Åse Gornitzka
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Editors

HIGHER EDUCATION DYNAMICS 22

Borderless Knowledge

Understanding the "New" Internationalisation of Research and Higher Education in Norway

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BORDERLESS KNOWLEDGE

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Preface

Processes of knowledge production and dissemination are increasingly set in an international context. In research and higher education, the links between local actors and the international environments are both proliferating and intensifying. Moreover, individual level self-organised international collaboration is increasingly supplemented by national and supranational organised activities, and by market-oriented activity with a global scope. Starting from these observations, this book analyses patterns of internationalisation comprising the national and supranational level, the level of higher education institutions and private companies, as well as the level of individual researchers and graduates.

The book – with the exception of Chapters 3 and 7 – results from a NIFU STEP Strategic Institute Programme sponsored by the Research Council of Norway, fully dedicated to studying the internationalisation of research and higher education. Whereas the Norwegian knowledge system is the empirical case in focus, this case is set in a broader context by using comparative data from a wide range of countries and accounting for the general trends and its broader relevance.

Commencing in 2002, the work underlying this book has been an extensive endeavour, and many people have contributed. We are grateful to the many who have provided information through interviews and questionnaires, and to all colleagues providing comments. We are particularly indebted to Christopher Caswill and Johan P. Olsen for their comments to draft chapters.

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Chapter 1
The Internationalisation of Research and Higher Education

Changing Borders of Knowledge

Åse Gornitzka

1.1 Introduction

In this book the internationalisation of research and higher education is discussed from a number of perspectives. The term 'internationalisation' refers here to the activities of knowledge production, dissemination and its use which takes place across state borders – without implying that the territorial state is constitutive actor in such cross-border activities[1] and without setting as a precondition that internationalisation implies an end state where territorial borders are irrelevant and dissolved.

The underlying observation is that processes of knowledge production and dissemination, research and higher education organisations, and the public policies with respect to the higher education and research sectors, are increasingly set in an international context. Knowledge systems, research and higher education structures, and academic cultures and activities represent a puzzling duality between being contained and shaped within national borders while persistently crossing them. Key questions in this are: How have these borders changed in the first decade of the 21st century? What has been the effect of these changes on research and higher education? Has the national character of research and higher education been weakened as a consequence of their growing internationalisation?

In research and higher education, local-international interconnections are both proliferating and intensifying. Understanding research processes, and teaching and learning in higher education, requires taking into account the wider trans-border environments in which such activities are embedded. The international connections of such a knowledge system present a complex picture consisting of diverse activities

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[1] Here we only partly follow the definition that sees internationalisation as processes of greater co-operation between states, reserving the term 'globalization' for cross-border activities that challenge the nation state fundamentally, i.e. the cross-border activities that are out of reach of state control (Enders 2004:367–368; Van Vught et al. 2002; Marginson 2007).

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of researchers, administrators, students, employers and policy makers, as well as universities and colleges, research institutes, and private companies. It involves various forms, levels, and territorial patterns of connectivity. Obviously, the implications of changes in such connections are far from trivial for national knowledge systems and their actors, as well as for the role of research and higher education in society. While the burgeoning literature and debate on globalisation and internationalisation of societies, economics and political systems have hypothesised specific transformative effects – the obliteration of the nation-state and global convergence – the empirical evidence for such effects is at best mixed, if not weak. That is also the case for our understanding of processes and implication of internationalisation of research and higher education. That is the starting point for the research endeavours presented in this book.

The book is concerned with the ways in which research and higher education become internationalised under specific conditions. It analyses the internationalisation of research and higher education using the case of Norway, a relatively small knowledge system set in an open society, political system and economy. As such, Norway represents internationalisation of a small knowledge system in the Western hemisphere. Why would Norway and its experiences, as the empirical case offered here, have any relevance for an audience outside its limited national circuit?

First, this case is a valid representation of the challenges and tensions that similar kinds of national higher education and research systems face. In fact, we would argue that keeping a small-country focus in the study of internationalisation is of particular relevance as the challenges of increasing global connectedness are more likely to be visible in small, more peripheral knowledge systems. Second, the Norwegian case offers exceptionally good data on the developments in its research system. It also has data bases at several levels that record and measure changes in research, and teaching and learning practices, through surveys and register data over time and across the different parts and levels of the national knowledge system. Further, there is also relatively easy access to information and data in a transparent society and polity. In this sense, Norway offers an excellent laboratory for studying internationalisation, even though it has characteristics that make it a special case of internationalisation under specific geographic, economic and political conditions. It is one of the most successful economies in the world that combines economic competitiveness with social and political stability and openness, and strong public institutions. It is part of the 'Nordic model' and it is among the global top performers not only from the perspective of wealth creation, but also as measured in terms of its innovative capacity, as can be read (very cautiously), for example, from its fifth place in the 2006 Knowledge Economy Index developed by the World Bank.[2] In these respects, Norway is not the average case – size, geographical location and openness make it likely to be more internationally connected. Given Norway's political traditions and as a case of the Nordic model, internationalisation is likely to implicate and affect the role of the nation-state in upholding a national knowledge

[2] See http://info.worldbank.org/etools/kam2/KAM_page5.asp (Knowledge Economy Index/KEI).

system. As such, this will be an apt case for studying the possible challenges to national state cohesion and public–national control over its research and higher education system.

A multitude of linkages is challenging the existing borders of national knowledge systems. The main argument put to the test in this book is that these represent a subtle transformation of national research and higher education systems, and this first chapter sets the stage for identifying and understanding the transformation process. For this purpose, the present chapter introduces an analytical framework for understanding the international dimension of research and higher education through the empirical case studies in this book. First, we review the concept of territorial borders and what they represent in research and higher education. Second, we introduce four perspectives on the dynamics of change and interaction that are involved when ideas, individuals, institutions, and policies in research and higher education cross territorial boundaries. In Part Three we introduce some basic dimensions for disaggregating the phenomenon of internationalisation. In the fourth section we formulate expectations about the implications of internationalisation.

1.2 Territorial Borders in Research and Higher Education

An important element of internationalisation concerns the growing networks of communication, transactions and organisations crossing national borders (Underdal 1984:4). Many associated terms, specifically under the heading 'globalisation', elaborate the idea of internationalisation to encompass a stage-wise development. Especially when applied to world economics, it denotes the development from increasing international trade between states, to transnationalisation with increasing levels of foreign investment and numbers of multinational companies, and then to the globalisation stage where networks of production and information have a global span (Østerud 1999:11–15). This stage is concerned with the global integration of markets of capital, goods and services (Svensson 2002). Underlying the conceptual discussion of internationalisation and globalisation is the contested idea that the last two to three decades have witnessed a transformation that is comparable in significance to the period of state and nation building in Europe. We make no such grand claims in this book – but we acknowledge that processes of internationalisation can only be understood against the background of the historical dimensions involved in the build-up of territorial boundaries.

Historical analysis of nation-building in Europe reveals a staged development of overlapping systemic, regulative orders under a single set of hierarchically-organised territorial institutions; the development of capitalism that defined markets along territorial lines; nation-formation that created cultural boundaries; the democratic revolution that defined democratic rights, and the development of the welfare state that created social rights for citizens within territorial borders (Rokkan 1970, 1975; Bartolini 2006:3–4).

European research and higher education have also developed within the framework of territorially defined boundaries associated with market-building,

nation-building and functional regime building. The notion of an integrated national higher education system in Europe dates back to 19th century Prussian and Napoleonic reforms concerning the development of a national regulatory system for higher education (Musselin 2004; Gornitzka and Maassen 2007). Although the extent to which national systemic integration has been pursued has varied across Europe, the territorial states' engagement with higher education has been geared towards system-building and maintenance within a fairly stable territorial space. Similarly, state involvement in the development of scientific capacity is the expression of how science and technology was fashioned to become an instrument in the service of the territorial state, to engine or to match economic development, military needs, and to provide a knowledge basis for national public policies in areas such as health and education (Gornitzka and Maassen 2007:83–86).

Theories underlying the concept of National Innovation Systems (NIS) also acknowledge the continuous relevance of national boundaries and the mutual dependency of the nation-state and research and higher education. Essential to the NIS model is that innovation, defined as the processes by which firms adopt product designs and manufacturing processes that are new to them, is a key factor in determining national competitiveness. Innovation concerns a complex interplay between various national institutions that together form a more or less efficient system. R&D units are core units in any national innovation system. Universities and colleges play a major, albeit sometimes an indirect role, particularly by training a large part of the work-force involved in innovative activities.

Constructing national higher education, research and innovation systems also implies defining the relationship between such systems and other national spheres, including policy arenas and economic sectors. For instance, a higher education system is linked to needs for skills and a competent work-force to match national labour market demands as well as to civic education and social inclusion. In addition, national research structures – especially in the areas of life sciences, and science and technology – are expected to respond to the needs of national industries (Crawford et al. 1993).

As such, the boundaries of a knowledge system are linked to the boundaries of other systems – political, economic and social – and to the nation-state as a community. Changes in territorial boundaries of markets and political systems are likely to affect the boundaries of research and higher education, at least as long as research and higher education are linked to these other spheres. The long-term historical process of defining and establishing national borders around knowledge has provided a strong foundation for nationally determined rules, regulations, funding streams, and standards that embed knowledge production and dissemination, research and teaching/learning in Europe as elsewhere. Such boundaries are also manifestations of cultural divisions, especially in terms of language barriers in research communication and teaching/learning.

Consequently, knowledge production and dissemination takes place within national systems and national institutions that reflect more than two centuries of establishing and defining the territorial boundaries of knowledge, and establishing the knowledge system bent to the needs of the nation-state. This suggests that these boundaries are not easily perforated or dismantled. Against such a background,

internationalisation is not a trivial matter; it stands in contrast to the widely held view of the universality of knowledge, of open knowledge production and dissemination that escapes nationality and other local ownership. The inherent universalism implies that the kind of knowledge and facts that research generates, and which higher education institutions store and disseminate, cannot be valid within only one geographical space or within one political system. From this perspective, the process of acquiring new knowledge and pushing the frontiers of research would be blind to national colours, thereby rendering territorial borders irrelevant. Historical observations of the development of national research, higher education or innovation systems and their links to nation-state building do not add up to perceptions of the global dynamics of research and scholarship that would defy the bordering process and challenge it.

This 'puzzle' draws attention to the multidimensional processes involved in 'bordering and de-bordering' – nationalisation and internationalisation – of research and higher education. This book identifies cross-border activities – internationalisation – of national knowledge systems as multifaceted, characterised by multiple dynamics taking place in different locations ranging from research in Norwegian institutes and universities (Chapters 2 and 3), industrial R&D and companies (Chapter 4), students, graduates and employers in the labour market (Chapter 5), and universities and colleges (Chapters 6 and 7), and internationalisation of government policies for research and higher education (Chapter 8).

1.3 Dynamics of Internationalisation

The international dimension of research and higher education cannot solely be understood as a 'more of the same' process, i.e. more of the same activities across national borders. In order to understand the international dimension of research and higher education as it has appeared previously, we need to see it as a process of *change*. There are new kinds of cross-border activities associated with research and higher education systems, of a different nature and following different patterns than those dominant up until the mid-1980s. We need to know what dynamics, in addition to the endogenous dynamics of knowledge production, come into play when cross-border activities in research and higher education increase. To assist this, we can identify a broad set of factors that drive internationalisation: technological change, economic change, political-institutional change, and cultural change.

First, *technological change*. The development of long-distance transportation enabled the development of border-transcending commercial capitalism (Rokkan 1987 [1974]). Technological change that has compressed 'time and space' is a precondition for current economic globalisation (Katzenstein 2005:14). Similarly, we can assume that ICT has changed the conditions for internationalisation of research as well as teaching and learning. It is an important condition for 'escaping' national borders when researchers, companies, students, ideas, qualifications and organisations can travel more easily across (very) long distances, both physically and virtually: 'Opportunity makes internationalisation' as the immediate costs of crossing borders

are lowered. Technological change can thus alleviate or make irrelevant the spatial location that places small, peripheral knowledge systems in marginal positions.

Second, *economic change* will drive internationalisation of research and higher education to the extent that fundamental changes in world trade and industry are linked to the knowledge production system. If it is so that the nationalisation of research and higher education was triggered by the industrial revolution, then it can be argued that increasing cross-border connections in research and higher education are linked to the 20/21st century economic revolution from the industrial to the post-industrial economy. When it comes to the 'knowledge economy' or the new economy, the dynamic part of any economic system is knowledge-intensive and embedded in a global economy with multilateral trade liberalisation and capital flow (Castells 2001). This puts pressures on national borders of labour markets and industries and on national research and higher education systems. Internationalisation would also then be linked to economic changes if knowledge is increasingly seen to be a tradable object in international competitive markets that are not restricted by loyalties to national institutions. International markets for research and higher education and for educated labour imply exit opportunities for students, researchers and companies. They need not be 'loyal' to national providers. If this is the essential dynamic, then internationalisation is a market choice.

Third, *political change*. The embeddedness of national research organisations in the national political system as objects of public funding and regulations shifts attention to the politically constructed borders of knowledge. These borders have enabled the integration of national systems, but at the same time limited cross-border activities. If national 'border control' exercised by political means is weakened, then the consequences of crossing borders are reduced. Such weakening can be induced by lower levels of public involvement in research and higher education, and by reforms directed specifically at increasing the autonomy of actors in research and higher education systems, thereby 'setting them free' to engage internationally. A political dynamic of internationalisation would also come into play if governments explicitly *encourage* internationalisation through means at the disposal of the territorial state – i.e. the same 'state machinery' that has created national boundaries is used in the nation-state assisted 'debordering' of national knowledge systems. This is internationalisation by political design. As such, this is not only a nation-state matter but linked to the emergence of international and supranational governance sites that have emerged to come to grips with the internationalisation of political problems and of political decisions (cf. Goldmann 2001). The emergence of regional or global governance actors and arrangements can cut national political borders and increase the complexity of political orders – including the orders within which national research and higher education systems are set. Further, such supranational and international regimes may directly address research and higher education by providing international funding opportunities, standards and rules affecting cross-border of skills, trade regulations, and so on. Just as much as the research activities and teaching and learning experiences cannot be understood solely in their national systemic context, the national policies directed at this sector do not evolve in splendid national isolation. Research and higher education are not normally considered

to be 'high politics' representing issues of core national geopolitical interests and operating within a logic of interstate diplomacy. Neither can domestic policies be understood without taking into consideration the international context within which they are set (Pollack 2005). For research and higher education, at least in the western democratic hemisphere, there is a noticeable and growing internationalisation of policy problems. Problems are increasingly affected by conditions and events abroad. There is also growing internationalisation of political decisions, with the proliferation of international decision-making to new areas (Goldmann 2001). Large research efforts demand international infrastructures, global problems have to be addressed, and students and researchers are increasingly mobile across national borders. The problems addressed by research and higher education policies have become increasingly international in nature.

Fourth, *cultural change*. Changes in the values, norms and identities of students, academics, research organisations, companies and higher education institutions towards an international orientation would constitute a driver for internationalisation if they lead to changes in practices. Parts of the literature on globalisation place heavy emphasis on the cultural component. Some identify globalisation with cultural homogenisation and ideas of a 'world society' that reduce the significance of local and national identities and a sense of commitment to national community. However, with respect to research and higher education, the underlying assumption of parts of the globalisation literature that there is a unidirectional development that weakens national cultural communities towards one dominant global culture does not seem to apply (Held and McGrew 2000). Rather, in the context of knowledge systems, the role of cultural factors in changing patterns of internationalisation may just as well be a case of a *re-emphasis* of common academic universal cultures, or the idea of multiple identities with coexisting local, national and international cultures.

For the purpose of this book, these factors are not ordered into a model specifying the connections between them. However, there is an underlying idea that such factors are interlinked and appear in different strengths as the working ingredients of internationalisation of research and higher education we analyse here, with the factors being addressed to varying degrees in the contributions in this book. Each chapter elaborates a specific analytical framework wherein some or all of these factors feature in the analysis of different aspects of the internationalisation of knowledge.

1.4 Disaggregating Internationalisation

Even in a small country, national research and higher education systems are highly complex. Consequently, there is a strong rationale to be highly attentive to the various aspects of knowledge systems and how the different components internationalise, i.e. seeing internationalisation as a *differentiated* process. In order to capture this we use a three-dimensional categorisation: (1) forms of internationalisation; (2) levels of action; (3) territorial constellations.

First, we distinguish between *forms of* interconnection or the *nature of the* (*cross-border*) *connections* between actors, i.e. informal networks of connections, organised forms and routines of connection, and market-based transactions. Further, the ways in which international links are forged are not homogeneous, but vary according to type of activities and actors involved in research and higher education, as the chapters in this book amply demonstrate.

Second, we acknowledge that research and higher education systems are essentially multilevel in character. Consequently, we categorise internationalisation according to the types of actors involved and at what level they operate. Actors and activities can be studied at four levels: the international level (international-macro), the national political-executive level (national-macro), the sub-national organisational level (meso), and the individual level (micro). Distinguishing between the micro-level actors, meso-level actors, national level actors and trans- and international actors, allows us to probe whether a different pattern of participation in the internationalisation of research and higher education may be observed over time.

Third, we distinguish between different *territorial constellations* of internationalisation, i.e. that internationalisation comprises connections that follows a specific geographical pattern that can vary from a global to a regional reach which cuts across one or several national borders.

1.5 What are the Implications of Internationalisation?

The recent developments with respect to internationalisation might possibly represent mutually reinforcing change processes, as well as fertile ground for dilemmas and tensions to emerge. First, between different *modes of internationalisation*. For example, how can market-oriented competition in higher education and research coexist with organised and routinised international collaboration? How does internationalisation in one area of the knowledge system affect the international activities of other parts of the system? Second, there are possible tensions between actors at different *levels of action*. When actors at one level gain prominence, how does that affect the capacity that actors at other levels have to shape and influence research and higher education?

We also argue that there is a potential tension between the different territorial connections that come to the surface – is it possible for research and higher education systems to develop cross-border activities with new territorial units without weakening the bonds of other connections? As national borders are lowered, there is an implicit understanding that this entails a challenge to *national* systemic integration. Control over national systems is weakened as students may more easily choose educational provision outside the national borders, employers can more easily choose to hire graduates educated abroad, companies can more easily chose to buy foreign R&D, researchers can more easily seek funding from foreign sources, etc. There is also a question about the extent to which ‘de-bordering’ (Kohler-Koch 2005) is challenging national systems of higher education, research,

labour markets and innovation when lowering of national borders is accompanied by setting or raising boundaries elsewhere. For example, with the re-bordering of knowledge systems, territorial boundaries are moved and drawn at different levels.

These considerations provide the background for our discussion of the following assertion:

> Traditional patterns of internationalisation in research and higher education have been marked by individual level self-organised networks formed around transnational epistemic communities. From a Norwegian perspective, this is increasingly supplemented by internationalisation as organised activity within one specific territorial space, Europe, where organisational, national level and supranational levels have a much stronger presence than before. There is also now an increase in market- oriented activities with a global scope, while these activities involve more and more the organisational level as a constitutive unit.

1.6 Overview of the Book

In *Chapter 2*, we commence by presenting the main characteristics of the Norwegian research and higher education system and some core indicators of internationalisation in Norwegian R&D. Patterns of international funding and international collaboration are examined regarding different fields of research, institutional and sectoral differences, and geographical orientation. This chapter explores how national, disciplinary, sectoral and organisational differences act as 'filters' in the internationalisation process, creating a highly differentiated pattern. Time series data from all research sectors and organisations in Norway are used.

Chapter 3 analyses the changes in contact patterns of Norwegian university researchers over a period of 20 years. Using survey data on five types of international contacts, changes in conference attendance and study periods abroad are documented, also guest lecturing, peer review/evaluation work abroad and research collaboration with foreign scientists. Changes over time in cross-border contacts that sustain transnational academic communities beyond the formal, written communications analysed in publishing and citation data are also captured (cf. Chapter 2). Given the overall rise in international research collaboration, also documented in Chapter 2, there is reason to assume that the forms, content and direction of international contacts may also have changed, possibly even to the extent that the distinction between 'locals and cosmopolitans' in the research orientation of academic staff is no longer valid. In this chapter, we ask: Has the motivation for establishing international contacts of Norwegian academic staff in general increased? Has long-term research cooperation across borders loosened the local ties in research?

In *Chapter 4*, we turn the focus towards industrial R&D and examine Norwegian companies' R&D activities abroad. In the analysis, we view the companies' international R&D purchasing patterns in relation to their use and experiences with the national research infrastructure. We also look at how internationalisation is related to strategic choices and actions within the companies. Using survey data from Norwegian companies and case studies of large R&D performing firms, the question is raised whether the internationalisation of this part of the research system

is a consequence of a mismatch between the research needs of companies and what the national R&D infrastructure can offer.

Chapter 5 addresses the effects of international student mobility and examines how Norwegian students graduating abroad succeed in the labour market. Transition from higher education to work is found to be less smooth for those graduating abroad than for domestic graduates, and they are more likely to experience unemployment and over-education. On the other hand, those who have studied abroad receive higher wages and have more internationally oriented jobs than domestic graduates. The results are discussed within the framework of general theories on transition from labour market to work and rationale of internationalisation of higher education.

In *Chapter 6*, the focus turns to the institutional level. How do knowledge organisations like universities and colleges respond to internationalisation? What are their strategies and driving forces regarding internationalisation? The empirical basis for this chapter is in-depth studies of five Norwegian higher education institutions.

Chapters 7 and 8 bring the analysis to the policy-making level. Norwegian research and higher education are positioned within a number of international policy-making arenas. In *Chapter 7*, the focus is on Nordic cooperation that can be characterised as a specific form of internationalisation in higher education i.e. regional cross-boundary cooperation. However, as a consequence of developments, especially at the European level, this Nordic internationalisation tradition has come under pressure. This chapter first analyses the main factors that stimulate or hamper Nordic cooperation in the area of higher education. Secondly, it looks into the way in which the traditionally academic goals of Nordic cooperation in higher education are influenced by the growing 'economisation' and 'marketisation' of the national higher education policies. *Chapter 8* explores various types of connections between national and international policy formulation for research and higher education. Three perspectives on coordination of public policies and international political cooperation are outlined: (1) a perspective emphasising the promotion of nationally defined interests, (2) a perspective that underlines the rules and norms that have been established in the various international arenas for policy cooperation, and (3) an idea-based perspective that sees national policy adjustments as a results of international learning processes. Within this frame, the Norwegian objectives and attitudes towards international and European higher education and research policy cooperation are examined.

Chapter 9 summarises the main observations and elaborates the core arguments in this book.

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Chapter 2
The Many Ways of Internationalisation

Patterns of R&D Funding and Collaboration

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2.1 Introduction

Internationalisation has changed the ways research and development (R&D) is structured during the last ten to fifteen years. Not only have general trends in communication and globalisation affected R&D, but developments more specific to this field have also altered the daily routines of many researchers. While the World Wide Web has changed the ways in which scientists collect and process information, email has changed the ways of collaboration. Together with cheaper airfares, these technological changes have dramatically improved the possibilities for international cooperation. At the same time, initiatives to increase international collaboration and funding have been more prominent on the agenda of governments and international bodies. However, these major trends are unlikely to affect researchers and departments in a uniform way. Science is not a homogenous undertaking: institutions, departments, scientific fields and disciplines show too much variation for any internationalisation trends to have uniform effects.

In this chapter, we will focus on the differentiated picture of internationalisation. By investigating the development of international funding and collaborative patterns in Norwegian R&D, we will demonstrate how scientific fields and institutions have been internationalised in different ways through attachment to different international sources of funding and collaborative networks. Our proposition is that the concept of 'internationalisation' will have distinct features when filtered by its national, institutional and scientific affiliations. We expect researchers within one scientific and institutional domain to be associated with a specific set of international funding resources and to have distinctly different patterns of collaboration, while researchers in other domains will have quite different types of associations. We will also look at the relation between funding and collaboration by asking the question: Do increases in international funding lead to increased international collaboration between researchers, and does this give a partial explanation of increases in international collaboration and co-authoring?

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After presenting the research questions, this chapter then presents a brief introduction to the Norwegian R&D system and the overall funding structure. Thereafter, we outline the details of R&D funding from international sources, before looking more closely at the collaborative patterns of Norwegian R&D. In the last section, we discuss our findings and outline some conclusions.

2.2 Internationalisation Differentiated

In recent years, important changes in the scientific, economic and political conditions surrounding research collaboration have taken place. The growth of the EU as an important source of funding, and the efforts to establish the European Research Area, are but two examples. We can assume that policy changes at the international, national and institutional levels have fostered closer collaboration between Norway and other European countries.[1] If this assumption is correct, and the overall pattern of international relations in R&D really has changed, what are the characteristics of current international networking, and how do these compare with the past? This chapter documents changes in the geographical orientation among Norwegian scientists by discipline and types of R&D-performing institutions. Bibliometric analysis show changes at the national level, but so far we have no analysis at the level of subject fields and institutional categories (Sivertsen 2001). An important question is, therefore, whether the trend from the overall national analysis can be found for all *subject fields* and for all types of *R&D-performing institutions*.

As a consequence of the universal character of theories and findings, the natural sciences and medicine have a research agenda which in itself is largely international. This is also reflected in the international collaborative and publishing patterns of these fields of science. On the other hand, the social sciences and humanities have been oriented more strongly towards national or local, issues. International collaboration has traditionally been less common in these areas, and the publication patterns have been more dominated by national channels. If we can assume that the trend of internationalisation is general, it should affect all scientific and scholarly fields equally. However, if the 'hard' sciences have always been internationally oriented, can we expect them to expand their international orientation to a level much higher than previously? After all, there are limits to how far the internationalisation may possibly extend. On the other hand, for the 'soft' sciences we should expect changes if the trend of internationalisation is as pervasive as is sometimes assumed. If so, it would be reasonable to expect *disciplinary variations* in the degree of recent internationalisation.

Another question is whether the increased international collaboration and competition also reduces the differences between the types of R&D institutions. In Norway, there has been a well-established division of labour between the universities at one hand, and the private and public research institutes at the other. This division may no

[1] See Chapter 8 for an analysis of policy developments.

longer be as pervasive, as the universities are entering the area of industry-oriented research and the institutes are seeking alliances with universities to improve their research quality. Even if we are witnessing a converging trend between the two sectors of the research system in respect of their participation in the international arena, there may still be broad variations in their international strategies and participation in R&D networks. Consequently, it will be interesting to investigate differences in internationalisation between *university and institute sectors*.

2.3 The Norwegian R&D System and Its Funding Structure

The Norwegian R&D system is characterised by three sectors of performers: industry, research institutes and laboratories, and the higher education sector. Compared to most industrialised countries, the industrial sector in Norway has a low share of the nation's total R&D expenditure – about 49 per cent in 2003 (Table 2.1). Another characteristic feature is the relatively large share of R&D performed in independent laboratories and institutes, i.e. institutions with an independent legal status and outside the higher education and business sectors. Such institutions are found in most European countries, but in Norway these kinds of institutions play a relatively larger role in the R&D system than in many other countries, accounting for about 23 per cent of all R&D in 2003. The higher education institutions carried out 27 per cent of total R&D, measured by expenses for this year. These variations are also reflected in the level of man-years devoted to R&D. The higher education institutions receive the main share of the public funding.

Table 2.2 shows variations between the higher education sector and the institutes and laboratories.[2] Overall, research institutes rely more on competitive funding as funding from business and research councils represent more than 20 per cent each. While the higher education institutions receive 5 per cent of their R&D funding from the business sector, research institutes receive 22 per cent from this sector. As higher education institutions are in the public sector in Norway, it is not surprising that 68 per cent of their R&D funding comes from government sources. Comparing

Table 2.1 Main indicators for Norwegian R&D 2003. By sector

	R&D expenses		Man-years on R&D		Public funding	
	Billion NOK	Per cent of total R&D	FTE	Per cent of total R&D	Billion NOK	Per cent of total
Higher education	7.5	27.4	7 918	27.2	6.5	57.5
Research institutes	6.4	23.3	7 238	24.9	4.0	35.4
Business	13.5	49.3	13 901	47.8	0.8	7.1
Total	27.4	100.0	29 057	100.0	11.3	100.0

Source: NIFU STEP R&D statistics

[2] See Chapter 4 for an analysis of the industrial sector.

