from A1 reports a growth of short-term outputs such as case studies, or what he calls "the micro history". His reasoning is that it is "a cheap and easy history to write in terms of research resources and time" (7). There is no time to invest in a long-term output: "Its short-term, you can't go away and spend 20 years writing the definitive book that will stand forever as the ultimate statement" (8). Here the compliance with the timing and outputs for the RAE is very important. A researcher from A1 notes that having time for a book has become a luxury:

I think the priority has become fixated on getting material out for RAE at the expense of I'll do one article by way of exploring which might be a book in five year's time. You just haven't got that luxury anymore. (8)

Moreover, non-compliance with this trend can result in a penalty from university management (8).

Since medieval historians are traditionally oriented towards long-term outputs following individual research lines, they create certain strategies on how to offset the pressures towards short-term project work. The common behaviour is a strategy of cutting their research line in shorter-term projects:

I think as an individual, if you have something really big and ambitious and long-term that you want to do, the only way you can do it is by kind of being a

bit sly and sneaky about it and chopping it up into a series of apparently small and less ambitious projects. You could then get funding for them and the big book that you hope it will one day build into; you try never to lose sight of it, you work your way at that through a series of shorter projects. (2)

Quantity and quality

Within the context of the RAE, researchers often refer to the issue of the quality and quantity of their research outputs. They think that the RAE presses for quantity while quality is often neglected. B1 researchers see the tendency of a changing mentality towards 'ticking the boxes' instead of concentrating on the high quality long-term outputs:

Since the RAE has come along, more and more stuff gets written, that nobody is ever going to read, and it is written to tick the boxes for research output for the RAE and I think that the important books that require time and reflection are, they come along less frequently than they used to. I think the research culture that we work in is largely to blame for this.(2)

According to researchers in B1 there is also hastiness in publishing premature papers and books (3, 4). The B1 department head points to the problem of actual usage of articles (3). The key aim as in B1 is to "fill the RAE boxes" (5).

Similarly A1 notes the trend of the inflation of publications. This could mean hasty work, a lot of "unremarkable work for publication by people desperate to have a book for the next RAE" (8) and "a certain amount of repackaging of ideas" (7).

However, despite the introduction of box-ticking mentality due to the RAE, respondents in both groups do not see the tension between quality and quantity in their own work yet. Quality still matters, but the question is also to what extent the box-ticking mentality leads to producing for the sake of producing in the long run as seen in B1. A1 also does not think that they adhere to the pressure for quantity. This means that researchers in both groups see themselves as not compromising on quality. For example, the head of the department notes:

We are all at different stages of different projects, but there is a resistance to simply producing for the sake of it. We still have commitment to let the ideas drive research, not the research assessment exercise or the money. (6)

All in all, the pressure to produce outputs coming from their changing environment does influence performance, as noted by a professor from A1:

So within ten years, in the 1980s, the demon suddenly was the old lazy man who never published a book or was talking about writing one. And of course that person can't exist now. It's not simply that this person is under pressure which happened by 1990, that person is gone. (7)

Both groups respond to the requirements to publish and prepare for the next RAE. They produce the required number of publications and comply with the rules of the game coming from the department and the university management. In most cases, researchers are very conscious about their response. Although the majority does not welcome this development, a junior researcher in group B1 is positive. According to him, monitoring and pressure to perform are useful to make sure that academics are producing important outputs (2). He thinks that the RAE "has taken out a sort of a free ride factor and people who often for very good reasons perhaps were not publishing much" (1).

Both groups comply with the requirements for a certain type, amount, and quality of research output within the frame of the RAE that is reinforced by internal management measures and external funding bodies' requirements regarding past performance. The major push for short-term outputs has to a large extent been accepted by the researchers who increasingly try to publish papers and articles. Both groups have institutionalized strategies to conform for what, where, and when to publish; all of them consider the top quality publications or publishers. Here the motivation comes from external and internal evaluations as well as their own motivation to build or maintain credibility within the academic community. Even professors with high credibility comply with these changed rules of the game by "throwing some articles into the journals" (7). However, this is predominantly part of a seal-off strategy where they divide their own long-term output preferences and long-standing research interests into short-term projects and outputs. In this way they still produce their preferred outputs, such as books, although at a smaller scale. Researchers in A1 particularly are also active in a 'window dressing' strategy where they promise certain outputs to the management knowing that they will not actually be able to produce them on time.

6.1.3.4 Teaching-research nexus

Researchers in both groups are involved in teaching and research. As academics they believe they should do both. They perceive a growing tension between these principle activities; there is "a subtle but significant shift of emphasis away from teaching and towards research and releasing the research time" (8). Teaching has traditionally been very important in the field of medieval history while the research function came second. For example, the A1 professor's

memories of the earlier days show that traditionally his role had been to teach not to research, so the growing tension that he notices is a big change for him:

When I was young, there was much less research been carried out, it was not considered a necessary part of being a university teacher, you were there to teach. And if I researched that was a luxury and extra private hobby that was good for department, but not essential. (7)

Currently most researchers in A1 and B1 observe changes in the teaching-research nexus. The importance of research has increased, encouraged by university management partly due to the RAE demands and the need to attract external funds. Research has become more visible and monitored in both groups. At the same time, all respondents report increased teaching loads due to increased numbers of students. In the view of a professor from B1, student numbers have doubled and that means more exams to correct which in turn means less time for research (3). Additionally the administrative duties have increased.

The teaching situation differs in the two groups; A1's staff has decreased while B1 retains a stable number of staff. The increased number of students and the reduced number of staff in A1 aggravate the teaching workload. Moreover, the prospect of increasing tuition fees in 2006 at the system level following the Higher Education Act of 2004 is deemed important for this basic research unit; teaching cannot be neglected in A1.

This is evaluated as a paradox in the system by researchers in A1. For example, a professor who was losing holiday time due to the marking of exams which he planned to spend on research, thinks this situation is unacceptable:

The system is not working together. It is changing so fast, developing in contradictory patterns. And there is no overall planning for it. We are trying to monitor it, but we have no power to change things. Monitoring shows up absurdities; all we can do is drink coffee and complain. (7)

The situation in B1 is better in this respect, since their university management is more accommodating. For example, according to a professor, junior researchers have reduced teaching loads and all staff have periodical research leave which is more frequent than it was a decade ago (4). At the same time, a junior from this unit complains about the lack of time to do research. In his experience, junior researchers spend around 40% or less of their time for research, while the rest goes to teaching and administration.

Both research units find this situation in general dissatisfactory, since they would like more time for research, as this is important for building credibility toward promotion or obtaining external funding. Researchers note that the

imbalance between teaching loads and research significance puts the system under pressure and contributes to work intensification. This is reinforced by contradictory signals from management and policies sanctioning bad research performance with higher teaching loads. For example, a professor in B1 draws attention to the evaluation procedures at his university that can have serious consequences if RAE requirements are not met:

If a member of staff doesn't publish in such a way that they meet the requirements of the RAE, the university could and does on occasion put quite serious pressure on them in terms of their position and their appointment, they are after all not doing the job. But I cannot say that the university is being particularly pro-active or stern in such matters. (4)

Similarly, A1 experiences the negative effects of research evaluation in relation to personnel policies such as promotion or reorganisation of teaching and research balance due to underperforming. For example, respondent 5 in A1 is told by the department management that he needs to produce a book for the next RAE on time if he wants to be promoted to senior lecturer. The 'threat' not only concerns promotion, but is also about being marginalized and going for 'only' a teaching position

The result of this shift is that teaching is increasingly seen as a punishment for not producing good enough research outputs. For example, in A1 the punishment is evident to be "pushed into a more teaching-only role" (5). Teaching is not rewarded as well as research; a researcher does not get much credit for teaching: "you don't get famous being the world's first best teacher" (8).

Researchers in A1 and B1 react to the conflicting demands by long working hours, trying to do both teaching and research even if it means working during their spare time or holidays (1,7). Encouraged by their management, they apply for external funding to 'buy out' teaching and free the time for research. Finally, they diversify teaching to those non-research active academics or contract staff. For example, encouraged by the university management A1 applies for external funds to receive research leave. This means they will be able to free their time from teaching and hire someone on a temporary basis to carry out teaching tasks. This is not met as a welcome development by A1. For example, one researcher feels sad that academics lose the acknowledgment of the importance of teaching, and that management evaluates the obtaining of external funds to offset teaching as a success. In his opinion, a neglect of teaching is "forgetting why we are here" (8). It can have side effects for students who pay higher fees. One can be decreasing teaching quality since the staff would not be able to teach in small classes; it would be done by younger members of staff or the graduate students.

Researchers from both units fear that this stronger division between teaching and research is likely to continue in the future. For instance, a researcher in A1 feels strongly against the diversification of teaching and research at the system level:

What I suspect is that the British love affair with tailoring teaching and research very closely will come under strain because we are teaching less. And there are few opportunities to teach your research to people, even at postgraduate level. So we might get a system which I think is in embryo now; which is where some institutions, which are research active, become more and more research institutes with the postgraduate students. And then there will be other universities which are essentially just teaching institutions. And if you can do a bit of research, good luck to you, but you are not going to be paid to do any. In a sense the British system at the moment is a sort of unholy alliance between those two tendencies and I think they develop like that. (8)

All in all, a stronger division between teaching and research can be seen in both research units. The importance of research has grown in terms of evaluation from the RAE in both groups. At the same time, both groups have been doing more teaching due to increased student numbers. However, with the encouragement of management, researchers try to take research leave as often as they can sponsored by the university as in B1, or through external funding as in A1. The overall opinion is that teaching is getting less important, universities are hiring temporary staff to teach and also look at the 'teaching-only' positions as a punishment. This shift of dividing teaching and research is likely to continue.

Both research units comply with conflicting demands from the increasing teaching loads and the requirements to actively research. It is important for the basic research units to balance the two activities and look good to the university management. In the case of A1 they have managed to achieve it by playing according to the rules and getting externally funded research leave which allows them to hire contract staff to teach. In other words, they bought out their teaching. Besides winning time for doing research, this strategy also contributes to their profile and visibility in the faculty. At the same time, researchers in both units work additional hours carrying out research, using their free time or even holidays. Both research units are eager to meet the requirements to produce quality research outputs.

6.2 Biotechnology in England: cases C1 and D1

6.2.1 *Brief characteristics of the two groups*

The 2001 RAE identified C1 and D1 as two distinct research units in the field of biotechnology. D1 was ranked lower than C1. Both work as interdisciplinary research units where different sub-groups are formed according to different projects, although the group as a whole works on the same overarching topic. C1 has six senior researchers; D1 has fourteen. In C1 all researchers are appointed at one department, while in D1 senior researchers may have joint appointments with different departments. C1 is thus integrated in a single department, whereas D1 is a semi-independent group affiliated with a number of departments. C1 is involved in structural biology (protein crystallography) and D1 in biomaterials (biosensors, cell and tissue engineering). Both groups work in partnership with other universities and with industry. Senior members of staff in both groups primarily see themselves as researchers who also need to teach. Their teaching is not necessarily related to their research. Researchers see teaching as a 'penalty' and also report wasting too much time on administrative tasks. In terms of resources, D1 experienced a funding decrease due to the 2001 RAE grading and a halt to their core funding from the Department of Trade and Industry. As a result, they are going to be restructured and integrated in a single department and staff members have to teach more. In contrast, new posts were created in C1 due to the improvement of the RAE score. Since they received more funding the facilities were renovated and new equipment was installed. Researchers spent on average 70% of their time on research.

6.2.2 *Perceptions of the institutional environment*

6.2.2.1 Funding

Research in both units is mainly funded from external sources such as research councils, private businesses, and charities as well as the European Union. All respondents note that funding has changed dramatically in each unit for different reasons. C1 has improved its RAE grade and was able to attract more external project funding. D1 had substantial core research funding halted in recent years so that the group has to earn more money from external research projects. Obviously, both groups are in a quite different situation but perceive similar problems and threats.

Drawbacks of external funding

Researchers in C1 and D1 emphasize that all their research is very expensive and cannot be carried out without external funding. Most researchers in both groups applied to research councils where funds are increasingly distributed according to thematic priorities on a competitive basis. Both units saw certain problems with thematic funding since it can threaten certain lines of research:

I think what influences research more is a shift in the balance of funding. Certain types of research at any one time are the flavour of the month. It is maybe easier to get into Science or Nature. That doesn't mean to say you would switch your research to that particular field just to get Science or Nature. So it doesn't influence it at all. What influences a shift in your research programs is all of the sudden the money for that type of research stops. That's what influences research and the reality of it is you cannot continue it even if you wanted to at the same level. (18)

Another respondent sees a problem with "the directed funding" (19), since it prescribes the area where a discovery must be made. And he raises the question about what happens to real innovation under such conditions:

Well, I don't think you discover anything absolutely astounding that you didn't know before, that's part of the problem with the directed funding. We want to work in this area, we think as a society, as a community that we don't know enough about this, fair enough, we don't. So go and find it out. But there are areas you know nothing about because you don't even know that area. So, how are you going to find it? 30 years ago, 40 years ago, 100 years ago, or whatever, people just poked around doing whatever they wanted. Presumably mostly wasting their time, but however you define wasting the time. Bureaus speak of 2005 as wasting their time. But they found out enormously important things that have changed the way in the society works. And that's not as easy now. Because as a society we think we know everything. But we think...we understand as a whole society we think we roughly understand what is going on. And therefore we don't think there is going to be a major breakthrough in any area, but if you look back in history every society always thought there isn't going to be a major breakthrough. But there is. And that's how you define the major breakthrough. It was unexpected, so you can't expect it by definition. Maybe we have got to the end of the road and there is nothing else to discover. (19)

The drawbacks of research council funding do not stop here. The tendency to fund larger scale projects is also seen as detrimental to individual researchers and smaller research groups. A C1 researcher notes that due to the grand scale projects, individual projects suffer (19). In such a context, the continuity of

research lines is seen as the key challenge in both groups. For example, a junior researcher from C1 reports that “post-docs have to move every three years and continuity funding is atrocious”(19). Similarly, in research unit D1, both professor and junior researcher are concerned about the fact that they could not keep good staff due to the short-term funding and the uncertainty about continuous funding. Usually they refer to junior researchers, such as post-docs or research assistants (13, 15). Both units link the continuity problem not only to maintaining qualified staff, but also to increasing requirements for new staff. C1, for example, reports that demands from principal investigators (PIs) have changed since the expectations for hiring staff have gone up:

As funding has gotten harder to get, reviews got harder and harder and it's become an increasingly important criteria in terms of the selection of the PIs. That's to say the standard that we would require for people coming into the department has gone up; that we would be looking for people who are more vigorous, more determined. And today that wouldn't be as it was 20 years ago. That's what changed across the field. (18)

Another perceived drawback of funding is increased accountability. Senior researchers in both units stress that the increase in accountability has become visible in recent years (14, 20):

Accountability to funding bodies is much greater than it was. Because there are cyclical and final reports and they are assessed. And there is always reporting going on. And they are all, in some cases they may be an actual visiting panel that observes what you have been doing in your report. It's increased; maybe not in the last 2 or 3 years, but perhaps in the last 5 years. (14)

All respondents have to report to their management and funding bodies, which means they have to write reports showing the produced outputs, such as publications. Reports take a variety of forms. The type of reporting depends on the type of the funding body as researchers from D1 note. Some reports are more demanding in terms of requirements to show the deliverables (15, 16). This means there are more reports to write and more forms to fill in. Researchers are not in favour of accountability procedures. C1 researchers complain that it is getting harder and it takes more time and more effort to account for funding (18).

However, they understand that accountability is “sensible” (17) and is seen as a precondition to secure further funding and thus survival within the academy:

If it's an early project, you might face termination or whatsoever, and after this deliverables need to be met; it would affect your future applications for funding from these people who are currently funding this project. (16)

The common complaint related to external funding is the low success rate of applications. Researchers experiencing positive reviews in the initial stages of competition are disappointed when the final screening turned the proposal down. Writing good proposals without receiving funding is detrimental to the credibility of the group. In this context, a respondent from C1 blames research councils for political decisions about whom to fund.

All respondents in C1 and D1 indicate that the bottom line is: no external funding, no research. Researchers have to “chase money” (19) as research money comes only from outside: “It’s essential that all research activity is moving to a funded research activity” (14). However, researchers are aware of and do see the potential downsides of this such as increasing accountability and competition.

6.2.2.2 Research evaluation

The RAE dominates the discussion of research evaluations in both basic research units. Researchers have mixed opinions about the importance of the evaluation. Some see research evaluations as a normal part of academic life without much further consideration, while others attach much importance to the RAE for their own and the unit’s future.

Government and the university are seen as the major actors related to the monitoring of research performance. The RAE and the internal monitoring procedures of the university are nested and are the primary determinants of the unit’s research funding levels. Thus, they are perceived as important for both units.

Good results in the RAE do not only help to gain credibility in the eyes of academic peers and the university management, but also in the eyes of external funding bodies:

And the other is the grant giving bodies. Now fortunately, as I sit on grant panels people look at that rating but actually they really look at the grant proposal, so they don’t really say: ‘oh, great grant proposal, poor department can’t have it’. They don’t do it that way, which is good. But when you have a good grant proposal and it’s a good department it always adds a little more.
(14)

As RAE results are so important, both units and university management are strategic about selecting staff for the research assessment. For example, internal monitoring leads to strategic choices about who will participate in the next RAE and in which group. The leader in D1 reports:

My colleagues were split between the materials return and the engineering return. And a lot of that is tactical as to see where you can show yourself to be the best. And that choice is yet to be made for us. I am pretty relaxed, it doesn't matter really. The important thing is that we present a good credible return that has financial implications. (14)

The strategic game is to maximize the funding gains for departments as a professor from D1 also emphasises (15).

Universities also differentiate between different departments following the RAE results. The results of the exercise matter thus to departments and also research groups since they help to build their reputation within the university and this can bring in new resources from the university into the group:

Based on the assessment exercise...and one of which is our department, and so the university then scores very well, it seems, when we're asking for new posts, or when we want staff in the university, they tend to help, because they are aware that the good departments should be kept good. It's good for the university. (19)

Both C1 and D1 have mixed opinions about research evaluations. The seniors in both units think that RAE related reviews are a useful procedure for the department as it improves the quality of research: "it is right and healthy for us to be open to external review...we welcome external review and if we get the opportunity we always take it" (18). However, the majority of researchers are not sure if all the procedures are necessary since they are motivated to work hard anyway:

We have an internal one insofar as we have a staff review development scheme; it is effectively a meeting once a year with a senior member of the department to evaluate where you are. How useful that is I am not really sure, but perhaps it makes you sit down at least half a day you are not doing already, and I think that most of us are already doing it. If we are not moving, it's not working. I don't think we need to press most academics to work, at least around here. (20)

6.2.2.3 Management

Another perceived important element in the institutional environment of C1 and D1 is university management. Leaders of the groups and professors are more opinionated about the management than junior researchers. Researchers report they have been encouraged by the management to apply for external funding and produce research outputs. Both leaders of the groups note that the key thing in relation to the management is gaining trust through the delivery of promised outputs.

Both groups see university research management as very strong and active. A line of accountability is clearly working where researchers report to the unit leaders constantly, and unit leaders report to the central university management. However, since both groups receive mostly external research funding, accountability to the central university level is seen as light since their research funding mostly does not depend on the university (14).

Based on ongoing monitoring, the management mainly uses financial and personnel policies as the instruments for steering. In terms of finances, they encourage principal investigators (PIs) to apply for external funding, to diversify groups' funding bases, and provide matching funds for certain initiatives. In C1 for example, the department has clearly encouraged researchers to diversify their research funding base to ensure a stable funding stream:

The department has to look at its portfolio of research activity. It has to have diversity, it's good for individual researchers to have diversity; depending on their area of work that may or may not be possible. Some people are wedded to some particular funding agency, and clearly they have to keep their fingers crossed and hope others who got the luxury of being more diverse can afford to have a foot in a number of different accounts, and of course that produces in principle a more stable funding base. In practice, that may not be the case, because their research may change. (18)

Both research units are positive about the financial support from the university, albeit for different reasons. D1 is positive since university management helped them to maintain the infrastructure as it was seen as a strategically important unit for university D. However, this meant not only close monitoring of expenditures, but also of the research agenda and performance. Management was not very confident in the research performance of the unit due to the lower RAE grade. C1 perceives financial mechanisms as a positive development since the research unit receives a number of incentives for excellent research performance. For example, they receive matching funds, money returned from overheads, new posts, and other financial support. A junior respondent notes that the university is willing to support C1 despite the competition for resources among departments:

I think our university is reasonably aware of what we want and reasonably prepared to give it. It's not so reasonable but they've got a lot of people talking at the same time. I think you are certainly not ignored, let's put it that way. (19)

Moreover, part of the overhead that goes to the central level from projects comes back to the department and then the head of department can use it as needed. At C1 the money goes back to PIs as an incentive to apply for external

funding; this is welcomed by researchers. However, if PIs are not successful in attracting external money then the overhead portion is retained within the department. In this way overheads are used as an incentive mechanism “so that they can be creative with it” (18).

Personnel policies

In terms of personnel policies, the university management of C1 and D1 monitor research progress in departments through quality reviews and annual staff appraisals. As part of their incentives, management provides new posts to promising units. Expectations for newly recruited staff are rising and changing, and management encourages the groups to look for promising candidates and new PIs according to certain criteria. In both units they apply a more business-like approach of planning staff capacities, recruiting new researchers, and strategically allocating internal resources such as overheads. As a result of the nested university monitoring procedures and the RAE, university management employs a number of ‘carrot and stick’ personnel policies.

Researchers in both units observe that expectations for new staff members are rising as a consequence of the monitoring procedures. Thus more is expected from the staff than has been before. Here the research performance of the new staff is very important as seen by C1:

The expectations of the university and its departments from its staff have gone up. Since research is an important part of our budget we’ve got to be well aware of that when we’re making appointments. (18)

The criteria for new staff in C1 include “looking for people who are driven. Who have got burning zeal for their work” (18). Moreover, willingness to collaborate is important as seen by all respondents, “you cannot afford to do things on your own” (18) and this is understood and encouraged by the management in their recruiting policies. Similarly, D1 also experiences a management strategy emphasizing the recruitment of promising staff that produce credible output. The leader of the group believes that people are more important than laboratories, so he attached a lot of importance to personnel matters (14).

Personnel policies can be used in support of research units. For example, in C1 the high performers are rewarded with new posts. The research unit is convinced that good quality has to be maintained and that the university quite rightly supports them in this respect since it is also good for the university (19). In D1 the personnel policies are used to maintain the research unit when the core funding came to a halt. Incentive mechanisms included ‘buying out’ teaching during the period of research council core funding. Later, the university management has

transferred some staff to different departments to teach, so they would keep their jobs after the halt of the core funding.

Researchers are well aware of the power of management to intervene in the case of a bad performance. Such interventions may take different forms: changes of the research profile of the group or individual researchers, re-allocation of work tasks from research to administration and/or teaching and termination of contracts (more of a threat to staff with temporary contracts). For instance, if C1 fails to perform management would plan and change the researcher's job into more administrative tasks or help to make a plan to change the field of research. This would happen in the case of failure to attract external funding and failure to change to a more prospective research field. (18) Similarly, in D1 one post-doc complains that if she fails to perform she would face a termination of her contract (16). Still according to the leader of C1 the staff are motivated irrespective of management instruments. He is content with the people and does not need to use the incentives that much:

The vast majority of my staff, I'd say, 90%, 85% have very clear areas of research activity that they are completely dedicated to and that still represent active fields of research; I do not need to incentivise them, they want to do their work, they get on with it, they know what's required and so I don't have to do anything with them. (18)

From the above examples we can see that C1 and D1 use personnel policies to encourage researchers to perform.

All in all, university management in both cases is active and has a number of instruments at hand that are relevant for the groups: RAE and internal monitoring, internal funding, and personnel policies. Both research units are pleased with the ongoing financial support. In C1 this is the outcome of good performance, in D1 it is a structural policy that accompanies closer monitoring and re-orientation of the research unit. Researchers in both groups complain about the workload due to ongoing accountability and the 'sticks' in case of underperforming. This is more of an issue for C1 but researchers in D1 also know about this hidden threat.

6.2.2.4 Competition and cooperation

Competition

Both groups have experienced increasing competition for resources partly due to the changing evaluation and funding policies and partly due to developments in the field of biotechnology. They think that the field of research is expanding and developing. More groups appear in their field, and thus it is more difficult to

publish, acquire grants, and hire researchers. Competition for external funding is key to both groups, since no research can be carried out without such project grants.

Competition for external grants have become a daily part of life in C1 earlier than it has in D1. D1 was for some time buffered from competition for external funding due to their major structural funds. C1 from the very start had to think of ways to be competitive. A head of the C1 group notes that the big change started in the 1980s. Since then researchers have had to compete for external grants or otherwise had to stop doing what they were doing:

We entered a new era in the 1980s, and life became tougher. The money was outside, I think people who were around then who haven't been brought up in a competitive hungry way, found themselves marginalized. And that was the situation here. (18)

Competition for resources is a question of survival for this unit and it managed to win more external grants and to earn credibility by increasing its research performance, visibility, and getting the top score in the latest RAE.

D1 has faced a halt of their core funding and had to seek external competitive funding to survive and they were strongly encouraged to do so by their university management. Earlier the group was quite unique in the field in the 1990s, but since then things have changed as there are nowadays many more groups of this kind in England as the field develops rapidly (15). The university continues to support the group. The group leader thinks that the trust of the university management in the group is based partly on previously earned credibility and partly due to strategic significance of the research unit (14). Thus, for D1 competition for resources is a relatively new and challenging phenomenon.

Both groups indicate positive and negative sides of competition. On the one hand competition is seen as problematic for their future. They are primarily concerned about the race to publish results and the lack of continuity for staff due to short-term project funding and short-term contracts. The competition to get research results published is negatively perceived. A professor from D1 thinks that the numbers of researchers in the field has expanded to carry out similar research and in his view the environment has become "negatively competitive." (15) A junior from the same group also draws attention to the increasing competition for external funding grants:

I think that competition for grants has increased significantly again over the last 5 years. Older academics tell me that 10 years ago you were coming up to the end of a grant, so you think I want to hang on the RAs, so I'd better put in another grant in 6 months time and then 6 months from an end of a grant you

think about applying for couple of grants and you get 1 of them and you have to keep your RAs and everything is carrying on in the lab. Whereas these days, you put in five and you get one sort of thing if you are lucky. (13)

At the same time researchers think competition is needed for the advancement of the field. The senior respondents in both units think it is healthy for the quality of the research. For instance, a professor in D1 reports:

And again that's good. I much prefer to be in a field where there are fifty groups working around the world doing good work, driving things forward than being in a field where there is just two. And you are one of them. So you are a world leader, but what does that mean? You are only talking to the other group. The area that we are in is to my feeling is quite a nice area to work with in terms of personalities of the groups that are out there. I think it's...we know most of the groups, they know us, and it's in a healthily competitive way. (15)

In their view competition stimulates the group and "rejuvenates the science that you are doing. And so it's been very positive in that way I think" (14).

Cooperation

Besides competition for resources, C1 and D1 are also keen on cooperation within the group and externally. It is in fact the 'name of the game' for all biotechnology researchers. It is part of the group culture, important for research and is a long standing tradition. Cooperation in general is ingrained in the groups due to the multidisciplinary nature of the research. Researchers have to cooperate in carrying out research projects and applying for funding as seen from the leader of D1:

But what is going to counterbalance that is the fact that to get the money in the first place really you never apply on your own; you can't do that. It tends to be normally two people or more, it tends to be more than one discipline. (14)

Cooperation is therefore also linked with funding and is a particular concern for junior researchers who still do not have big groups and cooperation networks as a junior researcher from D1 notes (13). Cooperation is also important for gaining access to and sharing the facilities and materials as indicated by both groups.

Cooperation takes a variety of forms: research projects, publications, and co-supervision of PhD students. The basis of collaboration is external funding from public and private funding bodies. Both groups collaborated mostly with groups outside the university. C1 has been also active within the university. Internally, cooperation takes place between groups in the department as well as with other

departments, such as physics, chemistry etc. Externally, they cooperate with pharmaceutical companies, hospitals, and other university groups in the EU, Japan, and the US. They are also involved in large consortia, though the professor in D1 is not in favour of those since managing them takes too much time:

And I think as well, if you have large consortia, you spend an awful lot of time trying to manage the issues between them rather than necessarily just getting on with the work that you need to do...but in order to get some of these grants...you need to see connectivity between the groups. And you may run into the problem that each group is sort of helping out everyone else. (15)

C1 and D1 recognize that personal bottom-up network building and maintaining can be crucial for cooperation. However, in their view the top-down efforts to strengthen cooperation are not always successful. A professor from D1 reports for example, that despite management efforts to foster cooperation, it will not happen if people are not willing to do it and if they do not have certain personal characteristics (15). A junior researcher from D1 wanted to access to equipment in a different department in her university but the responsible professor was not willing to provide it. She ended up cooperating with another university instead of collaborating with the colleagues at her own (13).

In C1 the need for internal and external cooperation is also recognized and institutionalized in staff policies since cooperation is ingrained in the requirements for hiring new staff in this group. They “actively sought to bring people in who would collaborate, rather than just plough their own furrow and do their own research” (18).

Researchers in C1 and D1 are mostly positive about cooperation, since their work is multidisciplinary in nature and it is useful for attracting funding, sharing facilities, and sharing projects and publications. The leader of D1 notes it was important also for raising mutual respect between different disciplines (14). For instance, a junior from C1 indicates:

There are 100 researchers or more all over Europe and they all meet every three months or so. And so within that group I think there were 3 or 4 crystallography groups, and so you know everyone who didn't have the crystallography, we ended up with collaborating much more than some of the other groups. That was very successful. We've kept those collaborations going. (19)

Researchers complain however, about the lack of internal cooperation. D1 in particular is concerned about the lack of facilitation of internal cooperation from management. A senior researcher from this group would like to bring scientists together in the dispersed campus situation:

One of the things that can be looked at and maybe hasn't been looked at as much as it could be is creating administrative situations where people simply come into contact with each other more often than they might do otherwise. And the nature of the administration within the college is sort of department, then faculty, and then the college. So what that means is that there are many people within our faculty from different departments that you bump into in this meeting and that meeting and so on, therefore, you just can interact. Within other faculties, or medical school you just don't have that. You are never really in a position where you sort of just interact with them. Although it's only a mile away, the hospital is enough distance you are not going to have an encounter in the coffee room. So that has been, I think a little bit of an issue. (15)

6.2.2.5 Pressure to perform and work intensification

Respondents in C1 and D1 report increased pressure to perform and increased workloads. The majority of respondents in both groups indicate that the pressure comes from the researchers' own career ambitions as well as growing requirements from the university, the funding bodies, and the peers (17). Personal career advancement is a strong motivating factor to perform well. A senior researcher from C1 emphasizes this drive to perform:

Mostly pressures come from me. It's been self driven lots of it, personally driven, but I don't think pressures have been changing, a lot of it has been there since I started my PhD. (20)

He also admits that the work loads have become different due to his career advancement that goes along with new responsibilities, such as more teaching and administration duties.

In the same line, a D1 researcher thinks that the higher the position, the more pressure to perform:

Yes, going from an RA to a PI it changes significantly. I remember the days when you could sit at your desk doing nothing for a couple of hours and chat to your mates, having coffee, whereas as a PI, you know there are only 8 hours in the days to get everything done. (13)

Here a strong driver for increased workloads is the intrinsic motivation to climb the academic ladder. Further impetus to perform comes from changing external demands, especially from the RAE. All researchers are explicit about the need to produce RAE related outputs. Other external demands are related to the deadlines and requirements for deliverables of the project contractor. A junior

researcher from C1 notes that the pressure for results comes from the university as well as from the outside, such as businesses (17).

Most respondents from D1 and C1 perceive the increased workloads as a challenge:

Universities aren't some merry fairy place where you go for an hour and think about something. They are a production line research environment on the tube. You don't pay us that's tough. And they produce workers as anyone else. (19)

They realize that they shift from being scholars to knowledge workers and that their academic work is becoming rationalized.

The same senior researchers who favour competition are also positive about the pressure to perform. For example, a professor from D1 thinks the pressure allows academics to think strategically. In his view the performance review is a positive development:

I think its growing and I am more than happy with that. Because I don't have any problem with indicators of performance if you are being relatively successful, you should have no problems with that. And academia is a strange world still where it still is possible for people to sort of hide away and always be working on this great bit of work that never actually comes to anything. I don't see that. I think people have to be successful, have to be demonstrating their success, and if they are not, then they must start to think about whether they should be doing things in different areas. And it does put that in fairly stark relief if people are, if there is external pressure to perform. All people are very anti RAE; I think most people would accept it's necessary, because it's about giving out money. But I do think it's driven out research and it's got people thinking more strategically. (15)

6.2.3 Research practices and responses

6.2.3.1 Problem choice

All senior and junior researchers report that they still have a lot of freedom to decide what and how they want to research provided they have funding for it. Therefore both external funding bodies and university management are important in steering problem choice in research. Funding bodies can in fact influence what area to research according to a professor in C1:

You a have a certain amount of room for manoeuvre insofar as nobody actually comes in says: "you will work on this protein" But if you cannot get the funding to work on this protein, because the charities or the research councils or

whoever it is doesn't provide you with a grant and you don't have the ground funded, then you had it, see you don't have that, you don't have a massive room to manoeuvre. Nobody comes in and says go and work on protein X but if you are not working on protein Y, that someone will fund, then you won't work on anything. So in a way there is someone, the funding bodies guide it. I don't have a little pot of money that the university provides me with, so just go away and do your own thing. (20)

In this way, the freedom to choose research topics is somewhat restricted by external requirements. All respondents report that the main concern is how to fit the priority areas of external funding bodies to enhance the fundability of their projects. Both units think of funding strategically as explained by a junior researcher from C1:

We are always looking for new projects; is it like a strategy? Yeah! Because you know that what you're working on at the moment may never carry on. So you have to think where is my next grant coming from? (19)

Strategies for increasing fundability and fitting project proposals into thematic priorities include the adjustment of topics, the strategic writing of proposals, and the repackaging of ideas.

All researchers report that the choice of research topics usually is related to the likelihood of funding. If there is no funding, there is a threat to that particular research line and a researcher has to go where there is funding available (18, 20). They often play 'percentage games' and strategically decide which funding initiative is most suitable to meet the basic research unit's interests (15). A professor in D1 for example, goes only for the highly probable funding, diversifies the funding base:

When these initiatives come up, I think more so now we are taking a strategic view on looking at what the topic is, if we see that this is something that we are really involved in and we can really put together a good bid, then we go for it. You are just playing simple percentage games, you are looking at your likelihood for funding through different routes and that is partly down to just simply doing the numbers; how much money is there in this initiative, how many people are likely to apply, what's your percentage of getting it. But it's also looking at your belief in your ability to put together a really good proposal. (15)

Applying for funding to him is about what is most efficient, weighing the pros and cons of the likelihood of funding of the research topic. He aims at less competitive grants due to a low application success rate. Similarly, in C1 a senior

researcher draws attention to the fundability and ability to pursue topics of interest:

It was my agenda insofar as I started working in an area which I thought was interesting to me and I've been fortunate on the whole until perhaps very recently, that it has also been fundable, so I carried on down that line until someone comes along and it gets worse. (20)

There is a change in terms of making strategic decisions if the topic fits the funding bodies' themes as researchers have to be realistic about funding and their ability to carry out research (18). If the research problem is not suitable for the funding priorities, then they try to be strategic and creative about how to find some other initiative to maximize the chances of success by adjusting the theme. But this does not mean real change in their research direction, just "you put a different spin on it, on what you are doing" (19). Thus, researchers in both groups strategically decide which research council theme fits their own research (19). Here they also follow certain strategies of using "fire words such as relevance, innovation" (14) in the proposals and even repackaging the ideas. In other words, in the grant proposals they emphasize what the reviewers of the grants want to hear:

Actually what they are doing is that they are probably getting the same research in, but they are just getting the people to write it in a rather different way. And I have, just from a pure research funding policy point of view, I do have some problems with things they are saying; they are going entirely for things which are terribly innovative and you know, you get this lie a lot. (15)

The importance of considering fundability is also for the sake of maintaining credibility. A professor from C1 emphasizes that it is dangerous to always lose, since it harms your prestige and therefore your future funding opportunities: "If you lose the edge in your field, you will not get your grant renewed in that area if you're not at the cutting edge of that area" (18). A researcher with a number of bad experiences in terms of good reviews but no funding is very concerned about it since this is an indication that funding bodies did not regard the topic as fundable (20). His strategy to improve the situation is to actually change the topic area, which he thinks is a difficult thing to do and what he does not regard positively:

I am trying to look and see whether I can swap what might be regarded as a more attractive funding area. That's not all that straightforward to do. But yes, that is what happens whether you like it or not. And you have to try and shift the emphasis of what you are doing and trying to get my PhD students in my

group to move on a biochemical basis rather than a structural basis, to do more x-rays, to do more lab work that is not directly related to structures, synthesis, put value added into our grant publications and output. This is the way the funding bodies wanted to pay, and that's fine. It's public money. (20)

Finally, as discussed in the section on funding, both groups follow diversification of funding via grant proposals that helps to offset the effects of competition.

Funding is crucially important while there is a question of how to balance between curiosity driven research questions and fundable research questions. Researchers in both groups still predominantly think that the ideas are coming from unanswered questions from previous research and only then researchers do try to fit into the theme of the funding initiative as seen from a professor from D1:

As a scientist I feel most comfortable with driving the next phase of research from what you have previously done. Now the danger of that is what people say, oh, it's incremental. (15)

Similarly, a researcher from C1 reports that the process of selecting his topics is "organic evolution" (19).

These strategic considerations help both research units preserve their problem choices. They are not willing to change their research areas easily because "it's hard to shift your thinking"(20). They find ways to adjust to the demands of external funding bodies by taking strategic steps in choosing the research topic.

At the same time, it is not only external funding that may influence problem choice in basic research units. University management in the case of D1 tried to do this as well by centrally appointing the group leader whose job was to change the direction of research within the group:

What the college did I think in appointing me was have somebody who was really quite different in their interest and activities and therefore stimulate different directions of activity. (14)

When asked about the guidance in problem choice, the group leader thinks that he is the facilitator for research themes, while the funding bodies are the ones that are directing problem choice. He admits that he could influence the research agenda of junior researchers but less so the research agenda of senior researchers:

Actually in research it's very difficult for people to turn the right hand corner. What happens is like a big ship, just turn slightly and to say well it's turning because of anything you've said or anything that is happening externally is hard to judge. What I think is probably correct is to say that the research leaders

are very clever and they have their own minds; they know what they doing and they will adjust a bit but they are pretty mature individuals who need I'd say discussion but very limited advice. It's the more junior staff who are coming through the ranks who kind of witness what I say and how I say it and are potentially influencable (sic). I think that's a key code: to develop and influence. Of course you do that in your own research groups but you also need to it with the other juniors. (14)

While talking to junior researchers, they admit that they contribute to discussions but the research topics are decided by the senior researcher, in this case, the group leader (16). The exception was the junior researcher who had an independent fellowship and could follow her own research line, but still had to fit into the overall research theme.

The question of the leader's role in research agenda setting and different decision power on problem choice between juniors and seniors was also a point of discussion in C1. This research unit is not due for re-organisation as it has earned high credibility from its excellent performance in the RAE. In contrast to D1, management has not become involved in major agenda setting. Researchers in C1 share strategic considerations regarding external funding (20). The professor from C1 reports that a researcher can do something "completely off the wall", in other words, completely follow his/her own research idea only if he/she is established in the field and has funding for research (18). Both he and another researcher (19) agree that the majority of researchers do not have this high credibility and no additional free hands to do what they want. A post doc does not have any freedom to choose his research topic, since it is already funded by the project for which PI applied and received funding (17). However, he can contribute to writing proposals.

Individuals or groups that successfully apply strategies to maintain a stable flow of external funds are unlikely to be forced to change their research agenda. They retain stability in their problem choice while they comply symbolically with challenges to their research agenda. Group C1 has been very successful in that respect while group D1 has more vulnerable due to the loss of core funding. In fact, D1 experienced a re-organisation that also has affected the choice of research themes. Overall, senior researchers with high credibility are more likely to use strategies of symbolic compliance in response to external and internal threats as regards their problem choice. This holds even true for group D1 that has experienced a serious change in the funding base and a re-organisation. Overall, the situation of junior staff is different. Usually they possess less credibility and are bound to the externally funded projects that have been defined primarily by senior researchers. Junior researchers are more vulnerable to external or internal pressures in terms of problem choice and most of them use compliance strategies in response to them.

6.2.3.2 Mainstream and risky research

Respondents in C1 and D1 indicate that both groups carry out mainstream and risky research. Although overall they carry out more mainstream research, they certainly see the importance of risky research. Each has pros and cons depending on the particular research funding opportunity.

Respondents in both units admit that risky research can reduce the likelihood of getting external funding. In C1 for example, most researchers admit that it is better to stay within the mainstream to attract funding. If they apply for a risky research topic to external funding bodies, they are likely to fail (18,19). Similarly, a D1 professor argues that a researcher cannot be too innovative to make the project happen: “if you go too far down the line of the innovative this, that and the other, actually what you get is projects which are unachievable” (15). At the same time the group leader in D1 underscores that the basic condition of research councils to fund projects is innovativeness (14). Thus in the majority opinion, a researcher should strike a balance between mainstream and risky research, which is not easy as a senior researcher from C1 observes:

You have to go with a slightly more difficult project and some more risky areas looking at proteins from higher organisms, where it's actually more difficult to get results. But it's actually a trade off there since as far as you put a project that sounds far too ambitious then you actually don't get funded either because it's impossible. So there is a very difficult trade off. Tricky balance! I've have to find some that are more risky but not too risky, but no one is actually going to fund it. (20)

To this end, both units admitted they had a variety of strategies of how to pursue risky research even when there is no or little funding for it. C1 for example, assures the critical mass of funding from mainstream projects and then tries out some risky ideas on the side. After initial results, researchers apply for a bigger grant from the external funding body to fund a big project (18, 19):

Let's say we will follow up some completely mad idea that we just want to, because we feel it will work. You will be very lucky if you get funding for that. So the fraction of those projects running in the department would necessarily be low. There are some which would be an interesting idea. I've got no idea that it will work but I think we should support that. It could be that some support can be found within the department and a fraction of that within the funding portfolio of each of the individual research councils. This kind of research might account for maybe 10% of the projects. But all the others have got risk associated with it. Even if that risk is just fierce competition and the problems that brings. (18)

A junior researcher in D1 for example, applied for an independent fellowship to carry out risky research, received it, and was able to completely pursue her research interests (13). In the opinion of the group leader of D1, the group has strategic considerations which research will be more likely to be published, which means there should be more risky competitive research questions in the group besides the mainstream:

On research front I think it has made people realize that what topic they actually choose does matter. That they may be able to publish with a different topic might be bit easier, but they actually need to contemplate what a competitive research question is. Which might be more difficult, maybe more higher risk, with the higher risk of failure; in that sense I think research choices have been influenced. (14)

Researchers are mostly of the opinion that they have to carry out mainstream research to obtain funding. In addition, they note that mainstream research will definitely yield results, which means produce research outputs such as publications. A junior researcher from C1 is negative about the 'box ticking' reasoning where safe research gets credits and is published:

I would say we were doing risky research and that is the most important research to do as far as I am concerned. But yes, there is a degree of doing this [mainstream research], because I know I'll get some results, I get it published, tick the boxes. You know, that's bad. Other people might not think it's bad. (19)

Another junior researcher from D1 emphasizes that it is up to the individual researcher if s/he wants to stay within mainstream or to take more risks; it depends how ambitious the researcher is, what skills s/he has and how broad the view on science:

It all depends on the strategy that you adopt in your work. You can make it risky and you can make it safe. I think the personal skills very much contribute into this as well. It might be very risky, but if you are not working on your own, if you are, if you have a narrow mind and you just listen to what you are doing, then it's very risky. Yes. You have to be open for discussion; you have to look at the work in a very broad way. (16)

Both groups understand that it is important to secure funding and to maintain the high standing within the scientific community by striking the right balance between risky and mainstream research. There are strategies to do so such as allowing younger researchers to attempt risky topics as well as setting aside additional funds to pursue risky areas while maintaining the mainstream base in the research units.