Table 2.2 Funding of R&D by source, Norwegian higher education institutions and research institutes 2003

	Business		Government		Research council		Abroad		Other		Total	
	Bill. NOK	per cent	Bill. NOK	per cent	Bill. NOK	per cent	Bill. NOK	per cent	Bill. NOK	per cent	Bill. NOK	per cent
Higher education	0.4	5	5.1	68	1.4	19	0.2	3	0.4	5	7.5	100
Research institutes	1.4	22	2.4	38	1.6	25	0.7	12	0.2	3	6.4	100

Source: NIFU STEP R&D statistics

R&D funded from abroad, research institutes receive 12 per cent of their funding from foreign sources, while the higher education institutions receive only 3 per cent of their funding from sources abroad.

2.4 International Funding of Norwegian R&D

Foreign sources of funding played a minor role in Norwegian R&D during the 1970s and 1980s. Not until the 1990s did international funding of R&D accelerate among both higher education institutions and independent research institutes. For the research institutes, the increase commenced in 1991, while it occurred a few years later for the higher education institutions (see Fig. 2.2 in the Appendix).

In 2001, funding from abroad represented 7.2 per cent of the total Norwegian R&D expenditure, just below the EU 15 average of 7.7 per cent. Compared with other smaller OECD countries, the amount of foreign funding was far lower than the 19.7 per cent in Austria, which had a tremendous increase during the 1990s. There was also a significant increase in the Netherlands during the early 1990s where the level reached 11.0 per cent in 2001. On the other hand, levels of foreign funding to Norwegian R&D were considerably higher than in the R&D intensive Nordic countries, for example, Finland (2.5 per cent foreign funding) and Sweden (3.4 per cent) (2001 figures). Norway thus seems to be in a median position among the OECD countries when comparing the ability to attract foreign funding.

For Norway's higher education institutions, foreign funding has been stable at almost 3 per cent of total R&D expenditures after 1997. Compared to other countries, this is somewhat lower. In Finland, higher education institutions obtained 6.6 per cent of their R&D funding from foreign sources in 2001. Corresponding figures for Sweden were 5.0 per cent, Denmark 4.3 per cent and the Netherlands 3.4 per cent. With 2.3 per cent, Germany ranks below Norway. As the other Scandinavian countries are EU members, this could explain why their higher education institutions attract more international funding than Norwegian institutions. However, Norway participates in the EU R&D Framework Programmes, and Norwegian institutions have the same opportunities as the EU members to attract funding from this source. On the other hand, institutions in the EU member countries might have easier access to

other sources of international funding, like European industry or governments. We should recall that 3 per cent is the average of foreign funding for the whole sector.

Funding from abroad is far higher among the research institutes than among the higher education institutions. The institutes had a larger share of international funding than the higher education institutions in the 1970s and 1980s, reaching 5 per cent in 1991. There was then a significant growth in the first half of the 1990s, levelling off in the late 1990s subsequently reaching an all time high of 11.5 per cent of total R&D expenditure in 2003.

For the research institutes and laboratories, comparisons with other countries can be problematic because the statistical delimitation of the Norwegian research institute sector is somewhat different from the OECD definition of the government sector. However, if we compare just the institutes and laboratories included in the OECD definition of the government sector (about 65 per cent of the total Norwegian research institutes sector measured by R&D expenditures in 2003), direct comparisons can be made. Among other OECD countries with a broadly similar structure of institutions, the institutes in the government sector of the Netherlands and Norway are those with the highest percentage of international funding. In 2001, the international funding for these institutions was on average 11.4 per cent in the Netherlands, and 9.8 per cent in Norway. The government sector in Finland ranks somewhat below with 7.5 per cent, while the large government sector in Germany only reached 2.9 per cent. However, not too much weight should be attached to these comparisons as institutional structure as well as tasks vary considerably between these countries.

These figures show that there are large national variations in how 'international' the R&D systems are in terms of foreign funding. Furthermore, there are broad variations between the different parts of the system. These variations will now be investigated in more detail.

2.4.1 Analysis of International Funding of Norwegian R&D

This section focuses on international funding of higher education institutions and the research institutes in Norway. There are good reasons for comparing these different kinds of institutions: they both have core funding from the government, they both produce knowledge for the international scientific community, and they are both becoming more exposed to international competition and to competitive funding regimes. In terms of performing R&D, they have become more homogeneous although there are also many differences among them. In addition to research, higher education institutions have education as their primary task, while research institutes usually are not involved in teaching. Research institutes are usually also engaged in applied research, development and consultative activities to a much larger extent than higher education institutions. Their funding from the government (38 per cent of total R&D expenses) is also considerably lower than for the higher education institutions (68 per cent).

For this part of the study, we have applied institutional microlevel data based on R&D statistics for the two sectors, in addition to annual statistical data for

the research institutes. For the approximately 45 higher education institutions, a biannual time series for the years 1991–2001 has been developed for the department (or in some cases sub-department) level.

2.4.1.1 International Funding of Higher Education Institutions

It is often asserted that the funding structure of higher education institutions is changing. Some observe a change in the direction of increased share of competitive funding through grants and contracts (Geuna 2001), while others find the public core funding relatively stable (Lepori et al. 2005). If there is a general trend towards more competitive and project funding, we should expect higher education institutions to seek such funding from abroad to supplement their national sources.

With the aid of national Norwegian R&D statistics, we have looked at the funding and personnel of more than 830 units (departments, centres, and research groups) within higher education institutions.[3] Only 210 (26 per cent) reported they had any funding from foreign sources in 2001. The impression of funding being basically national is confirmed by a survey among university personnel which showed 31 per cent of the academic personnel to have received R&D funding from abroad during 2001 (Trondal and Smeby 2001). From these figures, we can conclude that only a minority of units within the higher education sector has succeeded or wanted to obtain international funding for their R&D.

Among the 210 departments obtaining funding from abroad, the average funding from foreign sources represented 7 per cent in 2001. The median was 3.6 per cent, which probably is a better measure of the central tendency as a few outlying departments increase the average considerably. Among the 210, about 120 departments had more than 3 per cent of their R&D expenses funded from abroad. This group we will consider as departments with a high proportion of foreign funding. The median for these 120 departments was 6.8 per cent. For a closer analysis of the 'highly international departments' we selected the 59 units with the highest share of international funding (4.3 per cent or higher share of R&D funding from foreign sources). Most of these are what will usually be considered a university department, but centres and other more specialised units are also represented. For this group as a whole, 9.6 per cent of the R&D funding came from foreign sources in 2001. By comparison, the total foreign funding for the same group was 1.5 per cent in 1991, indicating a substantial growth during the 1990s. Table 2.3 shows the distribution of the departments according to broad scientific fields (OECD classification).

Among the departments attracting most foreign funding are 24 within the natural sciences, and 11 within medicine. The relative share of medicine departments is however rather low as the 11 departments represent less than 4 per cent of the total number of departments in this field. It is perhaps surprising that there are 17 departments within humanities and social sciences, considering that these areas are generally said to be more strongly oriented towards local problems and issues. This might, however, be about to change in a globalised world. Also, within these sciences there

[3] These are the discrete units investigated biannually as part of R&D statistics.

Table 2.3 Departments with high degree of international funding by scientific field. 2001. N and per cent of total number of departments in higher education sector

Scientific field	Highly international departments		Total no of depts.
	N	Per cent of total depts.	N
Humanities	6	3.6	166
Social sciences	11	6.0	183
Natural sciences	24	21.6	111
Technology	4	6.8	59
Medicine	11	3.7	296
Agricultural science	3	13.6	22
Total	59	7.1	837

Source: NIFU STEP R&D statistics

seem nowadays to be more options for international funding. Norway is believed to have a strong social science community and this might further enhance the possibilities for receiving funding from abroad. The large share of highly international departments in agricultural science might be explained by the fact that many of these units engage in developmental studies and receive funding from international organisations such as the UN.

When examining these 59 departments according to disciplines, some clear categories emerge. Many units cluster in an area that can be termed as life sciences or 'bio'-disciplines (20 out of 59). This group includes the more traditional biological disciplines like biology, botany and marine biology, as well as biochemistry, biotechnology and microbiology. Seven of the departments can be classified as 'earth sciences' (geology, geo-physics etc.). We also find a group of other natural sciences like physics, mathematics and zoology (see Table 2.7 in the Appendix for a complete list of units).

Among the human and social sciences we find several departments of economics, but also seven departments within the various disciplines of cultural studies (e.g. history, communication), among them also two departments of philosophy. The rest is a mixture ranging from general medicine to highly specialised centres within law, technology and cross-disciplinary studies. The high level of specialisation among some of these units probably makes them internationally attractive.

Among all disciplines, except the earth sciences, there has been a steady growth in international funding during the 1990s, and the growth rate for these departments has been much higher than for the higher education institutions in total. The 'earth'-disciplines had an exceptionally high rate of foreign funding in 1997, which is accounted for by two of the departments. This group was still the one with highest funding from abroad in 2001, with more than 13 per cent of its R&D expenses funded from abroad. For all disciplines except 'cultural studies' the dominant source of foreign funding is the European Union which accounted for more than 80 per cent (about 7 million Euros) of the foreign funding in 2001. This year the total funding from EU for the higher education institutions was 13 mill Euro, implying that the departments analysed received more than half of the total. This illustrates the importance of the EU Framework Programmes (FP) as a driving force for internationalisation in terms of funding for these departments. For cultural studies,

funding from Nordic sources plays a more important role, which probably reflects a research orientation towards more local or regional issues. Another explanation can be the low amounts allocated to social sciences and humanities by the Framework Programmes in the 1990s. The life sciences seem to have the most diversified sources of international funding, as funding from Nordic sources, UK, US and other national sources plays a more prominent role. In general, funding from foreign industry seems to play only a minor role for the departments analysed, even if many of them are in industry-relevant areas like biotechnology and geology.

This analysis shows a limited set of university departments within a limited set of disciplines have been receiving the bulk of international funding. The European Union is definitely the main foreign source of funding. Despite some growth during the 1990s, internationalisation in terms of foreign funding of R&D seems to be of relatively little importance for the great number of university and college departments. Even for the departments attracting most international funding, international sources are of minor importance compared to national sources.

2.4.1.2 International Funding Among Research Institutes

The situation regarding international funding for the research institutes is quite different than for the higher education institutions. Not only do they have a general funding from abroad on a higher level than the universities, most of them have such funding at a substantial level. For this part, we apply institutional level data for 61 independent research institutes and laboratories. These institutions are all dedicated research institutions and most of the international funding should be expected to be for R&D purposes.

Norwegian institutes seem to be very internationally oriented. Funding from abroad for the institutes in total has been at almost 15 per cent of total contract funding for the whole period 1997–2005. Another fact underpinning this international orientation is that the large majority of institutes have some funding from abroad. The 25 social science institutes received in total 7 per cent of their contract funding from abroad in 1997, increasing to 10 per cent in 2005. The 7 institutes undertaking environmental and developmental studies show the same increasing pattern (from 13 to 15 per cent in total), while the 14 institutes within agriculture and fisheries and the 15 technology oriented institutes retained their level at 7 and 20 per cent respectively.

A closer look at the sources of funding reveals greater variations between the groups of institutes. For the agriculture and fisheries institutes and social science institutes, the EU Framework Programmes are the most important source of international funding, with 42 and 49 per cent of total foreign funding from EU respectively.[4] For agriculture and fisheries, the EU share has been diminishing, and accounted for 65 per cent of total international funding in 1997, funding from

[4] Even if the institutes might get additional funding from EU than through the Framework Programmes, we know from other statistics that the larger share of the funding is coming from the Framework Programme.

foreign industry and other sources becoming more important. For the technological institutes, foreign industry is the main source of funding from abroad with a 51–60 per cent share during the period 1997–2005. For these institutes the Framework Programmes play a less significant role than for the others (19 per cent of total foreign funding 2005). For the social sciences institutes Nordic funding plays a significant role, while for environmental and development institutes international organisations are the most important international source.

In general, the research institutes and laboratories seem to be much more active in obtaining international funding than the universities. We should, however, be aware that most of these institutions operate in quite another way than the higher education institutions. Whereas the latter receive a large part of their funding by allocations from the government, the institutes and laboratories mainly operate in the market for R&D projects and contracts. Only a few are relatively well funded through core funding from the government, and most have actively to compete for projects on the national and international market. Their operating conditions are thus of a kind that forces them to seek out new markets and sources of funding. This driving force does not, however, guarantee success. The relative high share of international funding should thus indicate some success among foreign customers and a high rate of success in the FPs. We notice also that there are large income differences between the institutes concerning the importance of the various sources, indicating different customer support according to subject field and specialisation.

2.4.1.3 The Role of the EU Framework Programmes

For the universities the EU Framework Programmes (FP) are the most important source of international funding, and thus need some further elaboration (See Fig. 2.4 in the Appendix for EU funding of Norwegian R&D). Even if EU funding is important for all higher education institutions, their trajectories and the relative importance of this source of funding varies. Over time, the University of Bergen has extracted most resources from the FPs, and it has been able to have as much as 8–9 per cent of its total second stream funding from the FPs since the mid 1990s. However, The Norwegian University of Science and Technology (NTNU) has been able to increase this share from one to six per cent in the 1995–2003 period, while the University of Oslo only has increased from one to three per cent of total second stream funding in the same period.

There has been a notable diversity in EU funding according to the field of science. While in 1995 (FP4) the natural sciences accounted for more than 70 per cent of the total EU funding to Norwegian higher education institutions, their share has been reduced to 43 per cent in 2003 (FP6). The technological disciplines have been particularly successful in increasing their share, but social sciences and agriculture have also increased. This change has, of course, not only to do with the strategies and actions of the universities; also the orientation of the Framework Programmes has changed over the years allowing for a wider range of disciplines to participate.

For the research institutes, the EU does not play the same dominant role in foreign funding as with the universities; industry is a more important source. This is

to be expected as many of the institutes carry out research for industrial application. Still, the total funding obtained from EU by the institutes was more than 217 mill NOK in 2005 (Fig. 2.3 in the Appendix). A more detailed analysis shows the relative importance of EU funding to be greatest among the industrially oriented institutes (5 per cent of total R&D expenditures), while the public oriented institutes had a lower share (3 per cent of total R&D expenditures). The finer breakdown available for the 61 largest institutes shows the variation between the four largest groups of institutes to be from 3.4 per cent of total project funding in 2005 (excluding core funding from the government) for the institutes oriented towards primary sector (fisheries and agriculture), to 4.3 per cent for social science institutes. Even if there are institutional variations, this shows EU funding to be a prominent part for all groups of institutes, despite variations in their orientation. This is in contrast to the universities.

2.5 International Scientific Collaboration – Analysed through Publication Data

Scientific collaboration across national borders has significantly increased over the last decades. According to Melin and Persson (1996), the number of internationally co-authored papers has doubled in about fifteen years. Bibliometric analysis thus provides evidence to the effect that there is a strong move towards internationalisation in science, and that the research efforts of nations are becoming increasingly entwined. The move toward internationalisation is also reflected in the publishing practices of scientists: English has increasingly become the *lingua franca* of scientific research, and publishing in international journals is becoming increasingly important, also in the areas of the social sciences and the humanities.

In this section, the focus is on the development concerning internationalisation of Norwegian science based on bibliometric analyses. The development will be investigated at an overall national level, at the level of sectors, universities and university faculties in Norway.

The basis for the bibliometric analyses is the National Citation Report (NCR) for Norway provided by Thomson ISI. This database contains bibliometric data on individual articles for Norway (that is, publications with at least one Norwegian author address), and data for the period 1981–2004 is analysed. In addition to the NCR database, we used the National Science Indicators (NSI) database for some of the citation analyses. This database contains aggregated publication and citation counts at a national and world level for 105 different scientific fields (the so-called 'de-luxe' version). We have also identified the number of articles by Norwegian universities using the information available in the address field of the articles. These last data are, however, only available for the period 1991–2003.

During the period 1981–2004 Norwegian scientists published a total of approximately 90,000 ISI-indexed articles. There was a tremendous increase in the international co-authorship during this period. In 1981, 16 per cent of Norwegian publications involved international co-authorship. This proportion has been increasing steadily over the period, rising to 52 per cent in 2004. More than every second

paper published by Norwegian researchers now has foreign co-authors. In terms of the number of articles, only 400 of a total output of 2300 articles involved international co-authorship in 1981. By 2003, the number of internationally co-authored articles had increased to 2900 articles of a total output of 5500 articles.[5]

This analysis shows that a fundamental structural change of Norwegian science towards more international collaboration took place during the period. This development is, of course, not unique for Norway; several other studies have identified similar patterns. For example, in 1996, 40 per cent of Finnish papers were co-authored by researchers working abroad compared to 19 per cent in 1986 (Persson et al. 2000). Norway represents a country with a strong incidence of international collaboration in publications. Worldwide, only 17 per cent of all publications are now internationally co-authored (National Science Board 2002). Nevertheless, several countries have been shown to have a higher proportion of internationally co-authored papers than Norway. In a study by Glänzel (2001), based on 1995/96 data, Norway ranks twentieth of a total of fifty nations. Although most of the countries with a higher proportion international co-authorship are rather small scientific nations, there are a few other West-European countries ahead of Norway, among these Portugal, Switzerland, Belgium, and Denmark.

Generally, nations with large scientific communities have far more collaborative articles than smaller countries (Luukkonen et al. 1993), though a trend is found to the effect that the proportion of internationally co-authored papers increases as the national volume of publications decreases (see e.g. Luukkonen et al. 1992; National Science Board 2002). Hence, international collaboration is relatively more important in smaller countries. This is probably a consequence of researchers from small countries often having to look abroad for colleagues and partners within their own speciality. Small scientific budgets, the need for cost-sharing, and access to facilities abroad are other reasons. Country size is, however, not the only factor with bearing on the extent of international collaboration. Access to funding, geographical location, and cultural, linguistic and political barriers are other important factors (Luukkonen et al. 1992; Melin and Persson 1996).

Which countries and regions are the most important collaborative partners for Norway and has the profile changed during recent decades? This question has been addressed by analysing the distribution of co-authorships.[6] Figure 2.1 shows the regional distribution of co-authorship for the period 1981–2003.

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[5] The increase in total papers can partly be explained by an increase in the international publishing among Norwegian scientists, partly by an increase in the number of journals that has been indexed by ISI during the period, and partly by an increasing element of international collaboration (which serve to increase the publication counts because publications representing 'fractionalised' contributions in terms of Norwegian authors then count as 'whole' publications).

[6] Here, the basis for the initial analysis is the individual countries and not the regions. For each article, we counted countries only once. This means that an article with two authors from France, and one from Italy (and one from Norway), for example, was counted as one French article and one Italian article. For each year, the total number of foreign co-authorship represented the total (100 per cent). We then distributed the country counts to their respective regions and calculated each region's share for each year. Thus, the paper described above would count as two EU-Norway co-authorships.

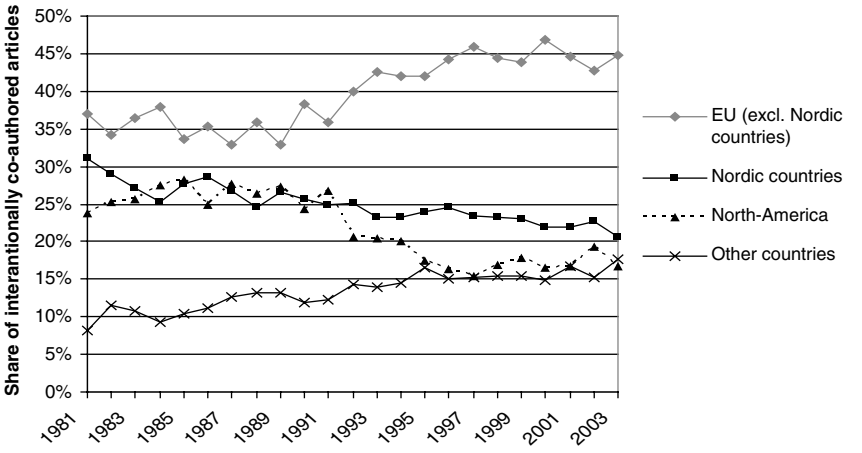

Fig. 2.1 Co-authorship by region 1981–2003. Percentage of internationally co-authored Norwegian articles by region

The profile has changed during the period. The relative importance of North American collaboration has decreased, while that of the EU, excluding the Nordic countries, has increased. The relative importance of the Nordic countries has also decreased while the share of other countries has increased. It is, nevertheless, important to emphasise that in absolute numbers, the counts for all the regions has increased considerably during the period. Participation in the EU Framework Programmes may be one important factor which helps to explain the changes in the collaborative profile of Norway at this time.

To analyse the regional change in more detail, we have calculated the share of co-authored articles per country for those countries with the highest share of co-authorships with Norwegian authors (Table 2.4). We have done this for two time-periods, i.e. the first three years of the period (1981–83) and the last three (2001–2003).[7] In both periods, the United States was the most important partner-country. In the first period, the US share of the Norwegian-foreign co-authorship was 22 per cent. This proportion declined, however, to 14 per cent in the most recent three-year period. The relative importance of the Swedish collaboration has decreased from 17 to 11 per cent, and the Danish from 10 to 6 per cent. The relative importance of most of the other EU countries has, on the other hand, increased.

Some general patterns are also evident in the findings for Norway. For example, for almost all other countries, the United States is the most important collaborative country this reflecting this nation's pre-eminent role in science. Generally, one also finds that most countries have much collaboration with their neighbouring countries

[7] The reason for using a three-year period in this analysis is to avoid random annual fluctuations. For the analysis of individual countries, we have used the same methodological principles as in the analysis of regions. That is, for each period the total number of foreign co-authorship represented the total (100 per cent).

Table 2.4 Norwegian co-authorship by country, 1981–1983 and 2001–2003. Share of internationally co-authored articles and increase in the number of co-authored articles during the period

Country	Share of internationally co-authored articles Per cent		Increase in number of papers during the period N
	1981–1983	2001–2003	
USA	22	14	1 697
UK	11	10	1 334
Sweden	17	11	1 256
Germany	9	7	863
Denmark	10	6	762
France	3	6	768
The Netherlands	3	4	600
Finland	2	4	510
Italy	1	4	532
Canada	3	3	438
Russia/USSR	1	3	408
Switzerland	2	2	283
Other countries	16	25	3 489
TOTAL	100	100	12 940

Source: NIFU STEP/ Thomson ISI

(e.g. collaboration among the Nordic countries). Over the last decade, we find a marked increase in co-authorship among western European countries, mainly reflecting the importance of the EU Framework Programmes.

We now go on to analyse the collaborative patterns within Norway, for example individual institutions and sectors. By way of introduction, we provide an overview of the publication profile of the Norwegian research system. There are four main universities in Norway of which the University of Oslo is by far the largest in respect of number of publications. The University of Bergen and The Norwegian University for Science and Technology are almost similar in terms of production of papers, while the University of Tromsø is the smallest of the universities. The institute sector in Norway is also an important actor in terms of production of papers.

The different institutions and sectors show some variations in their degree of internationalisation. We have calculated the proportion of international co-authorship for different institutions and sectors for two three-year periods: 1991–1993 and 2001–2003 (see Table 2.5). Although there are differences, it is fair to say that these are not very large, and all institutions and sectors show the same strong tendency towards internationalisation during these two periods. In both periods, the University of Bergen obtained the highest share of international co-authored papers, 33 and 49 per cent, respectively. Among the universities, the Norwegian University of Science and Technology had the lowest share, 28 and 43 per cent respectively. In the most recent period, the category for other specialised university institutions/university colleges had the lowest share (37 per cent).

Previous studies have shown collaboration to be particularly extensive in experimental research involving large-scale research instruments such as telescopes or particle accelerators (Katz and Martin 1997). The degree of collaboration may

Table 2.5 Co-authorship by sector and institutions, 1991–1993 and 2001–2003. Share of articles involving international co-authorship. Per cent

	1991–1993	2001–2003
The institute sector	24	40
The business enterprise sector	27	43
The higher education sector	28	44
University of Oslo*	30	46
University of Bergen*	33	49
The Norwegian University of Science and Technology*	28	43
University of Tromsø*	30	46
Agricultural University of Norway	21	43
Norwegian School of Veterinary Science	26	46
Other specialised university institutions/ university colleges	25	37

Source: NIFU STEP/ Thomson ISI

* Including university hospitals.

also be a function of the basic/applied dimension. It has been argued that the more basic the field, the greater the proportion of international co-authorship (Frame and Carpenter 1979). In an analysis of the natural sciences and medicine, the highest percentage of international co-authorship was found in the earth and space sciences, mathematics, and physics, with the lowest percentage in clinical medicine (Luukkonen et al. 1992). They suggested that financial as well as cognitive reasons could explain this pattern. When it comes to the social sciences and the humanities they are, by their nature, more nationally and culturally-oriented than the basic natural sciences and medicine (van Raan 1997).

To be able to analyse whether similar variations apply to Norwegian science, the development for three different university faculties at four universities has been investigated: the faculties for natural sciences (including mathematics), medicine and the social sciences. Interestingly, we find that the differences at the level of faculties are larger than the differences between sectors and institutions. The proportion of papers involving international co-authorship in the natural sciences is almost twice that of the social sciences, while medicine is positioned somewhere in between. For the natural sciences, the share increased from 40 per cent in 1991 to 58 per cent in 2003, for medicine from 24 to 45 per cent, and for the social sciences from 22 to 33 per cent (Fig. 2.5 in the Appendix). This means that medicine has been characterised by the strongest increase in internationalisation during the period. We thus find a certain hierarchy in internationality among the faculties, but also within the faculties some departments and disciplines are more internationally oriented then others.

Institutional variations in the development of international co-authorship were analysed in the above faculties for the four Norwegian universities (Table 2.6). For the faculties of medicine, the shares of co-authorship in 1991–1993 vary from 20 to 28 per cent. Ten years later, in 2001–2003, the variations between the different universities was somewhat less as the share was 41 per cent for the Norwegian

Table 2.6 Increase in share of articles involving international co-authorship 1991–1993 to 2001–2003 and number of internationally co-authored articles. By university and scientific field

Faculty	University of Bergen			University of Oslo			University of Tromsø			The Norwegian University of Science and Technology		
	N 1991 1993	N 2001 2003	per cent increase	N 1991 1993	N 2001 2003	per cent increase	N 1991 1993	N 2001 2003	per cent increase	N 1991 1993	N 2001 2003	per cent increase
Medicine*	917	1468	15	2272	3809	18	458	732	20	402	888	21
Natural sciences	668	1331	21	1272	2009	15	186	397	10	NA	NA	NA
Social sciences	43	85	13	97	264	7	16	119	2	47	189	22

Source: NIFU STEP/ Thomson ISI.
* Including university hospitals.

University of Science and Technology and 46 per cent for the University of Oslo. For all the universities the share of internationally co-authored articles had increased by more than 15 percentage points. For the natural sciences[8] the share of internationally co-authored articles was more than 40 per cent in 1991–1993, but has still increased by more than 10 percentage point at all universities. In the most recent period, all universities had more than 55 per cent internationally co-authored articles.

Similar results are shown for the social sciences. Here, we find larger differences between the universities, one reason being a smaller number of papers overall. The share is also more sensitive to the different field profiles. In 1991–1993, the variation was from 16 to 33 per cent, while in 2001–2003, the variation was from 25 to 41 per cent. The increase in share of internationally co-authored articles varied between 2 percentage points for the University of Tromsø to 22 percentage points for the Norwegian University of Science and Technology.

We can observe that even if the natural sciences had the highest share of internationally co-authored articles in the early 1990s, this field significantly increased its share from 55 to 60 per cent in 2001–2003. Medicine started out with a share about half of that of the natural sciences, and has increased such that in 2001–2003 it was at the stage where the natural sciences were ten years earlier. For the social sciences, the share of internationally co-authored articles was very low in the early 1990s (about 200 articles in total for the four universities considered). Still, the increase has been very moderate for two of the universities, indicating the social sciences continue to be domestically oriented.

[8] Excluding The Norwegian University of Science and Technology where data were not available.

2.6 International Funding and Collaboration – A Comparative Perspective

Our analysis of publication and co-authorship patterns gives evidence of increasing international collaboration by Norwegian researchers and a move towards collaborative relations favouring European countries. Even if increased collaboration is a general trend, there are still considerable variations between sectors, institutions and fields of science in collaborative intensity. Nevertheless, variations seem to be less evident in recent years and there seems to be a converging trend in the collaborative patterns. For international funding, on the other hand, a convergent trend seems less obvious. Our analysis shows that only a limited set of university departments within a limited set of disciplines receive the bulk of international funding. For Norwegian universities, the European Union is definitively the main foreign source of funding, while research institutes have much more varied sources of funding.

Concerning the relationship between international funding and collaboration, the increase in international funding has been much less rapid than the increase in international co-authorship. For example, during the 1980s the proportion of international funding remained fairly constant while the share of international co-authorship increased from 16 per cent in 1981 to 26 per cent in 1990. In 1991, funding from abroad represented 4.6 per cent of the total Norwegian R&D expenditures, while the proportion was 7.7 per cent in 2001. In the same period, the proportion of international co-authorships increased from 28 per cent to 47 per cent. These observations suggest that the increase in collaboration has been a more long-term trend than that in international funding, even if some institutions and departments have had considerable international funding over a long period. These observations might also indicate that factors other than funding have been more important as driving forces for the increase in international collaboration. In other words, international funding is not the primary driver of international collaboration but might be intensifying and reinforcing already existing dynamics.

When we filtered international funding and international collaboration by sector, for example comparing higher education institutions and research institutes, we found the proportion of funding from abroad increased from 0.7 to 2.9 per cent in the period 1991–2003 for the higher education institutions, and from 5.3 to 11.6 per cent for the institutes. In terms of international co-authorship, we found no particularly large differences between the two sectors (see Table 2.5). In fact, the share of international co-authorship during the period 2001–2003 is slightly lower for the institutes and laboratories (40 per cent) than for the higher education sector (44 per cent). This is contrary to what would be expected if funding from abroad would have a direct effect on the collaboration patterns.

Filtering at the institutional level in the higher education sector, we found that the share of international funding (2001) for the four main Norwegian universities varied from 2.0 per cent (University of Oslo) to 5.0 per cent (University of Tromsø), while the share of international co-authorship varied between 43 per cent (Norwegian University of Science and Technology) to 49 per cent (University of

Bergen). Again, it is difficult to demonstrate any systematic relation between the level of international funding and the level of international collaboration as reflected in co-authorship. Further insight into the relationship between international funding and collaboration can be provided by analysing the question at the level of university faculties. In 2003, the R&D statistics show that the share of funding from abroad varied significantly within the higher education sector. The lowest share was found for the humanities (1.4 per cent), for the social sciences (1.6 per cent) and for medicine (1.6 per cent). The share was much higher for technology (3.8 per cent) and for the natural sciences (5.8 per cent). The (relatively) high share observed in the natural sciences corresponds well with the high share of international collaboration found in this area. But the proportion of funding from abroad is low for both medicine and the social sciences, while the incidence of international co-authorship is much higher for medicine. Our analysis at department level showed international funding to be most prominent within certain fields and disciplines. Analysis of co-authorship by discipline shows a relatively similar pattern: physics, earth/space sciences, mathematics, chemistry, biomedicine and biology have the highest share of international collaborative articles. Even if the available data breakdown does not allow an exact department level comparison between funding and co-authorship, we find some similarities very likely, i.e. some disciplines/departments are much more internationally oriented than others in both the funding sources they seek out and in their collaborative patterns.

Our analysis of international funding by source showed EU Framework Programmes to be the single most important source, but there were also large variations dependent upon scientific field and the type of organisations involved. Within higher education institutions, funding from the Framework Programmes are of major importance only within a few scientific fields. For independent laboratories and institutes, funding from the European Union is often part of larger portfolio of international funding which gives these organisations quite another role within international R&D. For other such organisations the international business community is of much greater importance, while for others, international organisations and bilateral arrangements play the major role. While the introduction of EU Framework Programmes can be said to have been significant for academic institutions, other mechanisms seem more dominant among research institutes. The latter are also able to attract considerable EU funding amounting to an even higher share of their total funding than the higher education institutions, but other sources of funding are more important, at least for some groups. Here, we find a more differentiated picture, with industry, regional and international organisations emerging as important actors. This draws attention to the importance of recognising both policy initiatives and more market-like mechanisms as drivers of internationalisation.

A few words of methodological caution should be added. First, ISI data are most valuable for generating output indicators for academic research, and for medicine and natural sciences in particular. In the case of the social sciences, ISI data have important limitations. However, it is reasonable to assume that the ISI data cover the more internationally oriented part of the social sciences and that an analysis based

on such data are more likely to over-estimate rather than under-estimate the overall importance of international collaboration in the social sciences. Second, it should be emphasised that co-authorship has more limitations as an indicator of international collaboration in the case of the institutes and laboratories. This is because these institutions publish in international journals less frequently, and where other forms of publication including reports, are more important. Thus, the question remains whether the co-authorship patterns adequately reflect the collaboration structures of the institute sector. There is a third question regarding the comparability and possible connections between the two measures of funding and collaboration. The comparative analysis presented above is based on simple observations of these two measures only and the assumption that a positive correlation would be found if international funding significantly influences the level of international collaboration (although a positive correlation in itself, of course, would not prove that there is a causal relationship between them). In individual cases, it might still be the situation that receiving funding from abroad is linked with an increase in the international collaboration. But it does not seem possible to identify such effects for the Norwegian science system as a whole. There is nevertheless a possibility that a positive relationship exists but that other factors are more important and distort the effect of international funding.

2.7 Conclusions

Our main finding in this chapter is that internationalisation of R&D takes many paths dependent on scientific field, organisational features and the arena for international activity. We have utilised only two indicators, though often considered as important for measuring input and output of science, by which we find considerable variations when we filter data through sectors, institutions and disciplines. The analysis shows internationalisation to be differentiated and not to have developed as one common trend. Internationalisation should thus be understood in the context of the thematic orientations of the departments and the larger institutions of which they are part, which in turn have their own traditions and motives for seeking international funding and collaboration. Referring to internationalisation in general terms and without context only obscures important variations and should thus be avoided.

We have found international funding of R&D to be increasing, but then the pattern of increase is notably varied. Only 26 per cent of the units in the higher education sector reported that they had received funding from abroad, and foreign sources seem to play a minor role in Norwegian research funding. Internationalisation in terms of co-authorship has been increasing far more and in most scientific areas, and co-authorship is the rule in some fields when writing texts. We have not been able to establish a direct causal link between international funding and co-authorship but we find some grounds for believing that a correlation exists. Considering the increasing importance of EU-funding in particular, it would be counter-intuitive if this

funding did not result in more international collaboration. In fact, as we have seen from the bibliometric patterns, there has been a marked change in the collaborative patterns of Norway during recent decades: the EU-countries are more important relatively speaking, while the importance of USA and the other Nordic countries has decreased. Some of these changes can at least be reasonably assigned to the effects of EU-funding. Small levels of new funding may have large effects on how research is structured. This still needs to be demonstrated by other methodological approaches.

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Appendix

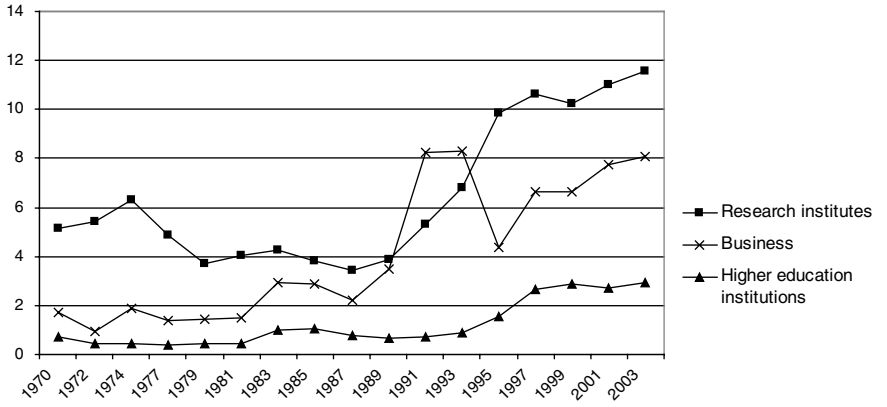

Fig. 2.2 Funding of Norwegian R&D from abroad by sector. Per cent of total R&D expenditures. 1970–2003

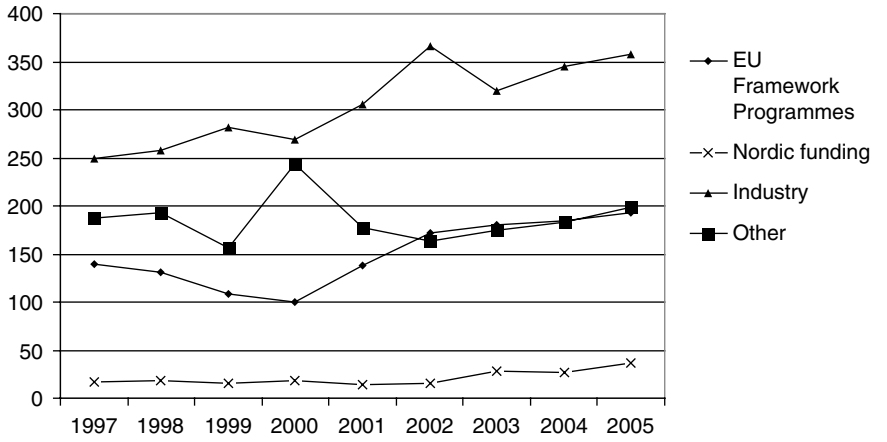

Fig. 2.3 International funding of research institutes by source. 1997–2005. Mill NOK

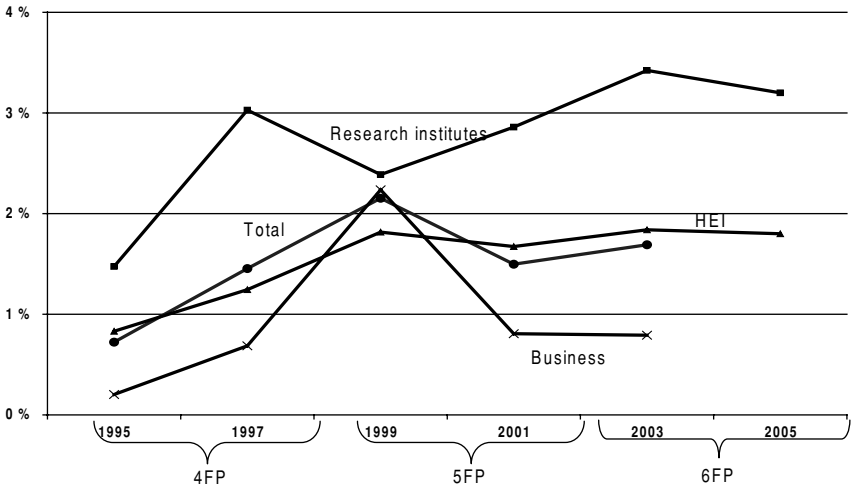

Fig. 2.4 Funding by EU Framework Programmes to Norwegian R&D as share of total R&D expenses. 1995–2005. Per cent

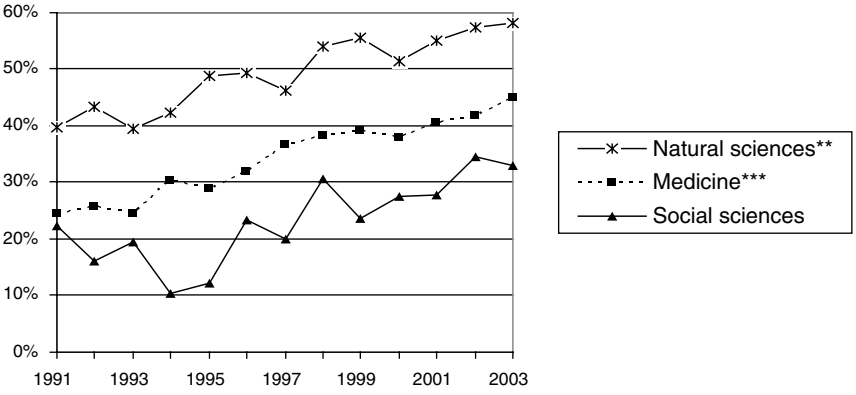

Fig. 2.5 Co-authorship by faculty for the Norwegian universities*, 1991-2003. Share of articles involving international co-authorship. Source: NIFU STEP/Thomson ISI

* Universities: University of Oslo, University of Bergen, University of Tromsø, and The Norwegian University of Science and Technology.

** Including mathematics. The Norwegian University of Science and Technology is not included.

*** Including University hospitals.

Table 2.7 Departments with high share of international funding. By discipline and field of science 2001

	Department	University	Field of science (OECD)
Earth-Sciences	Department of Solid Earth Geophysics	University of Bergen	Natural sciences
	Department of Geology	University of Bergen	Natural sciences
	Geophysical Institute	University of Bergen	Natural sciences
	Department of Geography	University of Bergen	Social sciences
	Department of Geography	University of Oslo	Natural sciences
	Department of Geophysics	University of Oslo	Natural sciences
	Department of Geology	University of Oslo	Natural sciences
Life sciences	Department of Basic Medical Sciences	University of Oslo	Medicine
	Department of Micro Biology	University of Oslo	Medicine
	Department of Biology, Section of Botany and Plants Physiology	University of Oslo	Natural sciences
	Department of Biology, Section of Marine Botany	University of Oslo	Natural sciences
	Department of Biology, Section of Molecular Cell Biology	University of Oslo	Natural sciences
	Department of Cancer Research, Section of Cell Biology	University of Oslo	Medicine
	Department of Anatomy and Cell Biology	University of Bergen	Medicine
	Department of Biochemistry and Molecular Biology	University of Bergen	Medicine
	Department of Molecular Biology	University of Bergen	Natural sciences
	Department of Fisheries and Marine Biology	University of Bergen	Natural sciences
	Department of Microbiology	University of Bergen	Natural sciences
	Department of Botany	University of Bergen	Natural sciences
	Department of Biotechnology	The Norwegian University of Science and Technology	Technology
	Department of Chemistry and Biotechnology	Norwegian University of Life Sciences	Technology
	Trondheim Biological Observatory	The Norwegian University of Science and Technology	Natural sciences
	Department of Botany	The Norwegian University of Science and Technology	Natural sciences
	Department of Microbiology and Virology	University of Tromsø	Medicine
	Department of Marine Biotechnology	University of Tromsø	Natural sciences
	Department of Aquatic Biosciences	University of Tromsø	Agriculture
	Department of Biology	University of Tromsø	Natural sciences

Table 2.7 (Continued)

	Department	University	Field of science (OECD)
Culture studies	Department of Philosophy	University of Bergen	Humanities
	Department of Cultural Studies and History of Arts	University of Bergen	Humanities
	Research Group for Text Technology	University of Bergen	Humanities
	Department of Media and Communication	University of Oslo	Social sciences
	Department of History	University of Tromsø	Humanities
	Department of Philosophy	The Norwegian University of Science and Technology	Humanities
	Centre for Women's Studies and Gender Research	University of Oslo	Social sciences
Natural sciences	Department of Physics	University of Bergen	Natural sciences
	Department of Mathematics	University of Oslo	Natural sciences
	Zoological Museum	University of Oslo	Natural sciences
	Department of Zoology	The Norwegian University of Science and Technology	Natural sciences
Social sciences	Department of Planning and Local Community Research	University of Tromsø	Social sciences
	Department of Economics and Resource Management	Norwegian University of Life Sciences	Social sciences
	Department of Social Sciences	Bodø University College	Social sciences
	Department of Social Anthropology	University of Tromsø	Social sciences
	Department of Economics	The Norwegian University of Science and Technology	Social sciences
Various	Department of Neurology	University of Bergen	Medicine
	Centre for International Health	University of Bergen	Medicine
	Department of Physiology	University of Bergen	Medicine
	Centre for Studies of Environment and Resources	University of Bergen	Natural sciences
	Centre for Materials Research	University of Oslo	Natural sciences
	Scandinavian Institute of Maritime Law	University of Oslo	Social sciences
	Norwegian Research Centre for Computers and Law	University of Oslo	Social sciences
	Department of Linguistics	University of Tromsø	Humanities
	Department of Animal Sciences	Norwegian University of Life Sciences	Agriculture
	Department of Forestry	Norwegian University of Life Sciences	Agriculture

Table 2.7 (Continued)

Department	University	Field of science (OECD)
Department of Psychology	The Norwegian University of Science and Technology	Social sciences
Department of Neurology	The Norwegian University of Science and Technology	Medicine
Department of Community Medicine and General Practice	The Norwegian University of Science and Technology	Medicine
Department of Hydraulic Engineering	The Norwegian University of Science and Technology	Technology
Department of Production & Quality Engineering	The Norwegian University of Science and Technology	Technology
Department of Telematics	The Norwegian University of Science and Technology	Natural sciences

Chapter 3
All Cosmopolitans Now?

The Changing International Contacts of University Researchers

Jens-Christian Smeby and Åse Gornitzka

3.1 Introduction

As key social institutions, universities are intricately linked to nation- and state-building. Yet, international contacts at the level of the individual university researcher have been a core prerequisite for development of the knowledge base of small countries. Personal contacts between researchers remain the core of international research cooperation in academia: university researchers have their identity anchored in disciplinary networks and communities, and international contacts are structured by the nature and orientation of such communities. 'Locals' and 'cosmopolitans' are the terms used to denote two types of scholarly orientations of scientists. Locals have a predominantly domestic audience, whereas cosmopolitans have the international, scholarly community as their frame of reference (Gouldner 1957). Given the overall rise in international research collaboration, also documented in Chapter 2, there is reason to assume that the forms, content and direction of international contact have also changed, possibly even to the extent that the distinction between locals and cosmopolitans among academic staff is no longer valid. This is what we set out to investigate in the current chapter. Second, we ask if the possible long-term research cooperation across borders has loosened local ties in research. Third, we analyse changes in geographical orientation in international professional journeys. Changes in research contacts are discussed in light of a distinction between global *de*bordering versus internationalisation as *re*bordering. We ask whether overall trends of globalisation can explain changes in the international contacts of university researchers, or whether such changes are better understood as a consequence of organised political efforts within the area of higher education and research policy that have evolved in the past ten year as part of the European integration efforts. According to a rebordering hypothesis, the cross border contact of Norwegian researchers in academia would increasingly follow the European path

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to the detriment of contact from research communities outside the geographical area covered by the European research cooperation.

At the individual level, one precondition for coming into contact with other researchers is the motivation to seek such contacts. Moreover, the scientist has to be attractive to other researchers (Olsen and Svåsand 1971; Kyvik and Larsen 1994). Another precondition that should be added is resources. Resources are needed to conduct research and to undertake travel. Material conditions like access to good research equipment may also constitute a basis of researchers' attractiveness. A key question in our examination of the changing international contacts of university researchers is how these mechanisms for international contacts relate to global debordering as well as international rebordering.

This chapter analyses the changes in contact patterns of Norwegian university researchers over a period of 20 years. Using survey data from 1981, 1991 and 2000 for five types of international contact, changes in conference attendance abroad, study periods abroad, guest lecturing and evaluation work, and research collaboration with foreign scientists, are documented. Based on this unique data set, we capture changes over time in cross-border contact that uphold transnational academic communities beyond the formal, written communication of academic communities analysed in publishing and citation data (cf. Chapter 2). In particular, we are able to disentangle changes in cross-border contact at the level of the individual university researcher to see whether the proliferation of international contacts is not merely a question of increase in 'light' forms of internationalisation, but also in activities that require more motivation and commitment.

3.2 Changing International Contacts: Two Hypotheses

3.2.1 Locals and Cosmopolitans and the Global Debordering Hypothesis

The concept of globalisation is often taken to refer to the increasing global connectedness and interdependence of economic systems, and the decreasing significance of geographic distance (Held et al. 1999; Fligstein and Merand 2002). In this chapter, we focus in particular on the latter aspect of globalisation. Development of information technology contributes to globalisation as the scope, speed and complexity of information increasingly affects our daily lives – we encounter the network society (Castells 2000). As universities are already internationally opened by the transnational character of disciplinary communities, we can assume that the advent of a network society would be particularly relevant for academic staff. The traditional perception of stratification in academia has been that scholars from a small, peripheral countries would be at a disadvantage. Moreover, researchers with low academic status would be 'locals' who are not visible or attractive, and thereby confined to their local institution and local academic practices, unable to have their work published outside the territorial borders and with no international visibility.

The development and enhancement of global networks could blur the distinction between centre and periphery as the geographical location of researcher becomes irrelevant. We would then expect to see a dispersion of cross-border contact irrespective of cultural and linguistic barriers and national borders – globalisation would foster cosmopolitanism in domestic research. According to a globalisation hypothesis, we would expect territorial patterns of cooperation and geographical proximity to be less important, and the geographical distribution of such contacts to disperse over time. Nevertheless, assuming that the 'Matthew-effect' in academia also comes into force in the patterns of international connectivity, it may also be hypothesised that the cross-border activities mainly involve a small attractive elite. The 'Matthew effect' refers to the mechanism by which well-reputed individuals, groups and institutions that have a record of accessing important positions and resources will be rewarded with future attention and in the allocation of resources (Merton 1968), or in the words of St. Matthew (Matthew 13:12) 'Whoever has will be given more, and he will have an abundance. Whoever does not have, even that what he has will be taken from him'.

Irrespective of whether resources or attractiveness are the most important mechanism, we could expect two different versions of cosmopolitanism to be on the increase. On the one hand, opportunities that global connectedness offers could lead to a de-stratification of research. The costs of cross-border activities are lowered by technological advances and cheap airline tickets, which in turn would have an equalising effect. Cross-border professional journeys would be mainstreamed, and also among the less motivated and less attractive researchers, and with academic disciplines that traditionally have been nationally embedded. On the other hand, if internationalisation is primarily to be seen as driven by intensifying international competition and attractiveness, we would expect the most demanding cross-border activities to remain an exclusive practice reserved for smaller elite segments among the domestic academic communities.

3.2.2 Internationalisation by Design: The Rebordering Hypothesis

While globalisation is often considered as comprising processes which, through its market-driven or network-based character, are out of the realm of political or organised control, there are several political initiatives that directly address the need to steer the intensity and direction of cross-border contact and cooperation in research within a given territorial space. This is what we identified in Chapter 1 as a debordering/rebordering process by deliberate design. Such initiatives are fashioned as a buffer against the unpredictable and uncontrollable forces of globalisation and cutthroat global competition in a knowledge market, and as a way of enabling domestic actors to cope and participate better in the global market place. Global challenges spur regional cooperation (Wallace 2000). Nowhere is this more evident than in Europe. This would then produce a different pattern of cross-border contact than one could expect from an internationalisation that does not encounter the deliberate efforts of re-bordering in Europe. The driver of Europeanisation of research – or

the increase in cross-border activities within Europe as knowledge space – would be located in the deliberately, controlled cross-border activities, developed at the supranational governance level.

Since 2000, the process towards establishing a European Research Area (ERA) has been a core instrument in the EU pursuit of the Lisbon Strategy. The ERA initiative aims directly at removing what is seen as obsolete national borders to create a common market for research in Europe faced with the challenge of transition to the global, knowledge-based economy. The work towards increasing the level of R&D funding in Europe (the 'Barcelona target'), the explicit ambition to coordinate national research policies through the Open Method of Coordination, and to link and open up national research programmes in Europe (ERA-NET), are measures that affect the parameters of European research. The potential effects of these intensified efforts towards establishing an internal research market within Europe cannot be measured in our data. The ERA concept, however, builds on the already-existing architecture and infrastructure for EU R&D policy-making. In addition to the intergovernmental institutionalisation of R&D cooperation (esp. COST and EUREKA) since 1984, the European R&D Framework Programme has been the pinnacle of efforts to deliberately increase cross-border contact within Europe. The EU Framework Programme makes explicit the prerequisites that European research collaboration has to involve research groups from three or more different EU or EEA countries in order to be eligible for funding. The 6th Framework Programme instrument – Networks of Excellence – also directly promotes and funds travel and cross-border activities of European researchers. In total, this constitutes an explicit territorial channelling of cross-border contact in Europe. Norway has well-established traditions for cooperating with the EU in research matters. With its full participation in the Framework Programme from 1994, this can be expected to have made an imprint in the contact and cross-border activities of researchers in Norwegian universities. Through the Framework Programmes, about 3000 Norwegian researchers have participated in some 600 European research projects. We would expect this to make a considerable impact on the level and types of international contact patterns among Norwegian academic staff, i.e. contacts and research collaboration with European researchers would increase in the 1990s. We note, however, that data used here cover the period up to 2000, and consequently do not capture the potential effects of more recent innovations in the EU research policy instruments.

Nordic cooperation has traditionally had a strong position as a regionally- based R&D regime. It features with priority in the most recent Norwegian university reform, and also in the national research council's strategy for internationalisation. This type of regional cooperation has manifested itself in established arrangements for research cooperation such as the Nordic Research Academy and mobility programmes such as NORDPLUS. We see this also in the initiatives towards establishing a Nordic Research Area (Björkstrand 2004). Yet, the Nordic organised dimension has to some extent felt the impact of Europe (cf. Chapters 7 and 8).

In addition to these efforts towards the deliberate internationalisation of research at intergovernmental and supranational level, Norwegian policy for higher

education and research has increasingly placed an emphasis on the domestic higher education and research system within its international context (cf. Chapter 8). A primary argument has been that internationalisation of Norwegian research is quality-enhancing – exposure to the international scholarly community serves as a quality check of domestic research. It can be calibrated with international academic standards. Access to the international disciplinary communities means being integrated into transnational epistemic communities, and access to latest development in research disciplines and to collaborative opportunities. Cross-border activities are performance-enhancing. This is also corroborated by studies of the association between international contacts and research productivity (cf. Kyvik and Larsen 1994).

There is also a division of labour argument raised in national policy which says that small size, and limited intellectual and financial resources, can be compensated by being included in international research communication and collaboration. So far, these elements of a domestic research policy are policy orthodoxies. Policy instruments used were primarily linked to incentives for academic mobility and to a strong emphasis on *juste retour* for Norway's contribution in the Framework Programme (Research Council of Norway 2000, 2001; Simmonds et al. 2001).

The last 10–15 years' higher education policy has put much more emphasis on the domestic aspects of internationalisation, and on a much stronger link between internationalisation and other aspects of higher education and research policy by the Norwegian Ministry of Education and Research. Domestically, internationalisation is also used as an *indicator* of academic standing and quality and, having an active international interface, is rewarded both by the institution (cf. Chapter 4) and by national governments (cf. Chapter 8).

3.2.3 Data

Data in this chapter are drawn from three surveys among tenured academic staff at Norwegian universities[1] covering a period of 20 years at three points in time: 1981, 1991, and 2000. The number of respondents in these surveys was 1585 in 1981 (79 per cent response rate), 1815 in 1991 (69 per cent), and 1967 in 2000 (60 per cent). We categorise the faculty members into the following five fields of learning: humanities, social sciences, natural sciences, medicine and technology.[2] In all these surveys, faculty members were asked to report destinations for professional journeys abroad in connection with conferences, guest lectures, study and research periods, peer review/evaluation work, and research collaboration. The latter type of visit was not a separate category in the 1981 survey. Journeys are, however, mainly analysed as a single dichotomised variable. Since research collaboration does not have to

[1] University of Bergen, University of Oslo, University of Trondheim (now the Norwegian University of Science and Technology) and the University of Tromsø. Until 2005, these four were the only universities in Norway.

[2] The 1981 survey does not include technology.

include visits abroad, data on research collaboration with researchers in their own department and in other countries in the previous three-year period are examined. These variables are only available for the two latter surveys.

3.3 Crossing the Border – How Motivated and Attractive are Norwegian University Researchers?

One measure of international interface of university researchers is their propensity to undertake professional journeys abroad. In the course of an academic year, a significant majority of Norwegian academic staff at Norwegian universities will have travelled abroad for professional reasons, where conference participation is by far the most prevalent reason for their travels (see Fig. 3.1). In 2000, three-quarters of university academic staff participated in conferences outside Norway. About a half travelled abroad in connection with research collaboration with foreign partners; almost 40 per cent gave guest lectures abroad; and an almost identical share travelled as visiting scholars and for short-term study visits. The least prevalent reason for foreign travel is participation in international peer reviewing and evaluation work.

The most striking change is simply the overall proliferation of travel abroad from the 1980s into the 2000s. From Fig. 3.1, it is clearly seen that the possibility of virtual travel through information technology has not reduced the propensity for leaving the country. The ubiquity of conference participation abroad clearly suggests that there are very few 'pure locals' left among academic staff at Norwegian universities.