Both research units employ compromise strategies to combine both mainstream and risky research, that is, they comply with the priorities of the financial backers while still pursuing their own research interests and taking up risky research lines. Since funding bodies are perceived as being related mainly to mainstream research, units have certain strategies about how to pursue risky research even if there is little or no funding for it. They try to find ways to maintain their cutting edge in science. The strategies are somewhat similar in both units. C1 and D1 researchers try to diversify their project portfolio, their staff and their publication strategies in order to assure the bulk of mainstream projects while carrying out some riskier research. In doing this, they seal off certain parts of their activity from external constituents and demands. They opt for symbolic compliance strategies trying to balance out prestige-seeking in the academic community as well as fundability of their research topics.

6.2.3.3 Output preferences

Biotechnology researchers from research units C1 and D1 carry out research with outputs geared towards different audiences. Researchers enumerated publications, patents, spin-offs, links with industry, grants, conference papers, reviews, participation in committees, consultancy services, and invitations to speak as their outputs. The key idea is to contribute to the researcher's standing in the academic community, receive funding, and contribute to the country's economy at large.

C1 and D1 underscore that publications are of primary importance as an output for the academic community and credibility building. Besides they feel pressure to publish from university management in line with the demands of the RAE. The emphasis is laid on publications in high rated journals and is perceived as a new phenomenon as a professor from C1 notes: "I suppose if you look back 30 years nobody would have bothered so much. But it was a different world 30 years ago" (18).

Other outputs mentioned extensively by both units are patents. They are largely negatively perceived compared to articles because they do not count as much for the research evaluation. A C1 researcher states that they do not bring much funding although they require a lot of work (18, 20):

Patents are seen as an output but I think everybody is quite realistic about patents – there is an awful lot of work in them and frequently they already got the toll, but yes, they are measurable, I don't think they are weighted as highly (20)

An additional problem with patents is competition that can block university research as experienced by a junior researcher:

In my case, I filed two and got one patented, which is the basis for the whole company thing. What was interesting with that is that we had some other ideas about things a few years ago which we didn't patent and now that area has been completely patented to hell as it were.... Whereas these days a lot of big companies are just blankly patented that they have no idea what they wanted to do with it, which doesn't leave much room for someone trying to actually do something. So somebody may have patented something without really thinking about what it is they were doing. And then somebody else would come along, any university will come along, oh, this would be really good to send somewhere and finally will find out that they can't do anything with it. (13)

Still, the D1 group leader thinks patents bring added value even though they are not the core activity (14).

The two research units are different in terms of the emphasis on basic and applied research outputs. C1 is more oriented towards basic research; most of its research is basic although they have patents and spin-offs and are open to applied research opportunities and are largely encouraged by the university management to commercialize (19,20). A senior researcher notes that although there is support from the university to commercialize, the department itself is focused on the basic research.

D1 is more actively involved in contract research with industry and applied research funded by external funding bodies as this was how they survived after their core funding stopped. Despite this, D1 also carries out basic research that leads later to application in companies:

They were looking at things which were pre-competitive but out of the blue-skies phase, so just a bit too early for the companies to be taking them. So we were quite successful with those schemes. (15)

In addition to the university management and the RAE, researchers in C1 and D1 are outspoken about the influence of external funding bodies on the type of research outputs. Although these bodies fund both types of research, there is a push for more applied type of research from the external funding bodies. For example, a researcher from C1 admits that he would be more likely to get funding if he would go for an applied research project and likes the idea of doing that:

I think the funding bodies would like us to do more applied research. I'll be happy to do more applied research; I just can't currently see many avenues where I can take my work. I would be quite happy to do a little more applied research I am just currently struggling to see how that will work and be able to do that. I feel that I'm more likely to get research funding going that way as

well. And to be fairer, it might be more stimulating. I might actually enjoy it.
(20)

The group leader of D1 notes that different funding bodies would fund different types of research. For instance, the Department of Trade and Industry and the European Union would fund more applied research while research councils would provide funds more for basic research (14).

Strategies for publishing

Facing the above mentioned demands, researchers produce outputs using different strategies for publishing and assuring continuity of their research and building their unit's credibility. First and foremost, the aim is to produce the required number of publications for the department and the RAE: "that is my strategy and that is the only strategy to survive, as far as I can see" (20). To reach this aim, researchers took different roads.

The common strategy related to publications is to go for the quality journals and while aiming highest also not to forget about the quantity, that is, to publish as often and as much as they can. Besides quality they consider how fashionable the topic is and what the likelihood is to be published in top international journals. Researchers think about the submission of papers carefully (19). For instance, for a D1 professor this means submitting to a top quality journal only if the paper is excellent. In case of a lower quality paper, he aims at a less prestigious journal:

You can't always publish in the top quality journals because not every bit of work is appropriate for that. So there will be some bits of work when we think all right, we'll be going for that really high impact factor journal and there are some other bits of work we are thinking well, we have an opportunity to publish something in this journal which is less well regarded but it will be out there, so there is a bit of work, we can put that in there. So it's selecting the bits of work depending on where you perceive they can be. Within a multidisciplinary environment publication it requires some strategic thinking.
(15)

An important criterion in considering where to publish is impact factors of publications (18). Here the role of the peer review is important as the group leader notes:

Publications are essential and it's also clear that those publications have to have an impact on the field and therefore most people know that they need to get into the journals which are the most widely read and cited. It's important for

their own work to be reviewed in journals where they are going to have a high impact. (18)

Some researchers in D1 mention another strategy to focus on the audience they want to reach. According to the professor, an audience of the paper is important to consider in addition to quality and the impact of a journal. The targeted audience may have an impact later for their visibility and credibility (13). In their case, they try:

...to hit journals which are much more engineering, medical engineering journals... the audience we want, is it more mechanical, is it more biological, where are we going to get that? So there is quite a lot of discussion over individual papers about where we try to put them. (15)

Further, since both research units are concerned about the continuity of funding, they also employ strategies to offset the lack of continuity. They combine short-term outputs and themes into a long-term theme and more substantial outputs. For example, in C1 the head of the group indicates that they manage to get grants one after the other so they can maintain longer term research that leads to bigger projects and credibility within that area:

Most of the projects will run over several cycled grants they will then apply for next trench of funding. So if you look at people here, they are still in the same sort of areas they change over two or three project cycle funding grants. (18)

This is shared by the senior researchers in D1 who find it difficult to maintain continuity. The D1 leader notes that researchers are creative about maintaining the lines of research and the stable production of outputs:

I think the grant funding system breaks continuity unlike the States, because you are looking at three year grants, two years, maybe three years, so that just breaks it. So what academics do, they are clever people, and so they try to keep long term themes going with a series of broken up grants. ... But everybody I think has a long term vision on where they want to be known for. And they will feed that with what I will call short term invention discoveries in science. (14)

Major concerns about the outputs

There are three major concerns that respondents in C1 and D1 voice in relation to output preferences: time constraints, especially related to the competition for publications in the field, and certain concerns with respect to the quantity and quality of publications.

There is 'a constant race' to be the first to publish certain results and thus high competition in the field is eminent. Researchers invest a lot of time to go for top journals. They risk being 'scooped' by other research groups who are faster in publishing the same results. This race has been enforced by obligations of external and internal evaluations:

Because we are already RAE assessed completely up to the neck, we are all get a little bit sick of it but we recognize the only way to survive is to get quality publications out of it. It's the primary determinant of your RAE status which your department expects of you, so you have to publish in as high quotation journals you can and as fast as you can. We are always in competition of course; very competitive. Virtually as I speak, am typing in a paper which has just been accepted in one journal, the 4th journal we are trying to get into, we work down the pecking order of journals highest, because we know that two other groups in the States have also been doing the same structure although they have not yet published and that happens all the time. It's constantly a race. (20)

The push for producing research outputs that has been enforced by the numerous research evaluations and especially the RAE has raised concerns about the quality of those outputs. The major question is balance between the increasing number of publications, that is, the quantity of publications and the quality of publications.

Both units agree that quality is more important than quantity, while some admit that "a slight bias towards quantity" (19) is emerging:

That is a good point. There is a slight bias towards producing more. Depends on the work you're doing actually. The quality is always the overriding thing. Top great journals still. If you say I've done this and this, so what? It's the quality that really comes out. What you don't have the ability to do necessarily is to work on a long term project. So you say: look this really important, it might not get any results for 3 years, stuff it. There is very little funding for long term research. (19)

This junior researcher from C1 also admits that the evaluation is basically based on the quality of publications, not the quantity. Science and Nature are very important journals for researchers for their own credibility as well as the department's credibility facing the RAE (17, 19). Seemingly, employability still depends on the quality, although the ability to attract funds is also important; thus, external grants are an output indicator:

People who are headhunted are the people with true papers. Well, and the ability to get funds. If you had 10 cell papers and no money, no research grants,

a little of chicken and egg there, but it's possible. Then you are less employable than some one with a chat-load of cash and a medium number of things. (19)

A senior researcher from C1 observes that there is a change towards producing more publications and less quality (20). In the end it is about striking the right balance between the two as one professor states:

I think you can achieve balance. I mean I think I said that. It's not about saying well, here's one bit of work here and you can divide it into four good papers or eight rubbish papers. It's more about reflecting that some work is really groundbreaking, it's really exciting and will get published in a top quality journal. There's other work there, which is, it has importance and it adds to the body of knowledge that's out there, but it's not going to get published in one of those top quality journals because they are just too pressured to publish. So there are other journals that will do that. So its not either going for one or the other, it's trying to get the right mix. (15)

C1 and D1 are strategic in terms of output preferences. The common basic logic is to apply to quality journals and publish as often as they can. High impact journals are the name of the game. In this way researchers comply with the traditional demands in their field as well as with the 'new' demands of the departmental reviews, the central university management, and the RAE. Researchers from C1 and D1 also pursue a common strategy to focus on certain audiences while publishing their outputs, thus picking certain disciplinary journals which help building credibility in a specific area. Researchers are careful about where and when to publish. They consider if the research topic is competitive enough and aim high, and are going down the pecking order of journals when needed. The groups have experienced a change in their funding environment as well as in the evaluation of their work that pushes towards more short-term projects and related publication strategies. On the one hand, they go for such short-term funding and produce short-term outputs complying with the demands from external funding bodies, university management, and the RAE. On the other hand, they apply strategies of symbolic compliance (such as selling long-term themes in project pieces and building long-term publications on short-term output) in order to maintain long-term themes and publication strategies.

6.2.3.4 Teaching-research nexus

Traditionally the C1 group has been involved in both teaching and research. On the contrary, D1 was mainly dedicated to research as it had a stable funding for 10 years just to carry out research. However, due to the changes in funding as a result of the latest RAE results, C1 received a substantial increase in funding

and thus they started to teach less. D1 experienced a halt in the unit's core funding so that they had to go for more external research funding as well as to start teaching in the departments in order to sustain their funding and staff.

Given this context, respondents from both groups think that teaching and research become more separated due to the RAE and the related availability of research funding. Scoring high in the RAE implies better chances to secure additional funding from the research councils. As a result, there is less need to earn money through teaching. In D1, the increased student numbers are mentioned as another reason for the change in the nexus. The group leader of D1 notes that such trends will lead to further stratification of research and teaching, especially in terms of teaching and research-only appointments. He reports that this can become a sector wide development:

There will certainly be a creation of what I would call a predominantly or entirely teaching appointment. And there is going to be a shift to that cohort, the teachers. It may be that they aren't there permanently, that you come in and out of that cohort. I think though that there will be the majority who have a reasonable teaching load and are recognized as doing acceptable research and there will be another minority at the seriously high end, where either relatively new professors or people really pushing very hard in research front, and they will be seriously protected. So there is kind of stratification that is going to happen. (14)

C1 scored high in the RAE, had sufficient research funding and their teaching loads decreased. The group leader emphasizes that the better they prove themselves in research, the less teaching they need to do since they do not need to earn money through teaching:

If you are in a highly rated department then it necessarily means that you've got staff. For first of all as a result of that you would be bringing in more income per staff in your block grant from the higher education funding council. But you'll also have a larger number of PhD students because that's the way it works. You'll also have more grants and more overheads. And therefore in order to pay all your bills you'll be less reliant on high undergraduate numbers. So your student to staff ratio will be more favourable and you'll be able to recruit smaller student numbers. So therefore you can afford to have students with higher A-level achievements and teach them. Because then you can have a coherent group. You can teach them to a similar standard and you can push them. (18)

In D1 the core funding has stopped and staff from the research unit had to go to the departments and take on teaching responsibilities. The core staff of the research unit are attached to different disciplinary departments and their

responsibilities in teaching are related to the changes in student numbers in those departments:

If you say that the people who are the core staff are the real drivers of IRC, who give its name outside, who contribute to scientific ideas, than we have to say that unlike me, they are not immune. They in their home departments have teaching loads, some of them are quite serious, so how much time they devote to their research, and therefore how much kind of IRC relationship and focus there is, is limited. And so there is an impact on them. Teaching is quite a demanding thing now, not the least because we all try to increase teaching numbers, and teaching quality is affected to some degree. (14)

In both cases junior respondents do not have many teaching responsibilities; their primary goal is research project work. For all respondents it is natural to start as a post-doc and concentrate only on research and start teaching when one's position has become permanent (15). Both units employed juniors only on short-term post-doc contracts that had very limited teaching responsibilities (13). The rationale behind such an arrangement comes from the senior researchers, the departmental management, and the external grant giving bodies. They aim at giving time to juniors to build their research experience and learn how to obtain funding, in other words, build their researcher's credibility and work on externally funded research projects. The professor from D1 for instance evaluates it as a positive staff development tendency:

Now, it may not be a bad thing actually taking more time, because there is a danger of stepping into a faculty position with teaching commitments and other commitments too early and you suddenly find that you've just got no time to do research. And you haven't got the standing within the community to get the money and so on. So there is a danger. (15)

In both units researchers are not too keen on teaching. However, C1 is more outspoken about this. They are reluctant to teach and see it as a penalty coming from university management. The department management believes that if a researcher does not manage to get research funding and cannot easily switch to a different research area, then s/he should change to administration or a teaching-only position (18). Obviously this is not welcomed by researchers: "I guess if one was extremely well funded and power research would be able to fight against the amount of teaching if one wished to, but I am not in that position, so my teaching load increases" (20).

In terms of the mix of teaching and research activities, both units comply with the funding demands in their environment. With the increase in research funding C1 is teaching less, the cessation of the stable funding D1 researchers' got more

involved in teaching. Both groups employ the strategies to diversify junior staff into research only and mixed positions to secure the needed critical mass for both activities and select the research talent.

6.3 Summary of the perceptions, practices and responses of English research units

Overall English medieval historians have reported significant changes in their institutional environment. Although there are differences in opinions within and between the two basic research units, the medievalists from A1 and B1 spot to a large extent similar developments in their institutional environment and have similar opinions on the consequences of these developments. Changes have been witnessed for all areas that have been addressed in our empirical investigation: research evaluation, research funding, lines of authority and power distributions within the university, cooperation and competition.

The Research Assessment Exercise (RAE) dominates most of the discussions within the groups and has changed the way researchers think about their research. Both groups are well aware of the spin-off effects of the RAE in terms of management measures and external funding opportunities. Researchers in both groups highlight the financial consequences of the RAE, the increasing need for external funding, and the growing competitiveness for such funding. A1 and B1 experience annual internal monitoring procedures, whereby each researcher meets with the management to discuss the last year's performance and outputs. They increasingly have to justify their existence, and account to management about their research outputs and externally funded projects. In general, management uses 'carrots and sticks'. The rewards usually include new staff appointments, promotion, and research leave. In cases of underperforming, the threat is a push into teaching-only positions or early retirements, a re-organisation of a unit or department, or in extreme cases to fire individual academics or to close down a unit.

Researchers in A1 and B1 experience changing work habits, since they are encouraged by the nested demands of the RAE and the management to increase research performance. Since there is not always enough internal funding for research, they are pushed to work more on externally funded projects. The usual precondition for such project work is collaboration with other researchers in the field; not a natural way to carry out research for medieval historians. Workloads have increased in both cases, partly due to higher student numbers and partly to the increased importance of research related to the RAE.

With respect to their responses to the changes in their institutional environment, we can also observe quite some similarities but also some

differences between the two groups. External funding is increasingly important for research in both groups as this is the way for them to 'free' the time from teaching and to carry out bigger research projects. The researchers of both units try to balance between their own research agenda and the research priorities of the funding bodies. They do so by following largely symbolic compliance strategies – maintaining their own research lines and at the same time selling their research interests according to the priorities of the external research funders. A similar strategy can be found with respect to the requests of funding bodies to establish collaborative research projects and the interest of the researchers to maintain individualised research practices. However, in the case of junior researchers in the low credibility unit A1, we can find evidence that they compromise their problem choice and largely comply with the research priorities of the funding bodies

In the case of A1, we can also see how the group aims to gain visibility and credibility in the eyes of the university management by participating in the multidisciplinary faculty themes. This group needs to gain credibility in eyes of the management so as to improve the situation after their reduced score in the RAE. After their successful participation in external funded research projects A1 could influence the faculty theme using a pro-active manipulation by proposing a medieval studies' faculty theme and in this way putting this area of research on the faculty 'map'.

Medievalists in both groups stay mostly within the mainstream areas of research to ensure that they have a chance to receive funding. This is especially true for researchers who have lower credibility because they are junior staff and/or belong to a group that ranks low in the RAE. Such researchers employ compliance strategies while researchers with high credibility use symbolic compliance strategies. Both groups mainly do long-term research, where outputs are oriented towards the academic community, and academic inquiry is for the sake of inquiry. The trend towards short-term research projects funded by external funders is not welcomed by researchers. Both groups have less time to produce research outputs, there is hastiness in publishing papers and books which leads to the inflation of publications.

In terms of output preferences, both basic research units use a mix of compliance and symbolic compliance strategies. Both groups comply with the requirements for a certain type, amount, and quality of research output within the frame of the RAE that is reinforced by internal management measures and external funding bodies' requirements regarding past performance. However, in addition they comply only symbolically with the requirements to produce short-term research outputs. They divide their own long-term output preferences and long standing research interests into short-term projects and outputs. In this way they still produce their preferred outputs, such as books, although at a smaller

scale. The increasing demands for research outputs, the need to attract external funding and the increased student numbers lead to tensions in the work of the research groups. They are especially visible in the division between teaching and research responsibilities. We see that medieval historians in both groups comply with the changing teaching-research nexus by diversifying their teaching and research staff and obtaining external funding for research leave and in this way 'buying out' teaching.

All the biotechnology researchers of the two research units note that the institutional environment has been changing. Differences in opinion do exist to some extent but in general researchers see similarities in their changed institutional environment. Researchers in both groups highlight the changes in their research funding. They draw attention to the consequences of the RAE, the constant need to apply for external funding, and the increased competition for project grants. Due to the excellent results in the RAE, C1 secured funding for its research base, refurbished facilities, and attracted new staff. Meanwhile, D1 is not in that fortunate position since their research council core funding stopped in 2001 and they did not receive a high grade in the RAE. Since then the group has to apply for other project funding to research councils and the programmes of the European Union, and has to establish closer ties with industry to secure their funding base.

The RAE dominates the discussion about evaluation of research in both C1 and D1. Researchers are aware that this governmental exercise translates into university management monitoring research performance and eventually into changes in funding. Both units have different concerns regarding the impact of the RAE for their work habits. C1 researchers think that the RAE brings pressure to work on short-term projects and encourages intensified production of research outputs. In D1 more attention is drawn to strategic regroupings of staff during each exercise. The concern in this group is the resulting stratification of groups within the university and the field and what it will mean for the potential audiences they serve.

Both groups observe increased levels of interference of their university management. The major management strategies concern instruments to motivate research units to apply for more external funding, to diversify their external funding base, to encourage cooperation with other research groups, and to recruit promising candidates -- who are not only excellent researchers but also promising academic entrepreneurs. The logic of planning staff and micro management are clearly visible. The major mechanisms employed by university management are 'carrots and sticks'.

Biotechnology groups in England, C1 and D1 are concerned about the challenges related to external funding of research. Increasingly they see thematic funding of research councils as a threat where they have to manage a balance

between scientific interests and funding priorities. They are also not pleased about the lack of continuity of project grants and low application success rates. Both groups think that the increased accountability goes along with external research grants. Most researchers are negative about this development as it means more administrative work for them.

Besides increased competition researchers report the importance of cooperation. In biotechnology, cooperation in project work, sharing facilities and materials is indispensable due to the nature of the field. The work habits of research units C1 and D1 have changed to some extent, as the workloads are high and there is more pressure to perform. The pressure to perform largely increased due to changes in funding and the growing competition in the field.

Both groups use a range of strategies in responding to the changes in their institutional environment. All three kinds of strategies that we have discerned in Chapter 3 are present. The symbolic compliance strategy has been prevalent in both cases.

Researchers in both groups retain stability in their problem choice while they comply symbolically with challenges to their research agenda coming from external funders. Group C1 has been very successful in that respect, while group D1 has been more vulnerable due to the loss of core funding. In fact, D1 has experienced a re-organisation that also has affected the choice of research themes. All researchers comply by adjusting the topics and writing in a way that fits financial backers. At the same time, they sealed off their real research interests from the thematic priorities by repackaging their research ideas and turning the angle of research question in a certain way. Overall, senior researchers with high credibility are more likely to use strategies of symbolic compliance in response to external and internal threats to their problem choice. The junior researchers are more likely to comply with the problem choice of their superiors and other stakeholders. The predominant use of symbolic compliance strategies means biotechnology researchers still preserve their own problem choice to a large extent.

C1 and D1 researchers try to balance between mainstream and risky research topics. Since funding bodies are perceived as being related mainly to mainstream research, units have certain strategies about how to pursue risky research even if there is little or no funding for it in order to maintain their cutting edge in science.

The management demands for particular outputs linked to the RAE requirements and the need to acquire external funding have increased. Biotechnologists in both groups perceive a need to comply with the requirements to produce more. Research groups use symbolic compliance to adapt to the changing rules of the game, that is, they produce short-term outputs to meet the demands of the external sponsors. At the same time, they try to pursue their long-term themes and to maintain their credibility in a certain area. Finally, teaching

and research are falling increasingly apart. In the case of not having enough external research funding they need to 'earn' from teaching. Teaching is then perceived as a threat to groups/individuals that are not performing in research. After the cessation of the stable funding D1 researchers got more involved in teaching. Both groups largely follow strategies of compliance by diversifying their staff and by working additional hours. The strategies taken up by all the groups are summarized in the following Table 6.1:

Table 6.1. Strategies used by English basic research units

	Compliance	Symbolic compliance	Manipulation and other pro-active strategies
A1	Change in outputs: <ul style="list-style-type: none"> • Aim highest • Produce faster • Adhere to minimum rule Change in teaching-research nexus: <ul style="list-style-type: none"> • Work overtime • Take externally funded research leave • Hire temporary teaching staff Compromise problem choice	Balancing problem choice: <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice Balancing mainstream and risky research: <ul style="list-style-type: none"> • Diversify between mainstream and risky research Balancing different outputs: <ul style="list-style-type: none"> • Diversify and combine project results into bigger publications but also publish short-term results • 'Window dressing' on output production to their management Collaboration	Participate in faculty themes Diversify funding sources
B1	Change in outputs: <ul style="list-style-type: none"> • Use best publishers • Aim highest • Adhere to minimum rule Change in teaching-research nexus: <ul style="list-style-type: none"> • Work overtime • Reduce teaching load for juniors • More frequent university funded 	Balancing problem choice: <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice Balancing mainstream and risky research: <ul style="list-style-type: none"> • Diversify between mainstream and risky research Balancing different outputs: <ul style="list-style-type: none"> • Diversify and combine project results into bigger publications but also publish short-term results 	Bargain for internal benefits with university management Diversify funding sources

	Compliance	Symbolic compliance	Manipulation and other pro-active strategies
	research leave	Collaboration	
C1	<p>Change in timing to produce outputs:</p> <ul style="list-style-type: none"> • Produce faster <p>Change in teaching-research nexus towards more research:</p> <ul style="list-style-type: none"> • Diversify research only and teaching only staff 	<p>Balancing problem choice:</p> <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice <p>Balancing mainstream and risky research:</p> <ul style="list-style-type: none"> • Diversify between mainstream and risky research • Use the results of mainstream projects to develop risky projects <p>Balancing different outputs:</p> <ul style="list-style-type: none"> • Build long-term publications on short-term outputs 	<p>Bargain for internal benefits with university management</p> <p>Diversify funding sources</p>
D1	<p>Change in timing to produce outputs:</p> <ul style="list-style-type: none"> • Produce faster • Adhere to minimum rule • Adhere to industry secrecy by not publishing their results <p>Change in teaching-research nexus:</p> <ul style="list-style-type: none"> • Work overtime • Diversify research only and teaching only staff <p>Compromise problem choice</p>	<p>Balancing problem choice:</p> <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice <p>Balancing mainstream and risky research:</p> <ul style="list-style-type: none"> • Diversify between mainstream and risky research <p>Balancing different outputs:</p> <ul style="list-style-type: none"> • Build long-term publications on short-term outputs 	<p>Establish strategic partnerships</p> <p>Diversify funding sources</p>

7 Perceptions, practices and responses of basic research units in the Netherlands

In this chapter we present and analyse the interview data derived from the case studies of research units in medieval history and biotechnology in the Netherlands. First, we look at how the researchers in these units perceive and assess their institutional environment. A research unit's institutional environment concerns the other parts of the university – particularly its management – and the 'world outside the university'. We take the opinions of the individual researchers and look for possible convergence or divergence within each group as well as between the groups. As we will show in this chapter, respondents have noted without exception that the institutional environment has been changing in the past years. To trace these changes and the current state-of-the-art of the environment we explore change and stability in the institutional environment as perceived by the respondents of the basic research units. We draw on a list of themes from our interview schedule and order them according to their overall importance or relevance for the basic research units. These themes comprise research funding, university management, research evaluation, cooperation and competition in the field of research, and pressure to perform and work intensification.

Second, we issue in this chapter the practices of the Dutch basic research units in a changing institutional environment and we discuss possible effects on their research practices. We focus on the four dimensions of research practices introduced in Chapter 3: problem choice, mainstream/risky research, output preferences, and the teaching/research nexus. In section 7.1.3 (medieval history) and 7.2.3 (biotechnology) these aspects of research practices of the basic research units are dealt with. Moreover, we address the basic unit's responses to the perceived changes in their institutional environments. Based on the three strategic responses that have been presented in Chapter 3 – compliance (conformity), symbolic action (de-coupling, sealing off) and manipulation (pro-active) – we point out the research unit's strategic behaviour.

Finally, we summarize the main outcomes for both medievalists and the biotechnologists in the Netherlands.

7.1 Medieval history in the Netherlands: cases E1 and F1

7.1.1 *Brief characteristics of the two basic research units E1 and F1*

The latest peer-based research evaluation, on the basis of the Standard Evaluation Protocol, points out that the basic research unit F1, part of an overarching research institute is seen as a group of high reputation and international standing. The research performance of the research group E1 has also been positively evaluated by peers but less so than the group F1.

F1 focuses on late medieval culture, specifically on ethnic identities; their research interests range from ethnic minorities to religious history. E1 works on early medieval culture, especially knowledge and the transmission of knowledge.

In each unit research can in many respects be characterised as an individual scholarly activity, locally embedded in a bigger research unit. Researchers belong to a national research school for medievalists, in which the researchers from both units cooperate. They are also embedded in the international scholarly community of medievalists. In both research units it is recognized that international research networks and collaborations are becoming increasingly essential.

F1 collaborates with foreign universities through the exchange of PhD students, and attending seminars and meetings; E1 has close connections with the region. Most staff members of the two groups see themselves as 'traditional' academics who are devoted to their research, but have huge teaching loads that have been growing over the last few years. F1 has a prestigious research master programme which brings in money as well as prestige. In both groups it is recognized that research is important for their status and well being. Their research performances are (critically) followed by the university management, and the two groups seem to be well aware of this.

In terms of resources, due to the financial problems at the faculty level of both groups, E1 and F1 have faced cutbacks in the sense that they cannot hire new staff members, retired posts are not filled, and the number of new PhD posts has been reduced. F1 did not get any new AiOs in 2005, while in E1 they are changing to stipend-based PhD students rather than having employment-based AiOs.³⁵ The funding the research units used to get for the AiOs decreased and now the basic research units have to search for alternative sources. At both research units this is seen as problematic since the work of PhD candidates is important for the unit's

³⁵ In the Netherlands doctoral candidates can be staff members with an employment contract: they are then called AiOs. Doctoral candidates can also be funded via other sources, such as fellowships and do not hold a status as staff.

research performance. And PhD candidates can contribute to the teaching tasks of the group, which reduces the teaching load per staff member to some extent. Compared to E1, F1 is better placed in terms of external grant funding from NWO and ESF.

7.1.2 *Perceptions of the institutional environment*

7.1.2.1 Funding

Research funding is mentioned as a very important institutional environmental factor for E1 and F1 that, not surprisingly, affects their research practices. Both research units have similar opinions about the funding situation in their immediate environment, the faculty and the university. Due to the cutbacks in funding at the faculty level, no new teaching and research staff could be hired, which includes no new AiOs. As a result of the troublesome financial situation both cases experience pressure from the university's management to earn more money externally; from research councils, European projects, or other public or private bodies. F1 has been more successful than E1 in attracting such external funds.

The insecure financial position is explicitly mentioned by both research units. Faculty cutbacks and vacancy stops are the dominant themes. The E1 group leader notes:

At present the faculty is having severe financial problems ... Because of these cutbacks this faculty has a vacancy stop. We will most likely not have new AiOs for the next two years. That is problematic. (24)

The decrease in research capacity as one of the consequences of vacancy stops is seen as an enormous problem: "this will be the kiss of death for research" (23). They are concerned about "the future generations in humanities" (31) and that the faculty does not offer new senior staff positions (22). Junior researchers in F1 see a lack of justice since university management has closed departments in the faculty of humanities, while at the same time they see the expansion in the sciences, e.g. by new buildings (31).

Both research units see two major reasons for the lack of funding in the humanities' faculties: the decrease of national funding in humanities and the lack of tradition to engage in contract research and to earn money this way. The first reason leads to the decrease of first flow funding in the faculty. The first money flow is the basic funding coming to the university allocated by the state. They see a big change in the first flow funds: they have become "thinner" (24) compared to

“20-30 years ago” (30). Here F1 is in a better shape than E1, since the CvB is interested in funding them additionally for their prestigious research master programme which brings in additional money; not only for teaching, but also for inviting speakers, buying books, and supporting the unit’s research and network building. Thus, although the faculty’s financial situation is poor and financial pressures are being felt, central university management is also seen as an important sponsor of research in F1: “...actually we have this research money, that’s a lot of money to do nice things....from the Central Board, the *College van Bestuur*” (29).

The lack of tradition to “earn money on the market” is mentioned as another reason for the bad financial shape of the faculties. Traditionally humanities have been funded for what they are without much thought about relevance to community and contract research.

Medievalists do have a culture of applying to the National Research Council (NWO) and other research funding organisations to support their basic research as well as their PhD students and post-docs. Research units manage to get funding from external public funding bodies such as NWO and to a lesser extent the European Science Foundation (ESF). The research grants coming from these organisations are in the Netherlands listed as second flow funds. F1 was very successful in attracting this money flow, especially from NWO. E1 has been less fortunate in this respect, although a number of their PhD candidates and post-docs also work on NWO funded projects (23, 24).

The NWO grants have always been competition-based. As such this has not changed too much according to the respondents (29, 31). But there have been changes as regards the way they need to apply for the NWO funding. The distribution of money by the research council has changed nowadays as besides unconditional research funding thematic research council has gained ground. Particular research themes may require multidisciplinary approaches and research collaborations. NWO has also introduced more young professionals support funding programs, such as the *vernieuwingssimpel* (29, 31) which funds talented scholars to improve their career prospects. Another commonly noted change in NWO funding is the shift from small to larger scale projects, which means less individual grants and more complex application procedures (23, 30). Both groups think that NWO is an important source of second money flow that finances their PhDs and post-docs. The group leader of F1 states that NWO is the most important external funding body for their group and this has been stable for years. A junior researcher confirms:

Medieval studies here has been very successful in applying for funding grants and stuff like that, so we had a ‘pioneer project’ run by part researcher X and several people have had the possibility to get Veni or even Vidi subsidies and

stuff like that.³⁶ It is highly successful. Its output is quite large as far as I am aware; we are always writing stuff, we go to conferences where there is a big international network with which we cooperate, it is just great. (31)

The European Science Foundation is another external funding body mentioned by both research units. This funding is not perceived as important as NWO-funding. There are success stories related to it, especially in F1. F1 had one project funded by the ESF which boosted their publication numbers and cooperation with international partners.

We got lots of publications coming out, mostly because people got to know each other better and cooperate in several fields and you can see that people who participate in that have much more the network than people who did not. So I think in that aspect such a boost of money has its effects. (29)

E1 also participates in ESF projects, but they have not been the leading party in this area. The major funding source for them is the university and NWO, according to a professor:

It is university and NWO. Europe is normally too big for us. We have the opportunity to participate in European projects that happen, but it is not that we have a leading role in developing a project. (22)

A junior researcher from E1 reiterated that they themselves are not that lucky in applying to ESF (23).

Both units note that they have not been very successful in earning money from contract research, the third flow of funds. The third money flow comprises funding that is earned by carrying out certain (applied-type) projects for public or private organisations. Despite the university management's attempt to encourage this kind of 'commercialisation', medievalists do hardly change their work habits. They think that medieval history is not a field that easily attacks this kind of external funding; selling 'knowledge and expertise' is regarded as difficult. It is thus very difficult to get constant big projects that are externally funded (24). E1 and F1 contrast themselves with research units in other research fields, such as

³⁶ NWO's Vernieuwingsimpuls programme started in 2000 and consists of three types of research grants: Veni, Vidi, Vici. Veni is a grant dedicated to recent PhD graduates to start their own three year project with max. €208,000. Vidi is a grant for researchers to develop a new research area and fund individual or group research up to €600,000. Vici is designated for senior researchers to help them build up their own research group with funding up to €1,250,000
(Source: http://www.nwo.nl/subsidiewijzer.nsf/pages/NWOA_4YJDQ3?Opendocument)

medicine, that in their eyes can attract a great deal of third party funding. Both groups indicate that this type of funding is not easily gaining ground yet in their discipline, as clearly verbalized by the professor in F1:

I think the normal thing [...] for us is to go for NWO [national research council] if we want something. Because we have some faculty money but that is mostly for PhD students and for the rest there is not really a fund where we can apply. There is no big pharmaceutical concern interested in our kind of research I am afraid. (29)

Still, E1 has managed to start working on the front of contract research and the first steps are taken to work with the region and local authorities. For example, they have a regional supporting body involved in funding them as well as the local municipality that funded a project about the history of the town:

Currently there is a project 'History of Town X' in which the university is involved and our staff that is engaged in writing a publication for this investigation...will get money for it and are exempted with the money of the municipality. (24)

But generally speaking third party funding is marginal in both groups.

Drawbacks of external funding

External funding is discussed in both positive and negative ways in the two units. The major concerns are the fragmentation of grants, the time spent on writing proposals, short term project funding, a low success rate of applications, lack of matching funds from the university, and increasing accountability to the funders. At the same time, both units have their success stories of securing funding from the NWO, ESF, and regional bodies.

A common complaint about NWO funding from both groups is that it leads to fragmentation and the necessity to collect bits and pieces (21, 31). Medievalists like to have more time for research. E1 and F1 are not pleased to invest a lot of time in writing research project applications, but they understand that they need a substantial second money flow and therefore acknowledge the need to continue writing proposals (24). Here E1 complained about the low success rate of applications, since then the time investment does not pay off. As mentioned, it is somewhat difficult to get NWO funding for E1 as noted by the group leader: "In this respect we perform rather poorly in comparison with other universities. University X, for instance, scores much, much better" (24). According to the junior researcher the success rate of applications is less than 20%: "No, they have money to only award very few (projects)" (23). Case F1, on the other hand, has been

successful with NWO funding as the group leader indicates. They also think that the competition for grants has not changed (32).

A related problem is that the application process is a time consuming activity. Therefore, researchers are becoming somewhat reluctant to write grant applications (24). However, researchers in E1 continue to apply to the research council, since it means substantial funding for a number of years and can be nicely combined with other funding sources (21).

Further concerns are associated with the funding policies of university management, such as matching funds and accountability requirements. E1 is particularly concerned about the lack of matching funds. This research unit points to the university's reluctance to provide matching funds to attract a major grant from NWO since they find it difficult to cover full costs (21, 23):

On the other side, the central executive board is not that keen on such projects since they have to match budgets, meaning it also costs them a lot of money. And this faculty has faced serious cutbacks and this is rather double. Once I mentioned interest in such a Vidi. I thought this might be a good idea, but they completely disagreed. And then I thought, okay now I have to make it up all by myself. But may be I will do it now because I realize that it is the only way to become a professor. (23)

F1, however, is not concerned about the lack of matching funds.

Both units mention increasing accountability measures for funding to the university. Although it mostly is taken for granted (24), researchers are not too pleased with requirements to fill in forms for the university and write accountability reports. Such monitoring demonstrates responsible actions to the department, the research institute, and the wider university management. At the same time, some believe that interference of some parts of the university management is not too bad. For example, at F1 the university's central management monitors how funds are spent by the group:

We receive additional money from the CvB [central executive board] to develop this [international research master] at the international level. That is one side of the story The CvB keeps an eye on what we are doing with this additional money for the research master, but apart from that they stay in the background. We have more to deal with the faculty. (32)

According to most of the respondents, increased levels of accountability requirements also hold true for external funding. For example, when a researcher receives an NWO grant it is allocated through the university. Thus, the researcher will have to account to the university as well as the external funding body, as explained by a junior researcher from F1: "At first they [external funding bodies]

shifted everything to the universities; it was now with my project as well. The money goes to the university and then to the researcher" (30). In this way, accountability to external constituents and the university is important. They may not like it, but most of them are not too bothered.

7.1.2.2 Management

The university management oversight has increased for E1 and F1. The various levels of university management – research institute, faculty, and the central level – are in differing degrees intervening with the activities of the research units. For instance, university management is allocating first money stream funds, encouraging units to be (more) active in areas of second and third stream money, engaged in human resources management (take the vacancy stops for PhDs as an example), and setting strategic directions. Many of the management initiatives seem less 'with no obligation' than they used to be; the general impression is that management is obviously more noticeable; a factor that clearly needs to be taken into account. Over the years the university increasingly seems to be trying to rationalise, or even control, some of the unit's activities. For E1 and F1 the management for research and teaching is separate. The faculty/department is largely responsible for teaching tasks and the research institute is responsible for research matters (24, 32). For both units it means that they have multiple internal stakeholders that impact on the research unit's activities (as teaching also affect research matters).

The respondents of the two units mention various similarities regarding the management of their universities, faculties, and institutes: the management structures (lines of authority) of the research institutes have changed and management has increased teaching responsibilities and accountability measures which has increased administrative work. Both research units have also been confronted with vacancy stops for PhD candidates promulgated by the central management. E1 and F1 experience more bureaucracy.

Researchers have also reported differences as regards university management. For example, the research units differ in how the management of research institutes and departments try to influence the unit's research through programming. The institute where E1 is located tends to direct through research programmes, while F1 sees its research institute as a research facilitator. In the case of E1, the research institute has overall research themes in which researchers participate. (24)

E1 is much more sceptical about the research institute's intentions and modus operandi than F1. E1 is concerned about the way its overarching research institute tries to direct the activities of the research unit. According to the respondents, the intention of this institute is to direct and streamline research efforts and expertise

within the units. The institute's programmes are seen as 'guidelines' or frames for projects. In the opinion of the E1 researchers, the institute tries to direct them and also put pressure to perform. By framing their research, the choices of the unit become more constrained, which may for instance have negative consequences for the originality or quality of the research (23). As a professor notes, a research director should facilitate, not to direct:

When I was the director of this research institute - it was to facilitate on each level the individual researcher to do what he/she liked to do so that they could do good things in a good way. (22)

Moreover, he stresses that academics should not be managed top-down, since it does not work:

I don't think that you can organize fundamental research in our field. The real innovative things that are developed are coming from individuals. Bottom up. You cannot programme it. That is one of the problems that I have at the moment in the faculty institute; they are trying to organize it from the top down. And I think you must facilitate research. As soon as you appoint a man or woman for a full professorship, or associate professorship, then he or she is good, so we will try to get our money by let him/her do what s/he is good at. I never met one of my colleagues who was a lazy man, was only working with his feet. That is not happening. Always you will get a serious thing out of it. (22)

The efforts to streamline research from above are a big change compared to the past. When talking about the next generation of researchers he observes a shift from individual research freedom to a more managed form of research:

They [young researchers] are living in a planned research society. When I started it was completely my own business, I did it myself. I had, I was lucky, I had a position within the university but I was teaching over there, I had my own projects. (22)

At the same time, the group leader thinks there is a lack of structure and leadership in the research institute, although a new research director is being appointed and may bring change. His concern is that there is little help with writing research project applications and bringing individuals into the groups: there is, in his words, 'no policy on cooperation.' (24)

In contrast, the respondents of research unit F1 express more positive views about the management of their overarching research institute. In their view it facilitates and supports different research initiatives by providing funds for research leave or workshops:

I think we have these institute construction... which tries as much as possible to facilitate our research and we also experience it that way. They don't try to block it, if you have an initiative. If you say: 'I want to organize a small workshop on this or that.' If there is money they will be do their utmost to help organize something like that. (29)

F1 researchers think that their research institute has changed since it used to be more 'directive' in nature. People were not happy about it (29). Currently, researchers are positive about the more facilitating role of the research institute management. They also positively assess the research institute's contribution to the establishment of a new master programme, the organisation of workshops, and fostering international orientation in terms of cooperation and publications. Although the research institute has established research themes, as is the case in E1, they are not much used as the F1 group leader notes. The problem is that researchers are quite resistant to change, they are "very stubborn and motivated people in general (and) will not be fobbed off on a different research area, or a different method, or a different research question" (32).

Management instruments

Both basic research units experience that the managers of their university increasingly monitor the work of researchers and influence the research units through funding and personnel policies. Both units have to participate in quality assurance procedures that monitor and assess their teaching and research. The units have to conduct self-evaluations and site-visits of international peers take place. The evaluations are organised by the university's central management (see also Chapter 4). Other ways to monitor performances are the yearly staff appraisal talks with superiors (with the dean among others). Moreover, the research units have to report to the research institutes they belong to, and then to the faculty's management.

Both units have participated in research evaluations and have submitted reports to their faculties and institutes. In these reports the unit's outputs are described. The group leader of F1 mentions that research evaluations have been both top-down and bottom-up exercises. On the one hand, it is management-driven; on the other, one clearly has activities of self-evaluation. The focus of research evaluation is the unit, not the individual:

One of the outcomes, among other things, is that by the research institute agreements will be recorded to increase 'control' somewhat. Not with respect to individual researchers; they will do their job anyway, but with respect to the research institutes to take care that it remains possible to use research time really for doing research. (32)

This also underlines that the interference of the managers is not always perceived as bad and indicates that they sometimes intend to 'protect' their staff to produce research output. The research outputs, especially publications, are important to the management and from that angle they try to encourage their staff to undertake research, when for instance teaching loads are threatening research performance. Both units link evaluations, including the pressure to publish, with all university management levels: the research institute director, the dean, and the central university management (23, 24, 29). In that respect they witness a clear 'management tendency' in one direction. It implies among other things that the various levels of the university management are increasingly more engaged for setting requirements of the amount and type of publications research units are supposed to produce, as reported by research unit E1 (23).