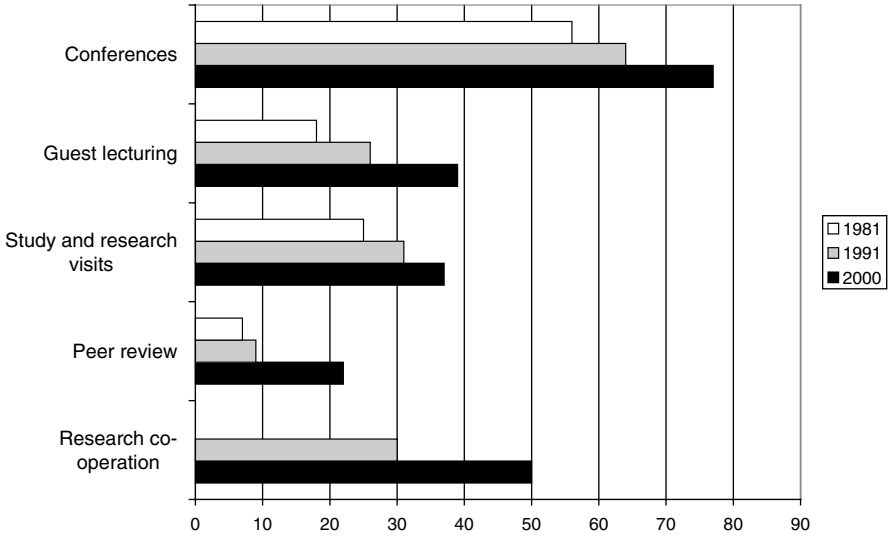

Fig. 3.1 Share of academic staff undertaking at least one journey abroad according to type of activity. 1981, 1991, 2000. Per cent

The integration of researchers into transnational academic communities is dependent on both a researcher's motivation and attractiveness. The researcher needs to have the motivation in order to make the effort to engaging internationally. Attractiveness refers to the extent to which international colleagues perceive a researcher as a relevant and interesting partner. Attractiveness would depend on the researcher's international visibility, active participation in transnational academic discourse, and formal competence. Motivation is a prerequisite for all types of international professional journey, ranging from the least demanding type of international contact and conference participation, to the most demanding forms of cross-border activity. Attractiveness, on the other hand, is a condition for being actively sought out by other colleagues, to give guest lectures, and participate in evaluation work and peer reviews. Even the most common type of foreign contact, conference attendance, is a mixed bag in terms of motivation and attractiveness, as shown by Kyvik and Larsen (1994). They demonstrate how this type of international contact includes the minimally-motivated 'conference tourist' who attends with minimal effort and no paper presentation, the highly motivated that actively participates and interacts in the international academic community by presenting papers, and internationally attractive researchers that are invited to give conference presentations and key notes. Our data show that conference attendance is not primarily an excuse for 'academic tourism': in 2000 over 80 per cent of those attending conferences abroad also presented papers, either at their own initiative, or by special invitation.

Study and research periods abroad also necessitate varying motivation and attractiveness, not only in terms of duration. Some study periods are primarily connected to academic staff qua teachers, as has been the case for the 300 university and college teachers who have participated annually in the teaching exchange programme, ERASMUS (Vabø and Smeby 2003). In 2000, half of the academic staff at Norwegian universities reported study periods abroad with a duration of one semester or more. Study periods of such length demand a least a high degree of motivation and, in most cases, some prior international visibility and attractiveness in addition.

As observed in Fig. 3.1, there is a striking increase in all forms of international contact from 1981 to 2000. Travelling abroad seems to have intensified more during the 1990s compared to the 1980s. We see the strongest increase in journeys as part of international research cooperation, i.e. the type of contact that is among the most demanding in terms of motivation and attractiveness. Such an increase should not only be seen as the increase in inner motivation, but also as connected to the increasing availability of international funding of collaborative research. This corroborates the general findings presented in Chapter 2, and serves to underscore that the general increase in cosmopolitanism is related to the changing organisation of international research cooperation, and also the resources and incentives for cross-border cooperation that have been offered as part of national and institutional research policy instruments.

Although not as prevalent as research collaboration, there is a significant increase, especially of university staff participating in peer review and evaluation abroad during the 1990s. On the one hand, this could lead us to conclude that this is sign of increasing attractiveness and scholarly reputation of the Norwegian

university research community; on the other, the 'glorious return' of peer reviewing and the strong increase in the use of formal and internationally-based research evaluation would suggest that in general more scholars are needed to perform such activities and, as such, it cannot be reserved for a very small elite of academics travelling 'first class'.

3.4 The International Interface of Research Collaboration

Figure 3.2 shows that 66 per cent of academic staff collaborated in their research with colleagues abroad in the period from 1998 to 2000. Compared to the situation in the period from 1989 to 1991, when 57 per cent of the respondents were involved in international research collaboration, this is a considerable increase. International research collaboration does not necessarily imply cross-border journeys, yet our data show that the propensity for travelling as part of international research collaboration increased far more, from 30 per cent in 1991 to 50 per cent in 2000. Contrary to the claim that virtual travel made possible by communications technology can reduce the need to travel, we see that the explosion in global travelling is no less relevant to academic life than elsewhere. An additional reason for the significant increase in journeys abroad related to research collaboration also rests with the universities that have the financial means available to sustain such a level of travel. It is encouraged as part of the institutional internationalisation strategy (cf. Chapter 4). Similarly, internationally organised research programmes,

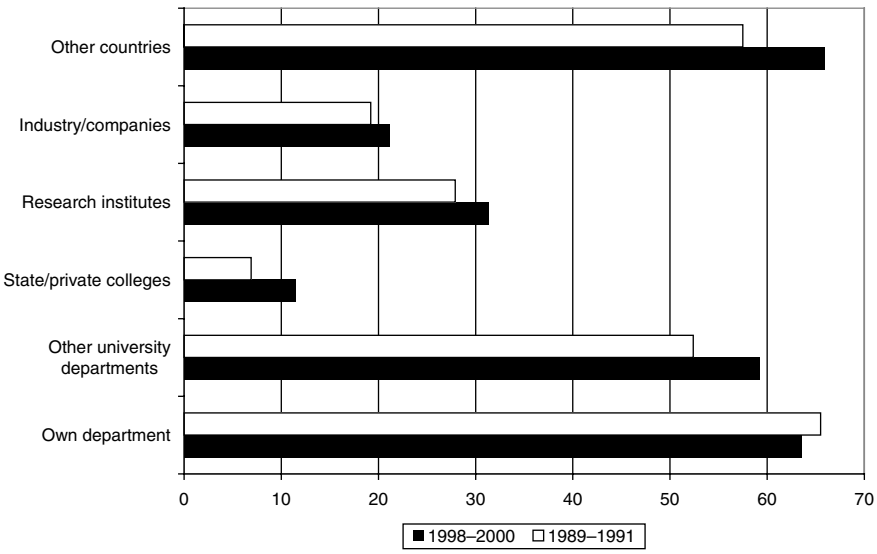

Fig. 3.2 Share of faculty members having research collaboration during the periods 1989–1991 and 1989–2000. Per cent

in particular the EU Framework Programmes, earmark funds for travel for the partners. In the EU networks of excellence, it is the network activities that are funded, not the research in itself, and in particular face-to-face cross-border interaction.

The proportion of faculty members who reported international research collaboration varies significantly between fields. Differences in international research collaboration according to fields of learning are, in general, greater than is the case for other types of cross border contact. International research collaboration shows the strongest increase for academics in the fields of learning that have been most 'local' in orientation. Yet it is still the case that university staff in the natural sciences (77 per cent) and technology (70 per cent) who are the most occupied with taking part in international research collaboration, while faculty members in the humanities collaborate least with researchers in other countries (55 per cent) (Trondal and Smeby 2001). International research collaboration has to some extent been mainstreamed into the more locally-oriented fields of learning. Compared to a decade ago, it is now more common to collaborate with international colleagues than not, also in the humanities and the social sciences. Yet the disciplinary differences in international research orientation still persist.

3.5 The Rise of Global Orientation – The End of Localism?

So far, the trend towards intensification and mainstreaming of international orientation is strong. That in itself does not answer the question of whether international research collaboration is a supplement or an alternative to collaboration within the national research system. The data on research collaboration clearly indicate that international orientation in research does not preclude involvement in national research cooperation. First, both international and national research collaboration has increased from the 1980s to the end of the 1990s. The only type of collaborative effort that has not been on the rise is that involving colleagues at the researcher's own university department. Nonetheless, there are still just as many university researchers who cooperate in their research with their departmental colleagues (64 per cent), as there are researchers engaged in international research collaboration (65 per cent). Second, there is a clear correlation between the different types of research collaboration. The correlation between collaboration with Norwegian university researchers and collaboration with a researcher abroad is 0.21 (Pearson's r). Being involved with research collaboration of one type increases the tendency to be involved in other types of collaboration (Trondal and Smeby 2001).

Does this suggest that the 'Matthew-effect' in academia (Merton 1968) also comes into force in the patterns of international connectivity? Our data indicate that internationalisation of university research also follows such a pattern where established researchers are increasingly involved in international networks and cooperation, while others of lesser academic status fail to connect. Such segmentation and stratification are seen by some as a particularly prevalent in case of researchers from small, and/or poor countries (Altbach 2001; van Vught et al. 2002). Similar claims

have been made applying to the institutional level. Geuna, for instance, argues that internationalisation of research might entail a bi-polarisation of research universities. One elite group of institutions has a global standing with resources and status to successfully participate in international networks. The larger group of domestic institutions will be unable to compete and will be internationally marginalised (Geuna 1998). The data referred to in this chapter are unable to document such effects at the institutional level; the findings at the individual level support the idea that global and local connectedness are mutually compatible and even reinforcing – researchers that tend to be active in collaborating internationally are also fairly active as 'locals', whereas others tend to be less active in both arenas. The Matthew-effect seems stronger than the delocalisation effects of globalisation.

3.6 Changing Destination: Europeans or Cosmopolitans?

While the 'debordering hypothesis' expects that a trend towards increased worldwide contacts and collaboration may be observed, the 'rebordering hypothesis' anticipates two kinds of territorial patterns, i.e. contact within European and Nordic borders. Figure 3.3 shows that there has been a significant increase in international travel to all the geographic regions. Researchers in Norwegian universities are increasingly 'going in all directions'. The relative increase has been the highest for journeys to North America and the rest of the world. The overall increase has been 20 per cent in the period from 1981 to 2000. Still, the regions closest to Norway, the Nordic countries and the rest of Europe, are the most frequently visited by researchers from Norwegian universities. This pattern varies somewhat according

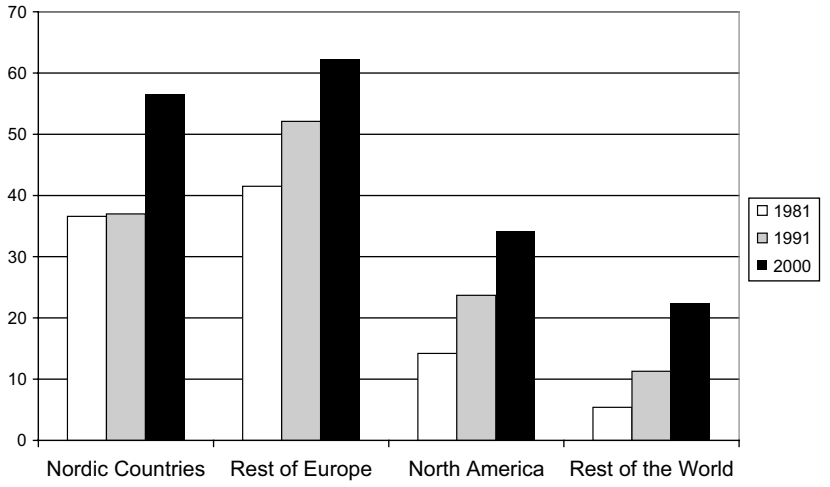

Fig. 3.3 Share of academic staff who undertook at least one professional journey abroad in 1981, 1991 and 2000. According to destination. Per cent

to the different types of international contacts discussed earlier. The Nordic region is a particularly frequent destination for the purpose of participating in evaluation work and peer review. But the Nordic countries are less attractive for study and research visits. The overall change in the travel pattern among university staff is thus consistent with what we identified as part of the globalisation hypothesis. Yet, there is no call for announcing the 'death of geography' on the basis of these data as the Nordic and European destinations are still predominant.

The mainstreaming of international contact patterns across all fields of learning is a general trend that also conceals some striking disciplinary differences with respect to 'geography'. Academic staff in the humanities, social sciences and medicine are just as frequently in contact with colleagues in the Nordic countries as with their peers in the rest of Europe. In the social sciences and humanities, this is in all likelihood related to the significance of language and cultural proximity for the subject matter of research and the social organisation of research in these fields. This we also know from the higher propensity in these fields for publishing in Norwegian or another Nordic language (cf. Chapter 2). The situation in medical science may be attributable to the high standing of Swedish medical research – i.e. the Norwegian colleagues have the research frontier already 'next door'. In the national sciences and technology, Europe is the most frequent destination. North-America is the third most frequent destination for all fields of learning, more important in the natural sciences, medicine and technology, least important in the humanities. University researchers in technology have the most global spanning travel pattern – a pattern that significantly includes destinations outside Europe and North America. This is probably due to the strong position of Asia in this field of learning (Smeby and Trondal 2005).

Regarding research collaboration, the geographical contact patterns during the last 20 years have developed in somewhat different directions compared to the general pattern of international contact (cf. Fig. 3.4). The percentage of Norwegian university researchers collaborating with colleagues in North America has remained virtually the same from the end of the 1980s to the end of the 1990s. This is where our data most clearly indicate a significant turn towards Europe and provide strong evidence of the impact of the world's largest regional research cooperation programme, the EU Framework Programmes. The increasing Nordic research collaboration demonstrated in Fig. 3.4 should not necessarily be interpreted as effect of specific Nordic regional cooperation in research, but is most likely an

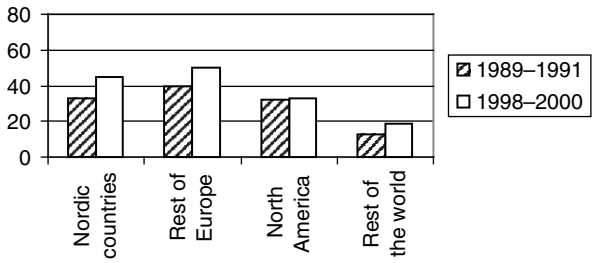

Fig. 3.4 Share of academic staff having research collaboration with foreign scientists during the period 1989–1991 (N=1815) and 1998–2000 (N=1967). Per cent

effect of researchers from other Nordic countries also participating in EU funded projects. This is corroborated by data on Nordic and international co-authorship (cf. Chapter 2).

3.7 Conclusion

In the course of the 20 years covered by our data, the world for Norwegian university researchers has become smaller. We find that international contacts among Norwegian academic staff have changed considerably. From 1981 to 2000, international contacts have proliferated and become mainstreamed among university researchers. There are 'more cosmopolitans and fewer locals'. Yet all types of research collaboration have increased – going global has not been to the detriment of local collaboration. Developments in information technology seem to stimulate and supplement traditional types of international contacts rather than replacing them. Nor has a distinct development towards Europeanisation of contact patterns precluded an increase in worldwide contacts. There has been a significant increase in different types of travel to all parts of the world. Personal contact between researchers worldwide seems to be more widespread than ever. International contacts and collaboration among university faculty members are complex processes affected by individual choice and political initiatives as well as collaborative and competitive characteristics of the international scientific communities.

When controlling for the content of international contacts, a clearer territorial dimension surfaces, and we can see the effects of a European rebordering of university research, notably to the detriment of research collaboration with North America. Funding schemes and programmes on national and supranational levels seem to be successful in terms of stimulating research collaboration within Europe. In general, research collaboration is the most demanding type of contact between researchers since it presupposes attractiveness, international visibility and often involves significant commitment by the researcher. It is also the most important type of contact because it involves the entire research process. Even though researchers in North America still hold a central position as partners, policy initiatives in Europe seem to have changed the research landscape significantly.

Our data nevertheless support the global debordering hypothesis. Contact patterns in general do not indicate that any specific geographic region has become more privileged than others. While markets and politics tend to be treated as conflicting dynamics of change, a study of the world economy and the EU single market suggests an intimate link between politics and market dynamics (Fligstein and Merand 2002). Correspondingly, our study indicates that European initiatives and globalisation processes are closely interrelated and not mutually exclusive processes. A central basis for international research collaboration is local and regional visibility (Kyvik and Larsen 1997). Moreover, less demanding types of international contacts, such as conference participation, may be a first step to more demanding types, for example, being invited as guest lecturer and being regarded as

a prestigious collaborator in research projects. Correspondingly, when individual researchers as well as research groups acquire visibility at a national level, this may be a first step to gaining visibility and recognition at regional and finally at global levels. It is reasonable to assume that programmes and funding to simulate contact and research collaboration on a regional level, such as the EU, strengthen the visibility of researchers involved in these projects. Such policy initiatives are therefore likely to have an impact on the development on research networks worldwide.

The present study is based on data on Norwegian faculty members. As argued in Chapter 1, such data are of significant interest in studies of the internationalisation of research as processes and effects of internationalisation are crystallised in small knowledge systems. Nonetheless, the conclusions we draw on the changed patterns of international contact are also limited by the particular conditions of our case. The tendencies demonstrated in the Norwegian case may be different in larger countries. Furthermore, there are significant differences in the level of international involvement among academics in industrialised countries, which may not reflect country size. Factors like research culture and research facilities also influence faculty members' international collaboration patterns (El-Kawas 2002). The relationship between Europeanisation and globalisation may also be different in EU member states and in non-member states. Future studies could well be focused on comparative analyses of the tensions between globalisation, regionalisation, the stratification of scientific communities, and between locals and cosmopolitans in academia. Moreover, it is reported that research collaboration often has an informal character and takes place because scientists share common interests and have complementary skills which allow them to tackle more complex problems (Thorsteinsdóttir 2000). Our data only shed light on faculty members' motivation, attractiveness and resources for international contacts indirectly. Studies of these mechanisms are needed to further develop our understanding of the dynamics of scientific communication and collaboration.

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Chapter 4
Internationalisation of Industrial R&D

Patterns of R&D Collaboration Among Norwegian Companies

Magnus Gulbrandsen

4.1 Introduction

This chapter deals with the internationalisation of *industrial research and development (R&D)*. In Norway, as in most other OECD countries, more than half of the country's R&D effort is carried out in companies rather than in public research organisations like universities and institutes. Nevertheless, the internationalisation of private[1] R&D follows different logics and processes than the internationalisation of public R&D.

Three interrelated questions are discussed in this chapter. First, the development of R&D activities abroad by Norwegian companies is briefly presented. Funding figures and data on scientific co-publishing are used here. Second, it is asked whether Norwegian companies' international R&D purchasing patterns are related to their use of and experiences with the national research infrastructure. Internationalisation of industrial R&D may be tied to a systemic inertia or mismatch between public and private research demand and supply, i.e. that certain companies' need for knowledge is not covered by national suppliers, forcing them to look to other countries to cover their demands for knowledge. This is the main part of the chapter, and is based on a survey among 218 Norwegian companies who purchased R&D services from external suppliers – 63 of them also from suppliers outside Norway. The third part is a discussion of how internationalisation is related to strategic choices and actions within the companies. This section uses case studies of eight of the largest Norwegian R&D-performing firms. The case studies are also used to shed light on the public–private relationship in R&D.

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[1] This term is used throughout the chapter although, of course, some of the companies may be partly or fully owned by public agencies and organisations.

Å. Gornitzka, L. Langfeldt (eds.), *Borderless Knowledge*,

4.2 Unintended Consequences and Mismatch: Views from the Literature

Before the empirical sections, a brief review of the literature is presented, aiming to set up propositions about R&D internationalisation processes in firms with a small country as Norway as their home base.

4.2.1 The Extent of Internationalisation

Internationalisation of industrial R&D has received much attention during the last 15 years. Various indicators of internationalisation like funding, personnel figures, and patent/publication data show that companies in most countries and industries are increasingly moving R&D activities across national borders (cf. Niosi 1999). Although there are important industry and country differences, this development takes place in most industries and parts of the world. Not least, companies from smaller countries find their central R&D partners abroad to an increasing extent (e.g. Granstrand 1999; Molero 1998; Okubo and Sjöberg 2000; Narula 2002).

The main focus in the literature is the *motivations* of companies for establishing research and development activities in other countries rather than their primary base. When looking for these motivations, it is common to scrutinise the company itself, the relevant technologies and characteristics of the foreign R&D environment. Few studies have looked explicitly at features of the national innovation infrastructure when studying internationalisation, although some examples may be found in Cantwell and Molero (2003).

Traditionally, R&D has been the least internationalised industrial activity when compared to marketing/sales in other countries and manufacturing abroad (e.g. Kuemmerle 1999; von Zedtwitz and Gassmann 2002). With the possible internationalisation of the third important business function – research and development – businesses and their laboratories may become organisations less dependent upon nation-states, and with fewer perceived obligations and responsibilities towards these. On the other hand, it has been argued that despite the increasing level of internationalisation, firms still tend to concentrate their R&D activities 'at home', not least the multinational enterprises (Pearce and Singh 1992; Patel and Vega 1999; Narula 2002; Edler 2003). Many companies depend heavily upon national R&D and educational infrastructure, and each company's direction of search is limited by its present competences and networks (Patel and Pavitt 1998).

4.2.2 The Mismatch Hypothesis

Generally, there are two predominant views of the process and the policy implications of internationalisation of industrial R&D (see Gertler et al. 2000). The first, typical in the organisation/management literature, depicts companies as more

or less rational actors that try to maximise learning by locating R&D ever closer to important markets/customers, production units, centres of academic excellence and/or specialised knowledge niches. Internationalisation thus *reduces* the significance of the home base as the primary site for innovation, as firms increasingly find sources for their innovations and apply them globally. The second view, typical in the economic literature and particularly related to the national innovation systems perspective, emphasises the incremental and path-dependent nature of internationalisation. Companies are embedded in a national system that has many attractions; a situation characterised by inertia or 'lock-in' between traditional R&D-performing companies and the national innovation infrastructure, which may make the non-company part of the system less useful for firms in newer and more high-technology industries. This view, as elaborated for example in Cantwell and Molero (2003), Narula (2002) and Patel and Pavitt (1998) underlies the empirical analysis below.

Patel and Pavitt (1998) argue that national systems of innovation are increasingly under strain, not least in smaller countries. The public science base cannot guarantee to provide the required skills and knowledge in all the important fields with equal effectiveness. Narula (2002) found that in Norway, the large multinational companies – most of them in traditional industries with historical competitive advantages – had 'less international' R&D than many of the advanced SMEs in newer industries. The author explains this finding with a process of 'lock-in' between the public research infrastructure and the traditional companies, making it necessary for the specialised and knowledge-intensive companies to go abroad to cover knowledge needs. Patel and Pavitt (1998) on the other hand, found that the proportion of national innovative activity *increases* with the technological intensity of the industry, with pharmaceuticals, and to some extent chemicals, as exceptions.

Learning is a key term in the current literature that explores the motives for setting up international R&D activities (De Meyer 1993; Niosi 1999). There are two crucial effects. First, learning takes place through exploitation and closer relationships with lead markets and customers that have a major role in technological development, and may be oriented towards adapting products, processes and materials to suit foreign markets and to providing technical support to manufacturing plants (cf. also Patel and Vega 1999; von Zedtwitz and Gassmann 2002). Second, important exploratory learning processes can be supported through locating close to key knowledge centres like universities, research institutes and private R&D units (often competitors). Investigations in the early 1990s also found that a large share of location decisions are 'accidental' – an unintended by-product of mergers and acquisitions that were not primarily carried out to access another company's R&D/knowledge base (Casson and Singh 1993; Håkanson and Nobel 1993; Niosi and Godin 1999; Patel 1995; Pearson et al. 1993).

The literature on internationalisation decisions has shown that factors not related to R&D may play an important role, e.g. tax regimes, general political climate and stability, intellectual property and product safety regulations etc. (Håkanson and Nobel 1993; Niosi and Godin 1999; von Zedtwitz and Gassmann 2002). Some have also found that access to public R&D research funding is a motivation for some firms to locate research activities abroad as this funding is most often allocated on a

national basis (Pearce 1989). In addition, national drug testing and acceptance procedures may be followed more efficiently with national R&D (Senker et al. 1996). EU funding has probably had an impact on the internationalisation of many European companies, as this most often requires cross-country collaboration.

Many investigations have found that firms differ in the type of R&D they choose to carry out abroad and at home. The most common category is 'vertically integrated subsidiaries' (Niosi and Godin 1999) which conduct process research at home, and advanced materials and final products research abroad (typically in chemicals and metals industries). This may also be termed 'local-for-local' (Bartlett and Ghoshal 1990) or 'market-driven R&D' (von Zedtwitz and Gassmann 2002). It is nevertheless important to note that the role of foreign R&D units may change over time (Pearce 1999). A high degree of internationalisation does not necessarily mean that they are embedded in their national contexts and innovation systems firms to a lesser extent. A survey of technology-intensive small firms shows that internationalised companies do not substitute international for local networks (Keeble et al. 1998). Internationalisation can be founded on successful *local* networking and research and technology collaboration.

Mismatch between company needs and the public R&D infrastructure can, of course, be tied to the motives for internationalisation. We have seen that there are two very important motives. The first is proximity to other corporate activities like manufacturing, and to local customers, leading to the establishment of local product development and engineering services. In this case, it does not seem relevant to talk about a mismatch. Mergers, takeovers, cost reductions and market position improvements (for example, through increasing manufacturing in other countries) have no obvious connection to the quality and size of the national R&D infrastructure. This can, of course, have an indirect effect on the public infrastructure. If companies move manufacturing to low-cost countries, this could lead to a subsequent need for local R&D and a reduction in the need for services from the home country public research infrastructure (e.g. Archibugi and Coco 2003, Edler 2003). The other main motivation for internationalisation is the quest for technical know-how and expertise which is only available in a few select locations around the world, and this is much more easily tied to mismatch. Locating close to public research units results in better productivity in R&D and allows monitoring of technical advances (Kuemmerle 1999; Pearce and Papanastassiou 1999; von Zedtwitz and Gassmann 2002). Moving or increasing R&D abroad could thus indicate a mismatch or dissatisfaction with national institutions.

Mismatch is not only related to the quality of the infrastructure. Senker et al. (1996) found that the internationalisation of industrial R&D is largely influenced by the internal development of scientific disciplines and the ability and willingness of countries to support new specialities in their public sectors. The higher degree of orientation towards the US by European pharmaceutical companies is at least partly explained by the US leadership in, for instance, genetic engineering. It is thus suggested that the globalisation of innovation warrants the *expansion* rather than the *reduction* of the public policy portfolio and support for R&D in order to ensure adequate returns on these investments (e.g. Archibugi and Iammarino 1999). This is

probably a greater challenge for small countries. It may not be realistic for smaller nation-states to provide the required skills and knowledge in all important fields (Patel and Pavitt 1998).

4.2.3 Internationalisation as Strategic Choice

Internationalisation is not only related to threats and opportunities in the companies' environment, but also to their internal capabilities and strategic/organisational choices. The 'mismatch' hypothesis assumes that the companies take some kind of rational strategic action to remedy the situation. This can be related, for example, to the companies' current R&D strategies and international activities, and to their capabilities regarding outsourcing and using external R&D. Von Zedtwitz and Gassmann (2002) have constructed four archetypical forms of international R&D organisations of firms operating on the international scene:

- *National treasure R&D:* In this mode, R&D is predominantly kept in the home country of the firm. The degree of internationalisation is modest for one of two reasons: either the firm has an international hegemony, i.e. it is in a strong position because it controls the dominant design of their product portfolio, or because the principal market of the firm is domestic.
- *Technology-driven R&D:* In this mode, firms have research sites at 'knowledge and innovation hubs' outside their home country in order to access scientific or technological centres and communities of excellence. Development activities are predominantly centralised in the home country of the firm.
- *Market-driven R&D:* In this mode, customer demands influence the location of international R&D. Development activities dominate, and R&D usually has to be close to the markets where the firm has a presence. Explorative research is generally modest and this is usually done in the home country of the firm. This is the most common archetype or strategy.
- *Global R&D:* In this mode, both research and development are internationally dispersed, but not arbitrarily. Location of R&D sites follows the market-driven principle for its development activities, and the technology-driven principle for its research. This is organisationally complex and costly.