Funding and personnel policies are seen as the main drivers to steer and control the research units. Through these policies university management tries to give incentives for proper behaviour. In the case of F1, the management of the institute facilitates research by targeted funding. This strategy is positively evaluated by F1's researchers. It is an incentive (money) to encourage research with a need-based approach; "where it can be used best; to relieve to most urgent distresses" (32). The strategy is, however, not successful in every respect. The problem F1 faces is that their institute is 'under-funded' in the sense that it does not have sufficient money for such research matters. This is a consequence of the faculty's financial problems. Therefore, the possibilities to influence the research units through such a mechanism of 'strategic funding' are limited.

Another example of using financial mechanisms to steer the unit's behaviour concerns the central university's management role in stimulating 'excellence in teaching' (to profile the university). The university's central management plays an active role in steering the institute and consequently, research unit F1, to provide additional funding for developing research masters programmes. As part of their internationalisation strategy, university F is very active in promoting research master programmes that are attractive for international students. This results in a stronger dependence on teaching to earn money for F1. Researchers are happy about this development since it offers a concrete and secure funding base and gives them the opportunity to do interesting things, such as "hire people from abroad" (29).

Research unit E1 also points to changes of university and faculty management with respect to funding that impacts their behaviour. In comparison to F1, this research unit is more explicit about the university management that encourages them to diversify their funding base. Because of limited resources in the first money stream, institutional management stimulates applications and initiatives to look for research money from external funding bodies with the help of bonuses

or posts (35). The researchers indicate that for them this is a big change. In earlier days university management provided first stream funds rather easily, including new staff positions: “it happened automatically” and “worked perfectly”. Now they see that they “have to search for alternative ways to get such money” (24).

Personnel policies are high on the list of management instruments in both cases. With the financial crisis, the vacancy stop was one of the first mechanisms used. This means that no unit within the faculty, even if it performed well, could get new tenure posts. The general procedure of appointments of new staff members is in the hands of the faculty (dean), usually in consultation with the leadership of research institutes.

Both units underscore that there are no clear incentives to facilitate better performance except for the requirements to get a tenured position for an individual researcher. A senior researcher in F1 draws attention to the consequences of not producing research or teaching outputs:

Individually there are consequences for people who don't have tenure so to speak, because they have to produce to get tenure. And for the rest, no, I think it [non-performance] makes your chances worse if you want to apply for funding. That's what I think. (29)

At the institute level, the faculty uses new AiO positions as an incentive for good performance. Good performance means obtaining minimum grade 4 on the four evaluation scores in the ‘visitation committee’ report (35).

Concerns about management

E1 and F1 express concerns about increasing ‘managerialism’ at their universities. Without downplaying the good parts, there are serious worries. The major areas of concern are the previously mentioned vacancy stops and the increased levels of bureaucracy; developments linked to tight budgets and more accountability requirements.

Both units are largely concerned about the management decision to stop hiring new staff. Teaching loads have greatly increased as the same number of staff has to teach more students and have to implement the new Bachelor Master course structure that was a time consuming process of curriculum reform with many meetings. Researchers are very concerned about future prospects, since even if they ‘produce’ good graduates, they will not be able to offer any academic tracks for young promising candidates. This is a problem for both tenured staff and the young generation. Moreover, heavy teaching loads means not having enough time for their own research (31, 32, 23, 24). This situation is without exception not welcomed by the researchers:

And with respect to research, AiO places and so on, there you have the same kind of problems. Because this year at the research institute, there was no AiO round. Thus, it was not possible to appoint a medievalist, or somebody from medieval history and that is very problematic, because it means that with respect to the prestigious master you have to deal with a faculty that must make cutbacks on the one hand and at the other hand there will be no money left to offer a pre-trajectory at our own university. (32)

Not surprisingly, in such a situation it is more difficult to obtain tenure. As a junior researcher notes: “Permanent contracts in humanities do not exist. There is a vacancy stop here at the whole humanities faculty. Horrible things happen” (31). The succession of the positions of retired staff is also questionable in both cases (23, 30). As a result, there is a lack of staff which results in big work loads:

We don't have enough hands for anything, but still we have to do it. We don't have enough people to teach, we don't have enough people to do the research that we want to do. Everybody is working twice as hard as what they are paid for. (31)

Another common concern is the increase in bureaucracy due to changes in internal management structures and the accompanying ‘new rules and mechanisms’. Also the requirements of external funding bodies such as the EU increase the administrative burden for the researchers. For the researchers these developments mean time consuming monitoring procedures, filling in numerous forms, sitting in meetings (21, 22). A professor in E1 is concerned about an increasing number of committees and the increasing administration loads that take away research time:

The organisation, committees, we have now this bachelor-master. Say, we have a master group, a bachelor discipline, a *bestuur*, a board for the bachelor. There is also a committee for the teaching *onderwijs*, the Teaching Committee (*opleidingscommissie*) for the bachelor. We have the corresponding master board and an OLC committee, the research master board. You cannot explain this to people from abroad. The situation where we are working and living in is completely ridiculous. This also takes time away from research. And it is not only time, but energy. And my predecessors did not have that problem at all. (22)

One of the big concerns lies in the organisation of teaching, especially in the graduate school where the major responsibility is in the hands of the research institute director (22, 24). The new Bachelor Master structure is in this context also seen as a factor that increases bureaucracy since they have created a number of

new committees to implement the curriculum changes and staff must spend time in the meetings (21). The F1 group leader notes:

Above all the changes concern the increase of too many management tasks. This is related to the BaMa structure which has created an additional layer on top of everything else. (32)

Finally, European research projects are also being blamed for increasing the bureaucratic complexity of a researcher's world. The E1 group leader worries about cooperation with other groups in EU funded projects since it brings "enormous bureaucracy" (24).

In general, the perception of management policies and instruments in E1 and F1 show by and large similarities. The two research groups mention the faculty and its research institute in terms of funding and personnel policies. The main problems they perceive are the vacancy stop, the lack of sufficient staff numbers, and increased bureaucracy. Both groups are to a large extent sceptical and concerned about these. The research evaluation procedures are other management instruments used by both faculties. Staff motivation is mainly driven by the prospect of tenure and by a self-driven credibility building process. There are differences as well. Where F1 sees the research institute operating in a more facilitating function, E1 complains that their institute is (too) directed towards research themes.

7.1.2.3 Research evaluation

Respondents state 'evaluation' as another theme concerning changes in their institutional environment. Evaluations refer to self-evaluation reports, 'visitations' of the external peer committees that assess research in different units of the research institute, and the yearly appraisal talks of individual researchers with their superiors – professors of the unit and directors of the research institute. Internal self-evaluation takes place every three years while external visitations occur once every six years (23). The self-evaluation is usually a serious exercise of stockpiling all the outputs of the research unit and an exercise of a self-reflection of strengths and weaknesses of their research programmes and activities. The external assessment is based on the SEP protocol endorsed by VSNU, NWO, and KNAW (see Chapter 4).

F1 participates in the self-evaluation of the medieval history group. They also participate in the visitation of the research institute and the history department. In all of these research evaluations, the research unit's work has received marks from good to excellent. E1 also carries out self-evaluation within their research institute and participates in the visitation of the research institute. Their marks also range from good to excellent.

Another assessment of research work is the annual individual staff appraisal which is (supposed to be) routine for researchers in E1 and F1. Here the director of the research institute and professors play an important role as described in the previous section on management (24). According to a junior researcher in F1 it is an informal “annual talk” about the past and future and researchers are not too concerned about it (30). There is a difference here between senior and junior staff. Both research units point out that yearly appraisal talks are more important for junior researchers who do not have a permanent position than for senior tenured staff (23, 24, 29, 30). The junior researchers without tenure are more vulnerable as their contracts can be easily terminated and they do not have much job security. This is not the case with the tenured staff, as they have strong labour protection and the procedures of firing staff are lengthy and costly. This makes senior staff less vulnerable to any judgments about their research quality as the faculty management cannot do much about it (in terms of firing them). The results of an individual evaluation do not matter too much for the senior staff; they enjoy significant freedom to do what they want:

Yes, we have a nice job. It is a privileged position...when you are working as a senior researcher –assistant professor, associate professor or professor- and you are no longer dependent on yearly evaluations as some young colleagues are, then it is an excellent job. We think we can do a lot according to our own taste. (24)

Opinions about evaluation

Generally the researchers of the two units have mixed opinions about evaluations. E1 welcomes the fact that they are seriously evaluated (22). Some are nevertheless concerned with some aspects, for example about the aging of the visitation committees. Being evaluated by people that are no longer very active in research is seen as problematic:

The serious problem I have is that we are evaluated by committees who are consist of people who have more grey hair than I have now, retired people who are far from the real scene. That is a serious problem for me. (22)

Moreover, some E1 researchers believe that the evaluation results are “pre-cooked” and “not worthy” (23). It is a kind of game that needs to be played but to a large extent it is an “artificial ritual”.

F1 researchers are pleased about the evaluations and their results, but are not sure how they affect them, since there is no apparent reward system (31, 32, 29):

There is nobody who says 'you're not doing well', but as I said, I think we are doing quite well as a medieval studies department, so I don't know exactly what the sanctions would be if we are not doing well. It might be that there are sanctions but I haven't come across them. (29)

F1 is anxious about the rules of the game, particularly in terms of outputs. First of all, they are not satisfied about how evaluations rank and evaluate different publications. For example, a senior researcher from F1 does not appreciate that book chapters are not as highly valued as journal articles (29). Another related worry concerns rankings: will evaluation committees indeed start considering journal rankings in the humanities? A senior researcher from F1 argues that it really starts to matter where to publish, even if the rankings are not yet officially accepted in humanities:

I do know that it tends to become, also in the arts, that they want to make more of a ranking, as apparently has been going on in sciences already. They want to do it in this and that and that. I do not know how it works in the sciences; I think it is absolutely nonsense to do that in the arts, because you have a lot more journals. The danger in this construction is that everybody wants to publish in a few American and English journals then. I am sorry, but there are quite a lot of French and German journals which are absolutely as valuable as the English ones, or even better. But there is a big tendency that they will not count as heavy in that kind of statistics. At the moment there is not yet a ranking in that, so you look more at the tradition. If you looked in the Netherlands for the history, you know that the *tijdschrift voor geschiedenis* is absolutely a good journal, but if you can get your article in the *bijdrage en mededelingen* then you really get in a posh magazine. It is a bit like that. (30)

Thus, without seeing performance assessments as complete nonsense, there are certain hesitations; and it creates a lot of work.

7.1.2.4 Competition and cooperation

During the interviews the researchers of both units also often talked about competition and cooperation as important in their everyday academic lives. According to most respondents competition for resources has increased among Dutch medievalists. Most of the increased competition stems from applying for external project funding and funding for staff. Both units argue that competition is usually between different research groups across universities. An E1 professor believes that this has increased since there is more project-based international research (22). Since budgets are limited and many researchers want or need a part of the pie, competition gets tougher. Junior researchers from F1 also think that competition for funding has seriously increased:

I look at that generation who did not have to do anything at all, no competition, which was totally unfair... There absolutely is far less money available for research than there used to be, 20-30 years ago (30).

The only ones that do not feel the change in competition for NWO funding are senior researchers from F1. When it comes to NWO-funding, allocated on competitive grounds, they do not sense more competition:

I haven't noticed that [more competition]. This is to say, the ones here that have applied for something were successful, sometimes maybe with a year delay, but they got it. And if you are being asked to advise, then it looks as if this advice is being followed by NWO. At least that is my experience. It is being listened to. And that is nice. (32)

The problem related to competition, as seen by the E1 group leader, is that humanities do not receive much funding from NWO compared to other fields of research (24). E1 is also not satisfied with the low NWO grant application success rate described in the section on funding. At the same time, in the view of a junior researcher from F1 the competition can be friendly and it is not personal, as s/he thinks that in their field cooperation is more emphasized than competition (31).

Both research units also note the changing patterns of internal and external cooperation in research. The cooperative culture seems to be more ingrained in F1 than in E1.

F1 stands out as an example of close internal cooperation where they have a common research focus in early medieval ages in the research institute. In F1 there is a specific focus on early medieval ages with a specific tradition that all researchers follow. They are socialized in a similar way and their research "is not as individualistic as you would think" (29):

This group of medievalists is an incredibly motivated and increasingly young, on average, team, which really works as a team. People come and tend never to go away again, because the atmosphere is so very good. (31)

Thus, to some extent there is internal cooperation in F1; there is a network of people working on the same time period but from different disciplinary angles. Cooperation takes place in terms of workshops and lecture series, not as much as publishing together (29).

According to junior and senior researchers there is not much internal cooperation in research in E1. There is an attempt from the overarching research institute to group different research themes according to time periods to stimulate some internal cooperation. One of the efforts concerns the organisation of

workshops within the research institute, where different disciplines meet. However, as the group leader notes, in practice there is still not much interdisciplinary exchange going on in terms of research projects: "I have to add that we do not manage sufficiently [to cooperate] and are not very active in the development of multidisciplinary projects" (24).

An E1 professor thinks that their research unit is a collection of individuals whom he compares to "ships that pass in the night" that do not want to change their course. He sees this is a problem:

[The group is] a collection of individual researchers, each on their own field. Sometimes they need each other, but the majority of the meetings are like ships that pass in the night....it is individualistic. That is one of our problems. When you are in a local situation your colleagues are each working on a completely different area in the larger field of medieval and renaissance studies that might be sometimes difficult. (22)

External cooperation is visible in both research units and seems to be growing. Externally funded projects usually imply international cooperation, and that is evident in both units.

National and international networks have been established through different project funding, as well as through participation in conferences and other international activities such as workshops for PhD students. In both cases, the ESF and NWO funded projects are mentioned as examples that fostered a further increase of international cooperation (29, 22). Their research partners are from different countries in Europe, USA, and Japan. Both groups' PhD students participate in the national research school. F1 has expanded this to an international level and organizes international PhD student workshops. They publish together with foreign colleagues and are successful in procuring European funding. The group leader of F1 notes that medieval history is really international. The group is involved in different international networks:

The fact is that we participate in various networks. We have a core of people that of course talk to each other about their research, but you could say that we are part of four partly overlapping networks, international and national, which means that you have interlocutors elsewhere and therefore internationalisation is very important. This is especially true for three out of four, because middle ages research is highly internationally oriented. We see each other for instance in Leeds, there is a huge medieval conference. If there is a big ESF project we like to participate, because in this way the exchanges are established. (32)

He notes that these networks have an effect of continuously developing further into different ideas and levels of cooperation, such as projects, co-authored edited books, and then visits and conferences:

Also more publications; three out of four of my book series are co-productions and they are people who have attended a conference attached to a research project of our university. One conference initiates the next and there are people from all over the world who like to come to our university because we have a fairly good infrastructure for small-scale workshops and conferences. (32)

For E1 the situation is slightly more difficult as the group leader admits that EU funding is not easy to get (24). However, the professor from E1 underscores that international orientation is vital now, which in the past was not necessarily the case (22, 23):

A serious difference is, for instance, the internationalisation. When I started, internationalisation was a thing every individual researcher had to look after whether he would like to be a man or a woman acting on the international scene or not. At this moment internationalisation is a must. We have to do that. (22)

Both units recognise the importance of cooperation at the national and international level and are positive about it. One professor from E1 states that the big project cooperation brings useful results:

That's also a change in a way of doing research out of workshops. I do not mean workshops where people come together and prepare one paper. But a real workshop of a week, working on one thing/theme....And that is very fruitful. (22)

F1 researchers feel that international exchange is very helpful on a daily basis and that it positively impacts their research (30, 31). In their view, this kind of external cooperation enriches research: "...we go to conferences where there is a big international network with which we cooperate, it is just great" (31). Junior researchers depict what they gain from international cooperation:

It broadens your field and it's a bit more work because you get into contact with more people and other ways of looking at it. And of course a lot more literature, as everybody says 'Have you read that?' And that's in the magazine you otherwise would not look into at all. But in general, it enriches your research I think. It is also a small world, even internationally. (30)

7.1.2.5 Pressure to perform and work intensification

The common opinion in both units is that there is a clear pressure to perform, and workloads have seriously increased over the last ten years. In E1 and F1 the pressure to perform is attributed to two major reasons: 1) the increase of other responsibilities besides research, such as teaching and administrative loads, and 2) increased pressure for research outputs, such as publications, which leads to a culture of 'publish or perish'. This pressure to perform happens either through personal career ambitions of a researcher, peer pressures, or by university management. Teaching loads have increased due to higher student numbers, the introduction of the Bachelor Master structure in the Netherlands, and the scarcity of teaching staff (24, 31, 32):

We don't have enough people to teach, we don't have enough people to do the research that we want to do. Everybody is working twice as hard as what they are paid for. (31)

This has consequences for the work intensification and time pressure, as the leader of the group in F1 states:

There is without a doubt higher performance! And everybody knows that workloads have increased and therefore the faculty is asked to perform even better in terms of teaching, because in fact it is believed that, though we have more students and though we teach more and more, we have essentially too much staff in our institute. That is very funny to hear! Currently we are running an introduction course in medieval history and three years ago 230 people participated; now there are 474. It is simply all hands on deck! (32)

Although most are concerned about increased workloads that diminish 'quiet time' and even leisure time, some senior researchers do not seem to mind this too much. They see it as a part of their professional commitment. For instance, a professor from E1 does not mind this pressure and it does not cause him any problems:

Commitment, I like to do that, I still like it. It takes my weekends and so on. The only problem is at home, I have to make that. Ok, but that's my problem. Of course I will not have a job with a decision that I must be at 9.15 or 8.15 in my office. I come when I am working and work all my life, I never have a free day. But that is no problem at all. (22)

The increased teaching load is coupled with an increase in administrative activities. The group leader of E1 for instance, mentions the time consuming writing of research proposals, and particularly the attendant red tape (24).

Attending meetings is seen as another unnecessary and time consuming activity, as a junior from F1 indicates:

They [workloads] have gone up in the sense that there are simply more things to do next to your own research. It adds up. Again I do not feel more pressure or something than [when I was] working as a PhD. Working as a PhD was 90% working as a PhD. And now, even though I am paid completely for doing research, the pressure is not just this one project. It's teaching a bit, it's sharing other stuff within the group, more pressure to attend meetings. And as a PhD student, ok, it was fun to see what was going on in the group, but it was not really necessary for my own stuff and that's a bit more now, administrative work so to speak. (30)

Time pressures to do the job, if it is research, teaching or administration, have grown. This requires better time management on the part of the researchers and according to some respondents it requires allocating their time only for one activity in a particular period of time. (21, 22, 29) A senior researcher from F1 expresses his fears about time management:

When I was a PhD student working on my thesis I had a lot of work to do, but I could do it just in my time and in the place I would like it to do and I didn't have many other things on my mind. Nowadays I'm interrupted, I have to do this, I have to read this; there are many more things that I have to do. Time management becomes more important. I am not very good at that, I am afraid. (29)

Although there is more perceived pressure to perform, it does not necessarily destroy collegiality in the unit. Researchers do encourage each other even further to be productive and to share interesting insights. This collegial pressure is positively valued. A junior from F1 states:

It is not as if they will strangle me if I do not produce 15 articles a year or something, not at all. But people do tell me: 'Oh come on, write up, do it. Don't fuss about it, just sit down and write that book, make your life easier, just do that'. In a friendly way, because that's a general atmosphere, it's a very friendly group of people who tend to share information and new findings. There is lots of trust. If people make an important discovery, they call you up in the middle of the night instead of shutting up for 5 years and then publishing. In that sense pressure is friendly but it is there. The further you come the higher it gets. (31)

She is intrinsically motivated and perceives pressure from her peers as an additional motivation. Interestingly, the trust in the group creates a positive

environment for a researcher who perceives the pressure to perform as beneficial to her advancement in the field.

In general, both cases are quite neutral about the pressure to perform. It seems to be regarded as a part of the job. But when it comes to the increased workloads, the picture is totally different. Without exception the researchers complain, especially about increased teaching and administrative tasks and juggling different functions.

7.1.3 *Research practices and responses*

7.1.3.1 Problem choice

The selection of research topics in both groups is predominantly driven by the dynamics of their own research inquiry, where the process of individual reflection and consultation with the wider academic community is central. They express concerns about the priorities of external funding bodies and the multidisciplinary themes of their research institutes. Both cases use strategies to ensure they retain their freedom in problem choice: one of the core aspects of professional autonomy.

Both groups indicate that problem choice is a bottom-up, academically driven activity where the most important considerations and starting points are the researcher's academic preferences and instinct. As many other researchers in E1 and F1, a junior researcher also underscores that she has a lot of freedom to decide on her research topics:

There is a lot of freedom, really a lot of possibilities to find your own voice; do your own thing and that have led to the most wonderful results. For instance, an AiO here who started two years ago or so, made a major discovery. She found manuscripts that were thought lost and people have been looking for them since the early nineteenth century. And she goes, reads her footnotes, thinks very deep and goes to the archives and finds them. That to us is something 'whaaa', to open your champagne for. In that sense, yes, there is, as long as there is no money involved. And that has not changed in my time. (31)

Similarly, a professor from E1 argues that being a professor in humanities means he has enough room to manoeuvre as an individual researcher to choose topics. In his view research cannot be strictly organized or programmed (22). Moreover, personal fellowships also help to follow own interests as seen from a junior researcher in E1:

In the past there were very clear subjects within which you had to work, but in reality it turns out better than expected. And because I left for some years and then returned with my 'own' funding, nobody dares to interfere. So, I absolutely do whatever I like. (23)

Researchers from both units mention certain factors that may influence the selection of research topics, such as the popularity of the topic and related likelihood of funding. Junior researchers from both units think that the relevance of certain 'hot' topics (30) can influence funding from the external funding bodies and consequently, the choice of research topics:

One sees for example something about religion. Actuality of religion they think is something that scores at the ministry and may get funding. That is how the matters are (23).

The funding of 'hype' topics and the associated politics are also nicely exemplified by a junior researcher from F1 who complies with the requirements of external funding bodies by following their thematic priorities:

In my case I grab everything I can get, simple as that. I need to keep a job, but in general when people write research proposals you just have to link up to international sexy research so to speak. Right now its ethnic identities and barbarians...I think that's one of the only ways to get subsidized. There are always these questions: 'How shall we write this?', 'Who might be the international referees?' 'Who might they choose?' There are five options for instance, not more than that. So, it is politics. (31)

Phrasing of the research questions does matter as both groups note, although the priorities of external funding bodies do not change the essence of the individual problem choice. They may frame the selection of research topics but do not dictate them. Researchers follow the reasoning of how to increase the likelihood of funding, which influences how to write your own ideas into proposals and how to package ideas (23, 31). A junior from F1 admits that to get funding, researchers follow certain considerations, such as wrapping the topic in a way that fits the funding priorities (23, 30):

If I learn that NWO is starting a project, we are inclined to do this. Of course you start thinking about well, what could I do with that, so it does influence your thoughts, but in the end, I guess, if you are really at the moment that you are writing a proposal, it's basically how can I sell this. (30)

They try to make the topic relevant for and attractive to the funding body (30). They also try to choose a broad topic and make it interdisciplinary (23, 24):

I currently have a research proposal awaiting funding that involves urbanisation and city culture. This is a non-recurring NWO funded program. My colleague in history has submitted an application for three studies; one for an archaeologist, one for a literature historian, and one for a social economic researcher. They have a research proposal which uses all three research areas. This type of multidisciplinary research is usually very successful in getting funding. (24)

Such strategies of how to 'sell the topic', to balance between priorities of external funding bodies and personal interests are common to both research units. But while it seems that they all play the game, the rules are not clear to everybody. Sometimes the decisions of external funding bodies are not clear to researchers; they doubt if excellence is always the criterion:

But to feel this whole machine of procedures, I mean it is so far away, it's a very abstract level. These people in The Hague, sometimes it seems that they just throw dice and reject excellent people. I mean of course you hear stories from each other and colleagues that people who are so good get rejected time and again, and then you think: 'Read his proposal people, come on, think, use your brains for God's sake'. But they don't get it. Somebody who has a go at it as well, they get funded. It is very difficult to understand how this mechanism works. On paper within the theoretical framework, it is all very beautiful, and wonderful, but in practice it's not. (31)

When the funding is secured, then there is freedom to do what a researcher wants, as expressed in F1: "as soon as the project is awarded, yeah, it's my project. I get all the freedom I want" (30).

Apart from considering the priorities of external funding bodies, researchers also mention the multidisciplinary nature of the research programmes of their own research institutes. Overall, researchers are not too concerned about them since they are very broadly formulated; umbrella themes for research units (22). Usually the programmes offer sufficient space to develop and implement their own research ideas. They do not constrain their choices to such an extent that it feels like being forced, limiting creativity, or seriously reducing the number of research topics: "We had a research plan but I think the plan is also written in a way that there is plenty of possibilities for people" (29). A more important aspect for researchers in F1 is following the traditions of the research unit (29).

Both external funding bodies and research institutes do not seem to significantly influence the problem choice in both research groups. Researchers still follow their own interests. They manage to keep their long term research

themes: "...all is long term. I see what is coming out of it. I am working on projects I started now 30 years ago. I am still working on it" (22).

All researchers claim that they have the room they need to select their own research topics. In this respect their professional autonomy seems to be unchallenged. External pressures to program research and define research themes are according to the respondents successfully resisted or ignored. The interviewed medievalists firmly believe they should have academic freedom to pursue their own research interests and are of the opinion that they still have this freedom. In terms of the strategies defined in chapter 3 at face value it seems that medievalists manage to ignore the attempts of stakeholders – such as institutional management (research institutes) and external sponsors – to program research.

This however, is only one part of the story. Many researchers, both from E1 and F1, say that while following their own research lines and interests, they side-glance the programs and research priorities of their research institute and the external sponsors. Popularity of a research topic and the chances of getting funding do influence many researchers' choice. They play the game by selling their own ideas in such a way that they fit research programs and interests of stakeholders (including institutional management). This is not too difficult since most of the research themes and lines in the research programs are very broadly and vaguely described. So we would argue that this is a clear example of a strategy of symbolic compliance. They balance the external expectations and interests with their own, where the latter have the upper hand. Without downplaying the influence of external programs on the selection of research topics, it seems at the end of the day this influence is apparent instead of real. This point is reinforced if we take into account that senior researchers in both units say that they are able to maintain their long-term lines of research (see also later in this chapter). Thus, compliance is only partial.

7.1.3.2 Mainstream and risky research

The dominant opinion in both groups is that they carry out both mainstream and risky research. In both cases respondents talk about what type of research is likely to get funded by NWO. They see the necessity 'to play it safe', at least to some extent as they need to ensure their funding: "Now with the decreasing budgets you want to know for sure that something comes out" (23).

Both groups seem to balance out mainstream and risky research, where F1 seems to be more strategic about it than E1. E1 researchers think they are involved in both the 'safe' traditional type of research which they see mainly as mainstream, and risky research. A senior researcher believes that in his topic there is no risky element involved:

Look if you do institutional research, you investigate how institutions have functioned in the Middle Ages, for example how the management in a medieval snack bar was functioning. That has a very long tradition, for that the sources are all exactly known, that is solid. That is also partially analyzed ... but it is not only descriptive, but you can also say that it is rather traditional, straightforward. Very important that this is researched, but you can not add revolutionary research questions. (24)

At the same time, some junior and senior researchers in E1 take up risky topics and their strategy is to stay with the risky and interesting topic and see if they get funding for it. A professor from E1 admits he is taking risks when applying for NWO grants. He is not bothered too much if he does not get funded for it: "...yes, I do risky business. When I do not get the grant from NWO because of that, then I will not get the grant. No problem at all" (22). A junior from the same group does not mind an innovative approach in her research despite the warning of her supervisors. She is funded as a post-doc from the research institute and is free to choose what to research. She understands that her risky approach may affect her future applications to NWO but thinks it is interesting and may have a future:

Yes, it can [influence future funding opportunities]. Because when you apply for an NWO research subsidy, when there is someone in the commission who doesn't like it, you are more vulnerable I think. (21)

In F1 researchers think strategically; they try to balance between mainstream and risky research by combining a new approach to a traditional topic. A senior researcher carries out traditional research and links it with new approaches that may be more risky. He is involved in both types of research:

In a way, some things I do are very safe, because what I am also doing is editing text which is one of the most traditional things we are doing. But as I said, in a new way, because we do not want to reconstruct this authoritative text but we want to see how the text lives and is being used in several ways. The other thing is also more of interpretation of texts, and I used anthropological models for interpreting medieval text, which is not very risky, I think, because more people are doing that, but it's less traditional if you do it that way. So the way I look at the text is, I think, more risky than establishing the text and trying to find out where it was written and when it was written, and by whom. (29)

A junior respondent in F1 brings in yet another dimension. He argues that they are involved in risky research if talking about the Dutch audience, but mainstream if an international perspective is taken: "Internationally it is mainstream, but in the Netherlands it can still raise eyebrows" (30).

Several researchers of the two research units say that they conduct both mainstream and risky research topics; the possibility of funding is obviously an important factor for consideration. These researchers use a strategy of symbolic compliance; they 'listen' to external rules and norms, at least to some extent. At the same time they try to balance safe and risky themes. In this way they try to combine their own interests, frequently on the risky side, with the interests of others (such as sponsors), frequently calling for mainstream research. Some of the researchers clearly say that they do risky research, 'taking the consequences for granted'. They ignore initiatives, programs and norms that would stress and reward mainstream research.

7.1.3.3 Output preferences

Medievalists mainly do long-term research, where outputs are oriented towards the academic community, and academic inquiry is for the sake of inquiry. Their major outputs to increase individual and unit credibility are book chapters and journal articles. Monographs are less frequent as there is a tendency to produce more short pieces due to pressures on time. This is partly due to short-term project funding and to research evaluations. Junior researchers, especially post-docs, have short contracts and they mainly produce conference papers and journal articles. Seniors are also focusing on books. Researchers are driven to publish by their career ambitions, encouraged by the university management evaluation procedures, and by funding bodies' demands. In E1 there is the goal to fulfil 'the minimum rule', though if there are career ambitions, the expectations are higher (23, 24):

Well, both [books and articles], but a book matters more. But this depends on your level of ambition. This is the reason you start to see a clear demarcation between more ambitious people and people who just say they are happy to have a job at the university being a lecturer and publishing one or two articles a year. I find it hard to solve this dilemma for myself; I want to make full usage of the funding for the project by finishing the book. But if you want to become a professor you have to be more ambitious. A career is made up of books and articles. (23)

Respondents are mainly involved in curiosity-driven research, but the donors of research increasingly push towards relevance where researchers have to justify themselves to the public and funding bodies. The overall demand for relevant research is visible as exemplified by a junior researcher's remarks from F1:

I think, I have not experienced that personally, that way back you could decide to do research on something for the rest of your life. Publish a book every 5

years, hold lecturers, and you did not have to justify yourself all the time. People seem to ask every 10 minutes or so, "Hey, why do you exist as a medievalist, why don't you go do something useful. Why don't you teach Dutch to all these poor Turkish people who cannot find a job?" Or "Do something that makes real money" and I don't think that this kind of research needs that kind of justification. We are working with cultural heritage. We are working with the stuff that identities are made of, as Europeans or Dutch people or whatever. And that should not be underestimated. (31)

She strongly opposes this trend since in her view research in this field does not need justification to the public audience: "We are convinced that what we are doing is relevant, which needs no further justification" (31).

A senior from the same group asserts that relevance and fashion of the day does not really matter for researchers in history:

I don't think we should write something on the canon of history because this is politically correct at this moment. What we're doing is basic history. Historians still like to read books, and I am happy they still do. (29)

Similarly, E1 is also mainly involved in curiosity-driven research. Researchers think that no one should organize research and they do not need to be relevant:

It is also a problem that you always have to say "well we are relevant for this or we are relevant for that" I don't like to be relevant for anybody for my work! The things I do are real and nice things...I don't think that you can organize basic research in our field. (22)

Still, both groups take care that they are visible to the public. A group leader from F1 asserts they are involved in public debates to show they are relevant, although in terms of research they still produce their monographs. E1 associates project work with the more externally funded research where visibility to the public is important. Here NWO requirements for relevance are emphasized (24).

We see that in Dutch medieval history curiosity driven research prevails. Relevance of research is 'despised' by many researchers, and although they recognize the importance of being visible – which they seem to be – they don't give in to these external pressures. Such rules are simply ignored or challenged.

Both units express certain concerns about externally funded projects related output tendencies. For them external projects mean short-term research, due to 3-4 year project funding and short-term post-doc contracts. This means that they have a relatively short time to produce articles and even less time for books. This tendency is a change from the way medievalists used to work when the standard was to publish once in five years with no need to justify how they spent their time

and what they researched (31). Short-term outputs become more common in the context of lack of time to write long books due to increased teaching and administration loads (32).

Though books are still important to medieval history researchers, there is an emerging culture of publishing conference papers and journal articles. This results in the balancing of the production of different outputs. Research groups try to diversify and combine short-term outputs with more substantial outputs.

To most of the researchers in the two units, both books and articles are an important output. They try to produce both and in this way try to meet the demands of different audiences. At the same time, they are 'cautious' not to produce only journal articles (24). A junior researcher in F1 tries to target different audiences with two different types of publications:

For my project now it is a book in Dutch, aimed not just an academic public. So, it has to be academic level, but a bit more popular. And I hope to publish some articles in English as well, for a more academic public. (30)

Still, the research units are realistic about their outputs and available time constraints. It is simply unthinkable not to publish, and it is best to publish articles, since they take less time (21). The time dimension is mentioned by the majority in E1 and one junior in F1. They claim that there is no time left to write books and it is much quicker to produce articles, or books on the basis of articles (22). According to the professor there is a shift from books as major outputs to articles, although 'books' can be interpreted in various ways:

The shift has been in place. When I look at the older researchers when I started, the majority of them wrote books. I have to say that some of the books are in fact articles, very long articles. What I hate is this: publish or perish. (22)

Strategies for publishing

In both cases researchers are being stimulated to publish through yearly staff appraisals and informal talks within their research institutes. The aim is to produce at least a minimum required number of publications, and preferably not only in Dutch. Seniors advise junior researchers on where to publish. Their major considerations for publishing are where and in which language. Researchers think of what type of publications they need to secure their career prospects and build their credibility.

To produce these outputs most of the researchers follow their own ideas where to publish. In other words, they are free to choose and do what they think is best for them (32). There are concerns in F1 about the rankings of journals as

put forward by a junior researcher who still does not have a tenure position at the university. Today there is a traditional informal hierarchy of journals that researchers are aware of. The game would be different if this was transformed into an official ranking of journals:

At the moment there is not yet a ranking. So you look more at the tradition as everybody. If you looked in the Netherlands for the history, you know that the *tijdschrift voor geschiedenis* is absolutely a good journal but if you can get your article in *the bijdrage en mededelingen* then you really get in a posh magazine. It is a bit like that. But like I say, you have half an eye already at well, is that going to be an official ranking, then you have to get your things because I am not in a permanent post yet. (30)

There are two major publication strategies employed in E1 and F1. The first is to write books with the help of project material and is used by senior researchers. The second, used by junior researchers, is to aim at a good output in quantitative and qualitative terms to build a name. They do not go immediately for the high-risk strategy of trying to publish in the top journals.

Seniors from both research units build short-term outputs into a substantial piece of work, usually capitalizing on the data collected from the externally funded projects. Since in general there are more externally funded projects in F1, this strategy is more apparent in this research unit (29, 32).

However, E1 has also some examples. A senior researcher from E1 participates in team work with different colleagues from different institutions in workshops on a specific theme which will result in a common publication. Such collaborations are possible due to externally funded projects:

Each is responsible for each publication, but it will be presented as the spin off of one results of the outcome of one research project. You can do that by writing one introduction for instance. ... Each year we have a special introduction by an invited editor; that is how you remain responsible for his own article brought in. People are also invited to write something as a real "We are inviting you for doing that part of the job". I think that it is very interesting thing for me. (22)

Researchers also try to aim highest when choosing where to publish a paper. Here prestige, audience, and language of the journal are important determinants of their choices. F1 is more explicit about these considerations than E1.

A junior researcher from F1 states that she follows certain publication strategies. She thinks about the audience, the referees of the journal, and access to a journal. Her aim is first to get visibility, publish in a journal with a wide audience, and have 'easy' access so that it can be published fast. This will increase her credibility first, before going to the top quality journals: "The people who are

now already recognized, like my boss, they publish also in journals like the French *Analle*, *Speculum*, and the more high level things, but that is too early for me" (31).

Another junior also starts 'small' with a conference publication. She plans to submit a new paper based on a project for a journal in English. This will mean reaching out to an international audience, thus language becomes also an important consideration:

But now I am also starting on a different part in a project where I look at law and I think identity in case of Friesians and I do hope to be able to write not in English and yeah, and then see which journal would be best. I can think of a few: "early medieval Europe" would be a good one, with quite broad fields; internationally there are others, which have a bit more standing. (30)

In general, F1 is keener on publishing in English than E1. An F1 professor asserts that there is peer pressure to publish in English and he accepts this:

I will write this book in Dutch and I will make an English translation after that. Because when I am working on this book everybody will ask why I am not writing it in English as well. (32)

In contrast, an E1 researcher is cautious about publishing in English. In his eyes it depends on the subject matter:

If I publish about Middle Netherlands Linguistics, I would normally do that in Dutch journals and I could publish in English for a rated journal once in a while but this depends on the subject matter. (24)

In addition to publications, PhD's are an important output in both research units. Post-docs are becoming important as well. With the trend of shorter projects and less money from the management, researchers see a trend towards shorter post-doc contracts rather than long four year PhDs; this again can lead to more articles than PhD monographs (30, 23).

Quality and quantity

In discussing outputs, both research units touch upon the quality and quantity debate and have by and large similar views. They report that research evaluations and the requirements of external funding bodies to present the list of publications push for quantity of research outputs. Research quality, however, is still seen as very important and therefore they express concerns about the tendency to quantify outputs.

Researchers have the impression that there are more low quality publications, more pressures for quantity, and repackaging of ideas in their research environment than there used to be. They refer in this context to pressures to perform from faculty and university management, and from research evaluations. As a result they see an increasing number of not well rounded papers submitted for publication, as an E1 senior researcher states:

A colleague of mine, he is not a man who publishes a lot of articles; around two articles in three years, but every article this man has published, 20 years ago or now, it is a fundamental publication and will be used as fundamental in the discipline. I like that. Why all this? And that is also my problem with communications on congresses and so on. I do not like to present a paper that is a complete fault; it could take several years before it will be published.... I am confronted with it [quantity and quality debate] every week when I get articles for my journal. We have to say 'no' or 'read this rubbish'. If you say 'no' you almost always have to say why not. It's not all rubbish, it is not fair, but it is not mature, it is not ready. (22)

The hastiness in publishing is also linked to 'repackaging' the same ideas. Writing another article on the same issue is not uncommon, since they have to 'play the game'. In E1 this is phrased in the following ways: "I make another version from the article, who cares?" (23) and, "It does not matter what you write, as long as you write. Let's organize a symposium, let's invite six people, they will present a paper, we put them together and we have seven publications" (22).

This attitude is reiterated by an F1 senior researcher who notices the tendency for 'page counting' instead of looking at the content and he does not find it sensible: "If I publish it here it is six pages longer than if I would publish it there" (29).

And although medievalists 'play the game' to some extent, they also stress that research quality is very important. Both units complain about the tendency that quantity seems to become an end by itself (22, 31). An F1 junior researcher argues that the understanding that quality is important comes with academic maturity, as demands for quality then increase:

Everybody knows you are starting up and it is more important to have something published than that it is fully rounded, etc. And I do feel that it has to be a bit more finished up before I publish it, or make it very clear "okay this is what at the moment I am thinking about and this is how I want to proceed." But of course I cannot do that all the time. In that sense it is a bit more changed. Quite natural I guess. (30)

With respect to research outputs it is clear that all the researchers to a large extent comply with the external pressures of being more productive, or showing higher levels of productivity. Moreover, awareness of where, when, and in what language to publish has grown. In both research units we find individual publication strategies. F1 is more explicit about such strategies than E1. Although the 'quantification' of research outputs is not welcomed at all, the norm of more short-term productivity is accepted and in fact reinforced by personal credibility building ambitions. If you want to have an academic career nowadays you have to be productive ('publish or perish'). Therefore, many medievalists, and particularly junior staff members, increasingly try to write conference papers and articles.

Also professors with high credibility comply with these rules, but they try to balance their output more by writing both journal articles and books. In this respect, their strategy has elements of symbolic action as well. It is predominantly part of a seal-off strategy where they divide their own long-term output preferences and long standing research interests into short-term projects and outputs. In this way they still produce their preferred outputs, such as books.

Evidently, there is no manipulation strategy employed. The external pressures may be strongly disliked, but they are neither ignored nor contested.

7.1.3.4 Teaching-research nexus

Respondents from both groups argue that the teaching-research nexus is influenced by increasing student numbers. There seems to be a tendency towards the separation of teaching from research; they have to increase their teaching loads since the funding is partially based on student numbers. If a researcher wants a permanent staff position, s/he has to teach. The faculty needs to know that a candidate has teaching experience (23, 30). But to gain teaching experience, a junior researcher has to use the post-doc time that is meant for doing research also for teaching. Another factor influencing the change of balance between teaching and research is increasing student numbers. Both units underscore that due to higher student numbers research time has been compromised (23, 31, 32). As a result, a F1 junior respondent emphasizes the lack of space for research:

So I am teaching, teaching, teaching and sometimes when I have 5 minutes of breathing space then I breath and if I have 5 minutes more than I work at a big edition project...we are in the middle of this chaos and it's lots of fun but research is not happening much I must confess. (31)

In terms of teaching and research loads, the situation differs among juniors in the two research units. There are juniors in both units who are obliged to teach a substantial amount of hours (in F1 because of a professor's sabbatical for

example), whereas other junior researchers are mainly involved in research projects (21, 23, 31, 30). Those that concentrate mostly on research are mainly funded by NWO. They have an obligation to teach 10% of their time, meaning teaching is 'incidental.' (30) Junior researchers with high teaching loads, especially from F1, are dissatisfied with the scarcity of teaching staff and the increase in student numbers which has led to a situation where PhD students must teach:

The number of hours we have to teach has doubled, whereas the number of students who want to study has tripled or quadrupled even. And the number of people who are expected to do all this has decreased. You can sort out the puzzle by yourself. I take the junior teaching staff, AiOs, for a drink every week, so they can unload their stories. First years say weird things and these people already, they just have finished their masters. They are getting stressed out with teaching. Of course we try to keep things as relaxed as possible and it is only a quarter of the year and everything, but this is crazy. We really need more people; we don't have enough hands for anything, but still we have to do it. (31)

More teaching also implies an increase in administrative tasks, as experienced in both cases. It can easily 'eat' research time as expressed by the group leader of F1: "It means that you say 'okay' for reasons of loyalty. I will give an additional tutorial to take care of it, but this goes at the expense of the time for doing research" (32). The increase in administrative activities, in terms of more meetings for instance, is also related to the research activities themselves, such as writing proposals for research grants. The E1 group leader is clear about this: "Apart from all the teaching, apart from all the other things we already do, you have to write proposals" (24). Another senior from E1 also emphasizes that the number of meetings and committees has increased due to the introduction of the Bachelor Master structure and this together with the increased student numbers indeed compromises research time. He does not appreciate this tendency:

I think when I look at 30 years ago there was more room and time for research. The organisation, committees, we now have this bachelor-master. Say we have a master group, a bachelor discipline, a bestuur, a board for the bachelor. There is also a committee for the teaching, *onderwijs*. The teaching committee for the Bachelor. We have the corresponding master board and the teaching committee. The research master board, you cannot explain this to people from abroad. The situation where we are working and living in is completely ridiculous. This is also takes time away from research. And it is not only time, but energy. And my predecessors did not have that problem at all. (22)

Overall, respondents have quite negative feelings towards this tendency, since they feel that teaching is at the cost of research time. They are complying with the

teaching demands, but they feel that “new teaching courses get increasingly loosened from research” (23), which is another shift that is not welcomed. Since F1 has high teaching demands, even on juniors such as PhD students, they are highly dissatisfied with the lack of time to carry out research. This leads to growing workloads and overtime during the weekends and their holidays (21, 32):

But I notice that if I want to keep up with the usual matters, then I have to work much more hours than the official office hours and as a consequence of ‘rush orders’ holidays evaporate. (21)

Their strategy is to ignore the official distribution of teaching and research tasks and to work overtime to make sure they carry out research as well. Since there is less time available for research, the traditional outputs in this field such as sizeable books are becoming increasingly difficult to produce. As expressed by the F1 group leader, teaching and administration disturb the concentration on producing research, which results in short papers that require less time (32).

University’s central management has been mentioned in relation to the increased teaching loads and some incentives for the junior staff members in F1 to deal with this. The university’s management has arranged that post-docs can receive a ‘teaching free’ period to do primarily research (although management thinks it is good for post-docs to get teaching experience) (32). In E1, institutional management has also been mentioned in relation to encouraging short-term teaching-only contracts through their funding arrangement of research institutes. A junior researcher is concerned about such staff appointments since if they become ‘only’ teachers they do not belong to the research institute and consequently do not get funding for research:

It is true that it is much stricter at the individual level. For example, there are sufficient people here that have had a temporary contract for years and partly a teaching appointment. They publish small numbers and hence they are not part of the research institute. As a consequence of this, they do not get any money anymore to do research. (23)

This illustrates the tendency to separate teaching from research very well.

As regards the teaching-research nexus we clearly see that the researchers of the two units follow a strategy of passive compliance. In both research units the researchers have noted a change in division between time for doing research on the one hand and doing other things (particularly teaching) on the other. This change is partly due to the increase of student numbers and partly due to the introduction of the BaMa structure. The first simply takes more time (since staff numbers do not go up); the second results among other things in bigger

bureaucratic burdens. Teaching is increasingly taking away time from doing research, especially in F1. But for reasons of loyalty to the job they do what needs to be done in this respect. In such a context, and depending on personal ambition, the researchers choose to work additional hours during the weekends and even give up parts of their holidays to carry out research, and to be sufficiently productive.

7.2 Biotechnology in the Netherlands: cases E2 and F2

7.2.1 *Brief characteristics of the two basic research units E2 and F2*

This section presents several key characteristics of the two research units (information on their organisational nesting can be found in Chapter 5). In the last quality assessment review, based on the Standard Evaluation Protocol (SEP; see also Chapter 4), E2 has been rated by international peers as excellent in all respects. F2, also evaluated through the SEP, received 'very good' scores for quality and productivity and 'excellent' scores for relevance and feasibility. Both units work as interdisciplinary research units where different sub-groups are formed according to different projects. The research units both have an overarching topic that unites the different sub-groups.

E2 has two professors and eight post-docs. F2 has three professors, four other senior scientists, and 16 post-docs. All researchers in E2 are affiliated with one research institute, whereas in F2 several senior researchers have joint appointments in two research institutes and different departments. E2 works in the field of functional genomics and F2 specializes in proteomics.

Both units collaborate with universities and industry at various levels (regional, national, and international). Most academics in the units have a strong preference for research. In this respect they qualify themselves above all else as researchers. Without downplaying the importance of teaching, this part of the job is frequently seen as an additional time consuming activity that distracts them from doing research. In both groups it is absolutely recognized that research is crucial for the reputation of the researchers, the research units, the research institutes, and the faculties. F2 is in better shape than E2 in terms of financial resources; they are part of a bigger research network and their leader has received a big national project that provides funds for upgrading equipment. F2's university has a special fund for multidisciplinary projects that supports this group in part. According to the unit's leader, F2 is in a rather prosperous position compared to many other units. E2 perceives itself in a financially viable position as it has secured high second and third flow of funds but its faculty is under

financial strain. This has consequences for the research unit. They cannot hire new staff, even though the group itself is self-sustaining thanks to external funding sources such as research grants and projects.

7.2.2 *Perceptions of the institutional environment*

7.2.2.1 Funding

Research funding is the major concern for all researchers since it is directly linked to building credibility. Credibility is important for their position within the academic community, vis-à-vis external funding bodies and university management. The two research units have rather similar perceptions of the funding situation. All respondents emphasize similar changes in research funding: they see a decreasing first money stream that is reduced to about 20% of their overall income. Thus, they have to fund their research via bigger shares of second and third money flows, including more contract research (27, 33). Although the two research units are positive about their own financial situation and their ability to obtain external funding, they are at the same time concerned about the decrease in university funding (first money stream). The main reason for the decline is due to the reduction of state funding to universities, as expressed by the E2 professor:

The funds from the Hague have become less and less over the years. While they talk about knowledge economy, they do nothing about it in my perspective. This means the CvB keeps receiving less funding, and this small amount is being divided using a certain distribution formula. This leads to us working as hard as we can to get funding. We managed to create a crew of fifty using all types of corporate funding and international fame. (26)

The declining budget of the university is also felt at the faculty level. The financial situation at the faculty is described as worrisome. One measure taken to deal with the financial constraints is that faculty management has decided to stop hiring new staff and paying for new PhD students. E2 and F2 see a number of reasons, apart from declining university budgets, why their faculties are in financial trouble. First, they point to decreasing number of science students – a well known problem in the Netherlands for years. And since student numbers are a source of income that partly cross-subsidizes research, declining student numbers are a financial threat. Second, they mention high energy bills for which they are insufficiently compensated. Third, they witness ever-changing ways of calculating the budgets. The junior respondent from E2 is very explicit about the budget cuts:

I do not remember all the memos we have got, but the general impression is twofold. First of all, there are not enough students coming in which might be due to the fact that they do not do the acquisition of students, they do not handle very well. This building is very costly, so there is also a big problem with the energy bill. The energy goes up and they are not compensated for it and get less money from the department. And the other thing which I've heard unofficially is that for the money thing they only look at the first money stream, the students, and this department is very efficient in attracting second and third stream money but this is not counted. And you have to give money from this project to the central level which you never see again. Then, there is money that you get if a PhD student graduates but that is a fixed amount and everybody wants this money. So, some faculties certainly start to produce a lot of graduating PhD students so that they get more of that money, which means that as the total money is fixed, this faculty also gets less money per graduating PhD student. So they start with calculations with a certain amount of income and it disappears. (25)

Obviously this researcher (several of his perceptions are supported by his colleagues) is both worried about and unhappy with these changes that affect the financial position of the faculty, and ultimately of the research unit. Rising costs and contract-related performances are not compensated for and uncertainty exists on how university rules for allocating budgets will affect the research unit. In trying to adapt to the new rules of the game, or one might say in order to survive in a tough environment, research units have become more active in securing second and third stream funding. They increasingly have to turn to external donors such as the NWO, the EU, other governmental agencies, and industry.

Among these donors, NWO is the most common sponsor of research activities and research infrastructure. All respondents are involved in a wide variety of projects funded by NWO programmes for basic and applied research, such as open or thematic competitions or special initiatives for infrastructure development (27). For example, E2 has an NWO grant that covers infrastructure expenses and various projects for PhD students. In this case, the acquisition of NWO grants led to the establishment of a new research area in E2 (27):

I was lucky because I started putting the most emphasis on genomics. I set up *transcriptomics* in this group that was non-existent; I stepped in it and it was a new field. There was a nice publication. We were one of the first in the Netherlands so when I applied for funding at NWO for equipment, it worked out. So then you start looking for where else you can get the funding and there were several nice genomics programmes like IOP genomics, genomics centres, as well as additional themes of NWO. So you apply... there where a lot of chances for application for applying for funding. That was not too bad. (27)

For F2 the strategic choices of the government to financially support research in genomics have been very important. The Netherlands Genomics Initiative (*Nationaal Regie-Organ Genomics*) has been very important for developing the infrastructure of the research unit. This national initiative is supported by substantial amounts of money and opportunities. Because F2 is part of a large centre of excellence related to the Netherlands Genomics Initiative it has a constant boost of funding for both expensive equipment and junior research staff (35).

The EU Framework Programmes have also been mentioned as another funding source. The overall observation of the researchers is that they see a decrease in EU funding for biotechnology research (28, 35). For example, the junior researcher from E2 notes that EU funding has been decreased for their particular field of research:

EU has been low for the last three years. There is some EU funding. We have two main organisms. One is a soil bacterium, the other one is used in dairy industry for making cheese. And the one for making cheese the EU stopped funding more or less five years ago. We got a huge amount of money for that. But for the bacillus there is still some money from the EU. But it has reduced over the past 5 years. (28)

Although several researchers criticized the EU-based projects, for instance because they are not seen as ‘academically challenging’, they all agree that they have to be involved in this kind of projects on a regular base. For E2 the money attached to it is important; for F2, according to their head, the money is less important (because of their healthy financial situation). Another reason to be involved in EU-project relates to visibility. There is a perceived need to ‘show yourself’ at the European research market (28). Not doing EU-based research projects may affect the research unit’s reputation.

Besides national and European funding, substantial amounts of third stream funding come from research projects carried out for, or in collaboration with, industry and foreign foundations. Both research units work with industry on diverse short-term and long-term projects (25, 28, 33, 36). These projects tend to have a more applied research character (28). According to the professor from E2, industry has always been an important funding source for their group.

In terms of funding, we find thus a mix of individual projects and large scale initiatives (35, 27). Projects are not only important for the group as a whole but also for individual researchers, especially juniors, since these funds give them flexibility to choose the group and an edge in bargaining for permanent positions

as a junior researcher from E2 notes (25). Most of the junior researchers, in fact, are funded on the basis of individual projects, mainly coming from NWO (28, 35).

The funding from the research council has always been competitive and reputation of applicants has always been important. Junior researchers believe that project funding was less open for them in the past. Recently, chances for junior researchers to go independently or in collaboration with a professor for successful funding have increased (28).

Drawbacks of internal and external funding

Both groups talk about the drawbacks of internal funding, such as the decreases in the first money stream (and one of its accompanying effects of vacancy stops). They also express concerns with respect to external funding, especially related to NWO and EU funding schemes. Increasing accountability measures and bureaucracy attached to the funding schemes are seen as the main problems. Further concerns include the increasing competition supported by the Dutch government with the aim of 'picking winners', which may result in an undesirable Matthew effect.

Not surprisingly, a common complaint expressed in both groups is the dissatisfaction with the faculty budget cuts and their implications for the research units' staffing policies. The repercussions of the first stream money decrease are noticed in both units, despite their good research performances. In F2 there are less junior positions available compared to the past: "But due the financial troubled waters the faculty is in, we have only one position that can be filled. So it's half from what it used to be. So that's a change" (36).

This opinion is shared by a junior from E2 to whom the vacancy stop reduces the chances to further pursue a career and continue to work in this group (25). Juniors worry about their employment and career prospects. The budget cuts also affect the senior staff members who are going to early retirement in E2. The faculty is going to be further reorganised, even after 50 people left their jobs last year (28). In such circumstances research leaders worry about the continuity in their group, the loss of expertise due to more short-term contracts, and the lack of employment/career prospects as a senior researcher from F2 explains:

What I do worry about is the erosion of the 1st money stream. There is a shift towards more temporarily employed staff. In principle I am not against this trend because we also have many people who are stuck in their job, but it often boils down to us training someone for two years, having him work with us for one more year and then he leaves. This erosion of the core, that's how I look at the 1st money stream, is worsening even with all the initiatives flying around.
(33)

Another concern in the two research units is about NWO's funding system for AiOs. Their salaries are funded by NWO but other costs (overheads) are not. They bring losses to the faculty and the research units because not all related costs are covered. Matching such NWO-grants within the university or faculty is increasingly difficult. According to several of our respondents, PhD students have become too expensive, stated clearly in F2:

The faculties are no longer that happy with the NWO funded positions. While they are prestigious they do not fully fund themselves and we make a loss on them. The salary is accounted for, but a typical AiO will spend around €10-15,000 on consumables, as we call it. The compensation we receive is only €5000, so that is a loss. (33)

Another concern in both units that is related to external funding is the increase of external and internal accountability measures in research. The higher levels of accountability lead to more bureaucracy in the everyday activities of the researchers. Most respondents say that they have to write detailed progress reports. To a large extent this has become a routine procedure for researchers (25, 28, 35, 36). Senior researchers are concerned about the increasing system of 'checks' in science and writing down the work hours:

They want to monitor if the money is being spent in the right way of course, and the managers and the accountants will check if what you've written down in hours compares with your deliverables. If you did not make it, you will say so, but science just doesn't work that way. In my PhD research, the first year was really hard, nothing happened. But if I had made milestones and deliverables beforehand I would have quit after one year because nothing had happened yet. You see that a lot in the first year, and then in the second and third year things really speed up because you pass a certain bottleneck. This is just the way it works. (26)

One of the major contributors to accountability hurdles as perceived by the researchers are EU projects (26, 27). They express dissatisfaction with the bureaucratic funding procedures related to the EU funding and with the political aspect of obtaining the grants. The group leader of E2 explicitly argues that mediocrity is favoured by the EU funding schemes and that sometimes 'relevance' is more important than quality. His major concern is that it is not the quality, but the political priorities that are taken into consideration when making the funding decisions at the EU level, which he finds frustrating:

I know some very bad European projects that have been funded. There are also very good ones. I know some very good scientists that no longer apply because they don't like that system and they say, well, mediocrity is favoured and not

the best because there is always this applied and economic aspect; they look very much to socially economical relevance as not always selecting the best scientist. It's also selecting the scientist that can make the best promises and promise a very good effect on economy. What they don't like is the evaluations. It's a big bureaucracy. Their evaluations are enormous but they don't do anything with it because the same groups that don't perform well are funded the next time again. So it doesn't serve a purpose, this type of evaluation. Bureaucracy is really awful I think. (27)

Another concern shared by E2 research unit's researchers (but not expressed by F2) is the governmental strategy of 'picking winners' in national research funding initiatives. E2 sees the creation of centres of excellence initiated by the government as a threat for small research groups such as theirs. The professor is afraid that being out of the 'network' rated as excellent will mean less funding from the state, even if the smaller units (also) perform at very high levels:

What I see as a big problem is not so much the competition (they are better than us), but the fact that these top institutes (centres of excellence) were set up to make it easier for the Hague to make their funding transparent. It means they do not have to check every time; they can do it with their eyes closed.....that is a bit negative. We try to claim exactly that, even though it's not a very good point. We are now very flexible and so on and we try to score on excellence and you apparently do not need a top institute for that. A possible danger of this policy is that if from the fixed amount of funding half or more goes to the top institutes, there's not so much left for the individual groups/small groups. (26)

Selective funding is an issue here. The E2 group leader draws attention to the political aspects of selecting the 'winners' rather than looking at the quality of a group. He is quite sceptical about this strategy:

In principle it's not a bad thing to make centres where all kinds of expertise are brought together. But of course there is a high political arena around that: who can be in and not. If it would be an honest system yes, but in reality it's not only about picking winners. It is picking the best lobbyist and so it's not always based on quality, I would say; the overall proposal perhaps, but not all the participants. It's where you are and how your faculty and your CvB, how good they are in getting their foot in the door in such initiatives. (27)

In contrast, F2 is not concerned about this governmental strategy of selective funding. This may not be surprising, given that they are part of the Netherlands Genomics Initiative and are regarded as a 'centre of excellence'.

Interestingly, despite the financial troubles and complaints as regards personnel policies, both units are positive about their own research unit situation,

performances, and future prospects. They see themselves as financially and scientifically viable, as the head of F2 states:

It is going really well with our group. It keeps on growing and financially we have no worries. We spend enormous amounts of money but we receive even more. These types of concerns are not relevant for us at all. I almost feel ashamed saying it, but it's just going really well, financially and scientifically. (33)

7.2.2.2 Management

Another important element in the institutional environment of E2 and F2 is the university's management. The importance of leadership and management at the faculty level has increased over the years, embodied in the changed role of the dean as his influence on the personnel policies for the research units has been strengthened. The units are concerned about the impact of university and faculty policies. They express this when talking about the pertaining incentives, such as additional staff positions, returned overheads, or matching funds during the interviews.

In both cases the faculties face financial constraints, as described in the previous section. The major tools of university management are clearly geared towards improving the financial imbalance in the faculties. This is particularly true in E2, as the research unit leader underlines in the next quote:

At the moment, we are facing cutbacks at the faculty of natural sciences. The faculty has a strong opinion about where you should continue and where perhaps not. If we talk about reorganisation, then the faculty has the main say I would say...[The faculty has a say] with the first money stream, with the staff, and the technicians. (27)

But at the same time, he acknowledges that the faculty's power is limited to some extent, since the basic units have other financial resources that can not (easily) be influenced by faculty management. The research unit's have some room to manoeuvre: "But at least for your second and third money stream funding you can decide by yourself of course. That's per basic unit; you make your own strategy" (27).

E2 has experienced a number of disincentive management instruments used such as reorganisations, early retirement, halt of faculty positions, reductions in funding, and changes in funding rules. For example, due to the faculty's budget deficit reorganisations take place. As a consequence people are 'asked' to leave (26, 28). Seemingly, faculty management adjusts the financial mechanisms:

We are in a difficult position [with the faculty] because there are considerable deficits that are already leading to large cuts; people go on early retirement. They are looking to make cuts wherever possible, either by proportional cuts or targeted cuts. (26)

F2 researchers do not mention 'early retirements' as a faculty policy measure. They are mainly concerned about the reduction of new, university-funded PhD students.

Further, university management in E and F use a number of instruments to facilitate and guide the research units such as peer-based quality reviews, performance evaluations of individual staff members, and incentive mechanisms related to these evaluations. First and foremost, the research unit's performances are evaluated through the Standard Evaluation Protocol. A self study is followed by an external review of international peers (visitation committees).³⁷ University management also fosters the monitoring of individual research performances through yearly appraisal talks with researchers at the unit level (28). Performance is discussed with his or her superior, a change from the past. In the 1980s more informal talks were common, and individual evaluations were seen as a formality if they took place at all. These days, staff appraisal talks are mandatory in the research units, though the routines differ from formal meetings to informal conversations about work progress (25). The majority of researchers do not attach too much importance to the appraisal talks. One junior researcher from E2 feels, however, that it is very important to record the responsibilities and the outputs produced, as it can affect future promotion possibilities. He prefers to have a more structured evaluation as he wants to be able to demonstrate his performance. He has experienced that promotion was impossible because of the lack of performance evidence and the lack of permanent posts at the faculty:

I didn't have proof to show that I did more tasks than what was defined. In order to show to our faculty board that my function should be defined higher than it is defined now. But then still it would have been a problem because I would have been defined on a higher paid level than I'm positioned. There's money for a post-doc and not for one step higher. I advise everyone now every year, please go and have your talk because then you have proof. Now, I always have in between talks with the professor. (28)

University management provides certain incentives when a research unit as a whole performs well, both in E2 and F2. The management incentives used to

³⁷ The reviews of the 'visitation committees' are described in more detail in the next section.

award good performance and cooperation include returned overheads (26, 27), new junior staff appointments on the basis of good results of evaluation (26), special funding initiatives for multidisciplinary projects (33), and the provision of matching funds (27, 28, 33):

[Faculties] have set aside five percent of their budget and the CvB has committed itself to double this amount which was the reason they participated. This created a budget of €130 million which was then used for inter-faculty/research group research. This has encouraged the communication and the cooperation internally. This is the policy not saying to researcher A and B to cooperate with each other, but they come up with a proposal themselves. The X fund will then decide whether they support the proposal. This makes it a very bottom-up approach, but the possibilities are being created. (33)

Further, in both cases university management encourages the units to commercialize on their outcomes, for instance through patenting. For this purpose the two universities have patenting offices designed to support the researchers in patenting processes. Such facilitation attempts to stimulate the research units to apply for patents. However, instead of being an incentive, some respondents report that it may have the opposite effect. The leader of E2 speaks of hindering the patenting practices. He negatively perceives the activities of the patenting office, because they operate too rigidly:

I think personally our university is very bad in imposing rules about patents. They think they know it but they're very bad. They make very bad deals and we never see a penny out of our patents from the industry. So the incentive to do so is decreasing, I must say. I think we know how to do it, but our CvB has made a sort of patenting and licensing office. And they would take care of these things but they make such crazy demands to the companies that things become counter productive. You lose your assignments with industry because of these lawyers that spoil the whole business, I would say. It's very bad in fact. (27)

Similarly, F2 are not keen on following the encouragement of university management (CvB) to patent. In fact, they more or less ignore and oppose it.

Personnel policies

Personnel policies are the area where the role of university management stands out. In both F2 and E2 university management is very active in this respect. The increased importance of the role of the dean in staff appointments is frequently mentioned, especially when it comes to appointing senior staff (27, 28).

Researchers in both groups observe a growing number of rules concerning staff appointments over the years. The regulations include the increased

requirements for new positions such as international experiences and the ability to attract funding and produce research outputs such as publications (28). University management personnel policy has also changed in terms of kind of appointments: the researchers witness a shift towards more short-term contracts rather than permanent positions. A rather new initiative concerns the introduction of the tenure tracks that accompany the abolishment of traditional positions, as a junior researcher from E2 explains:

Our faculty for instance skipped all university teacher (UD, UHD) positions. There no longer available, we only have tenure tracks. So, you only enter on a tenure track, which is a non-permanent position for the period of 10 years in which you have to qualify in different steps that you are able to set or develop your own research groups. So you have to take care of funding, you have to write so many papers, you have to supervise so many PhD students in a certain time period. And then you *could* end up as permanent. You could because there are these statements that if you don't fit the selection criteria, then you're obliged to accept this or you have to follow an outplacement. (28)

In E2, this policy on tenure tracks is complimentary to faculty policies on early retirement, 'golden handshakes', and bigger personnel restructuring within the faculty. Post-doc positions have become popular in this context. They have short-term contracts and are an important part of the academic workforce (26). Another reason expressed by researchers from both groups for more short-term contracts and the consequent lack of continuity, relates to national laws on academic employment. These laws oblige universities to employ staff on a permanent contract after a certain number of consecutive temporary contracts. This is not appreciated by seniors and juniors in both research units, since it leads to a lack of continuity in research (27, 28, 34). A junior researcher from F2 points to the perverse effect of the rigid employment regulation, that instead of protecting junior researchers in fact increases their likelihood of moving away from a particular group, since it cannot easily offer a permanent position:

You are only allowed to work so many years in the university. This very annoying law is a big hindrance for a lot of research. It's the stupidest they could have done. On the one hand it makes sense that there is some protection. The five year period or three contracts and after that they have to hire you, but it has the opposite effect: after three contracts or a five year period they throw you out. I don't think this achieves what they wanted to achieve. It is really the stupidest thing they could have done. (34)

Opinions about management

Generally speaking, researchers are predominantly negative towards management interference, though they also understand the sometimes difficult position management is in. The researchers of F2 are by and large more neutral and less explicit in their judgment than their colleagues from E2. Some researchers are very outspoken when university management is discussed. One E2 researcher metaphorically refers to management as a cancer that rapidly spreads all over and disturbs the lives of academics:

My proposition is that if you have to use managers, that's the beginning of the end. You have to arrange everything in such a way you don't need managers. Managers will provide work for themselves. It is just like cauliflower, it expands enormously, really like a cancer. (26)

The discontent comes from academics who critically perceive university management instruments, especially personnel policies and financial measures. Both E2 and F2 researchers are negative about management measures that concern restructuring, vacancy stops, and fewer permanent positions (27, 36). They are anxious that reorganisation leads to unintended effects. Decisions may easily have counterproductive effects over time. It is for instance difficult to predict which fields of research will be needed in 20 years' time. The restructuring has to be done taking the long-term developments in different research fields into consideration. The role of management is not denied with respect to such issues, but in the view of both groups, university management has to be careful when restructuring their institutions (particularly if this implies the closing down of research units):

I think they come in where the faculty board has to make the proper decisions because this competition is nice and works within a field where there is money. But if you go to the ecologist now or those working with fungi, for instance, there is absolutely no interest. But we can not predict now what will be of interest in 20 years time. And as a university you have also the obligation to maintain the fundamental interest, the knowledge interest, because knowledge is what it's all about, in time. And you cannot throw away everything and build it up later again. And there you have to find your balance and that's for the board to decide. (28)

University management is also blamed for not doing enough to facilitate cooperation between the groups, not being able to adequately match external funds, and poor incentives for producing research outputs (25, 26, 28). A professor from E2 finds the university's financial support "abominable" (26). He also ridicules the management's requests to focus on 'routine research' and

complains about the increased amounts of paperwork and bureaucracy that block creativity:

The amount of paperwork has increased exponentially and a lot of it is nonsense. Of course, societal relevance is not unimportant but it has become a predominance over what to me really matters; scientific relevance. You have to fill in what your deliverables will be three years from now, that is almost a contradiction *interminis*. If Fleming had worked this way, penicillin would never have been invented. (26)

The increasing bureaucracy is seen as annoying by several interviewees. E2 for instance performs excellently and has enough external funding. Nevertheless they are bothered by management requests to account for the things they do. Their misfortune is that they find themselves in a faculty with budget problems. This affects the researchers in a negative way. One of the researchers' concerns is that several management-driven processes are not transparent. The professor from E2 raises the problem of transparency and secrecy in respect to their university management. The management's pressure to hide their output indicators is not welcomed in E2:

Numbers per unit were not published, because the CvB did not allow that. A lower evaluation can have negative effects. This has been the case in the past. They subsequently do not advertise the results. The CvB is always talking about Cambridge or Oxford on the [canal]. We all have to be in the top. If you look at my faculty, where there are some research schools that all have good evaluations, and you look at the evaluation, we are world class. But what do they do, they cut instead of fund more. (26)

At the same time, researchers are rather neutral about the yearly individual-based research performance evaluation that staff members have with their superiors. They do not see this as a burden but rather as a friendly informal chat with the professor (27, 35, 36). A professor from E2 refers to time writing as a management failure since researchers can not comply with this requirement: "No we do not do time writing. Time writing was once an issue, but that would be ridiculous" (27).

E2 and F2 are nevertheless positive about their financial situation which is the result of high second and third stream funds. A group leader of E2 proudly states:

But as a rich group we don't have any problem at all. They [institutional management] can do whatever they want on there; we could nearly set ourselves outside and hire this building and continue. (28)

They succeed in the market and therefore are financially viable. Despite the financially healthy position in both units, dependence on the university management still exists due to overarching management policies. This is not welcomed by the research units because excellent performance/evaluation outcomes protect them from cuts at best, but does not lead to further support from the university management.

7.2.2.3 Research evaluation

Research evaluation is another important topic for the research units E2 and F2, as has already been mentioned to some extent in the previous sections. All respondents underscore they undergo two major types of evaluations: self-study and visitation committees (following the SEP), and yearly staff appraisal talks. The first type judges research quality of the research unit; the second provides an overview of the individual activities carried out during the year and activities to be done in the (near) future.

Both research units are evaluated as parts of the respective research institutes and faculties by a visitation committee every six years. The peer-based evaluation takes place by 'randomly' interviewing staff and leadership of the unit (25, 28, 33, 36). The visitation committee assesses, among other indicators, the publication record (26, 35). Both groups find these peer-based evaluations important, especially for reasons of visibility and credibility building. For example, the units display the results of the last evaluation on their website and extensively talked about it during the interviews. One reason for doing this is building reputation for their financial backers.

The common opinion in both units is that the evaluation results influence future research funding. Officially evaluation results are not linked to the state's funding mechanisms for research. Nevertheless, demonstrating good performances may be noticed by potential research sponsors. A junior from E2 says: "The truth is it does, in every application. I'm also writing now for NWO and I will write that we are the best, excellent in all the tasks and the techniques" (28).

Similarly F2 researchers underscore the indirect influence of evaluation results on obtaining grants from NWO (33, 35):

[Research evaluations help] get granted projects. From NWO, that is fair because these reports tell them you are excellent, and if you are excellent, people can trust you if they give you a project. If you are not so good, there are doubts if the quality of the project will be the same as with the group that is excellent. I think that this is the way it works. (35)

Thus, both research units view their track record – and the confirmation of it by international peers – as an important factor that helps them secure NWO funding. The overall opinion is that NWO looks at quality when they allocate research grants (27).

Besides the peer-based evaluations of the research unit's performances, researchers from both groups mention yearly and sometimes even monthly staff appraisal talks with the faculty management and/or group leaders. The appraisals include the so-called *functioneringsgesprekken* to get an overview of work in progress, look at the produced outputs, and plan for future work (33, 34). These evaluation routines are perceived differently in each unit. E2 has a formalized procedure, but mainly PhD students are required to participate. A post-doc from E2 says:

Nowadays we have a new one, *functioneringsgesprekken* and the POP, Personal Stimulatory Developmental...To be honest now I haven't had one since I'm a post-doc. We do have talks now and then. (28)

E2 is relatively small and informal and researchers meet with the professors on an informal basis to discuss work progress. In addition to the formalized yearly meetings in F2, the leader of the research unit organizes regular meetings with his staff. For example, despite the large size of the group the unit leader organizes monthly meetings with each researcher for discussing his education and research activities. In his view, the researchers appreciate this:

There are weekly conversations with people about their research and also about education. R&O meetings are once a year and during these meetings you don't talk about details for once. I do keep a close check on everybody, this may sound negative but the staff has asked for this and they value these 'Wednesday meetings'. (33)

In addition to the aforementioned evaluations, some researchers see the progress reports required by NWO as part of the evaluation of their work. A junior respondent from F2 notes:

If you are in a project or you are paid for a certain study, you will have to write a progress report at some point in time. You have to be accountable for it. I agree with this of course, if you write you will also write 'go-no go' and milestones you have to keep in mind. This is also the case for a project like that and this means you are being evaluated on these types of issues. (34)

7.2.2.4 Competition and cooperation

Competition

Both units are experiencing increasing competition for resources partly due to the changing funding policies, partly due to the developments in the field of biotechnology, and partly due to personnel policies of university management (28, 35). External funding is the key determinant for increased competition in both groups, since research cannot be carried out without project grants. They refer to more competition in finding permanent positions in the units and receiving stable external funding for their research due to the expansion of the field of biotechnology. The expansion of the field implies more researchers who want a piece from the pie. According to the F2 senior researcher this is evident from the increasing numbers of participants in their conferences:

We have an annual conference in America, and if you see the number of people attending this meeting every year, and if you take it as a measure of people working in this field, then it really expanded. I hope it calms down sometimes a bit. (36)

A first common concern in both research units is the competition for permanent positions. This is especially emphasized in E2, because there are not many other employment possibilities in the field due to their geographic location. A junior researcher from E2 states that competition for posts is severe since the supply of recent PhD graduates exceeds the demand in that part of the country. In her view, this competition is positive; selection for permanent posts is something to be valued:

Our professor always has the freedom; everyone can apply so there is no selection beforehand who can apply for something. Everyone goes. There was a certain moment when there was competition because a university UHD left. So then a position was available but our faculty decided not to fill in this position with a new... There was internal competition but that's also good. There has to be selection. (28)

Competition for funding is usually referred to as competition for external funding from national or international agencies. There are concerns about such competition. E2 is rather anxious about the low success rates with respect to grant applications and the increasing number of competitors in the field. The E2 group leader is clear that competition is a difficult game to play:

It is tough competition. It's never easy I would say because competition is always fierce and microbiology is certainly not the most, the largest field in the Netherlands. (27)

At the same time, they do not complain about their funding and admit that they are quite lucky: "We had the wind in the sails" (27).

Besides the competition for research grants from the NWO and the EU, units also mention the competition for third party contracts with industry. This is especially the case in E2, as they are a small group. They find it difficult to compete with big institutes:

What I see is that we feel the competition of the large institutes like X because all the industries support that. So we like to have industry support, but if I say I want to do systems biology on *lactococcus*, they say, "Yes, okay we are already doing systems biology via this large institute", because they claim to do it and they are large... I think that kind of competition is a bit of a threat for us. (27)

The competition for funding is something that the research unit is definitely aware of and is trying to find ways how to deal with it. In the case of this particular threat from bigger institutes, the group leader follows a strategy of becoming a part of a bigger consortium to collaborate with these big institutes:

One part of my strategy is to be part of that. I see also the drawbacks of being part of a big administration and the bureaucracy, but on the other hand at least you talk and you get to meet all the people in the food industry and in health industry; otherwise you're a bit of a small village. (27)

This indicates that competition is closely linked to cooperation and strategic partnerships, which is also perceived as ingrained in the research unit's existence in both cases.

Cooperation

Researchers in E2 and F2 are open about their teamwork related culture. Cooperation with each other and between different groups is seen as essential. Researchers of both research units collaborate in different projects within the unit. E2 indicates less cooperation with other groups in their university than F2. External cooperation is prevalent in both groups, especially with other universities, hospitals, and industry.

Generally researchers are eager to cooperate, mainly because of the nature of their research that requires expertise from various angles. They work in multi-disciplinary teams, publish together, and share facilities with other colleagues. However, the two cases differ in terms of internal cooperation between the

groups in the same university. In F2, researchers cannot work without cooperation in projects, since they are a more technical group and require links with biology or chemistry groups. Therefore they have numerous internal project teams within the university. A professor from F2 puts it straightforwardly:

There is quite a lot [of cooperation]; actually in all projects. That's mainly because we are a technical group and to get biological questions and samples coming in we need collaborations...The type of research we do fits quite well. We have other research departments in chemistry but also let's say in medical school or veterinary science. There is a very good communication to these. It's not like thick walls between them; there are a lot of collaborations. (36)

E2 is less cooperative with other groups in their university. For example, a junior from E2 thinks that the research unit is quite isolated:

Within the group [cooperation] is okay. You will find your experts but among the groups within the university it's an organisation of islands. Everyone has his discipline and everyone wants to be the expert in and the cross interactions it's minimum quite often. That's a disappointment; I think that's where the university loses a lot of its strength or potential, additional strength. (28)

In addition to common collaborative projects within the group or between different groups, researchers also cooperate through sharing facilities. In E2, it is rather preconditioned by the organisational structure of the research institute, since there are 14 groups in one institute, as described by the group leader. They use the facilities of other groups when they need specific expertise or they welcome other groups to use their laboratories (27). Such cooperation is seen as an advantage and is well organized within the research institute (26). The group leader also argues that although the dean does not approve of big interdisciplinary groups, E2 prefers this type of organisation and its cooperative nature. It facilitates facility sharing (27).

Sharing facilities is also common practice in F2. They welcome people from both inside and outside the university. Senior and junior researchers are positive about this practice. They call one of their assets 'a research hotel', as described by the group leader (33). The idea is that it is open for colleagues from inside and outside the university and even from industry and results in more interaction and a positive research culture. According to the professor, there is "a lot of communication" going on (36) and it is seen as one of their strengths (34, 35).

All the researchers underline the importance of the various forms of external cooperation that stretch from bilateral cooperation to big consortia (28, 34). At the same time, both units express concerns about cooperation with industry. Most of these concerns relate to issues of ownership and the publication of research

results. A professor from E2 draws attention to staff appointments. For them it is important to keep their own freedom to appoint staff in collaborative projects with industry, so that they retain their human capital within the group and avoid disturbances among different companies:

We collaborate with many different companies, national and international. But we do not want anybody from these companies working in our facilities. The reason for this is that you will then have someone from, say, [X] saying: "Hey, that is someone from [our competitor Y] who is working there". [X] has a project here as well, so we want to assign our own post-docs, AiOs, and analysts on these projects. We want to assign them ourselves, so they have no link to the company. This is how we can guarantee a certain level of secrecy. (26)

In F2, industry cooperation still is seen as an inspiring exchange process, which the group leader finds stimulating. There has to be mutual commitment and the two parties have to be on speaking terms, otherwise it does not work (optimally):

Yes, we are really collaborating. I think this works better. You should inspire each other in this type of research. The industry shouldn't only check and we shouldn't only listen. Ideally this requires commitment of both sides to be able to give scientific input and execute the plan together. If they give us a certain amount of money for some analysis, and will not tell us what it is about and only ask for the data, I won't accept the assignment. And let me stress this again [we can do this], because we are in such a good position. (33)

Other major cooperation partners are Dutch and foreign universities. In general, both research units are very active in such academic partnerships and are positive about the development of these networks. Although EU-projects attract a lot of criticism in both groups, the opportunities to build networks and work with research units from other universities are appreciated. In this respect, they are regarded as stimulating (26). They create an opportunity to expand the horizons for the group and especially for junior researchers:

[Cooperation] mainly for the networks I would say ... and also it gives very nice opportunity. It's a big stimulus to PhD students and post-docs because they also are in a scientific community, so it's very nice to visit these groups and countries. You learn from each other. (27)

But once again there are also less positive sides to the EU related cooperation. The respondents refer for example to the lengthy processes and many political imperatives. Research units dislike the amount of bureaucracy and the criteria

that the EU uses for cooperation. First, the collaboration projects take time: “We do in fact a lot of collaborations and that’s also taking a lot of your time, only in travelling and going to all the project meetings; that’s one of the burdens” (27).

Moreover, the selection of partners in the European projects raises many eyebrows. Some of the researchers believe that this is usually led by political rather than scientific imperatives; a practice unwelcome by the researchers of both groups. The group leader in F2 thinks that without the EU-criteria for selecting and rewarding collaborative projects, cooperation would much more establish among similar countries with similar science models. But because of EU priorities, they have to adjust and find new partners in countries with whom they would not have collaborated otherwise (33). This opinion is shared by E2, who also signal the (undesirable) political aspect of EU project related cooperation (28).

7.2.2.5 Pressure to perform and work intensification

Without exception the respondents in E2 and F2 report increased pressure to perform and increased workloads. The majority of respondents in both groups indicate that the pressure comes from individual career ambitions and the diversification of their job responsibilities at the university. The pressure to perform results in constantly increasing workloads.

Currently, a researcher is supposed to perform multiple tasks. Besides work in the laboratory, they have to write grant proposals, teach and supervise students, write reports, attend meetings, and write and publish papers and articles (28). All of this has to be achieved within a restricted timeframe, which means a serious challenge faced by many researchers. One professor finds it difficult to deliver high quality proposals within restricted time-frames that in his eyes are sometimes not very fair:

The Hague [the government] will deny this but the following happens. Suddenly, an amount of funding, €100 million is available. A few people who are well informed about the new funding scheme know the content roughly and are already working on proposals. I think this is all pre-arranged. I only have one or two weeks to jump on this train, which means I cannot prepare for it and have to do second rate work by using something that has been lying on the shelf to write a proposal on time. The chances for success are pretty slim. But the €100 million are divided and the Hague can say: “Look!, we invested another 100 million in our knowledge economy” but in the end you [respondent] weren’t able to participate seriously. (26)

Lack of time in relation to work pressure is also noted by other colleagues, indicated by statements such as “the week is always too short” (25, 26).

Researchers in both E2 and F2 attribute personal career advancement as the main reason for the pressure to perform (25, 35). A key motivator for juniors to perform well is the prospect of getting a tenured position. A researcher from F2 shows in retrospect the change in the pressure to perform since he was a PhD student:

If I look at myself, I think it changed. Looking at my scientific career, PhD, post-doc, then assistant professor. As a PhD student no pressure at all basically, post-doc became more, and now it becomes even more because people expect something from you. ... You publish quite a few papers and the more papers you publish, the more people expect from you so there is a certain pressure; absolutely. (35)

A second important pressure to perform comes from the motivation to get funds for the unit (25, 26, 35). Researchers appreciate the trust given to them by the research unit as regards their capabilities and competencies, but in return this means that they feel an obligation to give something back, whether it is external grants, publications or other outputs (35).

Due to the diversification of activities the workloads have increased in both research units. E2 is concerned about the numerous tasks, particularly since their senior staff capacities have been reduced, which results in more work for the rest of the unit. Understaffing becomes a real problem:

We have one UHD [senior lecturer] who retired two years ago and we are not able to fill his position because of financial problems [of the faculty]. This means for education and research that the entire show that used to be run by three persons is now run by only two persons. This creates enormous pressure. (26)

Nevertheless the majority of respondents are rather neutral about the increased pressures to perform, although there is a hint of dissatisfaction from junior researchers about the increasing workloads in E2. But generally speaking researchers are trying to cope with the situation instead of complaining about it all the time. One professor from F2 finds it even stimulating. He thinks it is a dynamic work environment for him:

It is difficult to ask that to me. If you would ask someone of say, sixty years old, you would see big differences. I am quite used to it by now. There are times I'm jealous when you hear the stories of how it used to be. But I also think the current situation is great; more dynamic. (33)

Workloads may have gone up but many Dutch biotechnology researchers still believe that they have a nice job.

7.2.3 *Research practices and responses*

7.2.3.1 Problem choice

All senior and junior researchers report that they have freedom to decide what and how they want to research provided they have funding for it. They mostly follow their own ideas, driven by their own curiosity and developments in the field. At the same time, in both cases external funding bodies are perceived as important in steering problem choice in research. Although they begin with their own research ideas, they need to consider potential collaborations vital for the development of the concept in order to attract funding (28, 35). In some cases collaboration may influence their problem choice as the implementation of research ideas depends on the availability of funds and on the available expertise, as indicated in research unit F2.

The usual process of developing a research topic starts with the idea and a small experiment to test it, then looking for partners and applying for external funding (35, 36):

When you want to write a project proposal, you ideally want to have a proof principal so you can do the work. So that's one. Two, do you have a suitable collaboration, cause it's often needed for a grant proposal. So that's the basis actually. If you have those two and a good idea, you can start writing. (35)

In exploring and negotiating collaboration, researchers admit that some project ideas may be influenced by other university research groups. The working relationship with industry is different. For some researchers there are clear lines that should not be crossed in such types of collaborations. If collaboration with industry is considered, the research unit F2 determines the problem choice and not the industrial partner:

Third parties influence our research absolutely and that especially true to the proteomics part...mostly university groups. We collaborate with industry, but I think here [it is] a bit different because these collaborations are mostly from a technical point of view and not a biological point of view. So we determine what happens and not the companies, that's a different type of collaboration. (35)

The problem choice is thus a bundle of decisions about a researcher's own research interests, cooperation opportunities, and project grant offers. If there are no project offers and no funding opportunities, a junior researcher from E2 thinks it is worth passing the idea to someone who has the financial means to carry it out. He stresses that in his eyes the research idea is most important, and therefore he accepts passing it on to someone who can find funding (28); a noble view that shows that funding is crucial for this field of research.

A common observation of junior researchers is related to the professorial influence on problem choice. In their view, the principal investigator's opinion counts a lot; their topic has to be approved by the 'higher authority'. Professors or program leaders may also give suggestions to junior researchers that fuel research ideas. In other cases, the professor's role is limited, just a signature on the research proposal, that is, just a symbolic gesture:

All the projects the post-docs have written are completely by themselves. The professor, if you need him or her for carriage then the name is there, the signatures at the end and that's the only thing the professor does. (28)

Professors are important in applying for externally funded projects because of their credibility, especially when applying for big collaborative projects. This does not automatically mean that professors prescribe in detail what to choose (26), though professors and program leaders are important in setting the research agenda for the whole group. In both cases professors and especially 'thematic' leaders have substantial influence on the kind of research undertaken and researchers cannot deviate too far from it (34). But most of the time the research programs of the units leave ample room for individual choice.

At the same time, the research themes are discussed among the researchers. Their leaders stress the freedom to propose new topics. In this respect it may be regarded as a 'team effort'. In E2 they jointly discuss and make strategic decisions where to go in terms of problem choice (27, 33):

There is one other staff member but of course we have strategic discussion within the group. And you rely also on your PhD students and your post-docs and their skills; I value their opinion. So I certainly ask them also about their view to the future; where do you think the chances are in the future? So strategic discussions we have with the staff members, but also as a group. We even have sometimes a day [for this purpose]. (27)

The overall opinion of researchers concerning their freedom to choose their own lines of research is that they can do what they want as long as they fit within the broad research theme of their group (26, 33). This means that they try their best to be embedded in the research unit and do not diverge radically from the

unit's overall research area, which according to the F2 group leader is "still pretty vague" (33).