Although internationalisation may be a rational response to (changes in) the companies' environment, most of the literature emphasises that internationalisation of R&D leads to major management challenges connected to knowledge transfer, diffusion and coordination. Growth in turnover and market shares may require a dispersion of the company, while R&D may benefit from a 'concentration of resources' approach. This tension between centrifugal versus centripetal forces (Pearce 1989) can explain dilemmas of 'concentration' versus 'decentralisation'. Pearce argued that decentralising forces are increasingly dominant. Among these are access to critical inputs in foreign countries, the need for interfunctional communication (with marketing and production located abroad), political factors, and the need for customer

proximity. Information and communication technologies (ICT) may contribute to decreasing the costs of decentralisation (or, in other terms, increase the centrifugal forces). However, knowledge about this process is still somewhat limited.

As soon as one or more foreign units are established, one can foresee tensions due to issues of autonomy-control and information-sharing (Asakawa 2001). The nature of organisational tension evolves along the different stages of R&D internationalisation, and the relationship between coordination and control changes with the degree of proximity (Blanc and Sierra 1999). This is not a tension that can be removed but, rather, companies search for an optimal balance by establishing hybrid structures and intermediary configurations (Gassmann and von Zedtwitz 1999). The general message in the literature concerned with tensions and coordination problems is that management should focus on knowledge creation and diffusion 'mechanisms'. The innovating firm must balance centralisation and decentralisation, and in international R&D, the role of the project leader becomes exceedingly important (Moenaert et al. 2000).

4.2.4 Propositions Based on the Literature

In sum, the brief review of the literature allows setting up three overall propositions:

- Norwegian companies' R&D activities should show signs of increasing internationalisation. There may, however, be differences with respect to industry, firm size and other characteristics of the firms (see Section 4.4).
- This internationalisation is at least partly due to a 'mismatch' between the companies' needs and the level, quality or orientation of the national public R&D infrastructure (Section 4.5).
- The strategies and R&D organisation of the companies should include aspects of mismatch and ways of dealing with management tensions and challenges that arise from internationalisation (Section 4.6).

4.3 National Context and Data Sources

In Norway, industry carries out relatively little R&D compared to some other OECD countries. Still, the share of private R&D has increased steadily and has exceeded 50 per cent of all Norwegian research and development since 2001. Key industries are mainly concerned with production and relatively simple processing of raw materials such as oil and gas, fish, metals, and pulp and paper. The country does not have as many large multinationals as its neighbour, Sweden, but there are large companies in oil and gas, engineering, telecommunication and chemicals, for example.

The public research infrastructure is highly concentrated. The research institute, SINTEF, employing close to 2000 people, undertook around 60 per cent of the nationally outsourced R&D according to Narula's (2002) sample of the major R&D-performing Norwegian companies. The country's leading technological

university – geographically and organisationally close to SINTEF – accounted for 15 per cent of the outsourced R&D in the same sample. In general, the substantial research institute sector is a significant player in the Norwegian innovation system, and a central provider of knowledge to industry. This chapter therefore focuses particularly on the 'technical-industrial institute sector', as it is termed. The sector comprises about 20 organisations whose main income is from contract work for industry, some of which is subsidised by the Research Council of Norway through user-controlled research programmes.

The main data source is a survey among Norwegian companies carried out in 2002 on issues like the level of R&D purchases from different sources, motivations, ownership influences, R&D classifications and views of, and experiences with, the national public research infrastructure. The 30 most R&D-intensive industries in Norway (NACE two-digit code) were selected, and a questionnaire was sent to all company units with more than 100 employees and a selection of the smaller ones, a total of 986 units. After the first round of reminders, 460 replies had been received, i.e. a 46.7 per cent response rate. There is a bias in favour of larger companies, but almost three-quarters of the sample consisted of firms with fewer than 500 employees. The industry code was unfortunately left out in the reminder round; this information is only available for 275 of the companies.

Only information from firms that either carry out R&D themselves or purchase R&D from other organisations has been analysed. This means that the total sample is 218 company units. Of these, 63 reported that they purchased R&D from sources outside Norway in 2000. These are termed 'international' in the remainder of the chapter. The remaining 155 company units did not purchase R&D from foreign sources, and are thus termed 'non-international'. According to the official R&D statistics, only about 150 Norwegian company units purchased R&D from abroad. The sample thus includes 40 per cent of the total population of 'international' firms.

Table 4.1 provides some general purchasing pattern information for the sample. Research institutes in Norway are major collaboration partners for the sample as a whole – half of all firms were engaged in R&D, and 71 per cent of those that outsource R&D, have used these. Sixteen per cent have purchased R&D services from the higher education sector in Norway; all these firms have also used the national research institutes. Another point to note is that the companies have as much experience with universities/colleges/institutes abroad as with universities/colleges 'at home'.

Only 8 per cent (6 cases) of the companies that purchased R&D, but which did not carry out R&D themselves, purchased R&D from foreign sources. Furthermore, there are 25 companies that purchased R&D abroad but not from Norwegian institutes, i.e. 17 per cent of the firms that purchased R&D, and 40 per cent of the companies that purchased R&D abroad.

The final part of the chapter is, as mentioned, based on case studies of eight companies. These were based on interviews with R&D directors and other information from documents and the web. Companies that have a high profile nationally were selected. Several of them have been in the media related to lobbying for better conditions for public and/or private R&D in Norway, threatening that unless these

Table 4.1 Share of surveyed companies involved in R&D that purchased R&D services from different sources in 2000, and mean purchased amount (NOK)

Source (N)	Per cent of firms involved in R&D	Per cent of firms that purchase R&D	Mean purchased amount (EUR)[2]
Any external source (146)	67	100	
Other Norwegian units in same company (26)	12	18	784 800
Other foreign units in same company (22)	10	15	237 600
Other companies in Norway (63)	29	43	1 200 400
Other companies abroad (30)	14	21	760 200
Research institutes in Norway (104)	48	71	434 800
Universities/colleges in Norway (34)	16	23	679 100
Institutes or universities/colleges abroad (30)	14	21	365 200
Any foreign source (63)	29	43	
More than one foreign source (15)	7	10	
(N)	(218)	(146)	

framework conditions are improved, they will move some or even their entire R&D abroad. Due to demands from the interviewees, names of the companies have been concealed. An overview of the cases is shown in Table 4.7, following the list of references. Although the number of cases is low, the selected companies represent a significant part of Norwegian industrial R&D. Totalling 3.9 billion NOK (approximately 480 million Euros), the R&D activities of the eight companies represent more than a quarter of the national industrial R&D.

4.4 Increasing Internationalisation of Industrial R&D in Norway?

In Norway, private companies spent around 160 million Euros on R&D purchases in other countries in 2004, up from 120 million the previous year. In 2004, this constituted around one-third of the total 'external' expenditure (purchased from outside the company), and a little less than 15 per cent of the total industrial expenditures on R&D (cf. Fig. 4.1).

The figures vary quite considerably from one biennial set of statistics to another, which probably mirrors restructuring such as mergers and takeovers. The 2001 data showed that involvement in EU collaboration had decreased, while expenditures on foreign R&D sources more generally, had grown. In 2003, there was a general decline in all types of R&D outsourcing.

[2] Furthermore, 16 companies answered 'yes' to questions about R&D purchases but did not report any amount. In these cases, it is assumed that their purchases are average for companies of their size. An exchange rate where 1 Euro = 8.20 NOK has been used.

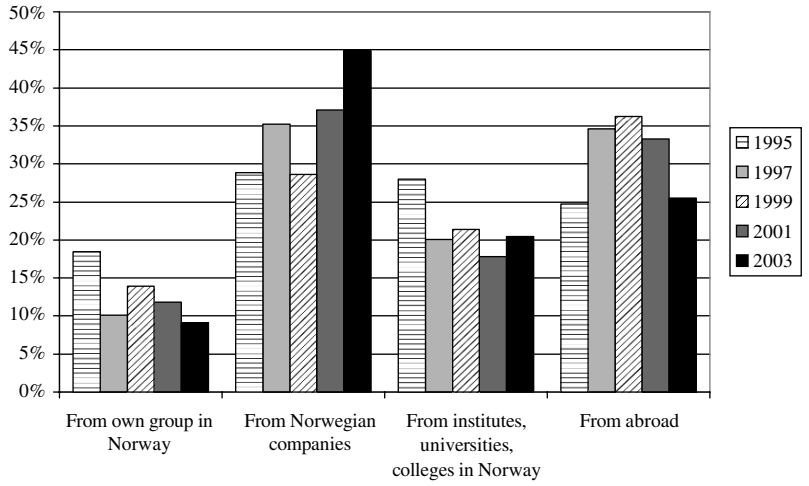

Fig. 4.1 External R&D purchases, all Norwegian companies.
Source: National R&D statistics

In total, the development of external R&D purchases since 1995 does not provide any clear picture about trends and possible mismatch between the knowledge needs of the companies and the knowledge they are offered by the domestic suppliers of knowledge like universities and research institutes. Nevertheless, the international R&D purchases have tripled their share since the early 1980s. Bibliometric data strongly confirm a general increase in internationalisation of Norwegian industry's research activities over a long period. The number of internationally co-authored articles (i.e. with a foreign address and a Norwegian private sector address) has increased by more than 25 per cent every second year since 1990, i.e. a tripling of the number of these articles in a twelve-year period. Internationally co-authored articles constituted 29 per cent of the total ISI-indexed publications from industry in 1990/1991, 37 per cent in 2001/2002, and over 40 per cent in 1997/1998 and 1999/2000.

Looking at co-publishing with different world regions, there is a very strong increase in co-authorship with partners in the European Union. Although the US is still a key partner for Norwegian industry, the firms actually published more with partners in the UK than in the US in 2001–2002. Figure 4.2 also shows how the Nordic region has become relatively less important compared to the rest of the EU. Measured in percentage change, the largest increase has nevertheless been partnerships with the 'rest of the world', where there is a fairly notable co-publishing with organisations based in Switzerland, Russia, Australia, Japan, and increasingly China (and with 39 countries outside of EU and North America in total). In sum, the internationalisation of Norwegian industrial R&D is becoming increasingly concentrated in Europe, but at the same time, it is slowly extending into other countries as well.

Behind this development are several trends. First, and probably the most important, is the expansion of EU R&D programmes targeting industry with cross-national collaboration as a requirement. Second, there has been a number of takeovers in

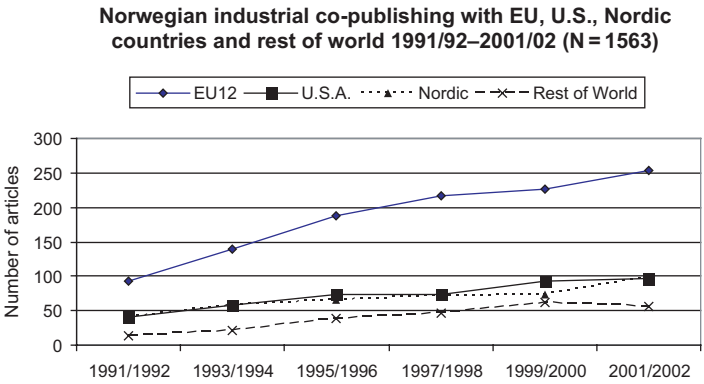

Fig. 4.2 Industrial co-publishing patterns

Europe by Norwegian firms the last 20 years. Third, companies are continually expanding into new markets. Increased international R&D in general may be an indication of this.

4.5 Patterns of R&D Purchases Among Norwegian Firms

This section commences with crosstabulation of firm size based on number of employees and some other variables (Table 4.2).

Table 4.2 Firm size (number of employees) and R&D purchasing patterns. Percentages (number of firms in parenthesis)

Size (number of employees)	Small (1–99)	Medium (100–499)	Large (500+)	Total
Share of firms in the 'non-international group'	20.6 (32)	57.4 (89)	21.9 (34)	99.9 (155)
Share of firms in the 'international group'	7.9 (5)	54.0 (34)	38.1 (24)	100.0 (63)
Share of firms whole sample	17.0 (37)	56.4 (123)	26.6 (58)	100.0 (218)
Mean share of total external R&D purchased from abroad[3]	11.8 (22)	19.4 (79)	20.3 (44)	18.5 (145)
Mean share of total external R&D purchased from Norwegian institutes	52.8 (22)	41.5 (79)	38.9 (44)	42.4 (145)
Mean external R&D expenses (Euro)	220 000 (37)	570 000 (123)	2 150 000 (58)	930 000 (218)
External share of total R&D expenses	27.9 (34)	25.1 (120)	24.2 (54)	25.3 (208)

[3] These figures were only compiled for the 145 companies that purchase R&D externally.

A chi-square test reveals, as expected, that there is a significantly disproportionate share of large firms among those that purchase R&D internationally, and small firms among those that do not.

Regarding the total external R&D expenses, the share of 'foreign' expenditure is lowest among the small companies (12 per cent), but quite similar among the medium-sized (19 per cent) and large companies (20 per cent). The differences are slightly larger when it comes to the share of external R&D purchased from Norwegian institutes. This varies from 53 per cent in the small companies, to 42 per cent in the medium-sized and 39 per cent in the large companies. None of these differences are statistically significant, however. Furthermore, these data show that the lion's share of external R&D is still purchased nationally for companies of all sizes. If only the 63 companies who buy R&D abroad are considered, the 'foreign share' of total external R&D expenses is, in fact, largest for the small companies (52 per cent) and decreasing with size (45 per cent for the medium-sized and 37 per cent for the large companies).

As expected, the total external R&D expenses are much higher for the larger firms. More interesting, perhaps, is the fact that the share of external R&D expenses does not vary much between firms in different size groups, but is slightly higher for the smallest category. This indicates that smaller firms are as dependent on external knowledge sources as the larger ones. In many of the statistical tests reported below, size does not seem to matter. One reason may be the high variance in the 'large firm' category.

As mentioned, information on the industrial sector is missing for some companies: the patterns for those that are known are summarised in Table 4.3. Companies

Table 4.3 Industries and internationalisation. Per cent (N in parenthesis)

Industry	Share of 'non-international' firms	Share of 'international' firms	Share of firms total selection	Share of ext. R&D purchased abroad	Share of ext. R&D from Norw. institutes
Oil and gas	15.3 (15)	13.0 (6)	14.6 (21)	7.1 (17)	43.6 (17)
Foodstuffs (agriculture, fisheries, food)	8.2 (8)	6.5 (3)	7.6 (11)	25.3 (7)	44.0 (7)
Chemicals and pharmaceuticals	8.2 (8)	23.9 (11)	13.2 (19)	26.4 (17)	48.1 (17)
Metals and machinery	12.2 (12)	17.4 (8)	13.9 (20	17.5 (16)	55.0 (16)
Electronics, electrical equipm./ components	8.2 (8)	13.0 (6)	9.7 (14)	22.7 (12)	21.0 (12)
Traditional manufacturing industries	26.5 (26)	6.5 (3)	20.1 (29)	7.2 (19)	48.4 (19)
Service industries	21.4 (21)	19.6 (9)	20.8 (30)	16.6 (20)	36.0 (20)
Total	100 (98)	99.9 (46)	99.9 (144)	16.3 (108)	43.1 (108)

concerned with chemicals, metals/machinery and electronics/electrical equipment are relatively (and significantly) more international than the companies from the other industries, similar to findings in other countries. The internationalisation rate is particularly low in what is called 'other traditional industries', a category which includes wood and paper products, furniture and construction.

These results correspond well with the national R&D statistics and earlier investigations (Narula 2002). Electronics/electric equipment companies have the lowest propensity to use Norwegian institutes; the opposite is the case for metals/machinery (these are, however, more international than the average company). There are major and expected differences in mean external R&D expenses between industries. These are not significant, however, not least since the differences within each industry are often very large. The highest expenditures are in oil and gas (average almost 3 million Euros), chemicals/pharmaceuticals (2.1 M Euros) and electronics (1.9 M Euros); the smallest are found in foodstuffs (0.07 M Euros) and traditional manufacturing (0.33 M Euros). The share of R&D purchased from external sources does not vary as much. This is lowest in electronics (16 per cent) and

Table 4.4 Characterisation of the 'international' and 'non-international' R&D purchasing firms. Mean figures. Number of firms in parentheses

Aspect	'Non-international'	'International'	Mean total sample (N)
Number of employees***	400	1 180	630
	(155)	(63)	(218)
Internal R&D expenditure	807	4 180	1 794
(EUR 1000)***	(146)	(59)	(205)
R&D purchases from other firms	749	1 666	1 200
in Norway (Euro 1000)[4]	(32)	(31)	(63)
R&D purchases from research	176	885	435
institutes in Norway (Euro	(66)	(38)	(104)
1000)**			
R&D purchases from universities/	94	998	679
colleges in Norway (Euro 1000)	(12)	(22)	(34)
Total external R&D purchases	252	2 602	931
(Euro 1000)***	(155)	(63)	(218)
Share of total external R&D	58.0	22.0	42.0
purchased from Norwegian	(82)	(63)	(145)
institutes***			
Share of total R&D purchased	19.7	39.3	25.3
externally***	(149)	(59)	(208)

Note: Asterisks refer to t-test
$^{*} = p < 0.05$, $^{**} = p < 0.01$, $^{***} = p < 0.001$.

[4] The number of cases is too small here to yield statistically significant differences (and the standard deviation is very high), although it can be noted that the absolute differences are large and expected, given the differences in firm size. The differences are smallest for the medium-sized firms, and largest for the large firms. For example, the 'non-international' large firms' mean R&D purchases from universities/colleges in Norway was less than 100,000 Euros in 2000, while the same figure among the 'international' firms was almost 1.7 million Euros.

metals/machinery (19 per cent), while the rest lie between 28 per cent (chemicals/pharmaceuticals) and 35 per cent (services).

4.5.1 Distinctions in Purchasing Patterns Between Firms

Table 4.4 shows some features that distinguish the international from the non-international companies. The large monetary amounts show that those going abroad in most cases are major players in the national innovation system through purchases from institutes and universities/colleges.

The non-international firms purchase R&D for smaller amounts from Norwegian institutes, but in one sense they are more dependent upon this national infrastructure as it constitutes a higher proportion of their external and their total R&D. Table 4.5 shows the proportion of international/non-international firms purchasing from various Norwegian sources.

All the differences in Table 4.5 are statistically significant – the international firms are also users of the national R&D infrastructure to a much higher degree. This leads to an initial conclusion that those going abroad for R&D are *not* less integrated in the national R&D system but rather the opposite.

4.5.2 Internationalisation of R&D: Motivations and Mismatch

Various general reasons for external R&D collaboration are shown in Fig. 4.3.[5] Obtaining public financial support is the least important reason for collaboration,

Table 4.5 R&D purchasing patterns among firms that purchase R&D from abroad or not (N = 218). Per cent (N in parentheses)

R&D purchase from	Share in the 'non-international group'	Share in the 'international group'	Share total selection
Other Norwegian units of same mother company***	5.8 (9)	27.0 (17)	11.9 (26)
Other companies in Norway***	20.6 (32)	49.2 (31)	28.9 (63)
Research institutes in Norway**	42.6 (66)	60.3 (38)	47.7 (104)
Universities and colleges in Norway***	7.7 (12)	34.9 (22)	15.6 (34)

Note: Asterisks refer to t-test
* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

[5] In this and the following figures, a five-point scale is reported with only three categories to make it more readable. The respondents were able to agree/disagree 'partly' or 'fully', and for most of the items in the questionnaire, the 'partly' category was preferred. The middle category was termed 'neither agree nor disagree'.

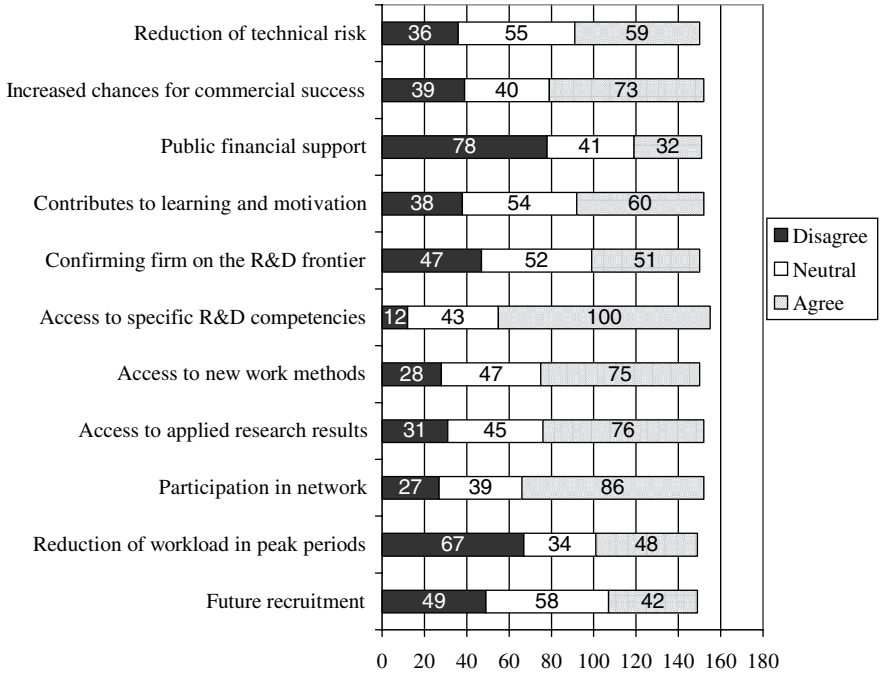

Fig. 4.3 Decision factors for external R&D collaboration

while the most important reasons are access to specific R&D competences and participation in networks. Only one of the items in the question concerning the reasons for external collaboration yields a statistically significant difference between the companies that purchase R&D from abroad, and those that do not. Almost all the international companies state that 'access to specific R&D competences' is a very important reason for collaboration. This may indicate that internationalisation is the result of a search for highly specific competences that may not be available nationally.

A factor analysis[6] reveals that there seems to be three overall reasons for external collaboration, with a particularly strong correlation between 'access to specific R&D competences' and 'access to applied research results'. This can be termed an 'R&D-oriented' justification for R&D collaboration. Obtaining public financial support is not related to any of the other items, while there is a relatively strong relationship between confirmation that the firm is 'on the R&D frontier', participation in networks, contributions to learning and motivation, reduction of workload in peak periods, and future recruitment. This can be termed a 'strategic' (or just 'mixed') justification for collaboration. Indexes (added) may be created using the

[6] This and the following factor analyses uses principal component analysis as the extraction method and varimax with Kaiser normalisation as rotation method.

factor analysis (Cronbach's alpha 0.71 for the R&D justification, 2 items, and 0.68 for the strategic justification with 5 items). Again, there is a significant difference between the international and non-international companies for the R&D justification ($p < 0.01$), but not for the strategic justification. The international R&D purchasers thus seem more competence-oriented.

The question about specific reasons for purchasing R&D services from Norwegian institutes reveals that personal contacts are viewed as very important, as is increasing the quality of R&D projects. Many agreed that they lack their own R&D capabilities and/or capacity in general. The non-international companies agreed more frequently that they only know Norwegian institutes (which is obvious), and that they lack own R&D capabilities. Otherwise, there are no significant differences between the international and non-international firms.

Looking at how R&D purchased from Norwegian institutes is used, developing new products and new processes were the most common replies. Although 'increase understanding of customer needs' and 'gaining new markets' were the least common replies (along with new materials research), these were nevertheless important to about 35 companies. Again, there are no differences between the international and non-international firms. The preliminary conclusion is thus that Norwegian institutes are not used for different purposes among the international companies compared to non-international companies. Internationalisation should be explained by the search for particular competences rather than anything else, perhaps even competences that may be available nationally.

The experiences with, and views on the Norwegian research institutes, are depicted in Fig. 4.4. The general message is positive about the institutes; they are seen as professionally strong and with important services and test facilities. However, many also agreed that the services are expensive and that the institutes have too little competition. The latter is probably natural, as many institutes have developed a unique national position, offering services to a particular industrial cluster with few or no national alternatives. There are no significant differences between international and non-international firms in any of the single items.

The claims 'institutes have small capacity' and 'the institutes have good knowledge of industrial R&D' are not systematically related to the other items. The others may be combined into three indexes:

- 'Positive' firms state that the institutes' R&D services are high quality, that they have valuable test facilities and that they are 'professionally strong' (Cronbach's alpha 0.65, 3 items).
- 'Critical' firms state that the institutes' R&D services are expensive, that the company prefers to do R&D on its own; that the institutes have too little competition; that confidentiality prevents collaboration; that institutes 'steal' R&D personnel from industry; and that institutes prevent university–industry relations (Cronbach's alpha 0.63, 6 items). It may be noted that the correlation is moderate (and negative) between the 'positive' and 'critical' indices (-0.3).
- 'Network-oriented' firms agree that personal acquaintances, good previous experience and the institutes' reputation are important (Cronbach's alpha 0.69).

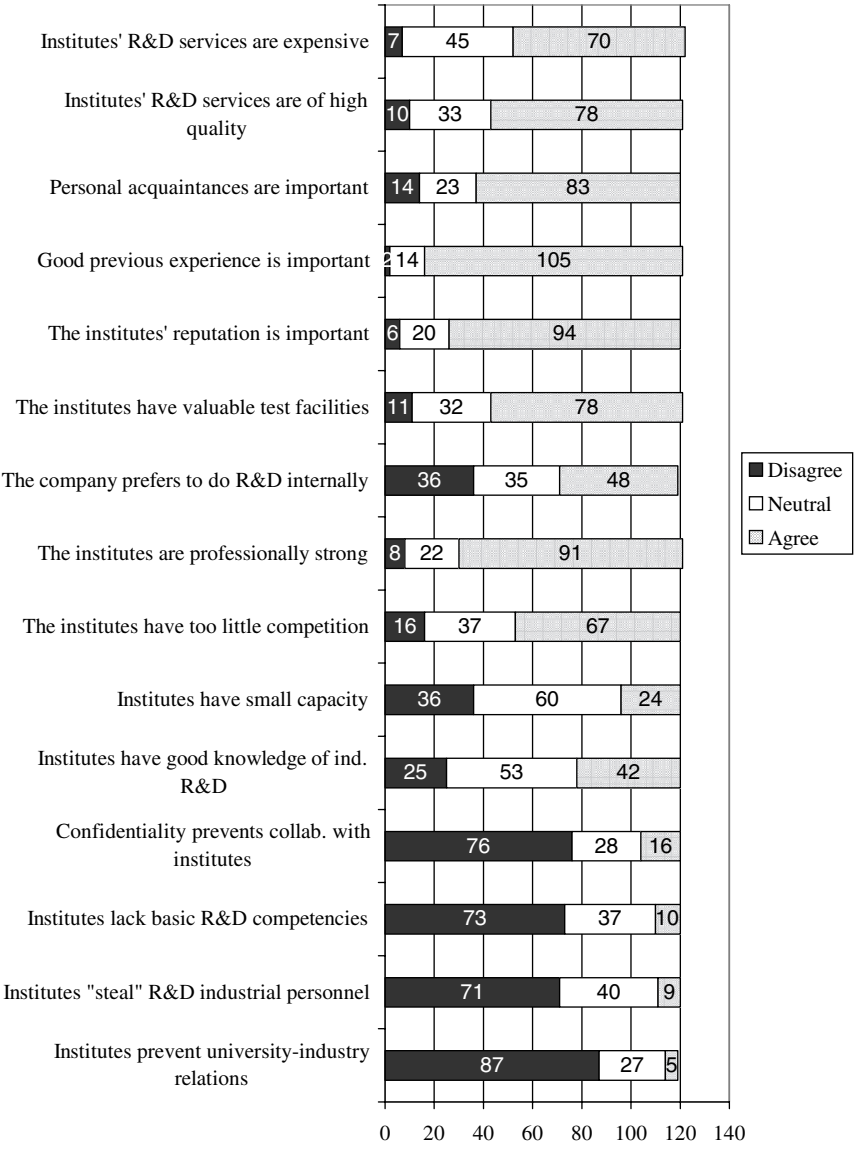

Fig. 4.4 Experiences with and opinions on Norwegian research institutes

There are no differences between international and non-international companies in how critically or positively they view the Norwegian institutes. Thus, internationalisation does not seem to be related to negative experiences with this part of the public national R&D infrastructure. Furthermore, it is interesting that there is a strong positive correlation between the indicator of a 'strategic' motivation for R&D purchases and positive experiences with Norwegian institutes. This indicates that

R&D collaboration requires 'absorptive capacity' (cf. Cohen and Levinthal 1990). It is likely that such capacity is necessary for internationalisation, and our results indicate that developing absorptive capacity is probably done in a national setting. Many companies' lack of critical attitudes towards, or negative experiences with, the Norwegian public infrastructure is not (only) an indicator of the quality of the infrastructure, but just as much of the companies' ability to define relevant collaborative projects and put the knowledge into use.