A junior from the same group does not want to change the field since it's important to be embedded in the group. She is pragmatic about staying in the same area, which in fact is framing her options for doing what she wants:

I did not select to work on streptococcus pneumonia because they just got a new project and there was a vacancy to which I applied. That project, during the work you give your own interpretation. And then I came here and started to think that I wanted to stay longer. So I needed to find a different line but preferably related to the research I am doing now because, you need to be, at least in the Netherlands, what counts a lot is to be embedded in the faculty or a group. So that limited my field to *streptococcus* pneumonia and then I started to read literature to see what I think was an area which was important and relatively little studied, and that is how I ended up the new *carriotic* cells. I selected one particular part of this disease process to study. (25)

Other researchers from E2 and F2 similarly think they are "set free on their own path" (34) as long as they stay within the area of research set by the unit and this has not changed much in the last years (33, 34, 35). This attitude is sustained by the faculty management; according to the interviewees, they do not direct problem choice in any way. The group leaders think that they have to know the rules of the game, which means that the research of their units must maintain a certain quality level and that the units must financially sustain sufficient external project funding. Then they are not restricted in their fields of research: "If you play the game right, there is a lot of room available" (33).

The professor from E2 confirms this: "We are so independent that we can do what we want, providing you meet the quality requirements and for that you have positive scientific visitations" (26).

The underlying rationale is that university management understands the importance of academic freedom and, therefore, there is not much exchange on problem choices between managers and research groups:

You have to keep that door [managers'] closed. If I would go to every meeting where managers tell us how to get into running initiatives, I would never be here. It's probably for the best they do that, they push for new funds, new initiatives, but I just have to make sure we do good research and if there are any opportunities that pop up, you should be able to work on that. I think we get a lot of freedom, and rightly so. It also depends on which people you hired but if you trust that someone wants to do his job properly, you should give him the freedom to do so. (33)

Both units observe that the priorities of external funding bodies such as NWO and the EU tend to influence research topics. Researchers are careful and strategic about following their own research lines and at the same time taking into consideration the fundability of the projects. When applying for the NWO funding, for example, they have to consider the selection criteria. Researchers are strategic about wording the proposals as the criteria and priorities of research councils cannot be denied. A F2 researcher puts it very precisely:

The theme we are working on is very popular. I mean there are many grants you can apply for, so there is a constant possibility to apply for grants. Of course you try to fit in as good as you can in the theme they want. Try to write to some extent what they want to hear. (36)

This example shows that it is not only useful to know how to write the grant proposal, but also important to go for a popular topic. Popular here means a trendy research line in their field. If a researcher works on a popular topic, then it is much easier to get funding for it. The popularity of topics derives from international developments in the field (36):

Yes, it's that and the international trends. There are few initiatives that spring from the Netherlands. You could say that if something is in the proposal for next year in the US, it will be in ours the year after that. I don't read a strategic plan from NWO and think "Oh dear, they came up with something I missed completely". (33)

EU projects are also mentioned in relation to the academic freedom to choose their own research lines. Researchers strategically write the proposals and cleverly focus in order to get EU funding. It is not an easy task since the priorities of the EU change quite often. It calls for creativity, as a F2 researcher notes. They are concerned how to reconcile their own research interests and the changing priorities of the EU:

EU priorities change so one has to be creative with themes in order to get proposals through: I mean EU is now focusing mainly on health, so it's all about health. So you have to refocus and if you are in a field where your bacteria are not really health related you have to find a way. Otherwise you cannot make proposals anymore. You have to be creative around the themes they choose. (27)

In addition to research programming coming from external funding bodies that may limit academic choice, researchers also mention legislation that may limit certain research. EU regulations on Genetic Modification (GM) are a concern

for E2 since researchers face restrictions for certain topics. A researcher from E2 expresses his frustrations about the regulation on the GM patents coming from the EU that basically bans certain research lines:

And especially in our area, just to give the background we work with genetically modified bacteria and there is a moratorium within the EU. So there is a blockage and that is now until 2008 and they want to extend it. So that means nothing but nothing that we find here which is all by genetic changes of bacteria can be implemented or is allowed. Nothing. (28)

In this case, they have to comply with the regulation. A professor from E2 believes that regulation of this kind can block serendipity (26).

All the biotechnology researchers argue that they have ample room to select their own research topics. External pressures are denied to a large extent, particularly when they would come from industry. Also institutional management does not interfere with the choices of the researchers, as long as they perform well. Therefore biotechnology researchers are successfully protecting this part of their academic freedom. In terms of our terminology presented in chapter 3, biotechnology researchers resist and ignore external demands to some extent. However, the researchers readily admit that this individual freedom is bounded in several ways. First, it is restricted by the research agenda of the research unit and the thematic themes defined by the unit's leadership. These research programmes and agendas must be taken into account, but usually they leave sufficient space for individual selection and additionally they are usually drawn up after consultation. Some of the juniors also take into account the professor's preferences. Although such restrictions affect individual choices they are all in the realm of the academic unit. There is at least 'collective' freedom of choice. Second, individual researchers consider fundability as well as popularity of the topic in their selection process. In this respect, external developments have an impact. This means that researchers comply by adjusting the topics and writing in a way that fits financial backers. At the same time, they seal off their real research interests from the thematic priorities by writing what financial backers want to hear. The strategy is one of symbolic compliance. The bottom line is that they preserve their own problem choice to a large extent. Third, external regulations may frame problem choice.

7.2.3.2 Mainstream and risky research

Respondents in E2 and F2 indicate that they carry out both mainstream and risky research. In general they stay more within mainstream research, even while they see the importance of risky research which they characterize as 'blue sky'.

The choices for opting for one or the other are linked to research funding opportunities (27, 28, 33, 34, 35). The group leader from F2 states:

I think three quarters of our research is mainstream and the rest is blue sky. Mainstream is the foundation you can trust upon. Everything that is blue sky can be a miserable failure. But you should always pursue blue sky research because it could just as well be a huge success. (33)

The two units think that the research programmes of external funding bodies mainly contribute to conducting mainstream research, since they require milestones and deliverables in advance within a clearly defined research topic area (33). Such requirements limit curiosity driven research.

Besides fundability, another reason to stay within the boundaries of mainstream research is to secure research outputs to build their credibility. Both E2 and F2 say that they need to play safe. They must be sure they can publish project results and that PhD candidates graduate. They can simply not afford to be unproductive. A junior researcher from F2 is obviously concerned about the future of his PhD students:

You should play it safe. The result has to be publications because you have AiOs who want to do a doctorate with some articles. So you should have a line of research of which you expect some results. Look, there's no 100 percent guarantee. Because of that I usually think along the lines of: you have to measure this and I have to measure that, if we do something together you have an article. (34)

In such a context, the two research units are consciously balancing between pursuing risky as well as safe research projects. To ensure they still can carry out cutting edge research, they use a diversification strategy: they start with a mainstream research project, get results, and use the obtained insights for more risky research. A junior from F2 explains his *modus operandi*: he normally starts with a project with a safe series of experiments which guarantee some useful results, and then continues with the challenging part which may fail in the end (35).

In E2 a junior also reports that he uses a diversification strategy; he is, as many others, betting on more than one horse when it comes to publications:

I am trying to set up two research lines. One which is rather fixed and straightforward and simple, and where I think I can publish at journals at a certain level. The other strategy is just to get there as fast as possible and then to be able to write it down and send it to those journals where I think it will be possible to send it. And then the research line which is rather more risky where

you could end up scoring very highly or not at all. You just have to wait and see a little bit what you will find and then you know where you can publish it. (25)

A somewhat similar strategy used in both research units is to combine safe and risky research elements in one project proposal. What they do is to try to cover both, to “have a safe part and a very challenging part and you want to combine them to one project” (35). This strategy is used for NWO and EU project applications.

Finally, the two research units are concerned about the future outputs of their PhD students. Since the PhD candidates must produce, they follow a strategy to diversify their personnel by employing post-docs for risky projects or project parts, and having PhD students carry out more mainstream research tasks that will definitely yield results. In this way senior researchers try to control the risk of failure of producing good and sufficient publications:

If it's a very risky project maybe you would rather choose a post-doc because there may be a chance that nothing comes out. And on the other hand he is more experienced. So there is a bigger chance that something will get out. So that's the main consideration. (36)

Generally F2 researchers are more outspoken about the balance between risky and mainstream research than E2 researchers. In the view of a senior from F2, researchers “should always take some risk and try things that have not been tried before, but there is a limit of course” (36).

This senior adds that in his opinion in the future there will be even more mainstream research as the field changes very fast and what is risky today will be mainstream tomorrow.

As we can see biotechnology researchers predominantly employ symbolic compliance strategies. They balance the expectations of the stakeholders with their own aspirations. They comply with external rules because they need the funding and to be productive. Researchers report that external pressures usually call for mainstream research. At the same time there is de-coupling: they ‘smuggle in’ some of their own preferences in terms of risky research. The researchers have not reported any kind of pro-active or manipulation strategy. They do not ignore, challenge or influence the external pressures when it comes to this dimension of the research practice, but they take them into account for their credibility. In the two research units we spot two tactics. One is to diversify between mainstream and risky research that is conducted by different people (e.g. AIOs on the one hand and post docs on the other). The second is to start with safe projects and using the results for developing risky research projects.

7.2.3.3 Output preferences

Biotechnology researchers from both units carry out research with outputs that are geared towards different audiences such as the scientific community, industry, and the broader society. E2 works more on the 'applied side' than F2. Researchers enumerate publications, patents, conference papers, reviews, books, and PhD students as their outputs. The key idea is to contribute to the researcher's standing in the academic community, secure their funding base, and improve the standing of their group in their university (25, 27, 28, 33, 35). Following the aspiration of academic credibility and anticipating the quality assessment evaluations, journal articles are the dominant research outputs. As one respondent said, books are fine, but who reads them?

Both units see publications, especially journal articles, as the most important outputs in their field. They help build credibility and identify their standing in the field. There is a strong internal drive to publish. By means of group leaders, the organisation explicitly encourages staff members to publish. A junior from E2 notes that they are evaluated once per year and there is an expectation of two published articles per year to be positively evaluated by their leader (28). The pressure to publish is also coupled with the external quality evaluations, which take articles as an important assessment criterion, and with university management, which also takes stock of the outputs produced by every research group in their institution. Finally, researchers mention external funding bodies that increasingly look at the number of publications when they are deciding on project funding (26, 28, 36). A professor from E2 underscores that:

Every application has to be sustained with how good you are; this means a list of relevant publications. If you can put a few heavy publications in this list, they will see: "Ok, these guys are doing a good job". (26)

The encouragement to publish means in fact a strong emphasis on scientific journals instead of books or popular articles and reviews. Articles in highly rated journals are basically all that counts. Researchers in both groups are very conscious about the citation indexes and about the impact factors of journals (26, 27, 36) and are not interested in "wasting time and effort" on writing books or book chapters, unless it concerns "a very prestigious series" (25, 35). The E2 leader well expresses that he is quite selective about what to publish:

I don't like [writing books] anymore I must say because they are not in Netline, in Puntnet. So you don't get your citation indexes from that and I get quite a lot of invitations for books but I'm very hesitant to take them. Only when they are very famous book series such as 'Methods in Enzymology' or something, then yes, but not for just another microbiology book. I usually don't do that

anymore. It's too much effort, it takes your time and I can make a review when I have time for a journal; I also prefer that. (27)

Patents are also mentioned as outputs for both groups but are perceived as less rewarding than articles (25, 27, 28, 30). E2 is more explicit than F2 why they are not very keen on patents. For them, patenting procedures are time consuming, take a lot of effort, and the benefits are negligible. Time lags, due to patenting, can have serious effects, as shown by an E2 junior researcher who had to wait for one year to have his PhD published because of the patenting procedure:

If you go for a patent then there is a delay. For instance, when I finished my thesis I had this nice booklet but there was interest in patenting. One had been patented the second year already, so that was out, there is one year protection, twelve months at least, so there was an interest and that was filed at the moment I finished my thesis. But that meant I had to wait for one year. Ok, I had a job and could continue, but the booklet is there for a year just waiting for defence. It was not allowed to be made public. (28)

There are patenting offices at the universities that are supposed to support the academics. Many researchers question the added value of these offices. Basically, the academics argue that the patenting offices do not provide many incentives for patenting. Researchers are also concerned about the very low success rates of patents. A junior respondent from E2 refers to EU regulation that bans patents in a certain molecular genomics areas (28). In the end, the researchers argue that patents do not bring much money, whilst they require a lot of effort. From their point of view, patents are not that rewarding. Despite the hesitations, researchers in E2 are aware that patents may be useful for their future career since they count as publications on their CVs (27, 26). Nevertheless, they prefer to publish a journal article and not waste too much energy on patents. This creates some tensions with central management since they would like to see a growing number of patents for the university.

The two research units are different in terms of the emphasis on basic versus applied research. F2 is more oriented towards basic research where relevance is an important consideration (33, 35, 36). In any case, an important consideration is about the 'relevance' of research. If there is a choice, then a professor from F2 goes for relevance:

If you have to decide to work on a protein that is involved in a very important disease or a protein which is equally interesting but involved in degradation of metabolising yeast, then you choose for the one that has medical relevance. Maybe the project itself is not that interesting but the potential impact is better,

so then you decide on that project. In that respect it influences your research.
(35)

The applicability of knowledge (relevance of the research) is a good and serious criterion in selecting research projects according to this professor. At the same time, he recognizes that this cannot always be the leading criterion because it is also important to retain the major basic research lines intact. A balancing act, in which basic and applied research project call for priority, is the result (35).

E2 seems to be more actively involved in contract research with industry and potentially relevant basic research funded by external funding bodies such as the European Union and NWO (26, 27, 28). An E2 junior draws attention to the relevance of their research, and relates this to their cooperation with industry: "The relevance comes from the fact that we obtain quite some money from industry. We do want to implement our research data...so there is the relevance" (28).

However, researchers also note that it is important to balance scientific and social relevance. The group leader of E2 is strategic in his thinking about bringing in a medical aspect into the group's research to have both scientific and societal relevance:

When I started seven years ago I thought very carefully about the fields I wanted to work in. Where I see the prospective scientifically, but also in applied fields in the food industry, and also in medical applications. That's one of the reasons why *bacillus* and *lectococcus* was already running research in this group of the old professor. But I brought *streptococcus* pneumonia in as a new medical leg in the research because I think the combination between good and bad bacteria to study them both and look at their differences was also a strategic point, also in view of funding. It was also a consideration and in view of science that we think there can be added value by using knowledge from the non-*pathogens* to use that knowledge into the *patogens* and that worked pretty well.
(27)

Strategies related to output preferences

Because of personal career ambitions and the perceived demands from management and external funding bodies, researchers use different strategies to produce research outputs. The production of the right outputs is important for assuring continuity of their research and building their own and the unit's credibility. First and foremost, the aim is to produce the required number of publications for the unit and the institute. For junior researchers as a rule of thumb this is on average two publications per year (27, 28, 33). To achieve this goal researchers mainly prefer to go for (highly rated) journal publications rather

than books or patents (27, 28). A usual instrument used in F2 to encourage researchers to publish is to stimulate conference attendance. The F2 group leader encourages this also because it enhances the unit's visibility (33, 34).

The major considerations regarding publishing are: what, where, and when to publish. Both groups try to aim for publishing an article in the highest impact factor journal. Citation indexes are taken into consideration, as this is one of researcher's evaluation criteria (26, 27, 28, 35). It means among other things that not only the label of 'top journal' is considered important in selecting where to publish, but the citations related to the journal as well. A professor from E2 exemplifies that it is important to bear in mind the citations coming out of an article:

If it is a very big step and very novel, new [research], you have got 'Nature' [to publish in]. After that it is really building on research that you can publish in other magazines. But getting into Nature is not the final goal ... it's all about getting cited. You can make a big/high claim/research and nobody will read it. If you make it a bit less high profile, everybody will use it and put it in their reading cabinet. Citations, that's what makes you further scientific knowledge. (26)

A researcher in F2 uses the following strategy, also heard from some of his colleagues: first he opts for the high impact journal and after refusal his article goes down the 'pecking order' of journals (35). There are other strategies followed as well. A junior researcher from E2 uses a diversification strategy: she tries to go on the one hand for the highest impact, and on the other hand for high visibility (25). Impact and visibility may go together but not necessarily. She adds that to aim for the top they need vast collaborations for research.

A senior researcher from F2 adds another dilemma to publication strategies. His dilemma concerns whether or not he should publish initial results in a lower impact journal or accumulate more results and publish later in higher impact journal:

What you can do when you do research, when you have an interesting observation, is to publish it in a moderate journal because otherwise you have to wait until you have two or three or four interesting observations and publish it in the higher impact journal. So that's always the trade-off, to publish it now or wait and send out more information, more data to support what you have seen or to expand. And also to decide when a study is complete; when you do research it's always going on but you have to section it in discrete parts for publication. There is a beginning and an end. (36)

Other respondents from F2 also stress the need to balance short-term outputs and the long-term research programme (33, 34, 35). In this case the research unit manages to get grants on a regular basis, so they can maintain credibility in a particular area. The group leader of F2 notes:

The kind of work is the same but the specific subject you're studying within the micro organism ... might vary, although I try to also get of course continuation in that like anti-microbes. We have done that for 20 years already and some metabolic regulation, we also try to do that for longer term. Of course if you want to be recognized in the field you have to have some long term show. Project with one theme for once and then ended and doing something else is not ideal. But sometimes it happens. (36)

In contrast, E2 is less concerned about balancing short and long-term projects. They are positive about three year contracts and think it is enough to produce journal publications. However, the professors in this unit also maintain the 'red line' in their research, which means they work on the same over-arching research topic and try to ensure continuity by building on short-term outputs (26, 27).

Major concerns about the outputs

There are three major concerns voiced by respondents in E2 and F2 in relation to output preferences: competition to publish results first, multiple authorship, and the quantity/quality debate.

Both groups are concerned about the competition to publish research results in a timely manner. They underscore that applying to top journals can be risky and even a waste of time since it is likely to be rejected as a consequence of high competition levels in the field. More and more researchers offer their articles and this reduces acceptance rates. Moreover, E2 researchers are concerned about the competition to be first to publish the results and not be 'scooped' by other research groups carrying out similar research. Being the first is important, but time lags for publication, which may easily take around half a year, lead to uncertainty (26). In such a situation, a senior researcher in F2 reduces the waiting time by opting for a 'quick' publication to ensure they are the first to publish their results: "And maybe at this moment I would rather opt for a quick publication in a lesser journal than a long range publication that has more impact" (36).

Another concern shared by E2 and F2 is the multiple authorship of journal articles. Multiple authorship is caused by the increasing multidisciplinary nature of research in their field and project collaborations (25, 33, 34, 36). The research groups are conscious that it is important where and in which order their names appear in journal articles:

And then for me personally I'm on many papers and what the trend is that papers are published increasingly by more authors on a single paper. So it's pretty easy to get an anonymous publication where you are in the middle of 10 co-authors. But of course it's better to be in the leading position and write the paper or oversee the whole project. So for me now that's an important thing to consider. (36)

A particular concern is expressed by an E2 researcher who thinks there can be discussions on the ordering of names (25).

Finally, researchers are worried about the increasing quantification in the evaluations of research results. This should not lead to less quality. The shared opinion is that there needs to be a balance between quality and quantity. A junior researcher from E2 aims at publishing in a top *quality* journal but when he does not succeed, he opts for *quantity*:

Yes there is a balance. I mean if you see that a certain paper doesn't get it at a high level, then you go for the quantitative. For instance I wrote a paper years ago and I thought it would end up high and it failed. So I've just split the thing and looked for two collaborators and made two papers of it. So then I have two contributions and one was reasonably good or equal to the first author and the other one was lower, but then I have a quantitative output while initially it was a qualitative highest. So it's also finding a balance. (28)

Research groups indicate a clear pressure to publish more; consequently, to some extent they go for quantity. Such a tendency towards 'quantification' is perceived as a negative development (25). In F2 and in E2 researchers acknowledge that quantity also brings in low quality publications, which is not just due to pressures to produce, but also to the expansion of the field:

I think the quality is definitely increasing because there is more mass in mass spectrometry, so there are more people and quality increases, but also the quantity increases because there are more people so there is more rubbish published. So both increased, but definitely also the quality enormously. (35)

The importance of quality in both research units is indicated by their aspiration to publish in top rated journals. They try to build a credible track record in this respect. An E2 professor warns for strategic choices that go for quantity:

This somehow conflicts with your ambition to work at the border of knowledge and you deliver world class quality. I can do something on routine, but I first have to get the project, which will cost me money. I will also have to manage it,

or give someone else this task, either way it will lessen the quality. You have to take care that you do not sacrifice quality too much. (26)

We see that the Dutch biotechnology researchers use basically two main strategies as regards the dissemination of their research outcomes: compliance and manipulation. First of all they comply with the general academic norms to develop and maintain credibility. The publication of journal articles is regarded as the most important thing. The academic competitions for publishing high quality articles for top journals and being the first to publish results on a particular topic have high priority. By doing this they also try to fulfil the expectations of university management and to establish credits for new research projects. At the same time, they are well aware that some trade-offs must be made. Impact of citations, relevance of the results and timing are other considerations for the publication of research outcomes. External pressures for being productive compromise some of the researchers: they have to balance quantity and quality of research outputs. Thus they also comply with the notion that they must be productive. There are no indications reported on symbolic compliance, but strategies of manipulation have been found. In both research units researchers ignore and challenge the call for getting more patents. Although university management is keen on getting patents, most researchers argue that this is a rather pointless endeavour. They are hardly willing to go this road of 'commercialisation'.

7.2.3.4 Teaching-research nexus

Both units are mostly involved in research and teach less than half of their time. In most cases student supervision is seen as teaching. There is quite a difference between junior and senior researchers. Juniors are supposed to be more involved in research than in teaching (26, 27). A junior researcher, who agrees that their teaching workload is smaller than those of seniors, adds that their teaching loads are higher than they used to be (25, 28, 34, 35).

A junior researcher remembers that the teaching load used to be about 10%, but things have changed due to the decrease in personnel numbers and the simultaneous increase of student numbers (35). The increased teaching workloads are experienced in both units:

Staff members have a 60/40 or 70/30 appointment, which means either 40 or 30 percent of the time is spent on lecturing. This pressure is becoming bigger because the student numbers are increasing and the number of staff is declining. (33)

E2 foresees a problem in the future regarding the declining capacity for teaching, particularly since the university intends to introduce a system of bursary PhD students. These bursaries will not be obliged to teach, in contrast to AiOs.³⁸ This further reduces the teaching capacity of the research unit; staff members are likely to face a further increase of their teaching load (25).

There is a common point of view among the researchers that the teaching-research nexus is influenced by changing student numbers, reduced number of permanent staff, and changing faculty policies towards the separation of teaching from research. Both research and teaching are main tasks of the researchers and their units. They are both evaluated and related to funding.

The changing balance between teaching and research disturbs the researchers. They argue that they can not afford to lose (too much) research time because of higher teaching loads. They see research as crucially important for the reputation of the unit: "During a study you don't want to spend 70% of your time with teaching, because you don't get around to doing research" (34). Without immediately downplaying the importance of good teaching, they have to produce research outputs, especially publications; this is the crucial capital for researchers (34, 35). Peer review-based evaluations look at both teaching and research, but the external funding bodies mainly look at research performances. At the end of the day, research performance determines the standing of an academic group:

The visitation committee evaluates both. But for example when you have to prepare your yearly reports for the research school and NWO, it is only research. So how well you teach, 'nobody' cares about that; the only thing that counts is your publications. You cannot publish if you do no research and with teaching it won't help too much. So that can become a problem if you are not publishing enough. And you have less chance in your grant application...you have to be a bit careful with that. (35)

This produces tension since both units have to conduct research and to publish, as well as that they have to teach. As a result of the increased pressure to teach more and to balance all the activities, time constraints have been a dominant theme. The lack of time for doing research is frequently put forward. This is seen as a big change by the F2 group leader (33). A junior from the same group confirms the increased teaching loads at the expense of time for doing research: "Of course the more time I spend on teaching the less I have for research" (35).

³⁸ In the Netherlands doctoral candidates can be staff members with an employment contract; they are then called AiOs. Doctoral candidates can also be funded via other sources such as fellowships and do not hold a status as staff. Then they are called bursary students.

Less time for research provides a bleak picture for the competitive future of a researcher. Because academic careers are 'research-driven', serious teaching loads may worsen career opportunities, as a junior from F2 argues:

I think in the future I will have to spend more time teaching and that makes it worse, it makes it harder to survive in this research world, on the other hand, I think I become more experienced. (35)

Similar opinions prevail in E2. But teaching may have its advantages as well. Gaining experience is one of them. Another opinion put forward by a junior researcher concerns teaching as an investment for the group's future PhD generation; it is a pool of resources (25). And as we see below, master students can participate in research projects.

The common strategy of both groups to cope with the increasing diversification of the activities of individual staff members, and especially with the increased teaching load, is to work additional hours. To cope with these pressures, work during the evenings and weekends is a common characteristic in both units (34, 35). It seems to be part of the life of the modern academic:

I do a lot in the evening and at home with the computer. So the reading, writing, correcting manuscripts, that's usually at home. And here [at the university] it's more like talking to people and managing, solving problems, all kinds of different things. You have a lot of distractions when you are here. When I'm home I can do some reading and writing. (27)

Still, the majority of the researchers in E2 and F2 believe that teaching and research go together: research is needed to 'feed' the teaching. In the eyes of the juniors from E2, the link between the two is obvious: Master's students need to start working in the laboratory as soon as they can and can be helpful in running experiments and contribute to the overall research (25, 28). For example, junior researchers believe that the students can help them in the laboratory although there is a risk of taking away time from doing research. In fact, a junior researcher from E2 explains from a pragmatic point of view the utility of students in their research:

We have the supervision of master students who will work for half a year on a research project and you have to supervise them because they have never really worked in the lab. This takes a lot of time, but can also be very rewarding because they can do a sub-project and some of your work. If they are reasonably good you can also use it for the rest of your research. If they are really bad, it just takes a lot of time. The pay-off is clear. Most people do not really object, because they take some of your work out of your hands. (25)

A group leader of E2 reiterated this point and takes it further. In his view, teaching and research cannot be stopped at the expense of the other. The major problem of separating teaching too much from research is that teaching will suffer from a lack of expertise if a particular research is not carried out at that university (27). Two juniors are concerned about the possible separation of teaching from research in the future where university could become a 'teaching-only' institution and where research is carried out in separate research institutes (28, 35).

As regards the teaching-research nexus we clearly see that the researchers of the two biotechnology units follow a strategy of passive compliance. In both research units the researchers report a change in division between time for doing research on the one hand and doing other things, such as teaching, on the other. The teaching load has gone up. This is particularly true for senior researchers; juniors are supposed to be more engaged in doing research. The increased teaching load is partly due to the increase of student numbers, partly due to the reduction of staff, and partly due to university policies. The nexus between teaching and research as such is not questioned; in fact, most of the researchers see this as something good. A heavy teaching load, however, is not appreciated since at the end of the day research performance is what really counts, but for reasons of loyalty to the job they do what needs to be done in this respect. In such a context, and depending on personal ambition, the researchers choose to work additional hours during the evenings and weekends to carry out research, and to be sufficiently productive.

7.3 Summary of the perceptions, practices and responses of Dutch research units

Without exception the Dutch medieval historians have reported significant changes in their institutional environment. Although to some extent different opinions within and between the two basic research units exist, the medievalists from the two universities spot to a large extent similar developments in their environment and have in many respects the same kind of opinions on the consequences of these developments. Changes have been witnessed in terms of research funding, research evaluation and accountability, lines of authority and power distributions within the university (changes in management), cooperation and competition. Budgets are under pressure, forcing the basic research units to be creative in finding research grants outside the university. Research performances are being monitored and assessed, which was not the case in the past. The consequences of the outcomes of the evaluations are not always clear.

Also there is 'more management' than there used to be. This institutional management, at different layers, tries to streamline or to bundle the research in their faculties and institutes. In both cases, institutional management is not per se 'cursed', basically because it leaves ample room for researchers to do their own thing, although increased levels of bureaucracy, partly due to 'managerialism' are not appreciated at all. Competition and cooperation have also grown, although opinions slightly differ here. One of the changes in this respect concerns the 'internationalisation' of research in medieval history.

In general, it is fair to say that they also see that their academic work place has been changed in several respects. It is, according to our respondents, clear that in the field of medieval history the pressure to perform has increased. The respondents also agree that there is obviously an intensification of all the work to be done, which pressurizes doing research. With respect to research, the researchers of both units conduct mainstream and risky research; almost all their research is qualified as 'curiosity-driven'. In terms of outputs books are still favourable but reality tells that for several reasons 'quick' outputs are required as well, and therefore articles and conference contributions are gaining ground. Many Dutch medievalists fear the possible advent of rankings; they see a quantification of academic output that is not welcomed at all. Another change concerns the growing administrative and teaching loads at the expense of research time. In terms of the teaching-research nexus the balance tips to the teaching (due to growing student numbers and the implementation of the BaMa structure). Moreover, there are some indications of separating teaching from research.

What has not changed is the fact that despite all sorts of initiatives the research units are still a collection of individual researchers. And these individuals say that they still have a lot of autonomy to select their own research topics. Many admit that to 'sell their ideas rightly' they have a sidelong glance at research themes and hypotheses promoted elsewhere, but basically they decide themselves on what and how to research.

Although there are different opinions within and between the respondents of the two research units, certain patterns come to the fore in terms of responses to external pressures. We witness a range of strategies, but symbolic compliance to the perceived changes seems to be the prevailing one. As regards problem choice we see symbolic compliance, which means other interests are taken into account without really affecting the individual choices. This seems also to be the case when asked about the nature of their research in terms of doing mainstream versus risky research. The fact that medieval history is curiosity-driven, as seen by the interviewees, and that pressures for relevance are largely ignored indicate that the strategy of manipulation is exploited. With respect to the teaching-

research nexus and in some instances the output preferences, however, we clearly observe strategies of compliance.

All the biotechnology researchers of the two research units note that the institutional environment has been changing in recent years. Differences in opinion do exist to some extent, but in general they see many similarities in their changed institutional environment. In terms of funding they see declining university budgets in the first stream funds and a need to attract significant amounts of second and third money flows to keep up their budgets. The two research units are doing well in attracting these second and third money flows; collaboration with industry is for instance regarded as dense, interesting and rewarding. Decreasing student numbers in science, growing energy bills as regards their laboratories, and constantly changing ways of calculating the budgets create financial problems and stress. Nevertheless, both research units mention that they are positive about their financial situation. Particularly F2 reports that they are doing well financially. Both research units also observe increased levels of interference of university management. The powers and influence of university management has grown in their eyes. This is particularly felt in the area of personnel policies, and with respect to the evaluation of research performances that are directed by central university management. Overall the researchers are not too pleased with this increased managerial oversight. Particularly in E2 researchers are critical about this. Restructuring, vacancy stops, fewer permanent positions and higher levels of accountability and bureaucracy are seen as problematic and annoying. The two research units also face the growing attention for assessing their research performances. Both research units score extremely well in the peer-based evaluations – especially E2 – and they believe such outcomes are important for their visibility and for attracting research grants in the future. Levels of competition have gone up, as mentioned by nearly all researchers. There is more competition for staff, permanent positions and research grants, partially due to the expansion of the research field. There are simply more people fishing in the same pond, which reduces among other things the success rates of applications. The competition is, in the eyes of E2, not always fair. Government initiatives seem to be pre-cooked. Cooperation, internally and particularly externally, has also grown, partially as a consequence of increased competition levels. Moreover, the nature of the research field – requiring expertise from various disciplines – calls for cooperation. In both research units scepticism exists with respect to EU-related projects. Although such projects can not be denied – one has to be visible in this arena – the academic relevance is questioned and the political drivers of the EU projects are seen as a thorn in their flesh.

According to the biotechnologists ‘the week is always too short’. The work loads are high, the multiple tasks to be carried out are pressing and pressures to

perform have gone up. Nevertheless most of the researchers believe they have nice job, are ambitious and try to make the best of it. From their responses to the perceived changes in their environment we can deduce a range of strategies. All three kinds of strategies that we have discerned in Chapter 3 are present. The prevailing strategy is symbolic compliance. In terms of problem choice biotechnologists use of symbolic compliance strategy; they are able to protect this part of their professional autonomy and to deny external influences to a large extent. However, they take, to some degree, the preferences of external sponsors into account. With respect to the division of mainstream and risky research we again see symbolic compliance. In terms of the teaching-research nexus, however, compliance is the main strategy. Although they feel that increasing teaching loads are eating away time for proper research, they obey the rules and fulfil their teaching parts. Also as regards the output preferences we witness compliance to produce faster. Finally, we see that biotechnologists of both groups dismiss and challenge the university management's desire of obtaining more patents, implying they exploit the manipulation strategy. The strategies taken by both research units are summarized as follows in Table 7.1:

Table 7.1. Strategies used by Dutch basic research units

	Compliance strategies	Symbolic compliance strategies	Manipulation and other pro-active strategies
E1	<p>Change in outputs:</p> <ul style="list-style-type: none"> • Aim highest • Produce faster • Adhere to minimum rule <p>Change in teaching-research nexus:</p> <ul style="list-style-type: none"> • Work overtime • Hire temporary teaching staff 	<p>Balancing problem choice:</p> <ul style="list-style-type: none"> • ‘fit’ into funding priorities and maintain personal/group problem choice • Choose a broad topic • Choose interdisciplinary topic <p>Balancing mainstream and risky research:</p> <ul style="list-style-type: none"> • Diversify mainstream only and risky only topics <p>Balancing different outputs:</p> <ul style="list-style-type: none"> • Diversify and combine project results into bigger publications but also publish short-term results <p>Collaboration</p>	Diversify funding sources
F1	<p>Change in outputs:</p> <ul style="list-style-type: none"> • Aim highest • Produce faster • Publish more in English <p>Change in teaching-research nexus:</p> <ul style="list-style-type: none"> • Work overtime • Involve juniors more in teaching 	<p>Balancing problem choice:</p> <ul style="list-style-type: none"> • ‘fit’ into funding priorities and maintain personal/group problem choice <p>Balancing mainstream and risky research:</p> <ul style="list-style-type: none"> • Combine risky approach with traditional topics <p>Balancing different outputs:</p> <ul style="list-style-type: none"> • Diversify and combine project results into bigger publications but also publish short-term results <p>Collaboration</p>	Diversify funding sources International visibility

	Compliance strategies	Symbolic compliance strategies	Manipulation and other pro-active strategies
E2	Change in timing to produce outputs: <ul style="list-style-type: none"> • Produce faster Change in teaching-research nexus: <ul style="list-style-type: none"> • Work overtime • Diversify tasks 	Balancing problem choice: <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice Balancing mainstream and risky research: <ul style="list-style-type: none"> • Diversify mainstream only and risky only topics • Combine both in one proposal 	Strategic partnerships Diversify funding sources Resist patents
F2	Change in timing to produce outputs: <ul style="list-style-type: none"> • Produce faster Change in teaching-research nexus: <ul style="list-style-type: none"> • Work overtime • Diversify tasks 	Balancing problem choice: <ul style="list-style-type: none"> • 'fit' into funding priorities and maintain personal/group problem choice Balancing mainstream and risky research: <ul style="list-style-type: none"> • Diversify staff doing mainstream only and risky only topics • Combine both in one proposal 	Strategic partnerships Diversify funding sources Resist patents

8 The influence of shifts in governance on basic research units

In the following, we discuss the researchers' perceptions of their institutional environment. Then we look at the responses of the basic research units to their institutional environment and try to understand what these responses mean for their research practices. We discuss the findings that derive from Chapters 6 and 7 for our cases in England and in the Netherlands in biotechnology and medieval history in a comparative perspective. Finally we revisit the expectations of the study that have been formulated in Chapter 2.

8.1 Shifts in governance in higher education and research in England and the Netherlands

We provide, first, a brief overview of the shifts in governance in higher education and research in the two countries building on the insights presented in Chapter 4. On that background, we compare how the researchers in the basic units perceive their institutional environments on the basis of our analyses in Chapter 6 and Chapter 7.

As seen from the literature and our empirical investigations, quite fundamental changes in the governance of higher education and research have taken place in England and in the Netherlands since the 1980s. In both countries the complexity and dynamics of governing the system have grown.

The change in the institutional environment in England in the beginning of the 1980s has meant a sharp increase in competition for resources thanks to the increasing effects of the RAE that are usually nested with the quality monitoring inside the universities. Performance-based funding mechanisms have contributed to a further stratification of the system. The state has strengthened overall oversight and control, and has taken measures to strengthen the management in universities. The strong role of academic self-governance in English universities has diminished to some extent while managerial self-governance has gained importance. Mechanisms of peer-review, enabling academic self-governance, have retained its importance. Also attempts have been made to strengthen the influence of stakeholders in the structures and processes in higher education and research. In order to survive research groups have to build their credibility not only within their academic community, but also a new and complex mix of

audiences such as research councils, industrial partners, and university managers must be taken into account.

In the Netherlands, the institutional environment of research units has also changed, but at a slower rate and less drastically. The most obvious example in this respect concerns the way research performance is evaluated. In the Netherlands the system of research evaluation gradually grows while the evaluation outcomes are not directly linked to funding as is the case in England. The state retreated from a strong and detailed role in university affairs. Most of the governmental steering philosophy employed was 'steering at a distance'. The gradual implementation of this steering philosophy through various policies and changes in the law aimed at enhancing the autonomy of the universities. A decrease in relative spending on higher education accompanied attempts by the state to foster competition and to strengthen the management of universities. Altogether, deregulation meant to give more autonomy to universities which at the same time brought more accountability. As a result of these and other developments powers of staff and students in the internal governance of universities have been reduced. Nevertheless academics still find ways within their institutions to voice their interests. Thus, internally academic self-governance is obviously less evident but still observable. At the national level, academic self-governance via peer review is still important for instance via external research evaluations. The role of stakeholders in internal and external university governance has been strengthened, although their role is not always easy to observe. In conclusion, research units are experiencing institutional environments that are fundamentally different compared to the recent past. The institutions both within and outside the university have substantially changed. More competition and stricter ways of performance measuring are two striking examples.

The following discusses how medieval history and biotechnology researchers perceive these developments looking at similarities and differences in the perceptions of researchers in the two fields of research in England and in the Netherlands. Overall, changes in the institutional environment are clearly echoed in the perceptions of the researchers in all of our cases. Issues of funding, research evaluation and changes in the internal governance of universities are predominant in the researchers' perceptions of their institutional environment.

8.1.1 Perceptions of the institutional environments in England

Researchers see funding related policies as the most important change in their institutional environment. They often relate their funding to quality monitoring within the university and the RAE in England in general. Looking at the perceptions of the two cases in medieval history (A1 and B1) and the two cases in

biotechnology (C1 and D1) we can see that all the units in fact perceive a change in both the levels and modes of funding. All groups state that funding has become more competitive, that they need to reach out more for external funding, and that they need to account more for the funds they receive.

Research units relate the increased competition for funding to the RAE, which in their view stratifies the research units into 'haves' and 'have-nots'. Biotechnology groups also attribute the increased competition for funding to the increased number of competitors in their rapidly expanding field. In all four cases the increased competition for funding is largely perceived as a negative development. Medieval historians see it as a more shocking experience than the biotechnology groups. For the latter competition has always been a part of their academic lives.

University management fosters in all four cases the research units to apply for external funding. In general, research units are negative about this pressure and the related need to diversify their funding base by applying to external funding bodies. They feel the increasing hassle of accountability to the financial backers. Moreover, external parties may have different interests and wishes that to some extent can not be denied by the research units. However, there are differences in the opinions between 'high' and 'low' achievers about their general funding levels and modes.

The groups in medieval history and biotechnology that scored high in the RAE (B1 and C1) are positive about their general funding levels. They feel quite secure in the competitive environment in which they have high credibility in the eyes of their scientific peers, university management, and financial backers such as the research councils. They are not anxious about securing funds from external funding bodies, although they do not appreciate the bureaucracy that comes with it.

The story is somewhat different for the units that scored lower in the RAE (A1 and D1), since they are not sure whether their credibility is sufficient to secure a constant flow of funds. They try to offset the uncertainty by following the rules of the 'management game'. In A1 this means diversifying their funding base by applying to different donors, doing more teaching and providing services. In D1, this means abiding by the management's encouragement to radically diversify the funding base, reaching out to industry and the European Union.

Another difference in evaluating external funding can be observed when we compare the views of the medieval historians and the biotechnology groups. Medievalists are quite positive about the flexibility of the funding schemes of financial backers. On the contrary, biotechnology researchers in both units are worried about the thematic priorities of financial backers as they see them as a potential threat for their work. That is, they fear that if they do not switch to a new area of research that is fundable, they will have to run down or even quit

research and go to predominantly teaching positions. Biotechnology groups are also concerned about the continuity of funding as well as the low application success rates, which shows that the competition in the field is really high.

In all cases researchers had to account for the received funding and this means increasing administrative work, bureaucracy, and overheads. They are not pleased about this development and the history units go as far as stating that this increase in accountability is a manifestation of a loss of trust in the academic profession. Still, medieval historians find some positive aspects in it as well such as the development of project management skills that are a result of the need to be accountable to the funding bodies.

Thus, all four units perceive that funding policies are not only important in their daily lives but have changed quite dramatically. They realise the growing role of competitive internal and external allocation for their survival and wellbeing. The English system of performance based funding is perceived as having its drawbacks, such as increasing competition and accountability.

Performance based funding is often related to another important policy that has been mentioned by all researchers: ongoing research evaluations, most importantly, the RAE. Researchers in all four groups perceive the RAE as dominating the discussions about research evaluation and funding. In fact, all research units point to the nested effects of the RAE and the research quality monitoring procedures within the universities. Every unit has to participate in the yearly appraisal talks as well as the internal exercises that prepare for the next RAE. Researchers are very well aware of the consequences of a low RAE score: a decrease in research funding, a threat to their overall credibility, and a less favourable position in the eyes of the university management. University management in this regard is very important, as it possesses the internal resources that units need. The RAE inevitably makes research units think about research outputs, improving RAE scores, and thus gaining and maintaining their academic credibility.

Researchers in the four cases have mixed opinions about research evaluations. The junior medieval historians think it helps do away with 'free riders' in academe and brings unity within the group as well as the ambition to score high as a unit. They take the research assessments more or less as given; it has become a part of their academic life. Senior medievalists are more reserved about it. Biotechnology researchers think it is a useful procedure although they are not sure if it is necessary, as they are motivated to work hard anyway. Junior biotechnology researchers are more neutral than positive about the research assessment. Their senior colleagues predominantly find the RAE useful. Overall, they see positive effects of shaking up the system, but there are some concerns that it is getting 'over the top'.

The research units in both fields point to the same possible negative effects of the RAE. In their view, the RAE encourages working on short-term projects and concentrating on producing outputs to 'tick the boxes' of the RAE. All four cases are concerned about these possible effects. This is especially the case for medieval historians who see their traditional working habits (individualistic) and output preferences (books) compromised or even marginalized by an increasing logic of collaborative research work, short-term projects and article production. Interestingly, junior researchers are more positive towards such a different working style than seniors, who feel more threatened.

Biotechnology units have their own concerns. The key problem is the intensification of the race to assure funding and to publish results that are ascribed to the RAE and the increasing competition in this fast growing field. Losing the competitions means losing credibility. This in turn means losing funding and internal support with the threat of being marginalized as a teaching-oriented group. Finally, C1 is concerned about the resulting stratification of research units in the field and the university due to the RAE.

This brings us to a third aspect related to the RAE and the funding: managerialism and management policies. All four research units experience increasing management oversight. In their view university management encourages the units to apply for external funding, to diversify their funding, and to strategically plan outputs and human resources as well as internal and external cooperation. Above all, university management increasingly plays a role in monitoring the performance of the research units.

To support the strategic planning and performance monitoring, top and middle managers are employing a number of 'carrot and stick' policies. For a good performance, such as producing the required number of publications, attracting substantial amounts of external funding, and being successful in the field and scoring high in the RAE, university management provides rewards by opening new positions, promoting staff, returning overheads, giving university funded research leave or matching funds. If the unit fails to perform, university management is perceived as a threat, since it can dismiss staff, push staff more into teaching and administration roles, or restructure the research unit. Not surprisingly, these threats are negatively perceived by all units; however, not all of them have experienced them.