Questions were also asked to companies that did not contract R&D from Norwegian institutes about their reasons for this. Few agreed to negative statements about the institutes, but the share of 'neither agree nor disagree' is expectedly higher than for the users. The item with the highest score is that 'institutes have too little competition', but the proportion of those agreeing is about the same as that for the users of the sector. Constructing a 'critical' index for the non-users identical to that for the users, we see that the users are in fact slightly *more* critical about the competence, quality and cost of the R&D services of the research institutes, than the non-users.

Reasons for not using Norwegian research institutes may be combined into cumulative indexes following a factor analysis (Cronbach's alpha and number of items in parenthesis):

- 'Negative experience' (0.77/5) is related to 'previous bad experience with institutes' and critical remarks about the professional level, capacity, cost and quality of R&D services.
- 'Foreign preference' (0.60/4) denotes companies that have a strategy to use foreign knowledge sources; these firms also agree that their need for R&D is covered by other sources and that confidentiality issues prevent collaboration. In addition, the statement that institutes 'steal' R&D personnel from industry displays a particularly high correlation with the other items in this index.
- 'Critical in general' (0.55/3) firms agree that institutes have too little competition and a small capacity, and disagree that they have good knowledge of industrial R&D.
- 'Specifically critical' (0.63/3) firms state that they did not use institutes (in 2000) because important equipment is lacking, that institutes lack basic R&D competences and that they prevent university–industry relations.
- 'Previous users' (0.46/3) claim that they normally use institutes, but also that they lack personal acquaintances in the sector and that the institutes are not professionally strong.

There is a significant difference (as expected) among the international and non-international companies in the 'foreign preferences' indicator. The international companies also score slightly higher in the 'previous users' index. Size of firms is not related to any of the indicators. Thus, there are few signs of mismatch in these questions. The international firms are not more critical towards, nor do they have more negative experiences with, the national R&D infrastructure: on the contrary, they have a slight tendency to be less critical.

4.5.3 Ownership and Internationalisation

In Table 4.6, the replies regarding ownership and group issues are summarised. More than 80 per cent (52 of 63) of the international respondents are owned by a foreign company or part of a Norwegian company with subsidiaries abroad. It should nevertheless be noted that this is also the case for more than 40 per cent of the non-international firms.

Above, it was shown that a formal strategy showing preference to foreign knowledge sources could not explain the lack of interaction with Norwegian institutes. Several questions were asked about how the company's overall strategy and ownership issues influence R&D purchasing decisions more generally. These are reported in Fig. 4.5. Almost 40 per cent express that the influence of the owner, top management and/or parent company is relatively strong, while the remaining (approximately) 60 per cent (very few used the middle category) express that the company unit has a relatively high degree of autonomy with regards to R&D purchasing decisions. There are no differences between the international and non-international companies, and neither size nor industry seems to matter.

A factor analysis reveals two underlying dimensions among these items, which may be used for creating additive indexes:

- The 'internally focused' (Cronbach's alpha 0.67, 4 items) companies agree that R&D purchasing decisions are influenced 'from above', that decisions are taken for the whole group and that units within the larger group/company (Norwegian or foreign) should be preferred.
- The 'externally focused' (Cronbach's alpha 0.85, 4 items) agree that Norwegian or foreign institutes and other external R&D suppliers should be preferred.

There is a slight tendency whereby the international companies (again, those who purchase R&D abroad) score higher than the non-international companies on both

Table 4.6 Ownership and group issues among companies involved in R&D. Per cent (N in parentheses)

Owner/group information	Firms without international R&D	Firms with international R&D	Total share
Owned by foreign company***	15.5 (24)	38.1 (24)	22.0 (48)
Owned by Norwegian company that also owns companies abroad**	25.2 (39)	44.4 (28)	30.7 (67)
Owned by Norwegian company without subsidiaries abroad	14.2 (22)	6.3 (6)	12.8 (28)
Not part of any group or divisionalised company	7.1 (11)	9.5 (6)	7.8 (17)
Not reported			26.6 (58)

Note: Asterisks refer to t-test
* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

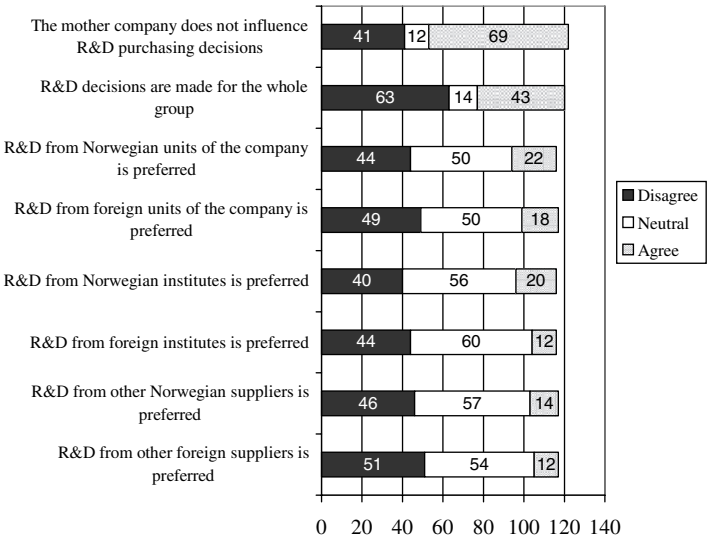

Fig. 4.5 Top management/owner/mother company influences on R&D purchases

these indicators, but the differences are not statistically significant. No systematic differences with respect to firm size can be found, while there is a weak tendency that oil and gas companies are more 'externally focused' and electronics companies are more 'internally focused', which makes sense from the motivations presented earlier. Thus, the international companies do not seem to follow formal strategies whereby foreign suppliers are preferred. It is interesting that in the cases where the companies did state preferences, the main dividing line is found between group-internal and group-external R&D rather than between national and foreign suppliers.

Finally, a logistic regression analysis was carried out where firm size, internal/external share and most of the indexes reported above were included, in order to control for the effect of many variables simultaneously.[7] The model has relatively good predictive power (87 per cent of the sample was placed correctly), and the main variables are reported in Table 4.7. It can be noted that firm size is not a significant variable in the model. Due to the small number of cases (73 are included in the model with valid responses to all the relevant questions), a distinction between industries is not possible.

Owner/top management control of R&D purchases has a negative impact on internationalisation,[8] as has a high share of external purchases from Norwegian institutes, the index 'accessibility' (location and/or proximity is important, as is access to national public funding) and the index 'capacity' (collaboration is the result of general or periodical lack of capacity). Share of purchases from Norwegian

[7] Some variables were excluded as they displayed a high correlation with many other variables, most importantly the two indexes for 'general motivation for collaboration'.

[8] Rather, that a lack of top-down control has a positive impact on internationalisation.

Table 4.7 Determinants of internationalisation (logistic regression results)

Variable name	Coeff.	Signif.
The owner/top management does not influence R&D purchases	1.065	0.019
Index 'Accessibility' (localisation is important, as is public funds)	−0.919	0.019
Share of external purchases from Norwegian institutes	−3.542	0.032
Index 'Positive experiences with Norwegian institutes'	0.845	0.038
Index 'Collaboration is competence-oriented'	0.423	0.062
Index 'Collaboration is due to general/periodical lack of capacity'	−0.626	0.074
Log likelihood	41.281	
Cox & Snell R^2	0.535	
Nagelkerke R^2	0.716	

institutes has the highest coefficient, which is probably natural, as firms who purchase from abroad, by consequence, will lower their share of national purchases (but, as we have seen, the amounts are still very substantial). No easy explanation can be found why owner/top management influence should be negatively related to internationalisation. It could be that subsidiaries of foreign firms are granted a high degree of autonomy in R&D purchasing decisions, and/or that the companies which do not purchase R&D abroad have guidelines where *internal* R&D is preferred. For example, it has been shown that these firms purchase for 'capacity' reasons to a much greater extent, this being another indicator that is negatively related to internationalisation.

The indexes 'positive experiences with Norwegian institutes' and 'collaboration is competence-oriented' are both positively related to internationalisation. This again confirms that there is no necessary tension between internationalisation and relations with the national R&D infrastructure. None of the various indexes of 'critical attitudes'/'negative experiences' are important to internationalisation.

4.6 A Closer Look at the Companies' Strategies and R&D Organisation

So far, little support has been found for the proposition that internationalisation of industrial R&D is the result of a 'mismatch' between the companies' needs and the public R&D infrastructure. Moving to broader issues, two central parallel trends is found in the case study of eight firms (see Table 4.7 following the reference list; this section is based on Gulbrandsen and Godoe 2008). One is decentralisation, where companies acquire foreign R&D through mergers and acquisitions or by efforts at entering new markets where a 'listening post' in the form of R&D may be the first step in developing foreign production. The other trend is centralisation As the number of R&D units increases and there is a growing overlap or convergence between them in terms of competences, tasks and projects, the firms close down some units and create a structure where the remaining units compete for funding and attention from business units.

4.6.1 Overall R&D Internationalisation Principle/Strategy

Using the terminology of von Zedtwitz and Gassmann (2002) (see Section 4.2 above) three of the firms are classified as following a 'national treasure R&D' principle or strategy (see also Table 4.7 at the end of this chapter). This means that they concentrate both research and development activities 'at home'. These firms represent three industries: ICT, oil/gas and food, the latter protected by import regulations. The food company, 'Eta', has always concentrated R&D domestically, while the ICT company, 'Beta', has recently closed down two foreign labs which were part of newly acquired foreign firms. In both these companies, R&D is under strain. The oil/gas company, 'Zeta', has kept its in-house R&D in Norway, but it is a major purchaser of R&D from foreign specialised companies and universities/institutes, and it uses Norwegian research institutes as the main partners in R&D projects in other countries. In some cases, 'Zeta' has urged and helped these national research institutes to establish an operation in another country before the company has moved activities to the same location.

In all the three 'national treasure' firms, R&D is closely aligned with specific business strategies in which development of competitive advantages for maintaining a dominant position in the domestic market is a primary goal. Two of these companies nevertheless have goals of expansion and increasing market shares in other countries. Liberalisation, removal of trade barriers for example, often initiates this type of process.

By developing unique competitive advantages they may attempt to enter into international markets, i.e. they gradually move away from 'national treasure R&D'. This is, of course, highly dependent on the success of the firm's international expansion. International R&D may still play an important role as agents of entry, scouts, etc. This may also happen suddenly, 'over night', through mergers and acquisitions. Thus, firms that pursue a 'national treasure R&D' strategy for purposes of maintaining a national hegemony may, in fact, be in a transitory phase.

One firm (metals producer, 'Theta'), is classified in the category 'technology-driven R&D' as it has advanced research facilities in several countries, yet maintains a concentration of development work in Norway. The company describes the academic partner in the United States. as 'most likely scientifically stronger than our domestic partners'. Two firms (chemicals company, 'Delta', and ICT company, 'Alpha'), are classified as following a 'market-driven R&D' strategy where research activities are concentrated at home but development activities take place in many locations. Here, the international R&D locations are more oriented towards developing products and processes for particular production facilities and/or markets. There is still a degree of competition between the sites. However, the Norwegian sites in both cases express some concern about being downsized as the foreign sites gain cheaper access to public R&D. The chemicals producer, 'Delta', recently closed down R&D laboratories in two EU countries for cost reasons, subsequently concentrating R&D in fewer locations.

Classification into market-driven or technology-driven R&D is not obvious since the distinction between research and development is not clear-cut, and the relevant

firms have features that qualify them for both types. Two aspects seem significant in terms of their international R&D. First, R&D in the firms is closely aligned with their worldwide network of factories, assisting the manufacturing processes here. This is related to another role – the contribution of R&D input to local or regional adjustments and improvements of the goods produced in these plants. Second, the internal organisation of the firm is important in how R&D is governed. These multinational firms are divisionalised; each division has autonomy in terms of their own R&D strategy, i.e. how much and what kind of R&D to do – or not to do. 'We do not do Blue Sky Research at all' was a statement from one of the informants illustrating the point that R&D is aligned to existing production lines and products and governed by the 'internal markets' approach (Reger 1999). In a divisionalised firm, the incentive for keeping R&D costs as low as possible is strong. However, when expanding into new countries/regions, establishing an R&D unit is often considered as an essential prerequisite. Although this may seem paradoxical in the light of R&D cost aversion, two factors may explain this pattern of behaviour. First, entering a new territory is a risky decision made at a high corporate level. An R&D unit may ensure that the construction and start-up of a factory runs smoothly. Second, the firm may use its R&D unit as an agent for establishing networks with local expertise and authorities.

An implication of this strategy is that there is an increasing similarity or convergence between various R&D units (as has been found elsewhere, cf. Edler 2003), which leads to a continuous internal competition between the sites. There is a certain degree of 'duplication' which might decrease coordination problems (Zander 1999) as each major production site has 'its own' R&D unit, meaning that the firm has less need for a complex organisation backed up by a sophisticated infrastructure for electronic communication and information sharing.

Finally, two firms – the pharmaceutical company, 'Gamma', and the chemicals company, 'Epsilon', – are classified as having a 'global R&D' strategy where there is a rather well-established work-sharing between several sites that have a global responsibility for one particular discipline, product group and/or technology. Here, there seems to be less competition between the international sites due to their specialisation and 'global leadership' focus.

The two companies classified as following a global R&D strategy had what they termed a 'virtual' R&D organisation. The main entity was the *project* financed by the corporate HQ or large business units. Projects most often involve researchers from many different sites around the world. These are not only company sites but also external partners and contractors where the Internet is very important in the relationship. This type of model was considered beneficial and robust by the Norwegian R&D managers because each company site would have global leadership in one area but also a broader range of expertise. As long as the main product areas of the companies remained the same, they felt that they avoided the danger of being too vulnerable to corporate R&D strategic changes. Even if R&D would be pressured for cost reasons, cuts would be distributed relatively evenly throughout all the sites. A 'global' strategy may therefore actually present fewer conflicts between internal R&D units.

4.6.2 Costs and Collaboration Patterns

Apart from one R&D manager, informants said that cost did not matter much as a decision factor for doing international R&D. The cost difference of personnel and equipment is seen as marginal – and the Norwegian level of salary for researchers and engineers is comparatively low, so that this does not motivate companies to undertake R&D outside Norway. Even the companies that considered opening R&D facilities in countries like China and India did not emphasise cost issues. Building research and development facilities in foreign countries are, in any case, long and costly processes.

There are typical national collaboration patterns for companies with R&D activities in several countries. Norwegian R&D units collaborate with Norwegian universities and research institutes, while Danish R&D units of the same company maintain ties with Danish universities and institutes, etc. Only the two companies we have described as following a 'global R&D' principle, and to some extent the oil/gas company 'Zeta', seem to have significant cross-border university–industry linkages. For the other firms, this national sub-pattern of internationalisation poses both coordination challenges and, for some of them, a strong level of internal competition for personnel, resources and 'the best' national partners.

The main rationale for many collaborative projects, hosting students etc., was the need for a steady supply of talented, highly qualified young people. This tends to take a national form. But firms are well aware of differences in costs for collaboration with public research organisations. Low collaboration costs due to a high level of basic funding for research institutes or public support for cross-sector collaboration, become a competitive advantage for local units able to exploit this. Countries producing skilled candidates in relevant scientific fields might be at an advantage, as some interviewees were concerned about the lack of interest in science and technology among Norwegian students. Otherwise, the companies acknowledged the advanced standard of the national R&D infrastructure.

4.7 Discussion and Conclusion

In this chapter, it has been shown that private sector R&D in Norway is increasingly purchased from or carried out in collaboration with partners in other countries, particularly those in the European Union, confirming the first of the three propositions based on the literature. Furthermore, it was asked whether this pattern is related to the companies' use of, and experiences with, the national research infrastructure. The answer is 'yes', but perhaps not in the way assumed from the literature, as little evidence of a 'mismatch' has been found. Internationalisation of R&D, like innovation itself, is incremental and path-dependent. Companies are embedded in a national system in a situation which might be characterised by inertia or 'lock-in' between traditional R&D-performing companies and the innovation infrastructure (Patel and Pavitt 1998; Narula 2002; Cantwell and Molero 2003).

Based on a survey among Norwegian company units with a main focus on the experiences with the important national technological-industrial research institute sector, 218 responses by R&D users/performers have been analysed, of which 65 have purchased R&D abroad – referred to as the 'international' companies. It has been confirmed that that international companies are larger, have a higher R&D purchase rate and are more common in industries like chemicals/pharmaceuticals. In addition, they are much more frequently foreign-owned or part of a larger group with subsidiaries outside of Norway.

The international companies' reasons for external purchases are more competence-oriented as opposed to capacity-oriented, or accessibility-oriented (where proximity and national funding is central). They also have *more* frequent ties to the national R&D infrastructure, and spend large amounts of money in national research institutes and colleges/universities. The company units enjoy a relatively substantial degree of autonomy in R&D purchasing decisions, and a strong influence of owners and/or top management is seen more frequently among the non-international companies. The main dividing lines in purchasing strategy are not between a preference for national and foreign suppliers however, but rather between a preference for group-internal contra external R&D collaboration.

In general, little evidence is found of a mismatch between company needs and the public R&D infrastructure. The data indicate that international firms are somewhat *more* satisfied with this infrastructure than the non-international firms. Several explanations may be found. First, the international companies have a higher share of external R&D in general. Second, there are probably industry-specific (and firm-specific) as well as nation-specific factors that come into play. For example, it is clear that the oil and gas companies are particularly satisfied with the national infrastructure. This might be due to the large national effort since the early 1970s aimed at solving the technological difficulties related to the production and distribution of oil and gas from the North Sea, which included getting foreign companies to locate R&D units in Norway. That the oil and gas industry is also among the most international could be explained by the increasing international involvement in search activities in Asia, Africa and South America.

A further explanation for a general lack of mismatch in the data may be that internationalisation is the result of a search for more diversity. Norwegian companies that can afford it, collaborate with knowledge sources abroad that are complementary to the national sources, to increase their monitoring of relevant technologies and to improve their chances of surviving more radical changes. This development may, of course, have long-term influence on the national infrastructure, not least since it introduces competition into an otherwise monopolistic market.

Fourth, indicators of 'satisfaction' with the national infrastructure are not necessarily (only) a sign of quality for the national institutions, but rather an indication that the company has the capability to define collaborative projects and the absorptive capacity to apply the knowledge. Non-international companies may lack these characteristics to a larger extent, which implies that internationalisation is not a realistic answer to mismatch. Developing absorptive capacity at home yields absorptive capacity also when it comes to foreign R&D purchases. This may seem

rather obvious, but it nevertheless pinpoints a process whereby companies first gain experience in R&D outsourcing and collaboration with national suppliers before they gradually internationalise their activities. EU programmes may have played a role here, as bibliometric data clearly point to the increasing significance of EU countries as Norwegian industry's main collaboration partners.

The third and final proposition in the chapter was that firms' strategies should deal with mismatch and tensions arising from R&D internationalisation. Based on case evidence from eight large Norwegian companies, mixed support was found for this proposition as well. Again, because of few signs of mismatch, the strategies are not very preoccupied with this. The companies' entries on the international scene have followed different patterns, events and rationales, but specific business strategies and business opportunities represent the strongest drivers. Major tensions seem to occur when R&D units in different countries have relatively similar specialisation profiles.

Historical antecedents of a firm's development obviously matter. This explains why most companies indicate that they have a so-called 'home' or 'home-town', a local/national community which constitutes their primary geographical location and core of their identity. This physical and historical foundation in terms of a starting point and subsequent growth will importantly characterise the firm.

In the view of the interviewees, public R&D policy should support what is generally termed as a 'national R&D infrastructure'. Supplying the industrial R&D labs with qualified and talented scientists was perceived as the most important role. The informants also emphasised the importance of public R&D policy for sustaining and developing a broad research and knowledge community in Norway relevant for their R&D. The scope of this was described as broad; university research, higher education and increased support for national explorative research programmes in public research institutes would contribute to strengthening the national R&D community that they belong to. Some interviewees said that even if this may be beneficial for competitors, the advantage of being part of a strong national research and knowledge community would outweigh this.

One may ask why companies retain a strong focus on Norwegian universities and if this does represent some kind of 'lock-in' (Narula 2002). A simple explanation is that scientists and engineers in Norwegian firms have a primary identity related to a broader Norwegian R&D community. The core of this seems to be a socio-ethnic identity that is intimately tied to those who populate the power structure of the firm. Even if a firm has almost all of its business outside Norway, the corporate management of this firm will 'think Norwegian' in a host of strategic issues – and R&D is one of these.

Thus, the analysis arrives at a somewhat alternative interpretation of Narula (2002), Patel and Pavitt (1998) and several of the chapters in Cantwell and Molero (2003): Strong ties and positive experiences with the national R&D infrastructure are not in conflict with internationalisation. Support has been found for the claim that internationalisation happens 'unwillingly' or 'reluctantly'. However, this is not necessarily due to a poor quality or limited knowledge supply nationally, but rather part of a search for alternative sources of knowledge in a situation where the

firms 'depend upon' providers that are sometimes perceived as monopolistic and expensive. Later studies may want to take a closer look at the other end of the equation: Is the national public infrastructure also becoming more dependent upon international funding sources? On the one hand, it may be dramatic for universities, colleges and institutes when 'their local firms' more of their R&D activities to other countries. There is a chance that these are irreversible decisions and processes. On the other hand, increased global characteristics of industrial R&D may also offer more opportunities for specialisations and services, also for foreign companies.

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Appendix

Table 4.8 An overview of the case companies

Company	'Alpha'	'Beta'	'Gamma'	'Delta'	'Epsilon'	'Zeta'	'Eta'	'Theta'
Industry	ICT	ICT	Pharma	Chemicals	Chemicals	Oil/gas	Food	Metals
Size*	Medium	Large	Large	Large	Large	Large	Large	Large
R&D location	NOR and US.	NOR	NOR, UK, SWE, US. and GER	NOR, SWE, FIN, AUT	NOR, FRA, NLD, GER	NOR plus foreign projects	NOR	NOR, GER and US
International-isation	Market-driven R&D	National treasure R&D	Global R&D	Market-driven R&D	Global R&D	National treasure R&D	National treasure R&D	Technology-driven R&D
Recent changes	Bought US. firm with R&D	Closed labs in Ireland and US.	No changes in site structure	Closed labs in Belgium and Denmark	Consider China and India for R&D	Urged national institutes to move abroad	No plans for interna-tionalisa-tion of R&D	Bought German firm with R&D
International-isation has happened by	Technology-motivated takeover	Market-motivated takeover, standardis-ation work, EU FP	Traditional site spe-cialisation, takeovers and mergers	Manufacturing expansion	Manufacturing expansion, takeovers	Market opportunities, specialised purchases	Standardisation, purchases of patent-related R&D	Takeover, manufac-turing expansion
Management principles	Organisationally separate sites, common technolo-gies	Top-down approval of EU part-nerships, regular project manage-ment	Tailored ICT systems, project managers high degree of autonomy	Virtual cross-national projects, project manage-ment	'Core teams' approach with own intranet areas, best practice focus	Prefer joint ventures; top-down strategy	R&D part of new product development; top-down strategy	Virtual com-petence centres, control of R&D left to business units

* In this table, medium-sized is defined as fewer than 1,000 employees. The large companies vary from 6,000 employees to more than 100,000.

Chapter 5
Career Impacts of Student Mobility

Stumbling Block or Stepping Stone?

Jannecke Wiers-Jenssen

5.1 Introduction

Student exchange may be considered as the best-known and most traditional form of internationalisation of higher education (van Damme 2001). Increasing numbers of young people are studying abroad; according to OECD figures, more than 2 million students were studying outside the borders of their home country in 2003 (OECD 2005). This expansion has been encouraged by technological development as well as economic, cultural and political changes. The Internet and e-mail have facilitated information exchange and marketing across borders, boosting Asian economies have created new markets for higher education (HE) providers, and internationalisation is on the political agenda in most countries. A core political rationale for promotion of student mobility rests on the assumption that the international learning and study experience students studying abroad acquire corresponds to the needs of a modern labour market, i.e. the knowledge-based economy needs international competences that foreign studies can provide.

Internationalisation and study abroad is encouraged by many stakeholders in HE, and often seems to be considered as an advantage per se. However, very limited research on labour market outcomes of study abroad exists. Outcomes of study abroad have been measured in terms of self-assessed language improvement (Maiworm and Teichler 2002) and development of extra-curricular skills like intercultural communication skills (Williams 2005) and international understanding (Carlson et al. 1990). But in general, research on mobile students has focused on challenges faced by students coming from third world countries to Western countries, or participants in exchange programmes (e.g. ERASMUS), rather than job-matching and labour market outcomes of study abroad. Though a sojourn abroad may be rewarding from a personal perspective, and that cultural contact is valuable for individuals as well as society, this does not necessarily imply that individual career opportunities are improved or that extra-curricular skills gained abroad are required in the jobs the

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graduates obtain. The research presented here takes on the latter investigation and tests the assumed relationship between international higher education competences and the labour market needs of a globalised knowledge economy at the level of the individual graduate and his or her labour market career. We look at the transition from Higher Education (HE) to work for graduates who have studied abroad, compared to graduates who have undertaken the entire HE domestically. Vertical career dimensions like employment, unemployment and wages are investigated, as well as aspects of horizontal career dimensions – to what extent mobile students have more international jobs than non-mobile students. The empirical basis for our analyses is drawn from a survey-based research project comparing careers of former mobile and non-mobile students. More comprehensive results from this project can be found in other publications (Wiers-Jenssen 2003, 2005, 2006; Støren 2005; Wiers-Jenssen and Try 2005).

Norway is an interesting case for investigating outcomes of study abroad, as the ratio of mobile students is higher than in the majority of OECD-countries (OECD 2005; Kelo et al. 2006). In contrast to most other western countries, the majority of Norwegian students abroad are so called *free movers* (i.e. students not participating in organised programmes, generally spending several years abroad), not *exchange students* (students participating in organised exchange programmes, generally staying abroad for a maximum of one year). In recent years, there has been a policy shift towards encouraging students to take short-term sojourns abroad and participating in organised exchange programmes like ERASMUS, rather than undertaking their entire education abroad. Hence, it is of particular interest to see whether the professional value of study abroad is different for graduates with short sojourns compared to those who have undertaken several years of study abroad. Another reason why Norway constitutes an interesting case is that mobile students are predominantly funded by the public purse.[1] From a government perspective, research shedding light on whether subsidising students abroad is a good investment should be of interest.

5.2 Topics: Aspects of Vertical and Horizontal Career Dimensions

The survey chapter is based upon The NIFU Graduate Survey 2002, and covers a wide range of questions of which some were posed only to those who had studied abroad.[2] Here, we will focus on topics relevant to all graduates, so that a comparative perspective can be applied. The following topics will be covered:

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[1] Domestic students are also mainly funded by public money, as HE is mainly public with no tuition fees in Norway.

[2] Questions asked only to those who had studied abroad included more detailed questions about applicability of language skills, assessments of the quality of HE institution abroad and whether graduates had applied for any formal recognition of HE courses from abroad.

- employment and unemployment
- over-education (skills-mismatch)
- job search strategies
- wages
- postgraduate working experience abroad
- international dimension of work tasks
- use of foreign language skills in current employment.

The first four topics are related to *vertical career dimensions*, while the others are related to *horizontal career dimensions*. By vertical career, we mean indicators that measure the degree of integration in the labour market and the economic returns of labour. By horizontal career, we refer to indicators measuring aspects of work tasks, focusing on the international aspects of jobs. We compare former mobile students to former students who have not studied abroad. In most cases, we also distinguish between two groups of mobile students: those who have their diplomas from abroad, and those who have their diplomas from Norway (see data and method section for further details).

Prior to presenting survey results, a contextual framework is outlined. Aspects of Norwegian student export as well as previous research in the field will be presented. Theoretical contributions to the understanding of transition from HE to work for groups educated abroad are scarce; hence, more general theories linking education to work are applied. Economic theories of human capital and signalling as well as sociological theory of networks and discrimination can explain why education may be imperfectly portable across countries.