The relationship between management and research units is differently perceived. The major difference can be seen between the units scoring high in the RAE and those scoring low. The high performers (B1 and C1) are not very excited about the increasing influence of the management and the high administrative workloads, but in general they perceive themselves as quite independent from the central management and appreciate this independence. They see themselves favoured by the management due to their excellent research performance.

Despite this independence, they follow the management rules and have institutionalized internal monitoring procedures and support systems to succeed in their managed environment.

Low performers feel more pressure to comply with the university management and to 'play the game' - even in D1 where this meant a restructuring of the unit under a new centrally appointed leadership that also re-organised the research agenda of the unit.

Funding, research evaluation, and the strengthening of the university management all point in the direction of a pursuit for improving performance at the shop-floor level as well as a pressure of doing more with less. Looking at the perceptions of the four research units towards their work loads and work habits, they note increasing work loads and work intensification. The traditional mechanisms of building reputation of groups and individuals in the academic community are still at work and they are speeding up. Further, increasing output requirements and quality monitoring go beyond traditional mechanisms and contribute towards intensification of the competition.

For medieval historians the push to perform according to the expectations of the RAE and the management and the need to get external funding is perceived as a real challenge to their work habits. They feel encouraged to collaborate more with other groups on externally funded projects and to manage increased workloads. Collaboration with other researchers in the field in projects is a new concept to many of them which they have to embrace in order to secure project funding. Quite naturally, these developments are not welcomed by all researchers in this field. Particularly senior researchers are negative about these developments, while juniors are more positive especially about the increased collaborations in their field.

In contrast, researchers of the two biotechnology cases do not perceive much change in their working habits, since cooperation, external funding and peer-reviewed output are ingrained in their field of research. New forms of collaboration across units and faculties within the university form, however, a challenge. The high performing unit C1 feels encouraged by the management to collaborate and they have developed extensive collaborations both inside and outside the university. The lower performing unit D1 complains about the lack of support for collaboration from their university management and in fact they see little collaboration with other groups within their university. The juniors in this group are quite negative about the lack of possibilities to cooperate with other research units in their university. The pressure to perform coming from their institutional environment has increased in both biotechnology cases, which means higher workloads for the individual researchers. While C1 is neutral about the pressure to perform, D1 is quite negative since they are encouraged to teach more rather than to carry out research.

All research units experience inter-related effects of the above mentioned changes in their institutional environment. For many of the units, the world in which they live has substantially changed. Overall there are similarities in the perception of an increasing need to secure external funding, to score high in the RAE and to 'play the game' of the university management. There are also distinct differences in the perceptions between fields of research and between high and low performing groups.

As regards the field of research, medieval historians are more distressed and surprised by the need to diversify their funding base, to collaborate, and to compete for resources. At the same time, they are quite positive about the flexibility of external funding regulations. Medievalists are concerned about the pressure to produce a certain amount of outputs for the RAE and perceive this as a threat to their traditional medium of publication, books. Junior researchers are more positive about the need to produce a determined number of publications within a limited time period than their senior colleagues.

The biotechnology groups are quite used to research collaborations, to secure external funding to be able to do research, and to go for journal articles as the preferred medium of publication. They are dissatisfied with the thematic priority setting of financial backers and acknowledge increasing competition in their field. One of the major concerns relates to the RAE and a related further push for competition and to publish as soon as possible. Particularly senior researchers from D1 were dissatisfied with the increased competition for resources.

The changing institutional environment is also differently perceived by high and low achievers. B1 and C1 appreciate their independence from the management 'earned' by securing high 2001 RAE scores as well as attracting substantial research funds. They are satisfied with their levels of funding. However, they are aware of the penalties of underperforming; thus they have institutionalized routines of monitoring and support to maintain their high performance.

In the low performing cases researchers are concerned about how to improve their RAE score and how to improve their credibility in the eyes of their management. They perceive a strong pressure to comply with the management demands, even if this means a reorganisation of a whole group.

There are some differences between opinions of senior and junior researchers in both groups concerning the pressure to perform, the changing working style and producing research outputs. Senior medieval historians are rather reluctant about the need to produce certain outputs for the RAE and to change their work habits, while junior historians take it as a part of their work routine and are more at ease with the idea of producing more articles and collaborating with the colleagues in common projects. There is also a slight difference in the perception of the RAE, between the biotechnology researchers. The seniors are positive about

the RAE although they think they work hard anyway. Juniors were rather neutral about the effects of the research monitoring on their work habits.

8.1.2 Perceptions of the institutional environments in the Netherlands

Research funding is the most important aspect and concern for the Dutch research groups. Looking at the perceptions of the medieval history cases (E1 and F1) and the biotechnology cases (E2 and F2), we see that all the units perceive a decrease in funding from their university which leads among other things to vacancy stops which endangers the advent of new generations of researchers. In most cases they link funding problems to the university and the faculty management. Even high performing groups with a sustainable external acquisition portfolio note constraints in their organisational environment that include, for example, decreasing support for doctoral appointments, vacancy stops, and faculty re-organisations. This is the major trigger to seek more external funding, both public and private. Both biotechnology groups secure high funding levels through research grants from NWO, governmental initiatives, and industry. The medieval studies units do not have such an impressive track record with respect to contract research; they have to rely mostly on university funding and NWO research grants.

All units are negative about the increased competition that they perceive and concerned about external funding bodies' requirements for accountability which brings more paperwork and bureaucracy. Medievalists point to the low success rate of grant applications in their field and the lack of continuity of research grants.

Another perceived change in Dutch higher education and research is the increasing power of the university management. Clearly one of the consequences of the 1997 Act on university governance is increased management oversight, experienced by all four research units. Speaking of their management at the university, all four groups refer mainly to faculty policies. The major areas of management intervention are funding, internal monitoring, and personnel policies.

All groups are encouraged by their faculty management to search for further income. This reflects the internal funding being under strain. The means may differ according to the field of research as well as with respect to further income generated via research grants or teaching activities. Medieval historians teach significantly more and obtain NWO funded research projects. Biotechnology groups get involved in strategic partnerships to obtain second and third flow of funds. Particularly one of the biotechnology groups reports to have no financial worries.

In terms of evaluation procedures, all four units comply with the usual monitoring routines following national evaluation standards and management rules. Research evaluations are increasingly perceived as a monitoring tool for the university management to decide about the performance of different research groups. A major matter of concern for the highly ranked groups is the discrepancy between theory and practice in the support from university management. Theoretically, management holds incentive mechanisms such as returned overheads, new junior staff positions, special funding initiatives for multidisciplinary research, and matching funds. In practice, even excellent performers rate the support from within the institution as poor. Moreover, all units feel caught in the overall financial constraints of their faculty that lead to budget cuts and re-organisations. A special concern is the lack of matching funds from within the university in cases of successful acquisition. As full-cost units they have to hold proper funding for all costs that are usually not covered by external sponsors. In such cases, matching funds are supposed to cover such costs that are, however, not provided to the extent needed. Paradoxically, this leads to a situation in which external income may produce a deficit for the group which calls in turn for a further need of external acquisition.

Finally, personnel policies are the most widely debated management instrument by the four research units and especially emphasised in E2. Researchers in all groups are highly dissatisfied with the vacancy stops in their faculties and the increasing number of rules and constraints concerning appointments. The biotechnology researchers explain in detail the tendency to hire more post-docs funded by project money and the meagre prospects of getting permanent positions from the faculty. Early retirement procedures in the faculty and bigger faculty restructuring are a concern in E2, although they do not feel personally threatened as they feel to have enough external funding.

For all four groups, visitation committees and yearly staff appraisals are the usual routine that is mostly institutionalized. Overall researchers are positive about these evaluation procedures. All four research units think that external peer-based evaluations and appraisal talks are useful for their own academic development and credibility building. The biotechnology groups note that good evaluation outcomes also contribute to their visibility and future funding, although officially research evaluations and funding are not linked together. Medieval history researchers are not sure how the evaluation results affect them as there is no apparent reward system. They see it as 'artificial ritual' and speculate that it may become more influential in the future. Their scepticism among other things is related to the aging of the review committees and the fear of journal inflation and their rankings.

Overall, the three policy areas of faculty management exemplify the intensified role of the faculty and university management and an increasing

importance of internal monitoring as well as the use of external evaluations for internal steering. They note the threats and opportunities that management can create with their rules for the research units. Researchers are largely dissatisfied with this notion of growing managerial oversight.

All units perceive increasing pressures to perform according to the management expectations and the need to get external funding. The atmosphere at work is not as relaxed as it used to be. The week is always too short to carry out all the teaching, research and administration. Mostly researchers do not appreciate increasing multitasking in their work but they try to cope with their situation. The intensification of all the work to be done pressurises carrying out research while the increased workloads are of course not appreciated.

Although medieval history researchers still work on their individual lines of research, they perceive that their work habits are gradually changing (E1 and F1). In research both research units are open to cooperation and work on larger projects with their partners from within their research institutes, other groups in the Netherlands as well as from abroad. Researchers think that such cooperation helps to attract external funding and that it is beneficial to work with foreign colleagues on joined projects as it stimulates further cooperation and international publications. The groups are more involved in teaching since there are more students and the staff resources are scarce. This is especially true for F1. They find it difficult to cope with the teaching workloads but they need to teach in order to earn money.

For the biotechnology research units cooperation with external partners is common; it is a natural work habit in their field of research. They work together as regards attracting big project funding, using research facilities and publishing together. Team work in solving research problems is the name of the game for both units and they are positive about their partnerships. In general biotechnology researchers are happy about their job despite the intensified work loads and pressures to perform (coming from their management, increased competition and their own career ambitions). Visible complaints are voiced by E2 researchers as they were anxious about increasing number of competitors in the field, low success rates of external funding applications and increasing difficulties to secure a permanent post in the field. The latter concern was especially shared among the junior researchers.

Overall, all research units have perceived changes in the institutional environment as they experience inter-related effects of decreased funding and strengthened faculty and university management. Their perceptions of the institutional environment have similarities as well as differences. The major concerns in all cases are the decreased funding levels at the university and the related faculty management's decision of vacancy stops coupled with the negative aspects of competition and increased accountability. Research groups

are not pleased about fewer opportunities to get permanent positions. Research evaluations however, are positively perceived as they are seen as useful for career advancement. There are differences in perceptions of the changes in funding, management policies and research evaluations between the two fields of research. Moreover, there are some differences in perceptions of the changing institutional environment between 'low' and 'high' performers.

Medievalist units experience decrease in funding and they are seriously concerned about the implications of that on the staffing policies coming from the management. Unlike biotechnology groups, they do not have abundant external funding. Moreover, they complain about low application success rates and lack of continuity. Therefore the groups have to teach more and 'earn' their income from this activity besides carrying out NWO-subsidised research. Their major complaints related to such funding are increased workloads. Although overall medieval history units are quite positive towards research evaluations, they are concerned about their 'artificial' nature. Juniors find yearly appraisal talks more important than senior researchers. Finally, for medieval historians increasing collaborative work is a big change from the past which they perceive as an extremely positive development and they increasingly find internal networks useful for their work.

In the biotechnology units, contract research is common as they work extensively with other universities, industry and hospitals. Collaborative work is natural for these groups and they are successful in attracting second and third flow of funds. As a result, compared to medieval history groups, they are less dependent on university management for their financial wellbeing. However, increasing management oversight is still a concern to these two units due to the constraints of personnel policies. This was particularly true of E2 as it voiced its concerns about vacancy stops in their faculty. Increasing competition for permanent posts is a concern in these units. In terms of evaluations, biotechnology research groups are positive, as they feel that the good results enhance their visibility and the likelihood to attract external funding.

The high performers, F1 in medieval history and E2 in biotechnology, differ in their views from their counterparts that are less outstanding in the field. In F1 a cooperation culture is more visible than in E1 and they cherish it. The management oversight towards their research priorities is less stringent in F1 than in E1 as the research institute is less directive towards F1 group's thematic priorities. In biotechnology, the high performer E2 is more outspoken about their contacts and partnerships with industry and are more concerned about the competition and policies of 'picking winners' than their counterpart F2. Moreover, despite being the star research unit in the faculty, they are more worried about the management constraints as regards personnel policies as they find it difficult to obtain permanent posts due to faculty restrictions. E2 is more

relaxed about such constraints although personnel policies were an issue of discussion in this case as well.

8.2 Responses and practices

This section looks at our findings as regards the responses of the research units to their environment and possible changes of their research practices. We analyse the strategies they create in response to uncertainties in their institutional environment. Specifically, we look at compliance, symbolic compliance, and manipulation. These strategies are derived from our conceptual framework built on the credibility cycle model as well as on resource dependence and neo-institutional theories (see Chapter 2). We draw upon our analyses of the case studies (see Chapters 6 and 7). Further, we address the selected aspects of their research practices - problem choice, mainstream and risky research, output preferences and the teaching-research nexus. In the following we discuss and compare the strategies and practices of the basic research units in England and in the Netherlands.

All eight research units in the two countries respond to their changing institutional environment by attempting to reduce uncertainty and to maximise their credibility building prospects. They are either adhering to the rules and norms of their institutional environment and/or actively engaging in a dialogue with their audiences and trying to influence them. In other words, the basic research units use different strategies in responding to their institutional environment. In some cases, environmental pressures are perceived as very strong; research units see no possibilities to de-couple their core activities, and have to compromise to retain their ability to build credibility. In other cases, their credibility is sufficiently high and they are in an advantageous position in terms of their resources, which allows them to retain stability in their core activities. Overall, we have found all three major types of strategies that we have distinguished in Chapter 2. First, we have observed certain compliance strategies that go along with changes for some of the core activities. Symbolic compliance has been used to seal-off research activities from the environment while formally conforming to the rules and requirements of the environment. Finally, pro-active strategies have been used by the research units to influence the environment and to reinforce their own power positions.

It is interesting to note some similarities and differences in how medieval history and biotechnology groups in the two countries intend to keep their stability or to change their core activities by conforming, symbolically complying, or influencing their institutional environments. The following is a reflective summary and comparison of how continuity or change have been achieved in

coping with institutional environments, and what the implications are for the research practices of the units. We will do this by addressing the four dimensions of research practices that we have discerned (problem choice, mainstream and risky research, output preferences and teaching-research nexus).

8.2.1.1 Problem choice

The evidence from all cases suggests that it is not easy to influence academic problem choice since it touches upon the core of the academic profession: professional expertise and academic freedom. Problem choice is the heart of professionalism which researchers want to protect 'at any cost'. All groups want to keep the possibility to make their own choices of research topics and most of them succeed to maintain their preferred lines of research. Two English groups with high credibility as well as all Dutch groups have managed to retain their preferred topics. They are to a large extent able to seal them off from internal and/or external thematic priorities (or internal re-organisations). They do so mainly by writing project proposals in a strategic way, formulating them according to the exigencies of the funding bodies while following their own idiosyncratic topics at the same time. Not all groups are fully successful in this respect. In England, two groups had to compromise their problem choice to some extent. In the Dutch cases, all four research units report that they can still largely research what they want in terms of problem choice.

The units A1 and D1 in England are in a highly uncertain environment; their ranking in the RAE is lower and their dependence on resource providers is so high that they see no other way than to compromise their problem choice. The medieval history unit A1 is eager to strengthen its research capacities and reputation and it is encouraged to do so by the university management. This implies it has to 'play the game' of university management and to become more active in getting external funding. The unit and especially the junior researchers in the unit see, however, less chance to receive external funding with their traditional themes. Consequently, they compromise their problem choice to some extent.

Researchers in the low credibility biotechnology unit D1 compromise on their problem choice. The group experienced the halt of a long-standing basic research grant and a 'sudden' substantial need to obtain competitive external funding due to high uncertainty in its institutional environment. In turn, this led to an internal re-organisation including the arrival of a new group leader who has been put in place by the university's management to change the research programme of the group. This example stands out as a case of multiple compliance, since researchers had to compromise their problem choice taking into account the programmes, interests and preferences of funding bodies, industry and the new

unit's leadership. Taking these programmes of various audiences into consideration really limited the room for individual preferences as regards research themes.

The above examples provide indications that resource dependence and high uncertainty are strong levers for the units to change their problem choice. At the same time, the prevalence of the symbolic compliance strategies indicates the persistence of routines and norms of academic self-regulation. Particularly when the unit's credibility is high researchers tend to be successful in exploiting their professional autonomy.

Across the board it is possible to see differences in choosing research topics between junior and senior researchers. In all cases senior researchers that have high credibility have more leeway to retain their problem choice than junior researchers have. Moreover, juniors who work in high credibility units are also less likely to compromise their problem choice. This especially holds true for medieval history junior researchers who are more likely to work on their own research topics and individually apply for some external funding. In the biotechnology field, juniors usually are employed on a post-doc basis to carry out research where the project is already acquired by a senior researcher; thus, the topic is already decided for the juniors.

8.2.1.2 Mainstream and risky research

All eight research units tend to carry out risk-averse mainstream research to ensure predictable outputs in an increasingly uncertain environment. Most external funding bodies in both fields today require deliverables and clear timelines. This usually prevents units from pursuing 'risky' research. However, research units are also eager to be at the cutting edge of their field. Not doing risky research is seen as a dangerous strategy in the long run. Thus, they intend to carry out risky research as well; and most of them have been able to do this. In general, all the units in England and the Netherlands use the strategy of symbolic compliance to maintain the combination of mainstream and risky research. The usual pattern is to balance between mainstream and risky research by keeping the critical mass of mainstream research that brings in external funding through conforming to the formal requirements of the external funding bodies. At the same time they de-couple from these requirements and pursue their own research interests and carry out risky research on the side. One of the reasons to do mainstream research is the need to produce outputs. This is particularly a serious consideration of the senior researcher who have PhD students. They want to ensure that PhD candidates get results in order to receive a degree. Besides this overall tendency, we can see different patterns across both fields of research where research units either separate mainstream from risky topics, or combine

them, or utilise both strategies at the same time in different projects. A clear difference can be seen between medieval history units and biotechnology units in England. Medieval history groups diversify their project portfolio, senior researchers carry out both types of research while juniors tend to stay mainly within the mainstream. Biotechnology researchers also tend to diversify their project portfolio by involving junior researchers in risky projects. They also start with safe projects and later develop them into risky projects using the previous results.

Similarly, the two fields of research in the Netherlands differ in their strategies used to ensure that they can undertake risky research. Medieval historians either diversify (E1) or combine (F1) mainstream and risky research topics. Biotechnology units tend to use the diversification and combination of mainstream and risky research at the same time.

Another interesting difference concerns junior and senior researchers. The juniors tend to stay within the mainstream and play it safe, or try to combine mainstream with risky research lines, while seniors can still go for a totally 'blue sky' idea if they have funding from some other mainstream projects. Sometimes junior researchers have to follow the 'risky' themes because the senior researcher's strategy is to diversify junior staff working on 'mainstream' and 'risky' topics. Thus, we find juniors in biotechnology units working on risky research projects besides seniors. In medieval history this happens only in the high credibility unit E1 as one of their post-docs was funded by the faculty and could pursue her risky research topic. All other junior researchers in medieval history prefer to stay within the mainstream, due to their future career prospects and partly due to increasing the likelihood of getting external funding for their research. The opportunities to carry out risky research thus seem to depend on the seniority of the individual researcher and the field of study.

8.2.1.3 Output preferences

The general tendency in both countries and for both fields of research is that they see themselves confronted with targets to produce a certain amount and type of publications during a limited time period. This holds especially true for England and is mainly due to the regular and formalised targets of the RAE. English and Dutch units respond to these demands mostly by complying. Accordingly, all eight cases indicate changes in their outputs. All the units prefer to stick to their traditional means of publication (books for medieval historians and journal articles for biotechnology groups). Nowadays the production time has been shortened. Medieval historians have to change towards producing more journal articles and book chapters. For the biotechnology units, the type of

outputs remained the same. However, the time to produce them has changed. Here competition to get into high impact journals has intensified. Biotechnology groups in both countries experience an intensification of publishing to comply with the requirements of external and internal evaluations as well to succeed in the growing competition in their field. These challenges are more pronounced in England.

Serious differences can be found between the strategies for outputs of the medieval history units in the two countries. While in England units are conscious of the minimum quantity of publications and very much aware of and adhered to a 'box ticking mentality', Dutch medievalists seem more relaxed in this respect. Medievalists in the Dutch groups are conscious of the need to produce journal articles, but are not pressed with a definite target number during a certain period of time. They do comply with the encouragement of the management to publish and are conscious of the yearly need to submit a list of publications to the research institute. Furthermore, the Dutch medievalists use unique strategic considerations considering the language of publishing to boost visibility. Traditionally Dutch medievalists are publishing in the Dutch language and only sometimes in other languages. Nowadays they are more and more interested in publishing internationally in the English language to increase their international visibility and credibility.

The differences in output strategies between biotechnology research units in England and the Netherlands are less pronounced. However, English biotechnologists are more aware of the quantification of their outputs where external grants are also an important output indicator. In terms of publications all English and Dutch groups aim for the highest impact factor journal and top quality journals and the production of the 'required' number of publications per year. However, English researchers seem more conscious of reaching specific audiences to have an impact. Further, the behaviour towards patents is slightly different in biotechnology groups in England and the Netherlands. In England biotechnology researchers do not like patents as they can be a lock in for publishing, but they nevertheless file them when there is an opportunity to do so. They still count for their visibility and the RAE, though not as much as high impact publications. Patents are by and large 'resisted' in the Netherlands. University management is pressing the groups to commercialize where possible, but the researchers are not very keen on playing this part of the game. It takes much efforts and gives hardly any gains. Finally, Dutch biotechnology groups are aware of the pitfalls of multiple authorship and voice concerns about the ordering of the names in publications. This concern did not surface in English biotechnology cases.

8.2.1.4 Teaching-research nexus

All eight research units have experienced change in the teaching research nexus albeit to a different extent. Irrespective of the credibility of the unit, the field, or the uncertainty in their environment, all cases comply with the increasing demands of teaching and research by working overtime. The groups also feel growing tensions between teaching and research.

Overall, the English cases are more affected by the separation of teaching from research than the Dutch cases. In England research performance has serious consequences for the funding levels of the research units. At the same time, their teaching loads have increased mainly due to growing student numbers. Since their funding also depends on the number of students, they must find ways how to accommodate the conflicting demands of teaching and research. Research units try to cope with this by 'buying themselves out' of teaching activities (A1 and B1) when ever possible and by diversifying their junior staff into teaching-only and research-only positions (C1 and D1). For the medieval history units A1 and B1 it is common to go on a research leave, funded either by the university or external financial backers. The biotechnology units C1 and D1 tend to hire post-docs for research-only positions, while the teaching-only positions are used as a threat to staff underperforming in research. The high performing units in England in both fields can afford to concentrate more on research, since they have high credibility within the university and receive internal benefits that sustain and reinforce their research base such as university funded research leaves (B1), or returned overheads (C1). The low performers A1 and D1 face seriously increasing teaching loads and have to work hard, while trying at the same time to re-build their credibility within the university to enhance their research potential and to improve research performance.

In the Dutch cases, the change in the teaching and research nexus is less pronounced than in England, but they also use compliance strategies extensively to address their gradually changing institutional environment. The four cases have to accommodate increasing student numbers and they must teach more, while at the same time retaining and enhancing their reputation through research. A common strategy to cope with this is to work overtime and to diversify the tasks in their work portfolio. The medieval history units E1 and F1 have a serious increase in teaching workloads due to increased student numbers and limited staff, more emphasis on quality of teaching and the introduction of Bachelor Master structure. Moreover, teaching is a source of substantial income for these units that have limited contract research income (third flow of funds). Hiring temporary staff to teach and the involvement of junior researchers in teaching are common strategic responses of the medieval history units. Biotechnology units E2 and F2 face increasingly diverse tasks of research, teaching, and administration although research is still their primary activity.

The groups experience growing resource dependencies due to a decrease of unconditional internal university funding. They increasingly have to 'earn their money' internally via teaching or externally via competitive research funding. Success or failure in research acquisition thus has serious implications for the work portfolios of the groups.

8.3 Revisiting the research expectations

This sub-chapter revisits the three expectations that have been put forward in Chapter 2. We base our argumentation on the theoretical premises presented in Chapter 2 in combination with the empirical insights described in Chapter 6 and Chapter 7.

1. We expect that when there is low uncertainty in the institutional environment (sufficient resources are available and are successfully transferred into credits to build reputation) research units will retain stability in their activities and create pro-active strategies to manipulate and influence the environment.

This expectation is based on the assumption that organisations prefer certainty, stability and predictability. In line with this argumentation, we expect organisations to become more confident in their activities and their further acquisition of resources and legitimacy when uncertainty is low, because they feel less threatened by changes in their institutional environment. Under such conditions, the manipulation of 'institutional values and the constituents that express them' may be the likely strategies for achieving organisational goals.

Reviewing our findings one would assume B1 in medieval history and C1 in biotechnology in England to behave according to this expectation. Both research units possess high credibility and perceive relatively low uncertainty in their institutional environment. They are highly respected research units in their field, they were evaluated as excellent and secured the top 2001 RAE grade. Consequently, they have ensured high levels of research funding with the help of these positive results in their research assessment. This holds particularly true for the biotechnology group C1, since it has been very successful in securing high flows of funds, rebuilding infrastructure, getting matching funds from university, and hiring new staff. B1 is also well off as they had regular university funded research leaves and their retiring staff was replaced by junior staff members.

Equipped with high credibility stemming from their research evaluation results, both research units behave in a pro-active manner and largely employ manipulation strategies and try to become even less dependent on their institutional environment. More specifically, the latter strategies aim for a better

positioning within the university, more international visibility, and to ensure an additional stable flow of research funding. Both groups mostly pursue their own interests in problem choice and follow their own output preferences.

Considering B1, the unit actively bargained with the university management and exploited its high scores in the RAE as the main argument in negotiations. In this context, B1 ensured the replacement of retired staff by junior staff and secured the funding for research leaves.

Although receiving more than substantial levels of funding due to their performance, the research staff of B1 employs another pro-active strategy by applying for external funding to conduct more research projects. Their institutionalized procedures of ensuring the high quality of project proposals has become routine for researchers. In this way, they ensure their visibility and increase their legitimacy to the management.

B1 also uses symbolic compliance strategies to increase the chances of obtaining external funding. When research priorities of external funding bodies are not fully in line with their own preferred research lines, they 'package' their research agenda in such a way as to fit the requested themes. At the same time, they are able to pursue their original topics. Another symbolic compliance strategy of B1 is visible in balancing between mainstream and risky research. To increase the likelihood of funding they opt for mainstream research and are willing to follow the priorities of the external funding bodies. Following their own risky research lines remains, however, important and they keep them besides their mainstream research. A further example of enhancing fundability using symbolic compliance is the establishment of collaborations with other research units within particular projects. The units are encouraged to establish collaborations and joined projects by research councils and the university management. Here, they use their high standing in the field and their privileged position to approach the best quality partners of their choice. Despite being involved in such collaborative projects, they retain their individualistic working style. In terms of outputs, they manage to a large extent to preserve their traditional medium – books - regardless of the need to publish more journal articles as preferred by the RAE and external funding bodies. B1 transfers project publications such as papers at a later stage into books. Finally, B1 uses passive compliance to cope with an increased level of teaching in their overall activity portfolio. The research unit copes with the increased workloads by working additional hours, especially in the case of junior staff.

B1 thus uses two major pro-active strategies, bargaining with the university management and extending and diversifying its financial sources. In addition, this research unit symbolically complies with external demands as regards the selection of problem choice and establishing collaborations. They comply with the increased workloads in teaching and research by working overtime.

Similar to B1, C1 actively bargains with the university management using their high scores in the RAE as the major argument to strengthen their institutional endowment. In this case, C1 jointly lobbies with other groups in the department to increase the level of matching funds by the management for their refurbishing project. As a result, they manage to become a part of the 'showcase' department with state of the art laboratory facilities. As a matter of fact, their manipulation strategy worked out quite well.

C1 uses another proactive strategy by extending and diversifying its funding portfolio. This strategy aims to achieve a threefold goal of gaining even more legitimacy in the eyes of the university management, positioning themselves better among competitors, and freeing their hands from teaching. As the case study shows, they secure remarkably high flows from the funding council due to their good research performance. They claim to be one of the few research units in England that receive the highest amounts of funding for research from the council in the specific field of biotechnology. This gives the opportunity for researchers to stay within their preferred areas of research and to follow their interests. It is made very clear by the department management, however, that if a certain area is no longer fundable, they have to switch to a different area or to teaching and administration. In other words, the department management does not interfere in the matters of the research unit; it only puts forward possible negative scenarios that would result from significant future challenges in the fundability of their research portfolio.

Complementary to these pro-active strategies, C1 seals off some of its activities by using symbolic compliance strategies. This is particularly true when researchers apply for external funding. They apply for more fundable topics and write project proposals carefully wording them in a way that would fit the topic priorities of the research funders. At the same time, they preserve their own problem choice. This includes balancing out mainstream and risky research. C1 is pragmatic in trying to adapt to the fundable mainstream topics but also follows its own interests which includes more risky research. The research unit diversifies its team work portfolio. While a critical mass of work is done on mainstream topics, some researchers work on 'saved money' from mainstream projects on more 'risky' themes that could not be funded otherwise.

Finally, C1 is compliant with increasing its research funding on the one hand and reducing its teaching loads on the other. Both achievements are beneficial with respect to capitalizing their research performance and codifying their excellence in research. The unit complies with the increasing competition in the production of research outputs in their field of research as well. Researchers publish as soon as possible knowing they could easily be beaten by competitors in some other part of the world and therefore intensifying their production cycle.

Having analysed these two high credibility units B1 and C1, the first and most obvious observation is that the units maintain their legitimacy in the eyes of their management by application for and diversification of external funding, and by using institutionalized procedures for project writing. These units have secured a high credibility and a stable resource base. Therefore they are able to bargain for an even more powerful position within the university. They are enabled as the top achiever in the internal university competition between units and try to maintain that position by asserting themselves as a top performer. At the same time, they use the opportunity of relatively low uncertainty to make capital investments and improve their internal functioning (as in C1).

The strategies used in both groups are similar, employing not only pro-active manipulation strategies, but also complementing those with symbolic compliance and passive compliance. One reason for using mixed strategies could be the continuous need to build and maintain legitimacy even for high credibility units. The manipulation strategies reinforce their position as a top performer within their university. Further legitimacy is maintained by complying with certain formal rules and requirements while at the same time de-coupling some of their core activities.

Apart from these similarities, we detect some differences regarding how the symbolic compliance strategy is applied to enhance fundability. B1 uses collaboration as one of its strategic arguments when applying for funding. As a medieval history research unit, it has to present itself as a group that complies with the external funder's requirement for cooperation and formally it is able to do so. Still this does not prevent them from keeping their individualistic research work styles. This is not an issue for C1, as cooperation is so natural in the field of biotechnology; they 'automatically' fit such cooperation requirements.

The second observation is related to similar coping strategies as regards the increasing workloads. Despite the high credibility and low uncertainty that characterizes the environment of these research units, both teams are confronted with increasing working loads. Here we see units adhering to the rules and routines that constitute appropriate and legitimate behaviour for the academic community and for university management. The teaching loads have increased in B1 due to the increase in student numbers. Although they have sufficient funding for research they do respond to the increased student numbers. This leads to working overtime as they retain the research activities at the same level. In C1 the change in teaching-research nexus translates into treating teaching and administrative work as a punishment. They diversify personnel appointments towards teaching-only and research-only as it is encouraged by university management. In both cases coping with the increased workloads shows their willingness to reassert themselves as top performers and maintain their

legitimacy for university management as well as their colleagues in the field of research and external funding bodies.

Consequently, our expectation is partially confirmed as both units with high credibility and low uncertainty do in fact retain stability in most of their activities and create pro-active strategies to influence their environment as expected. At the same time, we observe a mix of strategies that also implies compliance and symbolic compliance. This hints to the fact that there can be more commonalities between all cases in the current study that we expected. Thus, despite the stated conditions (high credibility and low uncertainty) successful units also have to change their practices and use compliance strategies. The following expectations will discuss other groups that as we will see also employ a mix of strategies.

2. We expect that when research units have high credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), they will symbolically respond by adapting formal structures and creating de-coupling strategies for their activities, thus ensuring symbolic change.

This expectation is based on the argument that when the environmental context is highly uncertain, organisations will attempt to re-establish the control and stability over future organisational outcomes. This can provide an impetus to create strategies to protect the gained capital, and to 'symbolically adapt' to the external pressures by de-coupling the core activities from the institutional environment. The units that have accumulated high credibility, that is, high reputation, are thus likely to afford little change if any in their core activities even given high uncertainty regarding other resources.

The expectation has much to offer by providing insights on the responses of the two units with high credibility and relatively high uncertainty: medieval history unit F1 and biotechnology unit E2. These are Dutch units that are highly respected in their field and have been evaluated as excellent in research by Dutch 'visitation committees'. The institutional environment for F1 has changed towards increasing uncertainty as it faced restrictions from the faculty to hire new staff members while retired posts were not filled due to the dire straits of the faculty. Similarly, E2 is financially viable as it secured high second and third flows of funds but its faculty is under financial strain. As a consequence, E2 could not hire new staff, even though the group itself is self-sustainable. Both units perceive decreasing basic university funding, increasing managerial oversight and encouragement to acquire more external funding.

Medieval history unit F1 seals off their problem choice from the priorities of external funding bodies. They attempt to maintain their individual research topics and simultaneously increase the likelihood of receiving funding through

packaging ideas in an attractive way and writing in a fashionable manner to funding bodies. This approach includes considerations of combining mainstream and risky research approaches; F1 tries to use innovative approaches for mainstream topics. Another example of trying to enhance the likelihood of funding is collaboration with other research units while retaining their individualistic working style. Furthermore, F1 symbolically complies with the expectations of their university management to publish in journals and to produce conference papers. A new publication culture emerged as they have responded to the pressure to produce journal articles and book chapters besides occasional monographs. At the same time, books are still important to the medievalists in F1. Junior researchers are not necessarily aiming at the top journals to assure publication success and respected output quantity, while senior researchers are predominantly aiming at the top journals. Compliance with the nested requirements of external and internal research evaluations thus go together with more active strategies of how to increase their credibility. Additionally, F1 uses a strategy to build short-term projects and articles into long-term research lines and books. In other words, the research unit de-couples the formal structure that conforms to the changing rules of the game while it maintains its academic freedom in terms of problem choice, output production, and working style. Thus it uses strategies of symbolic compliance.

Besides, F1 also used strategies of passive compliance to deal with tensions in the teaching-research balance and more active manipulation strategies towards a diversification of their funding base. F1 conforms to the increasing teaching requirements coming from the university that may endanger their research capacities. At the same time, it aims to retain the research projects and publication outputs to enhance the credibility in research. Researchers in the research unit work additional hours in the evenings or weekends to carry out research in order to cope with such a situation.

Furthermore, F1 employs more pro-active strategies by expanding its influence internationally and investing in international network building. This international strategy also makes F1 more visible at the university and nationally. The group seeks to diversify its funding base by attracting second flow money from NWO and by establishing an international research master's programme that assures basic funding that can partly be used for research purposes.

In the case of E2 problem choice is also sealed off from requirements of external funding bodies by 'adjusting' the topics and writing proposals that fit the priorities of the funders, while at the same time not compromising the group's research interests. This means that researchers preserve their own problem choice and also increase the likelihood of receiving funding. In doing so, they also diversified mainstream and risky research lines. E2 complies with the perceived need to go for mainstream research, while at the same time they pursued their

own research interests by taking risky projects on board. One strategy is to start a 'safe' pilot experiment and if it produces results to apply for a bigger project with higher risk. In these projects, they try to have both risky and 'safe' parts to maximize the outcomes and to ensure external funding. Another strategy is to carry out both types of research in parallel. In this way researchers offset the risk of failure of producing results. In relation to this, E2 tries to diversify their junior staff doing only risky and only safe research.

Besides symbolic compliance strategies E2 also applies pro-active strategies and strategies of passive compliance. In terms of the work loads in teaching and research, E2 complies with the increased student numbers. They teach more than they traditionally used to, which they consider a worrying trend. At the same time, they try to maintain their research capacities by focusing junior staff into more research positions so as to secure the needed critical mass of personnel for their research laboratories. To offset the lack of time consumed by teaching at the expense of research, E2 works additional hours in the evenings and weekends to keep up with their research activities. As a result, E2 complies both with the increased demands for teaching as well as with their research credibility building needs.

Furthermore, the research unit E2 complies with the requirements of the research evaluation, the rules of financial backers, and the university management by choosing to produce the required amount of journal articles. This process is also driven by their personal career interests to produce as many outputs as fast as possible. As a consequence, the time to produce publications has shortened. High impact journal publications are the ultimate goal of E2. However, in some cases of high competition in biotechnology and short-term project results, researchers also opt for 'quick' publications in order not to be 'scooped' by their competitors. Another strategy employed is to diversify publication outputs with some results aiming high and other project results going for the 'quick' publication.

Complementary, the research unit E2 opts for pro-active strategies partly due to the overall need of increasing the resource base and diversifying the funding risks, partly due to the expectations of the university management to increase external income. Accordingly, E2 has diversified its funding base in the second and third flows of funds. E2 is also very active to enter a strategic alliance with a bigger national research institute which facilitates better contracts with industry and offers more stable third flow of funds. Finally, they are active in resisting the pressure to patent coming from the university management.

Both units F1 and E2 perceive their environment as uncertain and attempt to decrease this uncertainty by being pro-active and multiplying their funding sources. They try to follow the established routines to improve their research activities and adhere to the norms of academic community as they depend on it

for recognition. Since both face resource constraints induced by the university, they try to minimize this risk by increasing and diversifying their external resource base. As a matter of fact, the research units need to act strategically in choosing partners with high credibility to ensure a higher likelihood of resource flows. For F1, participation in international networks and projects is one way to reduce uncertainty and gain recognition. For E2, the strategic alliance is helpful in ensuring a stable flow of funds. In doing so, the research units also aim at gaining credibility within their university.

The strategies used in both groups are similar, as they not only turn to symbolic compliance, but also to passive compliance and pro-active manipulation. In this context, it is interesting to note the difference between the two cases with regard to the compliance strategies aiming to enhance fundability. F1 uses collaboration as one of its main strategic arguments applying for funding. It shows that it complies with the external funder's cooperation requirements. Although F1 is involved in international networks and participates in conferences, it does not cooperate in terms of working collectively towards publishing as a group. Thus, it de-couples the individualistic working style from the formal requirements to cooperate. In other words, it symbolically complies to the external funder's requirements. For E2 a lack of cooperation is not a challenge to overcome, instead in the field of biotechnology cooperation is 'the name of the game'.

Another observation is that both groups regardless of their high credibility need to comply with higher teaching loads. This means a very unwelcome change in their activity profile that they have to compensate with work intensification. This observation suggests that despite being rather well off financially (especially E2), resource dependence to the faculty is very important even to the high achievers in both fields. They cannot neglect the rules and requirements of the faculty management as they are constrained through personnel policies. In F1, teaching is an internal money generating source.

Consequently, our second expectation is thus partially supported as indeed both units did symbolically comply by de-coupling their core activities. At the same time, we observe again a mix of strategies that also implies compliance and more pro-active strategies such as manipulation. Now we turn to the units that we found were of low credibility and high uncertainty.

3. We expect that when research units have low credibility within their institutional environment and there is high uncertainty in the institutional environment (pressure of cutting resources or threatening reputation building of research units), they will comply with the institutional pressures and change their core activities.

This expectation is based on the theoretical assumption that organisations will attempt to re-establish stability in their environment by 'coping' with trouble. Accordingly, the research units with low credibility will feel forced to change their activities as they depend on their resource providers. We expect that they will try to re-establish the stability over organisational outcomes by using compliance strategies.

The four research units under consideration, A1, D1, E1, and F2 are all characterized by lower credibility and high uncertainty in their environment. The English units in medieval history and biotechnology (A1 and D1) received lower grades in the RAE and the Dutch medieval history and biotechnology research units (E1 and F2) scored lower for research quality in the Dutch quality review through 'visitation committees'. The institutional environment is uncertain for A1 and D1, since their research funding was cut due to the lower 2001 RAE score. For the Dutch units, the uncertainty has increased with the faculty restrictions to hire new staff members and fill in the posts of the retired colleagues although financially they are viable (especially F2). Moreover, in E1 the uncertainty increased due to comparably low success with grant applications to research councils.

The medieval history research unit A1 from England complies with the requirements coming from the university management because it needs to enhance first of all its legitimacy within the university in order to reduce its uncertainty. The research unit abided to the requirements of internal research monitoring to produce a certain number of journal articles for the next RAE as well as to apply for externally funded research leaves. Although the research staff holds the opinion that monographs are the ultimate output of a medieval historian, they have changed their types of publications. A1 plays the game in three ways and thereby followed the management's proposals. Firstly, the research unit applies for external grants. Secondly, lower credibility junior researchers compromise their research problem choice to increase the likelihood of funding by opting for more fashionable and fundable topics. They also compose an internal ranking list of journals to inform themselves what they should aim at while publishing. Finally, to 'earn' their money, they have to teach more while at the same time trying to keep up their research activities. The coping strategy to meet all standards is to work additionally in the evenings, weekends, and holidays.

A1 also uses symbolic compliance and pro-active strategies. The latter strategies aim mainly at raising the chances of attracting research funding and thereby increasing their legitimacy and credibility. Within the research group, the most common symbolic compliance strategy is to balance between fundable and preferred topics. This strategy is not always successful, as mentioned earlier. The A1 team manages to find a compromise by tailoring it according to the priority

themes of research councils. Other symbolic compliance strategies include collaborations with other research units in their field and combining the accumulated short-term project outputs into long term outputs. Within these synergizing efforts the team often pursues risky research after acquiring mainstream projects. A1 researchers move further than passively complying with the requirements of the management by pro-actively participating in the faculty themes. This helps them gain visibility at the faculty.

The medieval history research unit A1 is an interesting case. The research team started as a low achiever in a highly uncertain environment, and gained legitimacy by compliance with management requirements and rules in a first step. In a second step it reinvested its newly gained credibility and positioned itself within the faculty. These efforts have been rewarded by gaining a new senior post, the acknowledgement of the focal resource provider of the increased credibility of the research unit.

The next case, English biotechnology research unit D1, also extensively uses a passive compliance strategy. Some researchers in D1 comply with the priorities of funding bodies by adjusting towards fundable topics and thereby compromising their own research lines. This was the case when the area of research was no longer fundable by research councils or did no longer fit to the contract requirements of industry. The research unit also complies with the demands of the internal quality monitoring that is imposed by the university management. As a consequence they opt for a twofold publication strategy. On the one hand, the team targets high impact journals and on the other hand they try to publish as often as they can. This results in a more intense cycle of publishing. Another area of compliance to university management and the financial uncertainty is to become more involved in teaching. This evoked a radical shift in practices of researchers in this unit, since they used to carry out solely research because they were formerly endowed with a ten years base funding. Moreover, D1 has no choice but to comply with industry secrecy requirements and is unable to publish some of its research. The compliance to industry's publishing requirements is seen by the research unit as a lock-in for their academic credibility.

Although D1 complies with many requirements in its institutional environment, some strategies are only symbolic. The most obvious symbolic compliance is balancing between funding priorities and their own research interests. When they can afford not to compromise their problem choice they opt for a strategy to formally comply with the requirements of funding bodies by repackaging their own research ideas and sealing off their real research interests, which they can pursue after receiving funding. The group also diversifies mainstream and risky research lines. To enhance the likelihood of funding, they opt to focus on the mainstream, but still managed to carry out some risky research on the side. D1 ensures that there are some risky projects that yield

competitive publishable results by diversifying junior staff to work on safe and on risky projects. D1 further uses symbolic compliance to build long-term publications on short-term outputs that are required by the project funding.

Finally, there are some instances of pro-active strategies in D1. These apparently occur when the unit follows the preferences of the university management. They are diversifying their funding base by searching for strategic partnerships within the health sector, with industrial companies, and other university research groups with higher credibility.

Initially the biotechnology research unit D1 finds itself in an environment characterized by high uncertainty and low credibility, facing the prospect of top-down restructuring of the unit imposed by the university management. Given these conditions, the group employs passive compliance to the requirements of their management. However, it can symbolically comply with the external funding bodies and even use more active strategies of seeking partnerships in order to boost their credibility and the likelihood of external funding. This is an interesting case as we witness not only passive compliance to the institutional environment, but also certain creativity and active strategies.

The medieval history unit E1 in the Netherlands also tries to reduce environmental uncertainty by using a mix of strategies. The common strategy is compliance with the requirements to publish papers, articles, and book chapters. Although books are still a highly valued output, they feel the need to produce outputs more often than one book every couple of years. Additionally, E1 complies with the increasing workloads stemming from increased teaching obligations. As in other cases, the rising workload means working additional hours to be able to carry out research and meet the requirements for research outputs alike, both efforts to build their academic credibility.

As in the previous two cases, the medieval history research unit E1 symbolically complies with the thematic priorities of research councils sealing off their real research interests. The research unit 'packages ideas' and chooses broad topics likely to fit priority areas. Symbolic compliance becomes visible when the unit tries to balance mainstream and risky research. The research unit tries to diversify their staff into following either mainstream or risky research themes. They will carry out risky research even if it do not receive funding from NWO. Another strategy to enhance the likelihood of funding is to cooperate with other research units while at the same time maintaining its individualistic working style. E1 de-couples the formal structure that meets the changing rules of the game, while at the same time it tries to maintain its academic freedom in terms of problem choice and working style. E1's pro-active strategy in applying for external funding paid off and the group successfully manages to diversify its funding base.

Altogether, E1 uses coping strategies that lead to some changes in their core activities, such as an increased teaching load and a stronger focus on producing articles rather than books. At the same time, it maintains the academic freedom to choose their own research topics and preserves its working style with the help of symbolic compliance and more pro-active strategies.

The last case with lower credibility and higher uncertainty is F2, a biotechnology research unit in the Netherlands. This research unit complies with the academic norms in the field of biotechnology as well as with the demands of external funding bodies and university management. As a response, researchers try to publish as often as they can and aim as high as they can. Due to the competition the time to produce publications has intensified and researchers have the feeling that they must adapt by submitting results to a journal as quickly as possible. Besides complying with the 'rush' to produce outputs, F2 also has to comply with the increased workloads stemming from teaching and administrative obligations. The coping strategy was working additional hours like in the other cases that had to cope with increasing teaching loads.

F2 also occasionally opts for a symbolic compliance strategy. For example, when researchers in the unit apply for external funding, they usually try to wrap the project proposals in a certain way so as to fit the thematic priorities of research councils, while in fact keeping their own problem choice intact. This de-coupling is largely successful as they have received substantial amounts of external funding. Most of their work is, however, based on short-term project funding. In addition, they balance between mainstream and risky research themes, including both elements in the project proposals and then diversifying junior staff to work only on risky or only on mainstream topics.

Finally, F2 has been proactive in diversifying its funding base, working with research council funds, support for projects from governmental and the EU, and industrial funds. This makes them less dependent on internal income from the university. Additionally, they are pro-active becoming involved in strategic partnerships within the university hospital to make themselves more visible within the organisation. Nationally, they have become part of a network of excellence which secures remarkable funding for equipment. This move gives them credibility and strengthens their position in the university as well. They are also active in resisting the pressure to produce patents as encouraged by the university management. Overall F2 has experienced some changes in its activities, namely, the output production has intensified and they have higher workloads. However, they also retain stability by de-coupling their activities from the formal requirements. Although their uncertainty is high due to restrictions of faculty personnel policies, they manage to retain stability in their activities by diversifying their resource dependence and re-establishing a visible and powerful position within their organisation.

The third expectation suggests that research groups will comply with the institutional pressures and will change their core activities. At the same time the expectation suggests implicitly that other strategies, for instance symbolic compliance and pro-active or manipulation strategies are less likely to occur. The analysis shows indeed that all four research units use certain compliance strategies and have changed some of their core activities. In other words, the explicit expectation is met. Though this being the case, the parallel application of other strategies does not provide evidence to fully support the expectation. In all four cases, symbolic compliance as well as pro-active manipulation occurred. Despite the similarities that the cross-case comparison revealed, we also observe differences between A1, D1, E1, and F2 with regard to their research problem choice(s). The two English cases have to compromise their problem choice in applying for external funding. The reason for this could be their low RAE scores and the ensuing financial implications and the much stronger internal university pressure to re-organise. E1 and F2 are in a better financial shape and their major constraint comes from the faculty regulations. Therefore while applying to external funding bodies they can afford to maintain their own problem choice intact.

After having revisited the three expectations of our study, we can see that a mix of three strategies identified in the responses of the basic research units in medieval history and biotechnology in the two countries is found. This complex dynamic mix will be explained with the help of our conceptual framework discussed in Chapter 2 in the following chapter where we will answer the major questions of the current study and reflect on the meaning of the use of multiple strategies by all the units irrespective of their credibility and level of uncertainty in their environment.

9 Conclusion: university governance and academic research

9.1 Introduction

In this study we have explored how changes in governing higher education and research systems influence basic research units in medieval history and biotechnology of public universities in England and the Netherlands. The multi-level study aims to understand the complex and interdependent dynamics between the macro, meso and micro levels in these two European higher education and research systems. The multi-level analysis has been guided by the following question: What are the effects of the governance models on research practices in university basic research units in England and the Netherlands? This central research question is further specified by four subsidiary research questions:

- What are the governance models in higher education and research?
- How do basic research units perceive their institutional environment?
- How do basic research units respond to their institutional environment?
- How do these responses influence their research practices?

We have addressed these questions on the basis of a theoretical framework and conceptual tools provided in Chapter 2, which were operationalised in Chapter 3. As discussed in these two chapters a number of changes are observed in public sector governance in general and in higher education and research more specifically. A shift 'from government to governance' has taken place that gives rise to multi-actor and multi-level governance of public sectors such as higher education (Mayntz, 1998). We have selected a five-dimensional governance model for our analysis of governance shifts, using models that have been developed in the higher education literature to unravel, understand and analyse the governance in higher education and research systems, (de Boer, Enders, & Schimank, 2007; Enders, 2002; Schimank et al., 1999). These five dimensions of governance are: external regulation by the state, academic self-governance, competition for resources, managerial self-governance and stakeholder guidance. As we will summarize in the next section of this chapter changes have taken place with respect to each of these dimensions in both countries.

The configuration of the five governance dimensions creates specific institutional environments for the basic research units under study. This implies changes in the rules, norms and values that govern the allocation of goods and services in higher education and research. To better understand and systematically analyse the complex relationships between a basic research unit and its (changing) institutional environment, we have used a combination of two well-known theories in the social sciences: resource dependence and neo-institutional theory (DiMaggio & Powel, 1983; Pfeffer & Salancik, 1978). Both theories provide useful insights on how organisations respond to environments with which they interact. Resource dependence theory postulates that organisations act in order to control their dependence on resources and try to reduce environmental uncertainty by exercising power, control and negotiation. Neo-institutional theory states that organisations aim to survive through conformity to external rules and norms and try to increase environmental legitimacy while de-coupling their core activities from organisational change. A combination of these two theoretical perspectives offers a range of possible responses to changes in institutional environments, among others put forward by Oliver (1991). Taking her institutional strategies as a basis for our analyses, we have investigated how eight basic research units of public universities perceive their institutional environments, how they respond to them and what it means for their research practices. In order to interpret the perceptions, responses and consequences for the research practices of the basic research units meaningfully, we have taken into account the particular characteristics of the world of research and science. For this purpose, we have used the credibility cycle model of the research organisation that was introduced by Latour and Woolgar (1979). Reputation and resources are the corner stones of this cycle.

In our study, carried out in the period 2003 – 2007, we have used a multiple-case design, where four cases have been selected in England and another four cases in the Netherlands. The basic research unit of a public university is the unit of analysis in our study. Three criteria have been used to select these eight basic research units: country (England and the Netherlands), discipline (medieval studies and biotechnology), and estimated quality of research (excellent and good quality). In this way the cases differ from each other; Anglo-Saxon versus Continental system, 'soft' versus 'hard' field of research (or Mode 1 and Mode 2 type of research) (Biglan, 1973; Gibbons et al., 1994), and perceived 'high achievers' versus 'middle achievers'. For the data collection phase of the study, multiple sources of evidence were employed under the rationale of triangulation (Yin, 2003). The study has used documents, literature, and semi-structured interviews. The documents and the literature address the period since the 1980s. The interviews took place in March – June 2005 in England and in October 2005 – January 2006 in the Netherlands. In the two countries, 77 interviews have been

conducted at all three levels that we discern in our study (macro, institutional and shop-floor level). Interviews have been undertaken with researchers, university managers and policy makers in the two countries. The data has been categorised by using descriptive, topic and analytical coding and NVivo software (Richards, 2005). The categories have been derived from both the interview protocols and the themes emerging from the corpus.

In this final chapter, we present the concluding reflections of the study, that is, we discuss the effects of the governance models on the research practices in university basic research units in England and the Netherlands. We start with an overview of the major outcomes of this multi-level study. We proceed to a critical reflection of the study's strengths and weaknesses from different angles. Based on these reflections we propose further research avenues.

9.2 Outcomes of the study

9.2.1 *Governance models and the research units' perceptions of their institutional environments*

The following section addresses the first two questions of our study to gain understanding of what kind of governance models can be found in England and the Netherlands and what type of institutional environments have emerged for the basic research units in the respective countries. We build on the insights from our literature and document analyses in Chapter 2 and Chapter 4. Based on the case study analyses that have been presented in Chapter 6 and Chapter 7, in the next section we also report on what basic research units perceive in their changing institutional environments, that is, what policies do they observe and find important.

9.2.1.1 Governance models in England and the Netherlands

Higher education and research reforms in Europe have included new governance approaches where a major shift has taken place towards multi-actor and multi-level governance systems. Coordination increasingly takes place through interlinked policy levels with an increasing number of actors influencing the higher education and research system (de Boer, Enders, & Leisyte, 2007). A plethora of concepts and models of governance have been developed and discussed (Braun & Merrien, 1999; Clark, 1983; Maassen & van Vught, 1994). In this study, we have looked at two higher education and research systems: England and the Netherlands. As regards the governance of universities in England is traditionally based on the Anglo-Saxon governance model; the

university governance in the Netherlands traditionally on the Continental one (Clark, 1983). Looking at the five governance dimensions described in Chapter 2 and Chapter 3 and having analysed the developments in the two countries since the 1980s, we see that both governance models have undergone considerable change.

In England, the traditionally limited regulation by the state in higher education and research has increased to a considerable extent. Several reforms, such as in funding and in quality assurance, are aimed at strengthening the regulative capacities of the state. The dominant motives of the reforms were to make universities more accountable and efficient, to call for 'value for money' and to make universities more responsive to the needs of the economy and the society. In the Netherlands, traditionally state regulation of higher education and research was strong as it typically is in a Continental model of governance. In the period under discussion in our study, state regulation in the Netherlands has been reduced because of a changed attitude towards higher education and research sector. Since 1985, the concept of 'steering at a distance' has been at the forefront of higher education and research policies where the government is not the 'almighty' system planner but instead serves to fulfil the role of a catalyst, coordinator and facilitator. Deregulation and increasing university autonomy have been the major policy drivers since then. In the 1990s aspects of accountability crept in, such as quality assurance requirements for research and more performance-based funding and reporting.

We thus observe changes in the role of the government in both countries, where state regulation in England has increased, while in the Netherlands it has decreased. It is important, however, to note that the traditional position with regard to state regulation was quite different in the two countries as discussed in Chapter 4. Certain elements of a changing state regulation in both countries have strengthened the role of intermediary organisations and of university management. This devolution of authority is instrumental in exercising power within the system by delegating parts of the state powers to lower levels. Such changes towards 'intermediarisation' and 'agentification' have also contributed to a growing complexity of actors and mechanisms in the system's coordination.

In the same period, the competition for resources has substantially increased in both countries, albeit to a different extent. In England, the core of the belief of government procuring services has led to a performance-based redistribution of public resources. In the context of the periodic research assessment exercise, funding has concentrated at the top research universities and largely contributed to a tougher competition for funding and staff overall. The competitive allocation of project grants by the research councils (that is linked to the outcomes of the RAE) has further stratified universities and research groups. In the Netherlands, competition for resources has increased as well but less pronounced compared to

the developments in England. State funding for universities in the Netherlands is to some extent performance-based, but still includes a rather stable historical component. Regular quality evaluations are being carried out, but are not automatically linked to funding. Nevertheless, basic funding for research is under strain.

The trend towards more competition probably supported the evolution of strengthened and more centralised management structures at the universities in both countries. Within the universities performance monitoring, target-setting and action plans were increasingly used. In England, the government aimed at a centralising the decision-making powers within universities in order to improve their efficient functioning. This push towards a more profound role of the central management in the universities in England implies more powers for the top and middle management of universities. Certain reforms in the Netherlands were also aimed at strengthening managerial self-governance in universities. This process started somewhat later than in England and worked out in a more incremental way. After the 1980s, financial and staffing matters were devolved from the state to universities, which 'created' the possibilities for the universities' central management to increase their influence in strategic decision-making and budget allocations. Further developments in the Netherlands included the strengthening of the managerial responsibilities at the middle level (deans, head of schools and research directors) and the 'verticalisation' of authority lines (e.g. top-down appointments instead of elected posts). In addition, in both countries internal monitoring has increasingly become a tool for university managers. This growing role of management oversight and control has also been reported in a number of other studies (see (de Boer & Goedegebuure, 2007; Deem, 2004; Henkel, 2007; Shattock, 2004). These studies point to the fact that the actors and mechanisms of supervision and management are getting closer and closer to the shop floor level of academic work. The devolution of authority from the government to universities is expected to facilitate the overall re-organisation of the system in order to increase the efficiency of the primary processes in universities. In fact, such a devolution of authority may be more ambivalent. Our study provides many examples of a more intrusive and business-like management of academic affairs, but at the same time it reveals many examples of central and middle managers who are trying to buffer 'their' academic units from the more immediate or dramatic consequences of environmental changes. Certain controversies and tensions between managers and academics have been observed in our study, but characterising the institutional cultures in terms of 'us' and 'them' would misrepresent the dynamics at play.

As we have seen in Chapter 4, and partly due to the strengthening of the managerial powers in universities, academics have had to give up some of their say in strategic university matters in both countries. In England, this loss of

academics' control in intra-organisational matters has emerged earlier and in a less consultative way than in the Netherlands. Overall, academics have lost their monopoly of influence over organisational goals, strategies, and structures. Traditional structures and processes of collegial decision-making are vanishing although old and new forms of informal co-determination still provide means to exercise academic powers within universities in both countries. At the same time, academic self-governance via peer review has clearly gained in importance in both systems. Actually, the regular and systematic quality evaluations rely to a considerable extent on traditional criteria and mechanisms of professional self-control within the academic communities. Certain academic elites also clearly play their role in the growing field of research forecasts and programmatic research planning. Nevertheless, the impact of academic self-governance on the policy process tends to be modified by changes in what is considered as criteria of academic performance and tends to be compromised by the inclusion of non-peers in decision-making bodies (as in the case of the English research councils, for example).

This inclusion also points to the increasing role of stakeholder guidance in the system's coordination. First, we see that the approach of one of the main stakeholders – the state – is not just one of regulation but also one of guidance. Strategic goal-setting and contractualisation have gained in importance as steering devices. Second, evidence from our study suggests that the role of stakeholders other than the state has been increasing in both national research programming and internal university governance. In both countries, we witness serious attempts to incorporate industry's and society's needs in academic research programming. Within the universities, lay membership in governing and advisory bodies provides examples of stakeholder influence in the higher education and research systems. Looking at the representation of lay members in the governance of universities in England, we can see external stakeholders represented in the boards of governors, in policy formulation and in discussing assessment criteria for the RAE. In the Netherlands, a number of universities established so-called expert councils to advise on research matters. Institutional leadership is also influenced by external guidance as every university has a supervisory board which is entirely composed of external stakeholders.

Put succinctly, the shifts in governance in England and the Netherlands have led to new governing constellations based on the five governance dimensions. This finding is in line with previous studies, (for an overview, see (Braun & Merrien, 1999; de Boer, Enders, & Schimank, 2007; Neave & van Vught, 1991). Clark's (1983) Continental model with strong state control in parallel with academic self-governance - where the university is seen as a bureau-professional organisation - is in retreat in the Netherlands. The policy reforms that have contributed to the 'fall of the Continental model' have partly been inspired by the

traditional Anglo-Saxon model and partly by the rise of neo-liberalism (which includes the emergence of new public management). The Anglo-Saxon model itself has also undergone considerable change, including more state regulation. In England neo-liberalist ideologies have been strong, but have led to stronger state control. Both countries have experienced attempts to increase competition on 'quasi-markets', to strengthen managerial powers and oversight as well as the guiding hand of stakeholders across the system and within the universities. Academics have lost institutionalised powers in intra-organisational decision-making, but outside the university their influence should not be neglected. Traditional mechanisms of professional self-regulation via peer review have gained in importance, particularly because of the increasing use and impact of evaluations and monitoring, research forecasts and research programming.

Comparing the two countries, we may thus note similarities as well as differences. The point of departure for the policy reforms has been different for each country since the two systems are traditionally based on different higher education governance models. As two distinct systems, they also have had different ways, styles, and timing of introducing the reforms. Whereas England can be seen as a more extreme case of the shifts in governance and as an 'early adopter' of rather fundamental changes, the reforms have occurred in a somewhat lighter fashion and at a later stage in the Netherlands. The Dutch approach has also been more concerned with consensus building in decision-making on major reforms and with the self-steering capacities in the higher education and research system itself.

In order to explore the effects of these shifts in governance on the research practices of the basic research units, we will now turn to the question of what changes the units perceive in their institutional environments.

9.2.1.2 Research units' perceptions of their institutional environments

As we have discussed in our theoretical and conceptual underpinnings in Chapter 2, institutional environments are assumed important for the survival and wellbeing of the basic research units. These units depend on the environment for their resources and for the opportunity to build their credibility and legitimacy. Bearing in mind the conceptual model of the credibility cycle, institutional environments bring in constraints and enablers for the units' survival and their credibility building processes. As seen in the previous section, changing governing models in England and the Netherlands tend to create changes in the units' institutional environments. Resource dependence and neo-institutional theories propose that organisational units respond to changes in their environments to 'protect' themselves. Their responses will (partly) be based on their perceptions of (changing) institutional environments, the relevance attached

to certain institutional features, and their meaning as enablers and/or constraints (see Chapter 2).

Our analysis has shown that respondents in all cases of our study perceive their institutional environments as changing. They identify a number of constraining and enabling pressures for their credibility building as the intended or unintended effects of these changes. While there are similarities in the trends perceived by the research units, there are differences as well. In this section we will report on these similarities and differences.

The major change in the institutional environment as perceived by the research units is related to the changing national regulation on funding and its interrelated effects on university funding policies. In England, funding issues are strongly coupled with the national research evaluation scheme, while this is less so the case in the Netherlands. In the Netherlands, there is no direct link between quality assessments and funding, but excellent assessment scores may attract sponsors more easily (and vice versa). Largely, the funding policies mean a change of the rules of the game for the allocation of academic goods and services as well as a multiplication of the means needed to assure funding for the units and the audiences with which they are interacting to this end. The funding also is becoming more conditional in the sense that it increasingly depends on the units' performance. External and internal funding policies are seen as means for efficiency in the primary processes; in other words, as instruments that promote the doing of more with less or the same. For the researchers, the research councils and their accountability rules have become more important as they are increasingly the major sponsors for academic research projects, research leave or for postdoctoral and doctoral fellowships. Mostly the research units are quite negative about increasing accountability requirements. However, they perceive them as the given rules of the game, an unpleasant necessity with which they have to comply. In practice, this means more bureaucracy and administrative work, writing and sending out proposals and reports. Another common worry as regards funding concerns the increasing competition for funding. In nearly all cases university funding has decreased (because of declining budgets from the government) and the research units are part and parcel of faculties that face fiscal crises. One of the consequences is that the university management 'encourages' the research units to diminish the financial uncertainties and to search among other things for external research funds. As a result, researchers increasingly face conditional and competitive types of funding. This means that more groups are bidding for the same pool of resources at the national level, including public and private bodies. Here a number of different audiences are important to researchers.

In the medieval history field acquiring external research funding is less culturally ingrained than in biotechnology. Research councils are the primary

source of external funding and an important audience for the units' credibility building processes. The Dutch medieval historians also consider the European Science Foundation as an important funder. English medievalists also turn to charities and acquire an additional flow of funds via public speaking and other 'entertainment' services. The groups are worried about the increasing competition of research council's funding. The major concerns include high overheads, increased accountability requirements and increasing call for 'relevance'.

In the field of biotechnology, research councils traditionally play a major role in providing funds for expensive equipment and projects. The units are nevertheless also concerned about growing competition in their field as well as about the frequently changing rules and procedures of the research councils. Researchers are in particular worried about governmental policies geared towards the funding of 'excellence' and large scale projects. Researchers in England understand that the RAE and all related mechanisms of research funding and university support are clearly related to 'picking winners'. In the Dutch context, the big governmental initiatives of networks of excellence and building consortia are other examples of 'picking winners' policies in relation to which some research groups feel marginalised. They perceive such 'one-sided' policies as worrisome. This is especially true for the smaller units as well as for units with lower credibility. Thematic priorities of research councils (and their changes) are another concern for researchers in both countries because they lead to insecurity about future funding. In addition, the European project funding is of interest to biotechnology researchers, although the rigid EC-rules and accompanying red tape are detrimental to their motivation to obtain such European funding. Finally, industry is an important funder in this field of research. Researchers see this as a useful additional source of income that is welcome particularly in times of decreasing basic funding and increasingly competitive funding through research councils. At the same time, the biotechnology research units are well aware of certain risks that may come along with industry funding such as publication constraints or interferences with 'doing research'. This can be detrimental to their credibility building processes in the academic world.

A further perceived change in funding concerns the move towards 'full cost units' and the related separation of funding for teaching and research. All groups in both countries and fields of research see themselves acting in an environment that asks them to 'somehow earn their money' (and thus to legitimate their existence) via external research income or internal teaching income or a mix of both. In consequence, the research units are increasingly encouraged to obtain external funding for research. A need to offset lack of such external funding usually means 'earning more money' from more teaching. This is particularly

obvious for the units that did not perform that well in the RAE in England and for the medieval history groups in the Netherlands.

Altogether, the perceived changes in research funding point to scarcity of resources and growing competition, both in and outside the university. In fact, for most research units, even the excellent performers, the changing funding policies imply a growing uncertainty about their financial stability and future operations.

Research evaluations and their potential consequences are also high on the agenda of the units in both countries (and particularly in England). The RAE and its related direct and indirect effects dominate the discussions of the theme in the English units. The groups are extremely well aware of the importance of the RAE for their reputation and their funding. The opportunities to get research council funding and internal university funding are to some extent dependent on the unit's performances in the RAE. Thus, the rules of the game set by HEFCE are paramount for the every day lives of the researchers in the English case studies. 'Winners' see performance-based funding as an enabler for their research activities, while 'losers' see it more as a constraint. The research units that scored high in the 2001 RAE are more secure about their funding and are quite satisfied with their funding levels. In a volatile environment, an excellent RAE outcome means, at least, some financial stability for a couple of years. The 'low' achievers, on the contrary, are concerned about their financial situation and growing financial insecurity. English researchers are also very well aware of the number and type of research outputs needed for the next RAE, and of the consequences of being excluded or scoring low. They perceive certain constraining effects as regards their research outputs. For medievalists, the RAE implies a threat to their traditional output preferences, which are books while biotechnology researchers see the RAE as another trigger towards the ever increasing competitive race to publish articles, and to publish them in the most prestigious journal possible. They think that the RAE also is a major trigger for growing internal monitoring in the preparation for the next national evaluation. After all, the research unit's reputation is not the only one on the line, but the university's as well. This makes the RAE also a delicate matter internally. At the same time, some voices are heard that argue that the RAE is a useful mechanism for doing away with the 'free riders' in academe. Overall, the RAE provides an impressive example of how an instrument that links funding and reputation can be ignored neither by the research units nor the university managers.

In the Dutch context, the research evaluations are also seen as important, but less than in the English case since the effects of the assessments are not as severe as in England. The research units perceive a growing amount of external evaluations and internal monitoring procedures as an important change in their institutional environment. The research units are well aware of the institutionalisation of research evaluations, organised by the university

institutional leadership and carried out through peer-based 'visitation committees' and the annual staff appraisals carried out by the institute or faculty management. The research evaluations, based on the nationally agreed Standard Evaluation Protocol, are taken seriously by all Dutch researchers, even those who argue that these evaluations are somewhat artificial. On the one hand, the research units see the quality assessments as an opportunity to get feedback on their past performances and advice for their future developments. On the other hand, evaluation results are also seen as important for signalling the research units' academic prestige and further credibility building capacity. However, the units are somewhat more speculative about the potential effects of the evaluations when it comes to funding. Biotechnology researchers believe that research evaluations affect their likelihood of external funding and visibility. In the case of positive evaluations they are also more likely to receive university management incentives, such as matching funds, new junior posts or returned overheads. Medieval historians do not have outspoken views on how the results of research evaluations affect their work.

Finally, besides changes with respect to funding and research quality assessment all research units see increased management oversight of their teaching and research activities as a serious change in their institutional environment. The common observation is that management has gained powers that cannot be ignored. All units, especially those with low credibility, feel they have a decreasing say in university affairs. Most of the researchers 'understand' the position their managers are in, they try to work together and consult each other (especially in the Dutch context). Tensions are also observed, however, particularly where management tries to intervene. In some cases, especially those with high credibility, research units see the management rules and practices as possible enablers of their credibility building processes or just as an imposition of additional administrative workloads, but nothing really threatening. All the units refer to the 'carrots and sticks' policies of their university's management that are aimed at improving the research performances. Commonly these include financial incentives and threats, internal quality monitoring, and personnel policies.

In the English cases the major complaints about management are related to the threats and incentives they face from their university management. The financial mechanisms seem to dominate the discussion. They include financial cutbacks and increasing accountability requirements. Monitoring procedures that mean more 'paper work' are also seen as an unwelcome development. The personnel policies are also used as an instrument of the university management. For example, all research units elaborate on the personnel related threats, such as early retirement, non-prolongation of fixed-contracts and teaching-only positions. At the same time, there are a number of incentives that are welcomed by the

units, such as matching funds for external funded projects, returned money from overheads and new posts.

The Dutch cases experience in a similar pattern tightening of their budgets, increasing accountability, more bureaucracy and 'vacancy stops' coming from university management, although in a less top-down manner than in England. The role of the dean has become more important as noticed by researchers, especially in personnel matters. The usual complaint relates to the increased requirements for new appointments, lack of stability and threats of reorganisation. Overall the research units see increasing uncertainty in their institutional environment due to the lack of adequate matching funds, reduction of staff positions, and early retirements. On the positive side, some management incentives are welcomed and include matching funds (mainly in biotechnology), returned overheads and new junior posts. However, research units complain about the discrepancy between the proclaimed positive incentives and their actual implementation, that is the difference between policy and practice in supporting successful groups (for example, lack of matching funds).

Looking at the eight basic research units, we conclude that they realise that they live and work in constantly changing institutional environments. These environments are characterised by changing rules of funding, increasing evaluations and monitoring, and growing 'managerialism'. Funding is perceived as being scarce, more conditional-based on performance, and more competitive. Performance measurements of different kinds have been institutionalised and cannot be ignored in the units' strategies and daily routines. University management at central and middle level has taken over functions that were traditionally performed by the academics themselves and, in the case of the Netherlands, by the state. To some extent 'driven' by the financial constraints, these managers use 'carrots and sticks' to change the research units' behaviour. Generally, the research units perceive their environments as increasingly volatile, uncertain, and complex. This is triggered by the perception of ongoing changes in the 'rules of the game'. While some of the research units see the changes as possible threats to their wellbeing, others see them as enablers. The researchers' dependence on resources such as money and personnel is impressive. Mainly in the form of finances, staff positions and equipment, the need to get resources in order to survive and maintain research activities is evident in all cases. Their ability to gain the resources is mainly attributed to their own capacities and prestige within the field, to the ability to 'play the game' of the university management and their abilities for successful fund raising.

The striking difference between the two countries in the context of our study is the specific functioning of the RAE and its importance for public funding, reputation, the capacity to attract other research-related funding and promising talent, and its impact on institutional strategies. The English research units clearly

perceive the RAE and its nested effects as a key determinant of their standing and future prospects. The Dutch research units identify traces of similar elements in their changing environments but nothing compared to the comprehensive and striking effects of the RAE

We can also note certain specificities as regards the two fields of research under investigation. In general, medieval historians are more distressed by the need to diversify their funding base, to collaborate in research projects and to compete more extensively for scarce resources as this runs counter to their traditional academic norms and habits. They feel more vulnerable as regards their capacities and opportunities to attract external funding and the potential threat of being 'marginalised' into teaching. Further, medieval historians are sceptical about the research evaluations as they somewhat artificially push a certain amount of outputs in a limited period. That can never be the true meaning of research. These rules that accompany the ongoing evaluations of research performances constrain their time to go for long-term research investigations and to produce traditional comprehensive and time-consuming outputs.

Biotechnology researchers perceive different changes in their institutional environment as regards research collaborations, the need to go for external funding and the competition for resources and publications. Collaborations and competition for resources have been ingrained in their field already and form part of their well-established realities of their work environment. However, they have concerns about an increasingly fierce competition for funding and staff positions which are partly attributed to changes in their institutional environments and partly to the sheer growth in their field of research. Moreover, they are dissatisfied with what they experience as the increasing management intrusion in their work practices and related restrictions, the encouragement to commercialise their knowledge base and the constant monitoring of their outputs.

Other changes in their institutional environments which deal with measures to improve the commercial aspects of the work, the 'relevance' of the research and the connections with other 'users' outside academe, are not major issues for most of the investigated research units, both in the field of biotechnology and medieval history. These issues and related policies are certainly on the research units' agendas but figure much less prominently than the ones discussed earlier.

9.2.2 Strategic responses and research practices: an overview

The third research question of our study deals with the responses of the research units to their institutional environments. Based on our in-depth study of the responses in Chapter 6 and Chapter 7, we will first summarize the major outcomes of our empirical investigations. After this overall overview of the variety of strategies used by the research units we focus in the following sub-

sections more specifically on the four dimensions of research practices and the related responses of the research units to their changing institutional environments. Thus, we will answer the fourth research question of our study: What do the responses mean for the basic research units' practices? We consecutively look in depth at problem choice, mainstream and risky research, output preferences and the teaching-research nexus of basic research units and the related strategic responses.

All eight basic research units in the two countries respond to their changing institutional environments by attempting to reduce uncertainty as predicated by resource dependence theory and to maintain stability in their core activities as predicted by neo-institutional theory. They also try to maximise their credibility building prospects by either adhering to the rules and norms of their (changing) institutional environments or by actively engaging in a dialogue with their audiences, especially their major resource providers. In their responses the basic research units are using different strategies from passive and symbolic compliance to pro-active manipulation. All research units prefer to maintain stability in their activities, but not all of them have been equally successful in this respect. Generally speaking the research units have tried to maintain their professional autonomy in terms of problem choice, a healthy mix of mainstream research and risky research, and their output preferences. Their capacity for doing this is dependent on their financial resource base, on their credibility and to some extent on the field of research. In some cases, pressures for change are felt as being so strong that there is no getting away from them. Some research units are not strong enough to resist these pressures. They try to de-couple their core activities or to pro-actively manipulate the changing environment into their advantage. But they also need to compromise with parts of the institutional environment to retain their ability to gain further resources and to build further credibility. The research units that possess high credibility obviously have an advantageous position in terms of their resources. They are able to retain stability in their core activities, either by symbolically complying with the demands of the institutional environment or by pro-actively influencing it. At the same time, the growing resource dependence of full cost units that somehow have to 'earn their money' easily leads to compliance with an increasing diversification of teaching and research activities. As a consequence, research units have a changing mix of teaching loads and research capacities. Nonetheless, at the end of the day, all research units report increasing workloads; some by trying to get into a better position, others by trying to keep the present position.

There are particular patterns across the groups in the use of specific strategies to retain stability or to adapt parts of their research activities. The most used strategy represents symbolic compliance. Researchers predominantly use it to seal off their problem choice and to find a balance between mainstream and risky

research. All research units employ this strategy to increase the likelihood to get funding from external funding bodies. The research units need this kind of 'taking into consideration' for an increasing number of audiences, which are likely to have different preferences. Such audiences are, for instance, research councils, governments, the European Commission and industry, see (Reichert, 2006). At the same time, the research units regard it as an ultimate necessity to maintain their legitimacy within the academic world. Therefore, they try to protect their academic preferences and academic freedom. Everything that distracts them from (basic) research and publishing is loathed. Research units are highly unlikely to compromise their own problem choice. The data from our study suggests that this is 'the last thing on earth' they would do, unless they really have low credibility and low resources. They manage to carry out risky research alongside mainstream research, despite certain pressures towards mainstream research, see also (McNay, 1997, 2003).

Symbolic compliance is also a widely used strategy in trying to balance short-term and long-term outputs. The academic tradition of the two specific fields in our study differs substantially, while researchers in both fields are seriously trying to keep their traditional outputs intact. For medievalists the result is that books, the main medium, are still prestigious and written, although increasingly combined with short-term outputs (such as conference proceedings and journal articles). In the field of biotechnology a similar symbolic compliance strategy is put into practice. Long-term research lines are cut up in pieces of smaller projects and outputs. The competition is fierce, both in terms of being the first one to publish particular results and to publish those in the highest ranked journal possible. What we see in both fields, and what is a somewhat new phenomenon in medieval history, is a double strategy of protecting long-term research topics through dividing them in short-term projects. This finding runs counter to the fears that external funding bodies are increasingly able to 'dictate' the rules for the academic world by asking for short-term results, which could undermine the researchers capacity to go for long-term outputs. A finding that has been earlier reported by (Becher & Trowler, 2001, p. 113). The case studies show that research units successfully manage to seal-off their traditional outputs, at least to some extent. Nevertheless, they cannot escape from the pressure to produce faster and more outputs, partly due to pressure arising from the academic world (the 'rat race' in the sciences) and partly stemming from the preferences and pressures from external sponsors. This means that the research groups are urged to be creative, need to intensify old means and at the same time have to find new ones to keep up with their usual practices.

Research units predominantly use passive compliance strategies to balance between teaching and research time. They accept rising student numbers for the sake of the money inflow with which they cross-subsidise research activities.

Their coping strategy is accepting the growing workloads in the area of both teaching and research. They increasingly separate the two activities (for similar findings see (Barnett, 2005; Lucas, 2006). Research units experience a crystal-clear clash between the time devoted to research and to teaching. They are mostly assessed on their research outputs and performances; excellent research is both economically and academically rewarding. At the end of the day, reputations depend on research performance. At the same time, they cannot afford to neglect their teaching; neither from an economic point of view nor from a moral point of view. Compliance is most strong among the lower credibility and high uncertainty units, as they are relying more on teaching for improving their financial situation than on research. Moreover, those research units seem to be more likely to lack staff to teach and offset this lack by hiring temporary staff to free time for carrying out research.

Finally, the diversification of the funding base is an example of a manipulation strategy that is used across the board, regardless of the areas of activity. The research units try to diversify their funding base, in order to avoid dependence from one or a few major resource providers for research. Their capacity to do so depends, however, on their standing in the field. In case of high credibility and low uncertainty, this strategy is complimentary to the bargaining for new staff posts in the department, and is used to ensure flows of funds for research so that there would be less teaching needed. In such cases, teaching loads for junior staff have been reduced and instead this staff has been given opportunities to nurture their research skills. In cases of high credibility and high uncertainty, 'earning' money from teaching can be a deliberate strategy in order to cross-subsidise research activities. Finally, in cases of low credibility and high uncertainty, pressure to 'find money somewhere', that is via teaching and/or contract research, gear the groups into the direction of diversifying their funding base.

The strength and positioning of the research unit is important for what kind of dominant strategy is applied and how successful it is. The high credibility and low uncertainty groups have a better positioning within their universities and can pro-actively influence their institutional environments using manipulation strategies to obtain, for instance, more international visibility or to ensure an additional stable flow of research funding. This allows these research units to protect their academic freedom to a large extent and to pursue mostly their own research interests. In other words, they are able to keep their core activities intact.

In cases of high credibility and high uncertainty, the research units are also able to retain stability in most of their activities; they predominantly use symbolic compliance strategies. This is particular true with respect to problem choice, the balancing of mainstream and risky research as well as the balancing different outputs.

Further, compliance strategies are largely used in cases of low credibility and high uncertainty. Research units mainly must comply with pressure to produce results faster and to change the balance and nexus between teaching and research. In the English cases, there is also evidence for compromising their problem choice (especially in D1 that has to comply with new thematic priorities that have been imposed on them by the university's management).

At the same time, all research units, independent from their strengths and position, are using the whole range of strategies. The high credibility and low uncertainty units do not only employ strategies to 'manipulate' their institutional environments, but they also use symbolic compliance and even passive compliance strategies. For instance, low credibility and high uncertainty research units, although expected to be highly dependent and vulnerable, have been able to employ complementary to compliance strategies, symbolic compliance and manipulation strategies. And high credibility and high uncertainty groups make not only use of strategies of symbolic compliance but also of compliance and manipulation as well.

When we look at the strategic responses of all basic research units to their institutional environments a rather mixed picture emerges. In fact, we find all three types of strategies used by all research units. On the one hand, we see that all groups are trying to protect their academic core activities to the greatest extent possible and they do this by using a range of strategies. The research units keep very strong beliefs and routines related to their academic affiliation, and the forces at work in their environments are not strong enough to 'force' research units into one particular type of behaviour. Even in the case of high uncertainty and low reputation, the research units struggle to avoid change and exploit a repertoire of strategic responses. This observation is certainly in line with the neo-institutional theory that emphasises the maintenance of stability via the decoupling of the technical core from trouble in the environment. We also observe that the groups cannot ignore certain changes in their environment, especially when these are concerning their funding base and their reputation. Especially for groups in a weaker position (especially in England) funding and reputation related changes translate into changes in their activity profile. Finally, even in the case of low uncertainty and high reputation, the need to secure their powerful position as well as a stable future flow of resources may lead 'strong' research units to strategies of adaptations to their resource dependencies. In this way, they try to reduce uncertainty in their environment even further, if this is perceived as ultimately needed.

9.2.3 *Strategic responses and research practices: reflections*

9.2.3.1 Problem choice

The research units in both fields have been very concerned and cautious about preserving their freedom of choice of research topics and have mostly been sealing off the attempts to steer their research interests. Their professional autonomy and the standing in their academic communities are paramount. For their problem choice, they value their own agenda and academic peers' opinions more than the research programmes and themes coming from the external and internal financial backers. They are also aware of the potential costs of major changes in their problem choice in terms of losing part of their expertise and reputation. Academic reputation certainly still fuels the credibility cycle. They attempt to preserve their long standing research lines and adhere to the norms of the academic world, where mutual exchange within the academic community and peer-review are expected to provide guidance in problem choice, see also (Henkel, 2000a). However, in practice, the major providers of resources, such as external sponsors, also affect their problem choice. These external sponsors have their own research agendas even though these are partly negotiated with representatives of the academic community. We have found evidence that researchers are trying to balance between their own research interests and the thematic priorities of their sponsors and they are using strategies of 'fitting' their own interests into the broader themes of external financial backers. In many cases (especially in England) the research groups institutionalise mechanisms that support researchers to write research proposals in a strategic way in order to increase the success rate of research proposals. This collective attempt to ensure the crafting of proposals in a way that 'fits' the priorities of the external funders highlights again the importance of these external resources for the research units. It is simultaneously an example of the possibility of academics to pursue their own topics. In some cases, however, the research units see no alternative but to follow the 'prescribed' research topics, which in fact can be considered to be a threat to their long standing research lines.

Our findings show that the capacity to resist externally prescribed research agendas depends on the research unit's and individual researcher's credibility. The high credibility units are more likely to resist external research agendas and have been able to carry out research of their own liking. This capacity is also related to the stage of a researcher's career. The junior researchers and their senior colleagues admit that there is not much room to manoeuvre when academic credibility is low and when there is not much experience to back up the research proposals. Past performance is important for academic autonomy and because

junior researchers usually do not have a very strong track record, they are more likely to follow the externally determined research agendas.

We have also found a nearly inexhaustible creativity of researchers in 'fitting' criteria of 'relevance' of external sponsors and simultaneously maintaining their own research interests. This is especially surprising in the cases of medieval historians, for whom the concept of 'relevance' was initially quite foreign; for a long time the common understanding has been that they need to be funded just for what they are. One example of combining relevance with personal preferences stems from a junior researcher of medieval history in England. He maintains his topic in medieval merchant ships by relating it to the regional history of the area where the university is located in order to get funds from the regional authorities. Because the local authorities are eager to learn more about their maritime history, as they are interested in making it a tourist attraction in the city, the junior researcher can indeed pursue his own research interests. Biotechnology researchers are already more used to 'sell' their research; that is, making it relevant. For instance, one research group focuses on a bacteria widely used in dairy products that helps the digestion process. They are pointing to wide applications and links with industry and the health care sector. Such strategic responses to the growing expectations as regards the relevance of research have also been observed by others (Adams, 2000; Morris, 2004; Ziman, 2000).

This evidence suggests that it is difficult to influence academic problem choice since it touches upon the core of academic freedom and professional expertise. All groups want to keep the possibility to make their own choices of research topics and most of them do indeed succeed to safeguard their preferred lines of research. They are to a large extent able to seal them off from thematic priorities that are internally and/or externally determined. They do this mainly by strategically writing project proposals and manipulating research agendas. Such behaviour implies resistance to change and mediates external attempts to influence internal research agendas. At the same time, funding opportunities mediate the problem choice of the units and their researchers that need a certain flexibility and capacity to adjust their topics to increase the chances of fundability. Research units and researchers are more likely to be affected by such resource dependencies if they face high uncertainty and possess low credibility. If this is the case, the likelihood of changes in problem choice increases and the researchers will either adapt to the requirements of their resource environments themselves or will be forced to do this by 'managerial intervention'.

9.2.3.2 Mainstream and risky research

All groups are predominantly involved in what they describe themselves as mainstream research. This means that they follow certain trends in their field as

well as the mainstream agendas of external funding bodies. Most research units are successfully combining this mainstream work with more risky research lines. Risky research means that the research process and its outcomes are highly unpredictable. Mainly high credibility researchers are using different tactics to pursue risky research lines while at the same moment conforming to the mainstream. The motivation to pursue risky research, which is not supported by external funding bodies, can be related to the researcher's serendipity and desire to fuel their credibility building. They are convinced that research ultimately dries up and scientific progress stagnates if there is no longer room for risky business.

Research units perceive a number of constraints to pursuing risky research. Mostly these constraints refer to changing audiences and rules in their institutional environments. The evidence from our interviews suggests that even funding from the research councils usually favours mainstream research (although a minority of the researchers has a different opinion here), and focus increasingly on predictable, demonstrable outputs and strategic areas. There is little room left for researchers to 'fail' and to adjust their research projects, although there are some examples of researchers who manage to be creative in changing their projects as they go along.

Another constraint to pursue risky research is the reduced time to produce research outputs, which is due to the increased competition in the field (especially in biotechnology) and the periodic research evaluations. This was especially visible in England due to the RAE. In other words, they have to regularly show research results.