5.3 Background and Rationales for Student Export

Various stakeholders in the field of higher education have different rationales for internationalisation, and the borders between different types of motivation are blurred. However, some major categories can be identified. A division between educational, cultural, economic and political rationales is often made (Knight and de Wit 1995; Blumentahl et al. 1996; van der Wende 1997; Knight 2004). It has been observed that economic rationales are increasingly important (Kälvemark and van der Wende 1997). Marketisation has definitely reached the field of higher education, and educational services are increasingly becoming a commodity in a global market. Effects of this development are also seen in Norway. HE providers from abroad (Australia and the UK in particular) have intensified promotional activities in order to attract Norwegian students during the last decade or so. Norwegian HE institutions (HEIs) have become more aware of global as well as national competition, accelerated by recent changes in funding structure.

The driving forces and policy rationales for internationalisation of HE in general overlap the rationales for student export and student exchange. Students, at least those from Western countries, tend to underscore educational and cultural aspects as the rationale for studying abroad. An important motivation for choosing

particular studies is the anticipation that an education from other countries can lead to employment abroad or an international career (Opper et al. 1990; CSN 1995; Wiers-Jenssen 2003). Students emphasise the 'added value' of studying abroad and expect that extra-curricular skills such as linguistic and cultural competence will be appreciated by employers (Wiers-Jenssen 2003; Krzaklewska and Krupnik 2006). However, there has not been much research on whether education from abroad actually leads to employment abroad or jobs with international works assignments.

5.3.1 Norwegian Student Export

Traditions for student export are long and strong in Norway. The first Norwegian university was established in 1811, and before then, leaving Norway was a prerequisite for obtaining higher education.[3] The student flow continued also after the establishment of a Norwegian university, as only a limited number of study programmes were offered. In the years following World War II, the numbers studying abroad were particularly high. In the mid-1950s, 30 per cent of all Norwegian students were studying abroad (Bie 1974). By then, the origins of the student flow had shifted from insufficient diversity of study programmes towards a question of lack of capacity. Supporting the education of Norwegian youth abroad has definitely been a means of compensating for the lack of labour in professional segments of the labour market (NOU 1989). Today, the ratio of students abroad is much lower than in the post-war era, per 2005 between 6.5 and 10 per cent of the Norwegian student body studied abroad, depending on whether exchange students are included in the figures (Wiers-Jenssen 2005). Nevertheless, the figures are high compared to most other countries. The destinations of Norwegian mobile students have changed over time, but today the main host countries are Australia, UK, Denmark, USA and Sweden – countries in which language barriers are low for Norwegians.

A high ratio of students abroad is an objective of Norwegian HE policy(KUF 1997, 2001), and is encouraged by relatively favourable financial arrangements offered through the Norwegian State Education Loan Fund (NSELF – *Lånekassen*). Support is given directly to the students, a system diverging from the indirect support systems in Southern European countries based on family allowances and tax benefits (Vossensteyn 2004). Norwegian students abroad are eligible for the same basic support as domestic students (though conditions apply). In addition, they are entitled to grants and loans to cover tuition fees and travel expenses up to a certain level. The Norwegian support system for students abroad is known to be rather generous compared to the system of most other countries, which is a major reason why tuition charging higher education institutions (HEIs) in certain countries put effort into attracting Norwegian students.

[3] Norway was in a union with Denmark from 1380 to 1814, and the University of Copenhagen served as university for the whole union.

The most explicit policy rationales for encouraging student export today are educational and cultural. However, economic rationales of securing educational diversity are also expressed (KUF 1997). For a high-cost country like Norway, there may also be more subtle economic rationales for supporting student export. State expenditure on domestic HE is high, due to that most HEIs are public and do not charge tuition fees. Providing students with grants and subsidised loans for studying abroad may be less expensive than adjusting domestic enrolment capacity to fluctuating demands. Regarding resource-intensive study programmes such as medicine and arts, student export is definitely an economical option. Hence, the domestic capacity deficit still contributes to student export. Political rationales for internationalisation are also seen, i.e. in the high priority of participation in the ERASMUS programme even though Norway is not a member of the European Union (EU). A development towards giving increased priority to exchange students may be interpreted partly as a result of changes in the funding of Norwegian HEIs introduced with *The Quality Reform* from 2003. Outcome-based performance indicators have made Norwegian HEIs more aware of domestic as well as global competition, and more eager to produce and promote exchange programmes serving their interests.

Norwegian students' rationales for going are more related to 'pull' than 'push' factors (Wiers-Jenssen 2003). Most students claim to be motivated by the opportunity to study in a foreign environment, to experience a new culture, to improve language skills, to improve prospects for an international career, etc. Some students are also motivated by the assumption that the quality of HE programmes is higher abroad, and applies to students in arts and business students in particular. However, some groups of students emphasise that admission restrictions in Norway is an important reason for going abroad. This applies mainly to medical students and others studying health subjects. An underlying premise for studying abroad, that most students seem to take for granted, is the generous subsidised student support system.

5.4 Research on Mobile Students and Transitions from Higher Education to the Labour Market

Research on mobile students from Western countries has mainly focused on exchange students rather than free movers. There has been extensive research on the ERASMUS programme (see, for example, Teichler and Maiworm 1996; Teichler 2002; Bracht et al. 2006), but limited information exists on the labour market outcomes of mobile students who take the entire degree course, or greater parts of it, abroad. This may be partly due to the fact that students not participating in organised exchange programmes tend to be more difficult to identify and trace. The research that has been done on labour market outcomes of mobile students rarely includes control groups of students educated in the home country. Hence, we may get to know that those who have studied abroad hold international jobs, but without corresponding information on graduates who have not studied abroad, we

do not get to know whether mobile students are *more* likely to hold international jobs than non-mobile students. However, our data set has the strength that allows us to compare those who have studied abroad to those who have not.

Teichler (2002) have carried out one of the few studies that does compare mobile and non-mobile students. Former ERASMUS students and other mobile students are compared to students without mobility experience. They find that more of the mobile students gain working experience from abroad, that they have more international work assignments and make much more use of their language skills compared to non-mobile students. Those who have studied abroad, but not participated in the ERASMUS programme, seem to make more use of their international competence than ERASMUS students. This may be due to longer sojourns. The authors conclude that study abroad is a step towards a horizontal differentiation of job roles as far as the international dimension is concerned. The fundament for drawing such a general conclusion is somewhat weak as this study does not control for subject field.

Labour market outcomes of exchange students compared to free movers are analysed in a report from Sweden (Zadeh 1999). Quantitative data indicate that exchange students have slightly better labour market opportunities than free movers. These results are supported by analyses of qualitative interviews with employers, showing that employers prefer to recruit graduates who have *parts* of their education abroad rather than applicants who have undertaken their *entire* studies abroad or in Sweden. A recent study on ERASMUS students concludes that the horizontal professional value of a sojourn abroad is stronger than the vertical value (Bracht et al. 2006).

A study of Greeks who have studied abroad, show that those who have studied in EU countries have higher employment rates and higher wages than those have studied in non-EU countries (Lianos et al. 2004). This is in line with a range of studies on immigrants, showing that education from abroad gives a poorer outcome than education from the host country. This has been shown for the USA (Borjas 1995; Funkhouser and Trejo 1995; Bratsberg and Ragan 2002; Zeng and Xie 2004), for Canada (Krahn et al. 2000), and for Israel (Friedberg 2000). These studies indicate an imperfect portability of skills across borders, which we hypothesise may also affect non-immigrants with HE from abroad. Immigrants and mobile students are likely to face some of the same challenges; professional networks are likely to be weaker, employers may not posit sufficient knowledge of education from foreign HEIs, and country-specific human capital from abroad may not be in demand.

5.5 Hypotheses and Theoretical Approaches

Our hypothesis is that Norwegians who have studied abroad will face more challenges when entering the labour market than those who have undertaken their entire education in Norway. Vertical career outcomes are expected to be poorer. Regarding horizontal career dimensions (different jobs), we expect mobile students to have more success. We assume that they hold more international jobs than non-mobile students, though we expect substantial variation by subject field. These hypotheses

are partly derived from results from former studies, but also from sociological and economic theories which will be briefly presented. As theoretical contributions to the understanding of transition from HE to work for groups educated abroad are limited, we draw upon more general theories linking education and work. These suggest different, though not necessarily contradictory, explanations for why HE and human capital may be imperfectly transferable across borders.

5.5.1 Human Capital Theory

Human capital theory regards educational choice as investment decisions where schooling enhances productivity (Mincer, 1958; Becker, 1964). According to this theory, a positive relationship between education and the degree of labour market success is expected. The standard version of the theory does not distinguish between foreign and domestic education, but in research on immigrants in the labour market, a division between country-specific and general human capital is often made (Friedberg 2000; Duvander 2001; Chiswick and Miller 2003). Examples of country-specific human capital are language skills, cultural skills and professional skills adapted to national requirements. It is assumed that foreign and domestic educations are not equivalent as parts of the education are related to country-specific human capital. We believe the concept of country-specific human capital is also relevant when looking at graduates who have studied abroad. Parts of what is often labelled as the 'added value' of studying abroad can be regarded as country-specific human capital. Though this will certainly be in demand in certain segments of the labour market (e.g. knowledge in French if working in a firm importing French wine), the country-specific human capital component in general may be more applicable in the country where the education is undertaken than in other countries. A *lower* level of human capital specific to the home country is attached to education acquired abroad, which employers may consider as a shortcoming in certain jobs. For example, in order to acquire a position as a journalist covering Norwegian politics, a person (recently) graduated abroad may be considered less suitable than someone graduated in Norway due to inadequate knowledge of the Norwegian political agenda, lack of relevant contacts/informants or having developed professional writing skills in a foreign language. We assume that vertical career may be negatively affected by human capital from abroad, but we do not expect mobile students with short sojourns abroad and diplomas from Norway to experience negative effects. Regarding a horizontal career, we assume that country-specific human capital will have a positive effect, though variations due to subject fields and country in which HE is undertaken is expected.

Murphy-Lejeune (2002) uses the concept *mobility capital* to describe that people with mobility experiences develop 'a taste for living abroad'. Experience with living abroad may be seen as a type of informal human capital. We hypothesise that graduates who have gained mobility capital by studying abroad are more likely to work abroad as well.

5.5.2 Signalling Theories

Signalling theories focus on the sorting and signalling effects of education (Arrow 1973; Spence 1973). Education from abroad may signal extra-curricular skills and certain personal characteristics like independence, initiative, open-mindedness and social and symbolic capital. Being educated abroad may have an important symbolic value, and even more so if undertaken in prestigious institutions with access to relevant networks. (Network approaches will be outlined the next section.) In an era of massification of HE, it has been claimed that the value of education is decreasing, and having the 'right' credentials is of increasing importance (Bourdieu and Botanski 1975; Dore 1976; Collins 1979; Goldthorpe 1996). Positive signalling effects may improve vertical as well as horizontal career opportunities. However, education from abroad may also have weak or negative signalling effects; it may be is less known or acknowledged by domestic employers or assumed to attract students with poor performance from upper secondary school.[4] Negative signalling effects may affect vertical career opportunities like job probability, but may also influence horizontal careers as employers do not necessarily offer former mobile students optimal opportunities to apply their international skills.

5.5.3 Networks and Social Capital

Network theories explain how information about vacant positions becomes available and trusted through personal and institutional relationships (Granovetter 1985, 1995; Rosenbaum et al. 1990). Relatives, friends, previous colleagues and employers may be important sources of information about jobs, and according to Granovetter, 'weak ties' rather than the closest relationships are of particular importance in job matching. Resources situated in social networks may also be labelled as social capital (Bourdieu 1985; Coleman 1988). Knowing the 'right' people is relevant also in meritocratic societies. Due to the sojourn abroad, mobile students may have less institutional and social relations in the home country than non-mobile students, and this may turn out to be an obstacle in job-searching if they choose to look for jobs in Norway after graduation. Graduates from Norwegian HEIs may hay have achieved access to additional networks through their contacts within the HEI (lecturers, tutors, supervisors), or in contact with the labour market through work placement or jobs held in combination with study courses. We hypothesise that lack of professional networks will effect mobile students' chances of getting a (relevant) job in a negative way, particularly those with diplomas from abroad. We will investigate this by looking at job-search strategies.

[4] Some students choose to study abroad due to fierce competition for acceptance in certain study programmes in Norway. This rationale for studying abroad was more prevalent some decades ago, but some people still believe that those who study abroad are less talented than others.

5.5.4 Theories of Discrimination

Theories of discrimination in the labour market are often applied to explain women's or immigrants' position in the labour market. Some forms of discrimination may also be relevant to graduates educated abroad. Some employers may have a *preference* for graduates educated domestically, but it is more likely that mobile students may experience *statistical discrimination*. This kind of discrimination occurs when an employer prefers one category of job seekers to another because he expects that particular category to possess more of certain desired properties (Thurow 1975; Cain 1986). Lack of information on the relevant qualifications is the central factor behind statistical discrimination. In the case of graduates who have studied abroad, employers may not be post the competence to evaluate the foreign diploma, and do not always bother to invest time in information-seeking if there are plenty of other well-qualified applicants. Hence, our hypothesis is that discrimination may negatively influence the likelihood of getting a relevant job for mobile students who have graduated abroad.

5.6 Data and Methods

Data are drawn from the NIFU Graduate Survey 2002. This survey comprises college and university graduates from foreign and Norwegian and institutions within most of the higher degree studies and selected lower degree studies.[5] The sample is stratified and graduates from HEIs abroad are over-represented. The analysis includes 914 respondents who graduated abroad, and 1386 who graduated in Norway in 2002. Of the latter, 286 had undertaken parts of their education abroad, while the remaining 1100 were had undertaken their entire education domestically. All students in this sample are Norwegians. All variables are based on self-reported data from the questionnaire, including retrospective information for the period 3.5–5 years following graduation. In the tables showing mean distributions, the data are weighted according to the stratifying sampling procedure in order to correct for over- and under-representation in the sample. In the regression analyses, no weighting is applied because all the stratified variables are used as control variables.

The overall response rate is 56 per cent, with a significantly higher response among domestic graduates (61 per cent) than among those graduating abroad (47 per cent). One reason for a lower response rate in the latter group could be inaccuracy in the data register defining this part of the sample, causing some people to have been included in the gross sample without being in the actual target group for the

[5] Higher-level studies are defined as those requiring more than four years of HE in Norway. The major higher-level studies not included in the survey are Law, Teaching/Pedagogy and degrees related to primary industries. These studies are excluded because very few Norwegians study these subjects abroad. Lower degree studies included in the survey are Business administration, Nursing and Physiotherapy.

survey.[6] The willingness to respond may be the same in the two groups, but as the abroad graduates are more difficult to define, a lower response is not unexpected.

Mobility experience is a complex phenomenon, and many graduates have studied abroad as well as in Norway. About 50 per cent of those who graduated abroad, had also undertaken HE in Norway. Among domestic graduates, 17 per cent had also studied abroad (most of them for a year or less). Our point of departure has been to distinguish between two major groups: those who graduated abroad (labelled 'abroad graduates'), and those who graduated in Norway (labelled 'domestic graduates'). Assuming that origin of diplomas is crucial when entering the labour market, we have grouped all those who graduated abroad. But in some analyses, we have chosen to treat those with diplomas from Norway but with study experience from abroad, as a separate group. Thereby three groups are compared:

- Mobile students, graduated abroad = abroad graduates (N = 914)
- Mobile students graduated domestically, who have undertaken parts of HE abroad (N = 286)
- Non-mobile students = home graduates without sojourn abroad (N = 1100)

For simplicity, the groups are labelled mobile/non-mobile students, even though they are technically *former* students.

Our rich data set allows us to investigate how numerous factors influence horizontal and vertical career outcomes. We concentrate on reporting differences related to mobility status, but when relevant to our hypotheses, we also look at differences by subject field and selected other variables. The multivariate analyses control for a number of variables, and socio-demographic variables like gender, age, marital status and children are included in all analyses; so is subject field, number of years in HE, year of graduation, and relevant working experience prior to graduation. We also control for performance indicators (intake score and academic performance relative to co-students), to get some indication on whether potential differences in labour market outcomes are related to differences in academic performance. For mobile students, we also control for country/region in which the education was undertaken, and in some models the perceived prestige of HEI abroad.

Before presenting results on career outcomes, we will briefly present some information on background characteristics of Norwegian mobile students.

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[6] Domestic graduates are drawn from the Education Administrative Register of Statistics Norway, while abroad graduates are drawn from the State Education Loan Fund data register. The former register includes all graduates from Norwegian institutions (except one private business and administration college: The Norwegian School of Management, BI), while the latter includes all graduates from abroad that have applied for loan and grants. Due to the generous financial support schemes directed towards students studying abroad, most abroad graduates will be included in the register (Wiers-Jenssen 2003). This register does not define completed and non-completed studies adequately; thus students concluding their studies without graduating are included in the gross sample, but they are excluded from the data-set used in this paper.

5.7 Who are the Mobile Students?

As mentioned, previous research has shown that Norwegian students abroad are generally more motivated by pull factors than push factors (Wiers-Jenssen 2003). We will now briefly look at some other characteristics of mobile students, as they appear in comparison to non-mobile students in our survey (See Wiers-Jenssen 2006 for details). The proportion having parents with higher education is approximately 20 per cent higher among mobile than non-mobile students, and the proportion with parents who have lived abroad is almost 50 per cent higher. The latter suggests that studying abroad 'runs in the family'. Average intake scores (grades from upper secondary school) are slightly lower among mobile students graduated abroad than non-mobile students (4.50 vs. 4.56 on a scale where 6 is highest), while mobile students graduated in Norway have a higher score (4.79). Concerning another performance indicator, self-assessed academic performance relative to co-students, both groups of mobile students claim to have slightly *higher* performance than non-mobile students. However, this is a rather subjective measure, and the validity may be low. On a general level, we can say that mobile students constitute a selected group regarding family background, but that the pattern concerning academic performance is less coherent (i.e. there are variations related to subject field). However, it can be added that mobile students graduated abroad seem to be more ambitious than others. Enquiring into job values, we find that mobile students graduated abroad put more emphasis on 'good career prospects' than the two groups graduated in Norway,[7] hence they may be considered as more ambitious.

5.8 Vertical Career Dimensions

By vertical career dimensions, we refer to indicators that tell us something about the degree of integration in the labour market and the economic returns of labour. Here present results on employment and unemployment rates, over-education and wages.

5.8.1 Employment and Unemployment

At the time of the survey (3.5–5 years after graduation), the employment rate among mobile as well as non-mobile students was high: 92 per cent among mobile students graduated abroad, 94 per cent among mobile students graduated domestically and 96 per cent among non-mobile students. Although the size of the differences in employment rates is moderate, the difference between abroad graduates and domestic graduates is statistically significant also in regression models when controlling

[7] The ratio stating that 'good career prospects' are 'very important' is 33 per cent among mobile students graduated abroad, 23 per cent among mobile students graduated domestically and 19 per cent among non-mobile students.

for other variables, performance indicators included (Wiers-Jenssen and Try 2005). Employment rates vary by subject field, but the pattern is similar for those graduating abroad and domestically. Graduates in humanities and social sciences have lower employment rates than other groups.

The numbers who are outside the work force are higher among abroad graduates than domestic graduates (5 contra 3 per cent), and so are the unemployment rates. But differences between mobile and non-mobile students become more evident when looking at unemployment history. Figure 5.1 shows the proportions reporting unemployment at different stages of the career.[8]

Mobile students graduating abroad are more likely to have faced unemployment than other groups, which is also confirmed with in regression analyses. Relevant working experience reduces the likelihood of unemployment, but only for those graduated domestically, indicating that shaping professional networks while studying is important, in line with network theories presented earlier. Having studied at prestigious HEIs abroad and having graduated from HEIs in Nordic countries also reduces the likelihood of facing unemployment. Positive signalling effects may be an explanation to this. A diploma from a prestigious institution may be interpreted as an indicator of selectivity, and it is also more likely that prestigious institutions are known to employers. Education from Nordic countries is also likely to be familiar to employers, and assuming that employers want to minimise the risk of employing the wrong candidates, graduates with diplomas from HEIs employers have prior knowledge of may be preferred to graduates with diplomas from lesser known HEIs. This may be interpreted as absence of discrimination towards HE from Nordic countries.

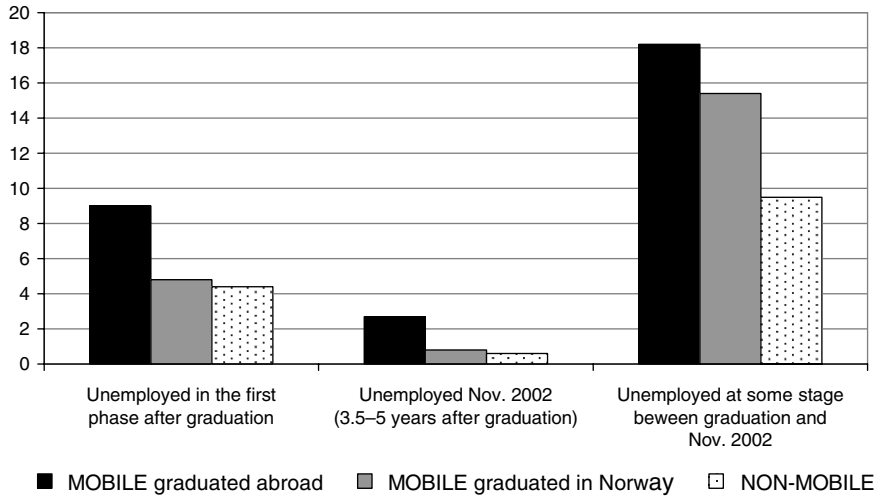

Fig. 5.1 Unemployment at different career stages. Per cent

[8] Ratios for unemployment are calculated for all graduates, not just those who are a part of the work force.

5.8.2 Job Search Strategies

We have seen that mobile students are more prone to face unemployment than non-mobile students. This is not due to less effort in searching for jobs. Mobile students have searched for more jobs, and used more strategies to find a job than non-mobile students, those graduated abroad in particular. Among those who have actively searched for jobs, the average number of applications sent before obtaining the first post-graduate employment is 12 for mobile students graduated abroad, 10 for mobile students graduated domestically and 6 for non-mobile students. The most common way to establish job matches for all graduates is through responding to an employers' advertisement (41 per cent) and contacting employers directly (21 per cent). However, regarding certain other job search strategies, we find diverging patterns between those who have graduated abroad, and those who have graduated domestically. Non-mobile students are hired significantly more frequently because they are contacted by employers without having sent an application (8 contra 5 per cent), and trough contacts established while working during HE (14 per cent contra 8 per cent). This is in line with the hypotheses derived from network theories.

Those graduated abroad use, and have success with using, relatives and acquaintances most frequently in order to get their first post-graduate employment (10 per cent contra 5 per cent). In other words, *personal* networks seem to be more important to this group. This could be due to at least two different reasons. It may be caused by necessity; those facing difficulties in finding a job may become more creative in using their networks. Another possible explanation is that mobile students have access to more relevant personal networks. More of them have parents with higher education, and family connections and other acquaintances may constitute a social capital that improves job-opportunities.

5.8.3 Over-Education

Over-education is an indication of skills mismatch. We have used a wide definition of over-education, which also includes jobs that require HE, but at a lower lever than the degree the graduate possess.[9] When using this definition, the percentages reporting over-education is 20 among mobile students graduated abroad, 17 among mobile students graduated domestically and 15 among non-mobile students. As with several other indicators of labour market outcome, over-education varies more by subject field than by whether the education is undertaken abroad or not. Although the difference in over-education between abroad graduates and home graduates is relatively small, it still persists also when controlling for a number of other variables (Wiers-Jenssen and Try 2005).

[9] Over-education often has a narrower definition, not including jobs requiring higher education.

5.8.4 Wages

Wage is an indicator of economic returns from education and tells us a lot about the acknowledgement of graduates in the labour market. Comparing the wages of abroad graduates and domestic graduates working in Norway, we find that abroad graduates earn 15 per cent more than domestic graduates. Wages vary substantially by subject field, but a substantial part of the wage differences is related to the fact that more of the abroad graduates work in the private sector, where the wage level is generally higher. When controlling for sector, subject field, performance indicators and background variables, the wage premium of abroad graduates is drastically reduced, to approximately 3.5 per cent (Wiers-Jenssen 2005; Wiers-Jenssen and Try 2005). Only mobile students graduated abroad have a wage premium. Mobile students graduated domestically do not have higher wages than non-mobile students.

5.9 Horizontal Career Dimensions

In this section, we will look at whether those who have studied abroad hold jobs that are different to the jobs of non-mobile students, regarding international dimension of work tasks. Research on students' motives for studying abroad shows that a central motivation for choosing to study abroad is the expectation that an education from other countries can lead to employment abroad or an international career (Opper et al. 1990; CSN 1995; Wiers-Jenssen 2003). Seen from a macro perspective, the extent to which mobile students hold international jobs can be regarded as a success indicator of certain aspects of cultural and economic rationales for student exchange.

5.9.1 Working Experience Abroad

Mobile students report far more interest in working abroad than non-mobile students. The difference between the two groups becomes even more striking when it comes to actively pursuing ambitions about gaining working experience abroad. As we can see from Fig. 5.2, far more mobile than non-mobile students have searched for and obtained employment abroad, particularly mobile students who graduated abroad. At the time of the survey, one of five mobile students graduated abroad was working abroad, while less than one in fifty domestic graduates was doing the same.

Pursuing a career abroad may be influenced by many different factors. Some of these were included in regression analyses investigating the probability of working abroad at the time of the data collection. These analyses confirmed that mobile students graduated abroad are more likely to work abroad than mobile students graduated domestically and non-mobile students. Another positive predictor was previous experience of living abroad, which can be related to Murphy-Lejeunes concept of mobility capital (Murphy-Lejeune 2002). Among mobile students, family status had

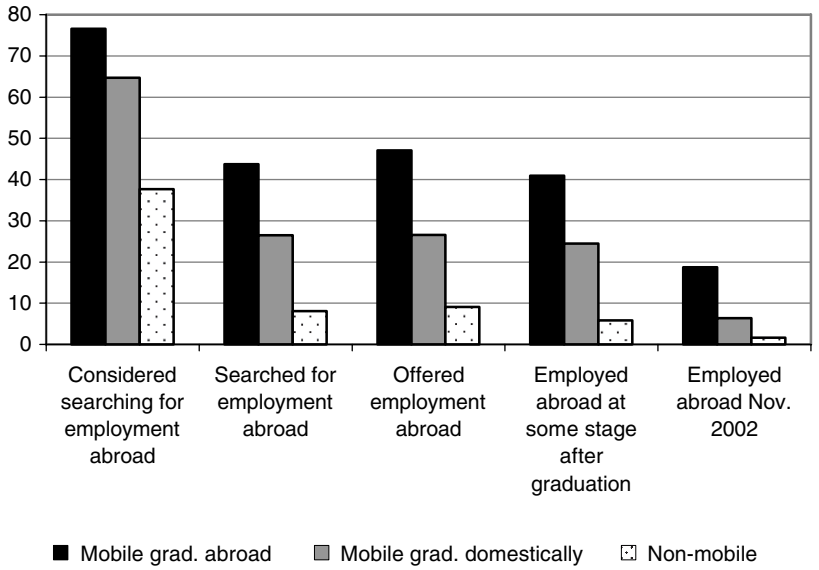

Fig. 5.2 Percentage of graduates who have searched for and obtained employment abroad

some influence. Graduates who were married or cohabitating, were more likely to work abroad, while women with children were less likely to work abroad.

Those who had studied in Nordic countries are more likely to work abroad than others. Geographic, linguistic and cultural proximity may lower the thresholds for working in these countries. Subject field did not show significant effects, except that medical doctors were less likely to work abroad. Graduates with a high intake score (good grades from upper secondary school) were also more likely to work abroad, indicating that the best graduates are more likely to succeed in a competitive market abroad.

5.9.2 International Jobs Among Domestically Employed

Working abroad is one way of pursuing a career where skills gained abroad can be applied. Having a job in Norway with international work tasks is another way of making use of international skills. We now look at those who were employed in Norway at the time of the survey (81 per cent of the employed) and investigate the extent to which they work for international employers and have work tasks with international dimensions.

Figure 5.3 shows that significantly more mobile than non-mobile graduates work in international firms and Norwegian firms with branch offices abroad. The proportion working in international firms is highest among abroad graduates. The figure also shows that mobile graduates are more inclined to go on business trips abroad.