Given these constraints, the tension between the security of incrementally building credibility and the eagerness to make a big leap in the credibility cycle by a major breakthrough is clearly visible in the research units in both fields. Researchers, especially senior high credibility researchers, pursue risky research lines in parallel with mainstream lines, partly due to the hope to fuel their credibility in the case of success, to be at the forefront of the field's competition and to make a major contribution to their research field. The research groups are using multiple strategies to offset these tensions, such as pursuing both mainstream and risky research at the same time, or diversifying their staff along the lines of mainstream and risky topics. In biotechnology, junior researchers play a role in pursuing risky research lines. This applies mainly to short-term contract post-docs, but not to PhD candidates. The evidence suggests that senior researchers see to it that PhD candidates definitely produce research outputs, that is, they opt for mainstream research lines. This latter finding is in line with the premise that the position in the hierarchy influences the functioning of the credibility cycle and the strategies of the researchers. Those at the top of the

hierarchy are more likely to risk and pass some of the risky tasks to the junior post-docs, see (Morris, 2004; Mulkay, 1979).

9.2.3.3 Output preferences

Because of the changes in research funding and the increasing dependence on multiple resource providers the rules of the game in determining research outputs have been changing. We observe external and internal quality evaluations as routines for all research units; there is a certain standardisation of output expectations in terms of quantity and quality, more and more performance-based funding and rising expectations overall. Increasingly diverse audiences try to define the kind of outputs expected from the research units in both fields of research. For medieval historians this means a potential threat to their traditional output medium, books (especially visible in England). The speed and rhythm of producing outputs is also increasingly influenced by changes in the institutional environment. Expectations as regards a certain quantity of respected outputs have risen and the research groups need to balance this with their major academic criterion – quality – that is still at the forefront of their considerations about outputs. In other words, the groups have to deal with a precarious balance between the norms and practices ingrained in their field, the need to satisfy the requests of external and internal evaluations and the expectations of their financial backers.

Irrespective of the credibility and level of uncertainty of the research group, all research units comply with the demands to speed up their production cycle, especially those requests that are linked to the further fundability of their research. In fact, this is changing the routines of output production of all units, even those with high credibility and low uncertainty: they all produce faster the expected number and type of publications. Certainly, changes in their institutional environments affect the resource base of the groups, speed up the production processes and increase competition.

Nevertheless we can see that the traditional outputs are still preserved in both fields of research although they are somewhat adapted to the changing institutional environments. In medieval history, there is a shift towards articles and book chapters besides the traditional monographs. In biotechnology, the increasingly fierce competition pressures towards an increasing turnover of publications and a ‘quantification of outputs’ while the groups work hard to strive for highest impact.

Another issue relates to the growing expectations as regards output relevant for other audiences than the academic community. Patents are a prime example in the field of biotechnology and public speaking/writing in the field of medieval history. The research units do in general not appreciate these kinds of demands.

They wish to invest their time into credible outputs for the academic community. Additionally, in biotechnology patents can be a lock-in for researchers who want to make the outcomes public as soon as possible. And all of them think that patents hardly pay off (in terms of costs and benefits). Tensions also emerge from ambivalent signals and partly contradictory expectations that the research groups are facing. On the one hand, major research evaluations and funding streams are based on expectations of academic excellence. On the other hand, the research groups experience a growing rhetoric of 'relevance' that does, however, not really pay off in terms of reputation and funding. This tension is more visible in England than in the Netherlands. For example, English medieval researchers are very concerned that public speaking does not earn 'brownie points' for the RAE and biotechnology researchers in both countries raise the same issue with respect to patenting. They know, however, about the forces at work that expect them to 'look good' also in terms of the (potential) relevance of their work. This leads to tensions between 'relevance' and 'excellence' that are also found in other studies, (see Etzkowitz (1998)).

9.2.3.4 Teaching-research nexus

Teaching and research are increasingly falling apart in both countries, especially in England. Structurally this can be seen in the increase in teaching-only and research-only personnel and increasing practices of 'buying out' teaching. The structural division is increasingly institutionalised between departments with their primary focus on teaching on the one hand and research institutes/centres on the other hand. In terms of status, research is still perceived as the dominant credibility building factor in academic careers. Our findings indicate that due to the decrease in basic university funding there is an increasing need to attract external funding. Failure to do so can in fact mean much higher workloads in teaching and eventually being 'marginalised' in research (especially in England because of the RAE).

The major tension in terms of building academic credibility is the reconciliation of increasing teaching workloads with the need to produce research outputs that further build credibility as a researcher. As a researcher in England notes, "there is no award for being the world's best teacher" at universities. This tension has also been discussed in earlier writings of (Clark, 1996; Lucas, 2006; Schimank & Winnes, 2000). The evidence of our study suggests that, under the intensifying pressure to perform, research gets into an even more favourable position vis-à-vis teaching, as most of the evaluations, especially in England, and the related funding, actually look at research. In England, this seems to be at the detriment of teaching, which is more seen as a punishment rather than as a part of the academic job (especially in biotechnology) (for similar findings see

(Trowler, 1998). However, for research units that have limited resources available for doing research, teaching is part of the survival strategy, since it brings in internal income. An interesting tendency can be traced in terms of staff distribution for teaching and research. The higher the credibility of the research unit, the more likely it is to use its own staff to diversify their teaching and research tasks, rather than to hire additional temporary staff to offset this tension.

However, as seen from the outcomes of our fieldwork, all units exhibit compliance to the increased work loads in teaching and research. They are working overtime to maintain the legitimate routines of research, so as to continue building their research reputation and not to lose out in their credibility building processes. At the same time, they acknowledge the need to 'earn money' for the department and loyally carry out their teaching and administrative responsibilities, even though these responsibilities in fact do not count as much for their research credibility, but are seen as a common good for the department as it brings in income.

Attitudes and practices towards teaching are somewhat different in medieval history and biotechnology. Teaching loads are for instance much higher for the medievalists. Moreover, the medieval history groups think of teaching as important and are concerned about teaching quality. This is especially visible in the Netherlands, where the introduction of the Bachelor Master structure has been a recent reform that bothered all researchers and makes them reflect on what teaching means for them. They have implemented the reform seriously, partly as they see teaching as an important part of their academic job and not only as a source of income. Biotechnology researchers are more sceptical about their teaching responsibilities. Their work portfolio usually does not include teaching as the major responsibility. They see it in comparison with the medievalists more as a necessary duty, and as a source of income in case of failure to attract research funding. Nevertheless, also the biotechnologists still believe in the nexus between teaching and research although they experience the tension between the two activities. This is partly due to the importance of research for their reputation and funding.

Overall, our findings suggest that teaching and research are increasingly falling apart as two distinct activities. There is nevertheless a common compliance to the increased workloads in both areas of activities. Success or failure in research acquisition and assessments has serious implications for the work portfolios of the groups. Due to a decrease of unconditional internal university funding, the research units' resource dependencies have grown and contribute to stratification in research-active 'winners' and teaching-active 'losers'. Another and highly unwelcome consequence of this development is the increased workloads.

9.2.4 *Summary*

In this section, we summarize our findings regarding the dynamics of change and stability in increasingly complex institutional environments and their consequences for research practices in public universities. We pay special attention to the shop-floor level, including the implications of our findings for the three research expectations that have been formulated in our study (see Chapter 2).

The central research question of our study addresses the effects of governing models on the research practices of research units in public universities. The outcomes of our study show that shifts in governance have certain effects on the shop-floor levels. Shifts in governance in the Netherlands and in England have resulted in changed institutional environments, as reported by all research units as well as by the university managers. These changing institutional environments trigger the resources and the reputation building of the investigated university research units, and this elicits particular patterns of changed behaviours of these units.

The underlying rationale for the shifts in governance in the Netherlands and in England show quite some similarities in terms of their rhetoric, although the policies and mechanisms frequently differ, given the different historical roots of the sectors and the different policy styles in the two countries. One of the major differences in terms of the governance dimensions that we have used in our study concerns the role of the state vis-à-vis the universities. Where in many instances the Dutch government has successfully stepped back, the English government has intensified its interference with the sector. With respect to the other governance dimensions, we have observed changes that go in the same direction in the two countries: more (external and internal) stakeholder guidance, less academic self-governance within universities and an increasing use of peer review via evaluations, more managerial self-governance and increased competition for scarce resources. The timing and depth of these changes differ between the two countries.

When we look at the strategies and practices at the shop-floor level of the investigated universities, preserving stability in the research units' core functions is largely similar in the two countries and in the two disciplines. As discussed in Chapter 3, the structural conservatism of academe is an important factor to explain the tensions between the traditional values of the academic communities, the dynamics of research, and the changes in their institutional environment. Our study shows that it has been difficult to shift research agendas of individuals and research units. Even in situations of growing dependencies, be it from internal or external stakeholders, research units are keen to pursue largely their own agenda. One way of doing this is through symbolically complying with other agendas;

another one is through participating in the agenda setting of other stakeholders. Researchers also prefer to stick to their preferred outputs that require long-term research and try to be at the forefront of research by pursuing risky research lines combined with the mainstream. These traditional academic preferences are challenged by the changing pressures towards more short-term outputs and predictable mainstream research. The research groups use multiple symbolic compliance strategies to offset these tensions. These strategies include pursuing both mainstream and risky research at the same time, or diversifying their staff along the lines of mainstream and risky topics, or combining short-term outputs into long-term research work.

The Dutch and English academic units largely preserve their self-steering mechanisms that are based on their own incentive system and are linked to scholarly advancement, peer review, and academic rewards. This finding is supported by earlier research (Geiger, 1985). Academic affiliations, their routines and the knowledge society's dependence on academic expertise help research units to resist change. They do this among other things by de-coupling their core activities from formal requirements. Apart from symbolic compliance, the most frequent strategy we witnessed from some research units was the use of proactive strategies to adapt their environments to decrease their dependencies. Research units make also use in ambiguities of their research environment. For example, research councils maybe active in 'steering' research into certain directions and may concentrate on 'fashionable' mainstream research areas. We find, however, evidence in our study that such programmes tend to be designed in a way that quite a variety of themes can be 'fitted' into such programmes. Equally, university management can assume the role of a buffer that cross-subsidises different research units and gives them leeway to improve their research performance with the help of different incentive mechanisms, such as matching funds.

The outcomes of our study also indicate that it would be wrong to suggest that research units' activities cannot be and have not been changed at all. On the contrary, we would argue that one way of actually changing their activities is to 'hurt' them where it hurts most: in their credibility cycle. In other words, policies and instruments that touch upon crucial points in the academics' credibility cycle – funding and reputation – are likely to be successful in terms of 'making a difference'. Quality assurance systems, only partly controlled and implemented by academics, and performance-based funding schemes, directly or indirectly connected with formal quality assessments, affect the positioning and activity profile of the research units. And this changes their behaviours as we have seen from the changed research practices in several research units. Some groups are more strongly affected (low credibility, high uncertainty) than others (high credibility, low uncertainty). Change in the institutional environment means

partly different things for medieval history and biotechnology groups, and challenges them in partly different ways. The most striking difference between the two countries concerns the nested effects of the RAE (its importance for public funding overall and reputation, its impact on institutional strategies, and its influence on management practices). The Dutch research units identify similar elements in their changing environments, but nothing compared to the comprehensive and striking effects of the RAE.

Examples of changed practices include the thematic re-orientation of units, the different kinds of outputs that are being produced nowadays, the 'willingness' to conduct mainstream research while the academic 'heart' prefers risky research, and changes in the overall work portfolio in teaching and research. There are examples in our study of research units that comply with the demands of research evaluations, external sponsors and the university management. Another consequence of the shifts in governance and its accompanying new structures and relationships is the increasing level of competition and the decreasing time to produce research outputs. This intensifies the credibility building speed and elicits different kinds of academic behaviour.

Thus, we observe successful resistance to change in some respects and adapted behaviours in some others. A question not explicitly addressed in our study is whether either conservatism or adaptation is good or bad. It has, for instance, been argued elsewhere that speeding up the production process or making the research units more risk-adverse can have negative effects on the quality of research (Becher & Trowler, 2001). Some of the research units in our study report to see this danger as well.

Answering the three expectations of our study, a mixed picture evolves. On the one hand, research units are using certain strategies as dominant ones as we expected. More precisely, the strategic choice depends on the research groups' positioning and the conditions they face. The high credibility and low uncertainty groups can pro-actively influence their institutional environments using manipulation strategies to obtain further stability and enhance their position. They are able to keep their core activities intact. In cases of high credibility and high uncertainty, the research units retain stability in most of their activities using predominantly symbolic compliance strategies. Compliance strategies are largely found among low credibility and high uncertainty groups that cannot fully mediate pressures to change.

On the other hand, a number of unexpected strategies have also been found in all cases. All three types of strategies are actually being used by all research units. This outcome shows that our expectations are only partially met. In reality, we see that all groups are trying to protect their academic core activities by decoupling their technical core from trouble in the environment, albeit to a different extent and with different success. As argued earlier, the widespread attempt of

the research units to symbolically comply with the change in their institutional environment is in line with the neo-institutional theory. We also observe that the groups cannot ignore changes in their environment, when they concern their funding base and their reputation. This forces weaker positioned groups to change their activity profile. At the same time, the weaker groups show to be capable to 'play the game' even if they have high uncertainty in the environment and try to be pro-active, although they are less successful in this respect. All the groups play with the fact that they have multiple stakeholders and sponsors in their institutional environment. They also hold multi-task work portfolios. They can try to use that to counterbalance the increase of uncertainty in their environment. Thus, the need to reduce uncertainty and gain resources does not necessarily lead to compliance strategies and change in work practices of 'weak' research groups as they use multiple means and ends to boost their resource base as well as credibility. This provides means that allow even 'weak' groups to be more active and to try to avoid compliance to changes in their institutional environment. In other words, in academy we deal with the case of multiple resource dependencies. At the same time, we see that 'strong groups' need to comply with some aspects in their institutional environment in order to ensure future stability if needed. In this way, they try to reduce uncertainty in their environment even further. Thus, we have found that the strategies employed are not necessarily mutually exclusive (while we expected them to be). In other words, we have found that the strategic responses are more a matter of degree and a matter of likelihood of success than a matter of either/or.

9.3 Reflection on theory and methodology

In the following sub-sections, we reflect on the theory and methodology of the study. In this reflection, we present some elements of the chosen research design to reflect upon. These include the use of the governance dimensions for the analysis of the shifts in governance, the use of the two organisational theories that have guided our research, the choice of the two countries and the two disciplines as well as the connectedness of research responses and practices. Further, we end with a proposition of further research avenues.

9.3.1 *Using the five dimension governance model*

The five governance dimensions have provided a useful tool to look at the governance changes in the two higher education and research systems in a cross-national comparative perspective in a consistent way. They have also helped make useful descriptions and analyses across time in the two countries

separately. The five dimensions of state regulation, academic self-governance, competition for resources, managerial self-governance, and stakeholder guidance have turned out to be instrumental in describing and analysing the particular shifts in the external and internal governance of the systems at stake. We believe that the dimensions have allowed us to capture comprehensively the complex dynamics of the governance reforms in the respective countries.

However, applying this model has also exposed challenges, as the dimensions are not mutually exclusive. A particular concern is, for instance, how to distinguish in detail between state regulation and stakeholder guidance when the state acts as an important stakeholder. Our fine-tuning of these governance dimensions in Chapter 3 has been useful in this regard. We have made a distinction between state regulation as a tight governmental prescription of behaviour under designed circumstances, while stakeholder guidance implies that a government provides general objectives and procedural rules that are setting the framework within which actors have room to manoeuvre to reach the goals set.

Each of the five dimensions covers a lot of ground. A dimension is in fact the sum of a large number of more detailed assessments. It is an overall judgment with respect to several aspects of the coordination of a higher education and research system. Such a judgment is easily imprecise or readily admits more than one interpretation. Further specialisation, as Clark (1979) calls it, might take away the disadvantages of statements and appraisals that are too broad. Ideally, 'all' aspects should explicitly be operationalised and reflected upon in an analysis. Further fine-tuning and operationalisation of the five dimensions would therefore be welcomed, among other things to minimize the ambiguity of the five dimensions.

Finally, a well-known problem of longitudinal comparisons is that the dimensions themselves may change over time, or may get different meanings in different eras, which of course makes a fair comparison hard. For the same reason, the dimensions may have different connotations and lead to different interpretations in different countries or in different public sectors. It remains to be seen to what extent such challenges can ultimately be met in future research.

9.3.2 Choice of countries and disciplines

The study contributes to a better understanding of the changing practices of research units in biotechnology and medieval history in England and the Netherlands. The eight in-depth case studies provide evidence of how research units respond to the higher education and research policy reforms. This study is one of the few elaborate multi-level comparative studies of the effects of changing governance models on academic practices.

The selection of the two higher education and research systems has fulfilled its purpose, that is, to trace the shifts in governance in a comparative perspective in order to identify common as well as unique features of each governance system. The higher education and research governance in England and the Netherlands display differences in the timing, style, and extent to which shifts in governance have taken place. However, in some respects it has been challenging to note the differences in the same type of reforms and decipher the national character behind them. This was particularly true in the case of internal governance reforms and the strengthening of the management in universities.

The choice of two distinct fields of research has also proved worthwhile, as it has identified how research units with different norms and habits have responded to the changes in the institutional environment. Besides the laborious task of becoming familiar with two very different fields of research and the extremely interesting opportunities to observe their work practices and environments, the challenge has been to grasp their different understanding of what constitutes research in their context. More specifically, we have found it important and interesting to understand that the terms such as short-term, long-term, risky, basic and applied research can have very different meanings in different disciplinary settings.

Previous studies (Becher & Trowler, 2001; Biglan, 1973) have pointed to the fact that academic tribes have different habits and working styles. Our study partly confirms that they respond sometimes differently to changes in their institutional environment as well. However, their responses have many similarities as well and the differences between the two tribes are not as large as we expected in advance.

9.3.3 The use of organisational theories

The study has combined elements of two organisational sociology theories, resource dependence and neo-institutionalism, together with the credibility cycle model. As far as we know this has been the first time of bringing the conceptual notions of these three together. In this sense, our study has been experimental and unique. We are enthusiastic about this 'experiment': the framework has proven to be a useful guiding light to analyse and explain the interaction between the basic research units and their institutional environment.

The neo-institutional theory has been useful insofar it emphasises the importance of rules and norms of the academic actors at stake. It also sheds light on the possible responses of the research units through emphasising stability and persistence that is based on strategies of conformity, symbolic compliance and decoupling. We can see that this theory still has a lot to offer, even if we want to study institutional environments that have strengthened the resource

dependency of its principal workers and their units. In turn, resource dependence theory has a lot to offer in looking at how important the available resources for research units are for their capacities to actually maintain stability in their core activities and how important uncertainty of future resources is for the responses of the research units. This theory has also helped identify that research units respond actively, trying to change the institutional environments through proactive manipulation strategies. In our eyes, the credibility cycle model has been indispensable as it pointed to the reputation building mechanisms that are part and parcel of the academic world. Without the link of credibility building with 'resources and credits', our understanding of the responses and strategies would have been less profound. The counter-argument here could, of course, be that reputation is a resource and for that reason could be built into the operationalisation of resource dependence theory. Similarly, the norms and values around credit accumulation may well fit neo-institutional theory. We believe, however, that by explicitly using the credibility cycle model, the exploratory power of our theoretical framework has increased. It has provided us with a clear focus of what seems to be at the 'heart of the academic game'.

The conceptual combination of these three approaches has given us the ammunition to pose three expectations about the strategic responses of the research units. According to our framework, these responses depend on the degree of uncertainty in the institutional environment and the amount of credibility of a research unit. These expectations have been phrased in such a way that they are mutually exclusive. Looking back to the findings of our study, this exclusiveness does not hold. We have found a mix of strategies that are employed by all groups, although the dominant strategies and their success reflect our expectations. Bearing this knowledge in mind, more detailed expectations with more detailed strategies should be formulated.

9.3.4 Connectedness of academic responses and practices

We have conceptualised the responses and practices of the basic research units as separate phenomena. Responses have been operationalised as strategies created and implemented in order to survive and gain stability in a changing institutional environment. The distinguished strategies are compliance, symbolic compliance and pro-active manipulation. Research practices have been operationalised as problem choice, mainstream and risky research, output preferences and teaching-research nexus. Conceptually, responses and practices are clearly separated; in practice, we have experienced that they are interlinked. Research units are, for instance, responding to their institutional environment by complying with the need to teach more, and thus have changed their work portfolio in teaching and research. When we asked respondents about their

research practices, they described and discussed them usually in relation to the responses to their institutional environment. This usually was intertwined with interpretations and judgements of stability and change in their environment that helped them to explain and rationalise their responses to it. Such explanations prompted researchers to reflect also on what means for their work. Thus, in our analysis we usually discussed the interplay between responses and practices of basic research units. We think that maintaining this interconnectedness and investigating the interplay between responses and practices helped us to do justice to our field observations and to reveal the findings in an appropriate way.

9.4 Further research avenues

This final section of our study proposes some avenues for future research. First, the scope of the study can be extended to validate the applicability of the conceptual framework and generate further empirical insights in a comparative way. There are several opportunities for this. The number of countries can be expanded and include other European countries, such as 'late adopters' of governance reforms in higher education and research. Interesting cases would be Germany, France, the Scandinavian countries or countries in transition in Central and Eastern Europe. Of course, comparing with countries from other continents – the US, Australia, Japan or emerging economies in South East Asia, including China – would be highly interesting to research. Additional insights into multi-level governance in higher education and research could be gained by extending the research to the supra-national EU level, which is gaining importance in this sector. What, for instance, would be the consequences for the five dimensions of governance?

Another extension of our study would be to include further fields of research, for example, fields that are supposed to be in-between Mode1 and Mode2 types of research. By including such fields of research, the empirical breadth might expand. A third expansion could be to look more closely at the level of the individual researcher. Our study has indicated at several places the differences in views of senior and junior researchers. A further step can be to include (potential) gender disparities. Finally, it would be very interesting to do this kind of research in other professional public fields. Health care is one of the usual suspects here. Are the governance dimensions also useful in this field? Do professionals in this field use the same kind of strategies?

Further, it would be interesting to carry out a follow-up study and to revisit the countries and research units that are included in this thesis. Such a longitudinal approach is rare and would allow to capture and verify in more detail the effects of changing higher education and research governance on

academic work practices. The English case provides one illustrative example of such ongoing changes. Given the importance of the RAE for English academics in the past, it would certainly be interesting to study the likely changes in English research assessment policies that are currently under discussion and their effect on the research units.³⁹

Finally, further studies can contribute to the growing but still limited empirical investigations into the interactions between researchers and other stakeholders and their possible effects for the research practices. Contract research, technology and knowledge transfer, spin-offs, patenting and licensing, community service and regional development, policy advice and business consultancy belong to a growing list of activities that nowadays are expected to enhance such interactions and that call for further studies on their repercussions for the inner life of academe.

³⁹ We acknowledge the support we have received for this study from the Germany Research Foundation (DFG) for the project "Comparative Study on Management and Self-governance Models" in the period of 2003-2006. We also acknowledge the further support of the DFG for the period 2006-2009 for a second stage of the overall project. This will allow us to revisit the countries and the research groups that have been under investigation in this book, to investigate into further cross-national comparisons including Austria and Germany, and to analyse policies at the supra-national EU level.

Appendix I: List of abbreviations

AD	Anno Domini
AHRC	Arts and Humanities Research Council (UK)
AiO	<i>Assistant in opleiding</i> , PhD candidate
AWT	<i>Adviesraad voor het wetenschaps- en technologiebeleid</i> , Advisory Council for Science and Technology Policy
BBSRC	Biotechnology and Biological Sciences Research Council (UK)
BSIK	<i>Besluit Subsidies Investerings Kennisinfrastructuur</i> , Subsidy Decision on Investments in the Knowledge Infrastructure
BUOZ	<i>Beleidsnota Universitair Onderzoek</i> , Policy Document University Research
cryoEM	<i>cryo-elektronische microscopie</i> , Cryo-electron Microscopy
CvB	<i>College van Bestuur</i> , Executive Board of the University
CVCP	Committee of Vice Chancellors and Principals (UK)
CWTS	Centre for Science and Technology Studies
DfES	Department for Education and Skills (UK)
DSM	<i>De Nederlandse Staatsmijnen</i> , The Dutch State Mines
DTI	Department of Trade & Industry (UK)
EPSRC	Engineering and Physical Sciences Research Council, (UK)
ESRC	Economic and Social Research Council (UK)
EU	The European Union
FTE	Full-time equivalent
GM	Genetic Modification
HBO	<i>Hoger Beroepsonderwijs</i> , Professional Training
HE	Higher Education
HEFCE	Higher Education Funding Council for England (UK)
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency (UK)
HM	Her Majesty's Treasury (UK)
HOAK	<i>Hoger Onderwijs: Autonomie en Kwaliteit</i> , Higher Education: Autonomy and Quality
IOP	<i>Innovatie-gerichte OnderzoeksProgramma's</i> , Innovation Oriented Research Programmes
KNAW	<i>Koninklijke Nederlandse Academie van Wetenschappen</i> , Royal Netherlands Academy of Arts and Sciences
MA	Master of Arts degree
MinOCW	<i>Ministerie van Onderwijs, Cultuur en Wetenschappen</i> , Ministry of Education, Culture and Sciences
MPhil	Master of Philosophy degree

MSc	Master of Science degree
MUB	<i>Modernisering Universitair Bestuur</i> , Modernisation University Governance
NGI	<i>Nederlands Genomics Initiatief</i> , Netherlands Genomics Initiative
NMR	<i>Nucleair Magnetische Resonantie</i> , Nuclear Magnetic Resonance
NWO	<i>Nederlandse Organisatie voor Wetenschappelijk onderzoek</i> , Netherlands Organisation for Scientific Research
NOWT	<i>Nederlands Observatorium van Wetenschap en Technologie</i> , Dutch Observatory of Science and Technology
NPM	New Public Management
OCW	see MinOCW
OECD	Organisation for Economic Co-operation and Development
OST	Office of Science and Technology (UK)
OUN	Open University
PhD	Doctor of Philosophy degree
PI	Principal Investigator
POP	<i>Persoonlijk Ontwikkelingsplan</i> , Personal Development Plan
QAA	Quality Assurance Agency for Higher Education (UK)
R&D	Research and Development
R&O	<i>Research and Ontwikkeling</i> , Research and Development
RA	Research Assistant
RAE	Research Assessment Exercise (UK)
RAWB	<i>Raad van Advies voor het Wetenschapsbeleid</i> , Council for Advice for Research Policy
RPU	Research Production Unit
SEP	Standard Evaluation Protocol
SER	<i>Sociaal-Economische Raad</i> , Socio-Economic Advisory Council
SME	Small or Medium Enterprise
TTI	<i>Technologisch Top Instituut</i> , Technological Top Institute
UD	<i>Universitair Docent</i> , Associate Professor
UFC	University Funding Council (UK)
UGC	University Grants Committee (UK)
UHD	<i>Universitair Hoofddocent</i> , Assistant Professor
UK	United Kingdom
US	United States
UUK	Universities (UK)
VSNU	<i>Vereniging van Universiteiten in Nederland</i> , Association of Universities in the Netherlands
WHW	<i>Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek</i> , The Act Higher Education and Research 1993

WRR	<i>Wetenschappelijke Raad voor het Regeringsbeleid</i> , Scientific Council for Government Policy
WUB	<i>Wet Universitair Bestuurshervorming</i> , Law on University Governance Reform
WW II	World War Two

Appendix II: List of interviewees

Cited interviewees in Chapter 6 and Chapter 7:

Number	Field of research	Research unit	Seniority
1	Medieval history	B1	Junior
2	Medieval history	B1	Junior
3	Medieval history	B1	Senior
4	Medieval history	B1	Senior
5	Medieval history	A1	Junior
6	Medieval history	A1	Senior
7	Medieval history	A1	Senior
8	Medieval history	A1	Junior
13	Biotechnology	D1	Junior
14	Biotechnology	D1	Senior
15	Biotechnology	D1	Senior
16	Biotechnology	D1	Junior
17	Biotechnology	C1	Junior
18	Biotechnology	C1	Senior
19	Biotechnology	C1	Junior
20	Biotechnology	C1	Senior
21	Medieval history	E1	Junior
22	Medieval history	E1	Senior
23	Medieval history	E1	Junior
24	Medieval history	E1	Senior
25	Biotechnology	E2	Junior
26	Biotechnology	E2	Senior
27	Biotechnology	E2	Senior
28	Biotechnology	E2	Junior
29	Medieval history	F1	Senior
30	Medieval history	F1	Junior
31	Medieval history	F1	Junior
32	Medieval history	F1	Senior
33	Biotechnology	F2	Senior
34	Biotechnology	F2	Junior
35	Biotechnology	F2	Junior
36	Biotechnology	F2	Senior

*Other interviewees:***England***University A*

Top management –Pro-Vice-Chancellor responsible for research
 Middle management – Dean of Humanities
 Two senior officers at the university central level responsible for research policy
 The History Department: a professor responsible for quality monitoring within the History Department, a former head of the History Department

University B

Top management –Pro-Vice-Chancellor responsible for research
 Middle management – Dean of Humanities
 The History Department: a professor responsible for monitoring quality within the History Department

University C

Top management –Pro-Vice-Chancellor responsible for research
 Middle management – Dean of Biological Sciences, Research Director for Biological Sciences
 Department of Sciences - a professor who cooperates with C1 from the department
 Administrative officer at the central university level responsible for research policy

University D

Top management –Pro-Vice-Chancellor responsible for research
 Middle management – Dean of Biological Sciences
 Administrative officer at the central university level responsible for research innovation
 Department of Engineering – a junior researcher who did her PhD in D1
 Department of Materials - a senior researcher who is responsible for quality management in D1
 Department of Pharmacy – a professor and member of the D1 management team

Policy level

The Medical Research Councils (MRC) - Executive officer

The Biology and Biotechnology Sciences Research Council (BBSRC) - Director of one group

The Arts and Humanities Research Council (AHRC) – a grants' officer

The Arts and Humanities Research Council (AHRC) – a professor from a university who was one of the members of former Arts and Humanities Research Board (AHRB) and encouraged the establishment of the AHRC

The Higher Education Funding Council for England (HEFCE) - member of the Board

The Higher Education Funding Council for England (HEFCE) mid-level officer responsible for higher education in one region in England

The Netherlands

University E

Top management - Rector Magnificus

Middle management – Dean of History, Dean of Sciences, Director of the Humanities Research Institute

Researchers in humanities - a professor of Linguistics and a PhD student of medieval texts

University F

Top management - Chief Administration Officer

Middle management in Humanities: Dean of Humanities, Manager of Research Institute of Letters, Scientific Director of History Research Institute

Middle management in Sciences: Dean of Sciences, Research Director of Physics institute, Director of the Pharmacy school

Senior officer of Pharmacy school

Policy level

The Ministry of Education, Culture and Science (OCen W) – Senior officer at Research and Science Management Department

The Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) – the Rector of NIAS

Royal Netherlands Academy of Arts and Sciences (KNAW) – General Affairs Director/Chair

Foundation for Fundamental Research on Matter (FOM) –Senior officer

Netherlands Organisation for Scientific Research (NWO) - a member of NWO humanities' committee

Appendix III: Examples of interview protocols

III a. Interview protocol with respect to institutional leadership and management: the university level

Part one: Brief introduction by the interviewer regarding the overall project, introduce CHEPS and the interviewer, explain the reason of the visit:

Part two: Profile of the respondent

1. Would you be so kind to give me an overview of your main responsibilities and your role in the decision-making processes of this university?

- *For how many years have you been in this position?*
- *Are you coming from this university or have you been appointed 'from outside'?*

2. To what extent are you directly or indirectly engaged in decision-making regarding the university's research policies?

3. And to what extent are you engaged in decision-making regarding research policies outside this university?

- *Are you for example involved in committees, networks or groups at the (sub) national or international level that are having an impact on research agenda's, research priority setting etc.?*

Part three: Profile of the university

The next set of questions concern the general profile of your university.

4. How would you characterize this university? How does this university profile itself?

- *What is (your reading of) the university's mission? What are the most striking strategic goals of this university?*
- *Is this university for instance known for its research, teaching and/or service orientation?*
- *Regionally, nationally and/or internationally focused?*

5. a) Have there been significant changes in the overall strategic orientation of the university? Why or why not?

6. Has the context of the university been changed, i.e. the context in terms of conditions and resources for doing research?

This last question provides the opportunity to shift the focus more concretely to the research policies of the university.

Part four: Research policies of the university

7. a) Have the objectives of the research policies of this university been changed over the last few years? Why or why not?

8. What kinds of initiatives or instruments do you use in this university to achieve these objectives?

- *What are the main levers of change to implement policies?*
- *Structural re-organisations*
- *(Strategic) funding policies?*
- *Personnel policies?*
- *Creating specific research conditions for certain groups?*
- *Rewarding certain kinds of research outputs?*
- *Using performance-based contracts (with faculties, research groups or institutes)*

9. What is your impression about the impact of the policies and strategies in the university? Do they really make a difference at the shop floor level?

10. In recent years, have things developed for the better or for the worse for your university?

Part five: Reflection

We would like you to consider the overall environment for research and to ask about the consequences for the research policies of this university.

11. How is the competition for resources influencing the research of this university?

- *Is the competition for research grants, excellent researchers, fancy labs or high quality PhD's for instance enabling or facilitating the research objectives, strategies and policies of this university?*

12. How are the regulations of the state influencing the research of this university?

- *Are the kinds of regulation, the number of regulations, the level of detail of the regulations or the issues that are regulated enabling or facilitating the research objectives, strategies and policies of this university?*

13. How are the academics of this university influencing its research policy?

- *How do you see the role of the academics and their academic self-governance in setting strategic research priorities, developing strategies, funding and staffing?*

14. Apart from the state and the academics, how are other stakeholders influencing the research policies?

- *The others stakeholders can be national research councils, industry, local communities, the EU.*

15. How are the institutional leaders and managers of this university influencing research policies?

Thank you for this interview!

III b. Interview protocol for researchers (post-docs)

Part one: Brief introduction by the interviewer regarding the overall project, introduce CHEPS and the interviewer, explain the reason of the visit:

Part two: Getting acquainted

1. What kind of research are you doing?
2. What kind of contract do you have and what are your major responsibilities in this research group/centre/institute?
3. How would you characterize your group as a whole? How are research matters organized here?
4. How does your research group fit to this university?
 - *How would you typify the university context with respect to the research of your group?*
 - *Is it from your research group's point of view a stimulating work environment or would the group be better off elsewhere?*
 - *Has the university an impact on the research group?*
5. How is the field of research ofdoing in general?
 - *What are the major trends and players in your field of research?*
 - *What policies are influencing your field of research?*
 - *Dynamics/complexity: (what is 'happening'?)*
 - *What about the resources for doing research in you field of research? Is it hard to get your research projects funded?*

Part three: Stability and change in respect to research activities

6. Now we would like to talk about how do you organize your work? We would like to hear about selecting research themes and priorities, funding, infrastructure, publication strategies and the like.

- 6.1 How are the research themes and research projects selected?
 - *What does the selection procedure look like?*
 - *Can you as an individual researcher influence the procedure?*
 - *What kind of considerations do you follow in this regard?*
 - a. Have there been any changes or not? Why?
 - b. Does this influence your research?
- 6.2 How do you get funding for your research?
 - *From whom do you get funding?*
 - *What kind of considerations do you follow?*
 - *Do you apply for funding yourself?*
 - a. Have there been changes in funding or not? Why?
 - b. Does this influence your research?
- 6.3 How are your projects staffed?
 - a. Has that changed or not? Why?

- *e.g. do staff members have different professional background compared to some years ago?*
- b. Does this influence your research?
- 6.4 With whom do you cooperate inside and outside the university?
- a. Have there been changes or not? Why?
- b. Does this influence your research?
- 6.5 What kind of infrastructure do you need for your research?
- *Library*
 - *Lab*
 - *Archive*
 - *Computers*
- a. Has the accessibility/availability of the infrastructure changed or not? Why?
- b. Does this influence your research?
- 6.6 What are your publication strategies?
- *Where do you publish what?*
- a. Has that changed or not? Why?
- b. Does this influence your research?
- 6.7 What are your strategies for other research output?
- *e.g. PhD students, patents, spin-offs*
- a. Has that changed or not? Why?
- b. Does this influence your research?
7. Is your research due to some kind of regular evaluation?
- a. If so – what does this evaluation look like?
- *Internal/external*
 - *Level of observation/who carries it out?*
 - *Frequency*
- b. What kind of consequences does the evaluation have for you?
- *Research themes*
 - *Funding*
 - *Output orientation*
 - *Teaching/research nexus*
8. If you look at your own career as a researcher so far, how does it feel to be a researcher in this field of research and how has this changed?
- *External pressure to perform*
 - *Work intensification*
 - *Growing competition*
 - *Accountability*
 - *Quantity versus quality*

9. If you think about the next generation of researchers (e.g. the present doctoral students) – are they being brought up in a different research environment?

10. In recent years, have things developed for the better or for the worse for your research group?

Part four: Reflection

Finally, I would like to ask you to reflect briefly more in general on how your research looks now and how it has been changing:

11. Are you involved in basic and applied research? What is the balance between the two? Has this changed and how?

12. Are you involved in teaching? How about the relationship between teaching and research? Has this changed and how?

13. How would you describe your research in terms of working on long-term themes and working on more short-term themes? Has this changed and how?

14. How would you describe your research in terms of more safe or more risky research? Has this changed and how?

15. How much room for manoeuvre do you have as an individual researcher in deciding what and how to research? Has this changed and how?

Thank you for this interview!

Appendix IV: Examples of questionnaires for medieval history and biotechnology

IVa. Indicators - Medieval history

Indicators that will be asked for 'during' the site visits in England and the Netherlands (adapted from U. Smoch, Fraunhofer-ISI 14-04-2004)

All the questions address the research group as a whole and not the separate individuals (such as institute leaders).

The research unit is the organisational unit that is engaged in the theme 'medieval history'. This can be a unit, subunit, or department, dependent on the institution that will be visited.

In case of problems or questions one should keep in mind that rough estimates are preferred above no estimates/data at all.

The interviewed institution and visited unit:

Personnel Data (Actual situation 2004-2005)

1. Number of academic staff (full-time equivalent)
 - a. Funded by 'the university' (basic funding)
 - b. Funded by third parties
2. Number of professors
3. Number of readers
4. Number of academic staff holding a PhD degree
5. Number of academic staff without a PhD degree
6. Number of research students
7. Number of technical non-academic staff
8. Number of represented disciplines (only the basic disciplines such as physics, chemistry and so forth)

Which ones?

Data on the Structure of Research (Present Situation)

9. What percentage of their work time does the research group spend on the following activities? (totalling 100%)
 - Research (including attending conferences)

- Teaching (including preparation)
 - Field activities
 - Acquisition of projects
 - Other activities (e.g. legal activities, advice)
-

10. Have there been changes over the last 5 years with respect to the activities in question 9?

	Strong decrease			Strong increase	
	1	2	3	4	5
Research (including attending conferences)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquisition of projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other activities (e.g. legal activities, advice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. What percentage of the research time does the research group spend on (totalling 100%):

- Basic research (free of pre-determined results)
 - Applied research (committed towards a specific result)
 - Experimental development (development or design of new products or processes that are built on available knowledge)
-

12. What percentage of the research time does the research group spend on third party research (%)?

13. Who is funding the projects within the third party research (totalling 100%):

- Portion of OST Research Council/AHRB funded projects
 - Portion of projects funded by other public organisations in UK (central government)
 - Portion of projects funded by international public organisations (EU)
 - Portion of projects funded by national and international industry (private sector)
-

- Portion of projects funded by the national and international charities
- Otherwise funded projects

Technical Infrastructure (Actual Situation 2004/2005)

14. What is your satisfaction with the technical infrastructure?

	Strong decrease			Strong increase	
	1	2	3	4	5
Satisfaction with the computer facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with the laboratories (facilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with the facilities to get information (libraries, archives, databases)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with possibilities to travel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Performance Indicators (Previous Period 2002/2003)

- 15. Number of research grants/scholarships (including grants to stay elsewhere)
- 16. Number of joint projects with public and private organisations outside the academy (project length more than two months)
- 17. Number of successful dissertations
- 18. Number of memberships of scientific advisory councils
- 19. Number of academic staff who were 'head hunted' and promoted by other research institutions in the country or abroad
- 20. Number of received research prizes/awards
- 21. Number of written monographs
- 22. Number of articles in peer-reviewed journals
- 23. Number of editorships in journals and book series

Thank you for filling in the questionnaire!

IVb. Indicators - biotechnology

Indicators that will be asked for 'during' the site visits in England and the Netherlands (adapted from U. Smoch, Fraunhofer-ISI 14-04-2004)

All the questions address the research group as a whole and not the separate individuals (such as institute leaders).

The research unit is the organisational unit that is engaged in the theme 'biotechnology'. This can be a unit, subunit, or department, dependent on the institution that will be visited.

In case of problems or questions one should keep in mind that rough estimates are preferred above no estimates/data at all.

The interviewed institution and visited unit:

--

Personnel Data (Actual situation 2004-2005)

- | | |
|---|----------------------|
| 1. Number of academic staff (full-time equivalent) | <input type="text"/> |
| a. Funded by 'the university' (basic funding) | <input type="text"/> |
| b. Funded by third parties | <input type="text"/> |
| 2. Number of professors | <input type="text"/> |
| 3. Number of readers | <input type="text"/> |
| 4. Number of academic staff holding a PhD degree | <input type="text"/> |
| 5. Number of academic staff without a PhD degree | <input type="text"/> |
| 6. Number of research students | <input type="text"/> |
| 7. Number of technical non-academic staff | <input type="text"/> |
| 8. Number of represented disciplines (only the basic disciplines such as physics, chemistry and so forth) | <input type="text"/> |
| Which ones? | <input type="text"/> |

Data on the Structure of Research (Present Situation)

- | | |
|---|----------------------|
| 9. What percentage of their work time does the research group spend on the following activities? (totalling 100%) | |
| • Research (including attending conferences) | <input type="text"/> |
| • Teaching (including preparation) | <input type="text"/> |
| • Clinical activities | <input type="text"/> |
| • Acquisition of projects | <input type="text"/> |
| • Other activities (e.g. legal activities, advice) | <input type="text"/> |

10. Have there been changes over the last 5 years with respect to the activities in question 9?

	Strong decrease			Strong increase	
	1	2	3	4	5
Research (including attending conferences)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquisition of projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other activities (e.g. legal activities, advice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. What percentage of the research time does the research group spend on (totalling 100%):

- Basic research (free of pre-determined results)
- Applied research (committed towards a specific result)
- Experimental development (development or design of new products or processes that are built on available knowledge)

12. What percentage of the research time does the research group spend on third party research (%)?

13. Who is funding the projects within the third party research (totalling 100%):

- Portion of OST Research Councils funded projects
- Portion of projects funded by other public organisations in UK (central government)
- Portion of projects funded by international public organisations (EU)
- Portion of projects funded by national and international industry (private sector)
- Portion of projects funded by the national and international charities
- Otherwise funded projects

Technical Infrastructure (Actual Situation 2004/2005)

14. What is your satisfaction with the technical infrastructure?

	Strong decrease			Strong increase	
	1	2	3	4	5
Satisfaction with the computer facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with the laboratories (facilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with the facilities to get information (libraries, databases)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction with possibilities to travel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Performance Indicators (Previous Period 2002/2003)

- | | |
|--|----------------------|
| 15. Number of research grants/scholarships (including grants to stay elsewhere) | <input type="text"/> |
| 16. Number of joint projects with public and private organisations outside the academy (project length more than two months) | <input type="text"/> |
| 17. Number of successful dissertations | <input type="text"/> |
| 18. Number of memberships of scientific advisory councils | <input type="text"/> |
| 19. Number of academic staff who were 'head hunted' and promoted by other research institutions in the country or abroad | <input type="text"/> |
| 20. Number of received research prizes/awards | <input type="text"/> |
| 21. Number of written monographs | <input type="text"/> |
| 22. Number of articles in peer-reviewed journals | <input type="text"/> |
| 23. Number of editorships in journals and book series | <input type="text"/> |

Thank you for filling in the questionnaire!

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