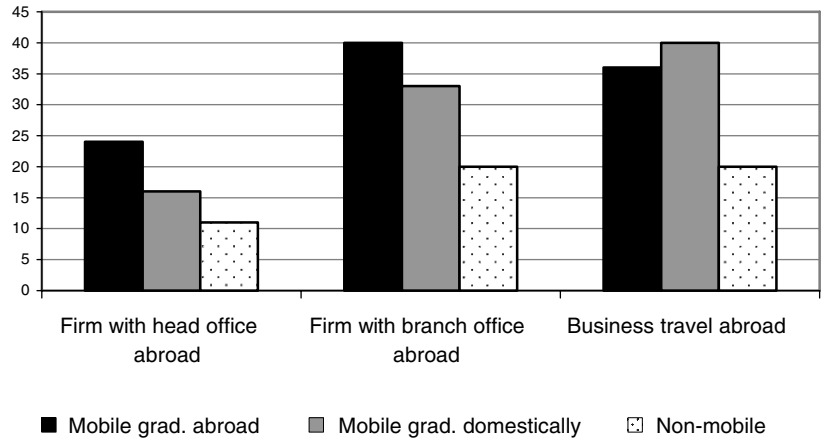

Fig. 5.3 Percentage of graduates employed in Norway working in international firms and making business trips abroad

5.9.3 Application of Language Skills

Mobile graduates report more frequent use of foreign languages for different purposes than domestic graduates (Fig. 5.4), but in this case differences between mobile graduates with a diploma from foreign HEIs contra domestic HEIs are small. Those who have studied in English-speaking countries apply language skills more frequently than others (Wiers-Jenssen, 2006). As for subject field, graduates with a higher degree in the natural sciences and technology, and in business and administration, report most frequent use of languages. At the other end of the scale, we find those who have a lower degree in health care sciences (nursing and physiotherapy).

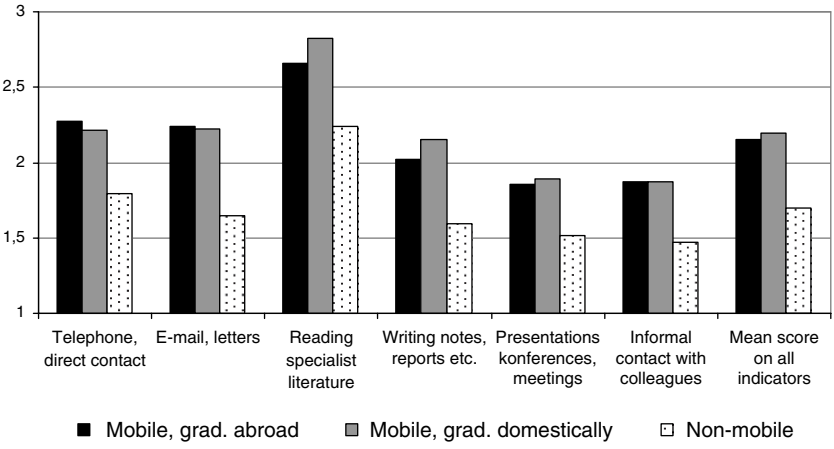

Fig. 5.4 Use of foreign languages in different work tasks. Mean score, 1 (rarely or never) −4 (almost daily)

5.9.4 Who Holds International Jobs in the Domestic Labour Market?

What is an international job? This can be defined in many ways. We have constructed an index based on whether the graduates work in an international firm, extent of business travel abroad and to what extent the graduates apply (foreign) language skills in their current job,[10] (see Wiers-Jenssen 2006 for further details). The score goes from 0 to 6; the higher the score, the more international the job. From Fig. 5.5 we see that mobile students' score on this index is higher is than non-mobile students.[11] This figure also shows that the mean scores vary substantially by subject field, in line with our expectations expressed in the theory and hypothesis section.

Regression analyses confirmed that differences between mobile and non-mobile students and graduates from different subject fields persist when controlling for more variables (Wiers-Jenssen 2006). Year of examination also shows a significant effect, meaning that the most recently graduated students have jobs with less international aspects. This indicates that it may take some time to find a job match including application of international skills.

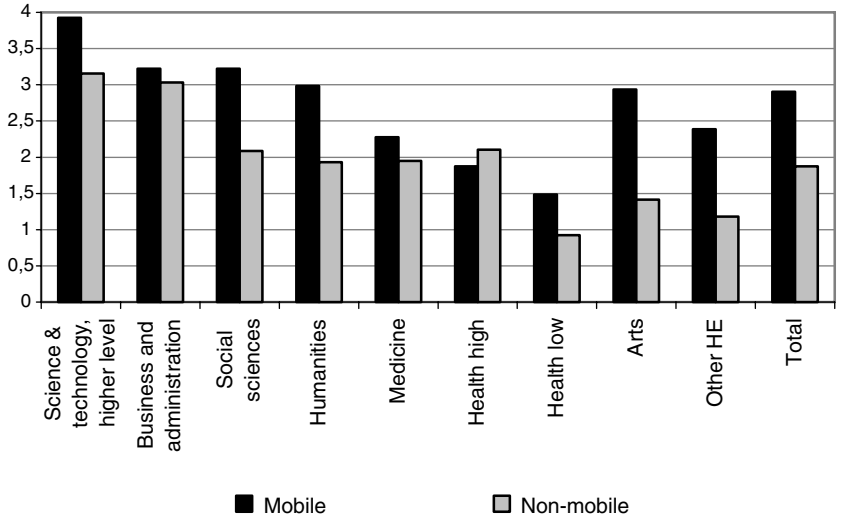

Fig. 5.5 International job index, mean scores

[10] For application of language, we have added all items in Figure 5.4, and divided the scores into four categories, each comprising approximately 25 per cent of the sample.

[11] Mean scores for mobile students graduated abroad and mobile students graduated domestically were fairly similar, hence the two categories are grouped together.

5.10 Summary and Closing Discussion

We have seen that education from abroad has both positive and negative effects on outcomes in the labour market. Table 5.1 provides a general summary of the effects of studying abroad on vertical and horizontal careers, compared to having an all-Norwegian education. The general picture is in line with the conclusion from the recent ERASMUS study (Bracht et al., 2006): the horizontal professional value of a sojourn abroad is stronger than the vertical professional value. More precisely, in our data horizontal outcomes are positive, while vertical outcomes are both negative and positive.

Mobile students face more difficulties entering the labour market. They apply for more jobs before finding the first post-graduate employment; they use more sources to find a job and they experience unemployment more frequently than home graduates. In other words, it seems as though admission to relevant jobs is somewhat constrained. We find that networks are important for getting a job and that abroad and domestic graduates use different networks. Those graduated abroad make less use of a professional network and more use of their personal and family network compared to those who have studied in Norway. This supports the assumption, derived from network theories, that lack of relevant professional network may represent a setback for mobile students. Our results also indicate that signalling effects are present and some form of discrimination does occur, as graduates from prestigious HEIs and Nordic countries face fewer difficulties, also when controlled for academic performance. Regarding vertical career, it is more difficult to prove an effect of country-specific human capital. To shed more light on this, studies of employers, employment processes or qualitative interviews with students are needed.

A positive outcome for mobile students is that they had higher wages at the time of the survey. The higher wage level is partly explained by the fact that mobile students more often work in the private sector where the wages are generally higher. But the higher wages may partly indicate that mobile students are seen as productive

Table 5.1 Labour market outcomes of mobile students compared to non-mobile students

	Mobile, graduated abroad	Mobile, graduated domestically
VERTICAL CAREER		
Employment rate	lower (neg.)	similar
Experienced unemployment after graduation	higher (neg.)	somewhat higher (neg.)
Job search	more intense (neg.)	more intense (neg.)
Over-education	more prevalent (neg.)	slightly more prevalent (neg.)
Wage	Higher (pos.)	similar
HORIZONTAL CAREER		
Employment abroad at the time of the survey	much higher	higher
International job	higher	higher

employees. In general, studying abroad implies more challenges than entering a local college, e.g. moving and studying in a foreign language and foreign culture. This implies that mobile students may constitute a select group regarding ambitions and personal features. We have seen that mobile students graduated abroad are more career-oriented than others, and indications of selectivity related to personality traits are also found in a study comparing Norwegian medical students abroad and in Norway (Aasland and Wiers-Jenssen 2001). In qualitative interviews mobile students tend to claim that they diverge from non-mobile students in that they are more outgoing, have more initiative etc. (Stensaker and Wiers-Jenssen, 1998). Such qualities may improve career opportunities and wages.

Differences between abroad and home graduates in vertical career outcomes are relatively small, but they are quite robust and consistent across different regression models. However, it is important to note that unemployment in early career does not seem to have a lasting stigmatising effect for Norwegians who have studied abroad, in contrast to immigrants in the labour market (Støren 2005).

Regarding horizontal career dimensions, working abroad and holding an international job in the national labour market are two different ways of using skills and qualifications gained abroad. We have seen that former mobile students are more likely to do both compared to those who have undertaken the entire HE domestically. However, the regression analyses show that variables predicting one of these outcomes do not necessarily predict the other. Some variables (e.g. intake score) show a significant effect on working abroad and having an international job. Other variables like subject field show limited effects on the likelihood of working abroad, but clearly influence the chances of having an international job in the national labour market. Working abroad seems to be more related to personal features: marital status, whether one has children or not, and previous experience with living abroad. The decision to work abroad seems to be influenced by having a foreign partner, and future research should look into this. To hold an international job in the domestic labour market seems more related to performance, experience and labour market specific conditions, rather than socio-demographic characteristics.

We have seen that the vast majority of mobile students return home, but one of five mobile students graduated abroad was still employed abroad at the time of the survey. However, *brain drain* cannot be considered as a serious problem for Norway, and certainly not so if we take into account that some of the returnees bring foreign partners back home.[12] From previous research, we have seen that a partner is an important reason for migration among highly skilled workers such as researchers (Nerdrum et al., 2003). Nevertheless, working experience from abroad may be just as valuable for internationalisation as HE abroad, also for the 'added value' part. Working abroad adds to the country-specific human capital; different skills and experiences are acquired and networks are formed.

[12] We do not have exact information on this. However, one in six mobile students graduated abroad reported using a foreign language at home, which may be seen as an indication of a foreign partner.

It is likely that more graduates will return to Norway at a later stage, bringing international working experience with them to the domestic labour market. Those who stay abroad contribute to internationalise other countries' labour markets, which may be seen as positive if political and cultural rationales of internationalisation are taken into consideration.

The proportion working abroad at the time of the survey may be seen as surprisingly low, compared to the preferences mobile students state while studying abroad. A survey mapping Norwegian students in their sojourn abroad has shown that one in two students expect to work abroad 5 years after graduation (Wiers-Jenssen, 2003). Apparently, many change their minds. Some explanations for this are the low unemployment rate in Norway[13] and a comparatively generous welfare system including long maternal leave. Our results show that women with young children are less likely to work abroad, which can be seen as a support for the latter interpretation.

Among those who work in Norway, graduates who have studied in English-speaking countries make more use of language skills gained abroad than those who have studied elsewhere. Good command of English may be seen as general or transnational human capital rather than country-specific human capital. Increasing the number of students in countries other than those who are English-speaking, is an objective frequently repeated in Norwegian policy on study abroad. More information on the applicability of linguistic and cultural skills acquired in such countries is needed.

Mobile students' jobs are, on average, more international than the jobs of non-mobile students. However, not all mobile students obtain jobs with international work assignments or an international employer. We have seen that there are substantial variations between graduates from different subject fields regarding the international profile of jobs, illustrating that some parts of the labour market are more internationalised and globalised than others. Graduates with degrees in business/administration and technology frequently hold international jobs, while those who have studied health sciences have jobs that are less international than others. Given the work assignments attached to the health professions, it is not very surprising to find that graduates from these fields make less use of extra-curricular skills gained abroad if employed in the domestic labour market. This may have been obvious to the mobile students from the start. A substantial part of mobile students who have studied medicine abroad, and other health sciences too, chose to do so because of *numerus clausus*, and not because they were particularly interested in living abroad or pursuing an international career (Wiers-Jenssen, 2003). Thus, they may be sufficiently content with having obtained the education and profession they were aiming for, even though horizontal career opportunities are not substantially altered. These groups easily find jobs, independent of the origin of the education, (Wiers-Jenssen and Try, 2005). According to our data, the likelihood of having an international job increases over time, meaning that it is likely that more graduates

[13] When the survey was conducted in 4th quarter of 2002, the unemployment rate in Norway was 4.1 per cent compared to 5.9 per cent in USA and 7.8 per cent as the EU average.

will eventually find job matches where their international skills can be applied. But it is not likely that everyone will obtain, or want to obtain, an international job.

From the government's perspective, it may not be considered as a problem that some groups do not report extensive use of linguistic and cultural skills. Again, those who have studied health sciences constitute a good example. They supply the domestic labour market with formal skills, currently in great demand, and the cost attached to supporting them with grants and loans for studying abroad is lower than potential cost of expanding the domestic enrolment capacity. Although the cultural outcome may be limited, these groups are successful in terms of educational and economic rationales.

Mobile students graduated domestically face fewer problems entering the labour market than mobile students graduated abroad, mostly in line with the results Zadeh (1999) found in Sweden. They also seem just as successful in obtaining international jobs in the domestic labour market as those who have diplomas from abroad (which in most cases implies longer sojourns abroad). This is somewhat surprising. One might have expected that those who have spent more time abroad have acquired better language skills and other sorts of country-specific human capital that would make them more qualified for international jobs.

5.11 Conclusion

Education from abroad has both positive and negative effects on labour market outcomes. Mobile students face more problems entering the labour market, but are more successful regarding wages. Those graduated abroad are more likely to work abroad than those who have graduated in Norway. Mobile students who have returned to Norway hold more international jobs in than non-mobile students. Despite some challenges related to entering the labour market, the portability of HE from abroad to the Norwegian labour can be considered to be successful, and in general seems like a good investment for individuals as well as for society.

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Chapter 6
Justifications and Drivers

Higher Education Institutions' Strategies of Internationalisation

Nicoline Frølich

6.1 Introduction

Research and higher educational institutions are increasingly addressed in analyses attempting to describe and analyse their goals and strategies concerning internationalisation (Huisman and Wende 2005). In this chapter,[1] we pose the question: How do Norwegian research and higher educational institutions interpret and handle the challenges of internationalisation of higher education and research? On which justifications are their internationalisation strategies based? What are the driving forces of these strategies? How are they embedded in the organisation?

As the point of departure, we define internationalisation as border-crossing relations (Frølich 2006b:406). Such a broad definition is not trivial; there is no general agreement on the definition of internationalisation in research and higher education (Knight and Wit 1995). One distinction is the difference between two meanings of 'internationalisation': Internationalisation refers to changes in the environment of research and higher education (in terms of general trends and resulting challenges); internationalisation also describes the higher education institutions organisational response to these changes (Wende 2004:10).

Building on the concept of internationalisation as an organisational response, studies of internationalisation *in* the organisations define internationalisation as a 'process which integrates an international dimension or perspective into the major functions of the organisation' (Knight and Wit 1995:16–17). The analytical focus of these studies is 'the process of integrating the international dimension

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[1] This chapter is based on data and investigations which are part of two projects, one funded by the Norwegian Research Council (NIFU 2001) and one funded by the 5th framework programme of the EU (HEIGLO 2001). In this chapter the argument presented in Frølich (2006b) is elaborated. The concept of strategies is put more up front in the analytical framework. The empirical data is organised differently. The conclusion is, however, similar as in the article. Magnus Gulbrandsen, Jannecke Wiers-Jenssen and Johan P. Olsen have contributed with valuable comments to this version.

Å. Gornitzka, L. Langfeldt (eds.), *Borderless Knowledge*,

into teaching, research and service functions of an institution of higher education' (Wende 1996:8). The definition of 'an international dimension' is 'a perspective, activity or programme which introduces or integrates an international/intercultural/global outlook into the major functions of a university or college' (Knight and Wit 1995:15). These studies investigate internationalisation *in* the organisations by analysing *how* organisations become, or turn into more international entities.

We also aim to look into the foundations and drivers of the international strategies of higher education institutions. We investigate higher education institutions internationalisation strategies. These strategies develop in the interplay between the changing contexts in which the organisations operate, and the organisations' core tasks. Internationalisation strategies relate both to the organisational environment and to organisational features such as the international linking of academic, student and research communities (Frølich 2006b:408). The empirical basis of the analysis builds on a case study of five higher education institutions.[2] We formulate two hypotheses. These are based on the characteristics of the sample of cases. First, the cases have high international activity measured in terms of student mobility and funding from abroad compared to other Norwegian higher education institutions. As such, the cases are comparably highly international. Based on this, we expect them to have a sound internationalisation strategy. Second, the cases differ in research – intensity, which could provide them with different conditions for internationalisation. The higher education institutions we look at also differ in terms of age. We might expect the old research tradition of a university to facilitate the development of an internationalisation strategy compared to younger higher education institutions with a less strong research base.

We organise the analysis in two stages. First, we look into the two organisations that differentiate the most along these dimensions, the oldest university and the most vocationally-oriented university college[3]. Second, we expand the perspective on the strategies' drivers and justifications by comparing the analysis of the first two cases with data from the three other cases. One aim of the research procedure is to increase the external validity of the findings (Yin 1994). We seek to obtain this by comparing the results of the first and second step of the analysis.

In the next section, the data is presented in more detail: the analytical foundations of our expectations are elaborated, the two main cases presented, and the findings discussed in relation to evidence from the other cases – first by looking at drivers and justifications, then by looking into the embeddedness of the strategies. Finally the main conclusions are drawn.

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[2] The University of Bergen, the University of Tromsø, the University of Life Sciences, the Oslo University College and Agder University College.

[3] Unlike many countries, notably the UK, university colleges in Norway are not associated with a specific university. Rather, they are independent colleges and were previously regional colleges of higher education with a strong vocational aspect based on regional labour requirements. Today, they have a national status with both vocational and degree courses. Research has become an increasingly important function of these colleges.

6.2 Data

Sixteen semi-structured interviews[4] with key players and an examination of organisational policy documents from five higher education institutions form the empirical basis of the investigation. The interview guide addresses main themes in internationalisation: formal agreements of international cooperation, funding from abroad, research priorities, student mobility, internationalisation 'at home', and the infrastructure of internationalisation. The interviews were conducted over a long period, commencing during the autumn of 2002, and ending during the spring of 2004. Each interview lasted between 1 and 2 hours, and was recorded and transcribed by the author. Analysis of the policy documents validate the interviews and add more information on the topic. The empirical basis also includes data on international funding and data on publication patterns of the institutions based on the international database Thompson/ISI. NIFU STEP[5] collected and analysed the data for the purpose of this study.

6.3 Plans and Actions Interplaying with Context and Purpose

An established point of view asserts that, in certain respects, universities are inherently international (Berchem 1991; Schuster 1994; Welch 1997). Some European universities are nearly a thousand years old, operating across Europe before any nation state. Research is inherently international as far as knowledge can be seen as common property and ideally conducted independently of geographical borders. The argument is based on the idea that efforts to enhance the quality of research and identify scholarly relevance and originality contribute to the international character of research and academic activities. Additionally, the need to cooperate for the advancement of science is seen as pushing research activities across national borders (Aksnes et al. 2003). These characteristics of the process of establishing knowledge form the basis of the argument that research, and consequently universities, are internationally oriented.

In contrast, higher education institutions have been, and still are, major national institutions in terms of their contribution to the national labour market and national economy, culture and society in general. The organisations have had important tasks as nation-building entities (cf. Chapter 1). This argument questions the idea of higher education institutions as being inherently international.

Nevertheless, Norwegian researchers today have more contact with international research communities than they did twenty years ago, and they publish internationally more frequently (Smeby and Trondal 2005) (cf. Chapters 2 and 3). This could

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[4] All together 16 interviews were undertaken. The group of informants consisted of 13 persons (7 rectors/vice-rectors and 6 senior officers/directors). Three informants were interviewed twice (2 rectors/vice-rectors and 1 senior officer/director). Data was also collected as part of another project (Maassen et al. 2004). Uppstrom and Frolich did part of the interviews together.

[5] Antje Klitkou performed the analysis of the bibliometric data.

be taken to imply either increased internationalisation, or that to a certain extent the organisations are becoming 're-internationalised' (Teichler 2004).

An established argument says that the environment of higher education institutions changes fundamentally. There is increasing competition in higher education and changing international rules and regulations (Enders 2004). Higher education institutions face an increasingly competitive environment which is less focused on cooperation. The higher education institutions are also confronted with a changing set of international rules and regulations. In Europe, the process of Europeanisation is a main driver of changed rules and regulations to which the higher education institutions respond (Huisman and Wende 2005) (cf. Chapter 8). In addition to these major external changes, Norwegian higher education has been recently reformed. The reform, called the Quality Reform, was introduced in 2002. Several changes to the system of higher education were introduced: some of the changes include implementation of a new degree structure (bachelor/master degrees), the European Credit Transfer and Accumulation System ECTS,[6] and a new grading system which applies five grades (A–F). In addition, the higher education institutions were confronted with new commitments within quality assurance and evaluation, and a more performance-based funding system (Gornitzka and Stensaker 2004:105–107) (cf. Chapter 8).

Based on these observations, we conclude that the Norwegian higher education institutions face external changes. Increased competition, new European rules and regulations, and a major national reform of higher education make up the environmental changes the higher education institutions are confronted with. In addition, we note that the core tasks – notably the research function – are being '(re-)internationalised'.

We base our analysis on the concept of organisational change in higher education institution. The organisation's environment plays a major part in the strategies that the organisations develop. The state, and thus public policy, are important external features to which the higher education institutions respond (Gornitzka and Maassen 2000). In addition, the higher education institutions also connect to the global process of change (i.e. globalisation). Improved conditions for international contact impact the strategic process of the higher education institutions as the improved conditions for international contact impact the process of research.

There are several justifications for increased internationalisation. The economic justification for increased internationalisation can be seen as rooted in the marketisation and commodification of knowledge. In public policy, increased internationalisation is legitimated by referring to the need for knowledge for use in production

[6] In order to facilitate student movements, The European Credit Transfer and Accumulation System (ECTS) was created. ECTS was initially a system for credit transfer within the European Union, allowing students to transfer credits from one country into a degree in another country. ECTS has also later been developed into a system of accumulation of credits, and a way of transferring grades from one system of higher education to the other. Today, ECTS has multiple usage, both as a system for transferring credits but also for transferring grades and the purpose of it is to facilitate student exchange in higher education (Hovdhaugen and Frølich 2007).

and industry. The academic justification of increased internationalisation asserts that internationalisation is a sign of academic quality (Gornitzka and Stensaker 2004). Based on this, there are multiple justifications for internationalisation. The higher education institutions confront at least a double set of justifications: increased internationalisation can be legitimised by referring to improved academic quality by means of internationalisation, *and* increased internationalisation can be justified by referring to the need for increased economic performance in the knowledge economy. Improved academic quality in order to increase *economic competitiveness* is one justification. Improved academic quality *for its own sake* is another. Additionally, the argument of increased academic quality can be presented in two versions: there is both the question of increasing the academic quality of the higher education institution *itself*, *and* the question of increasing the academic quality *at large* by exporting knowledge and competence, which adds an aid dimension to the process of internationalisation.

We use the term 'strategy' to denote the organisations' strategy as this appears when we collect information both about intentions (plans) and about the actions (realisation). Our concept of strategy takes as a starting point the definition preferred by many organisational researchers (Scott 2003:293). Strategy is the long-term goals and objectives of an organisation together with measures taken to obtain them and the necessary resources to achieve them (Chandler 1962:13). Scott (2003:294) underlines that intentions are not actions; official goals are not necessarily the operating goals (Mintzberg 1987). Based on these observations, we seek to describe both plans and actions.

Strategy, as interplay between the context in which it takes place and the core activities of the organisation, fit well with theories on competitive strategies in general (Porter 1980). In studies of public organisations (like publicly-funded higher education institutions), 'policy' is the term applied to denote strategy (Scott 2003:294). Lowi (1972) observes that policy causes politics and drives the design of organisational structures. In our case, we would argue that strategies cause politics (in organisations) which in turn impact the organisational structures. Such a statement builds on institutional theory (March and Olsen 1989; Scott 1995) which has brought fresh inspiration to studies of organisations and policy implementation since the 1990s (Frølich 2006a:189). (For reviews, consult, for example, Parsons 1999; Scott 2003).

From institutional theory, we develop two main expectations concerning the strategies the higher education institutions develop. Firstly, a normative 'match' between the changed environment and the organisation fosters implementation. Secondly, a normative 'mismatch' between the changed environments and the organisation hampers implementation.[7] The organisational strategies are seen as relating to or 'coming from' these environments. In this perspective, organisations are receptive

[7] There is a vast body of literature on policy implementation. I use the term 'implementation' as used by Van Meter and Van Horn (1975): 'Those actions by public .. individuals ... that is directed at the achievement of objectives set forth in prior policy decisions.'.

to changes in the institutional environment because their products are hard to define. Therefore, the organisations have to legitimise themselves by fulfilling the expectations of their environments (Meyer and Rowan 1977), meaning that they seek to adjust to change. In this perspective, the drivers and justifications of the organisations' internationalisation strategies would relate heavily to the context in which the strategies are formulated. However, they also relate to the value basis of the organisation itself. A normative match means that the value basis of the changes of the environments matches the value basis of the organisation (Brunsson and Olsen 1997). Thus, a normative match between the external changes and organisation is seen as the mechanism by which change is fostered.[8]

The argument is not that changes of organisations (in terms of formulation of a strategy) depend on environmental changes, but that internal processes of interpretation and translation and traditions may slow down, accelerate, reverse or redirect change, as a function of how well external changes and reforms 'match' institutional identities, histories and dynamics (March and Olsen 1989; March and Olsen 1996; Olsen 1997:161). Organisations with loosely coupled structures may also decouple the formal structure (i.e. the 'implemented' changes) from the actual behaviour in the organisation (Scott 2003:215). The organisations seemingly have adjusted to the strategies, whilst organisational behaviour 'in real life' proceeds in accordance with informal norms. Based on this, we may also expect a distinction between *talk* and *action* in internationalisation strategies of higher education institutions.

The double structure of the organisation relates also to the fact that the higher education institutions consist of two types of structures labelled 'disciplines' and 'institutions'. Disciplines cut across the boundaries of the local enterprise, and institutions (i.e. local organisations) pick up subgroups of the disciplines and aggregate them locally (Clark 1983). This means that the academic disciplines are internationalised according to their own dynamics, and the disciplines are loosely coupled to the specific higher education institution. Based on this, the internationalisation strategies which the higher education institutions develop might as well be driven and justified by the core tasks of the organisation, as they would relate to external changes of public policies and organisational contexts in general.

In addition, we might assume there are differences between *research-based* universities and higher education institutions more focused on *vocational training*. The term 'inherent international' is justified by referring to the border-crossing character of research activities as they are conducted in several disciplines. Consequently, higher education institutions directed at vocational training having less strong research traditions would possibly show a correspondingly weaker international profile (Wächter 1999).

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[8] The 'logic of appropriateness' is based on both the values and identity of the organisation, and gives direction to the choice of paths of action and strategies. Thus, some changes are perceived as appropriate; others as inappropriate.

6.4 A University's Internationalisation Strategy

The University of Bergen is a research university with long-standing international relations. In the strategic plan for 2000–2005, the university emphasises five priorities with respect to internationalisation: the university puts weight on its contribution to solving global problems and challenges. We relate this to internationalisation as an activity that gives aid. The aim is not solely to internationalise in order to increase academic quality itself; rather to act internationally in order to contribute to a 'global agenda' (i.e. aiding). Student mobility is an important aim of the strategy. The university's goal is to develop new English language master programmes and to increase the number of international students at the university, exchange students and students from developing countries. The university thereby stresses that student mobility concerns students from developing countries in addition to exchange students. Through these measures the justification of internationalisation as aid is underscored in the strategic plan. The reference to exchange students and the goal of increasing the number of exchange students we see as a clear response to the national policy, i.e. the Quality Reform, and which emphasises the importance of student mobility. The new performance-based funding system introduced as part of the reform gives the higher education institutions incentives to increase the numbers of students from abroad studying at Norwegian higher education establishments, thereby improving the balance with the numbers of Norwegian students studying abroad.

Adjustment to Europe is another major objective of the university. We see the weight in the strategic plan put on increasing and expanding existing educational cooperation and exchange agreements with universities abroad, especially with European universities, as an indication of the importance of relating to the process of Europeanisation. Finally, the response to the national policy is clear in terms of the university encouraging Norwegian students to spend a period of their studies abroad and to ease the process of recognition of credits awarded at foreign institutions.

In the interviews, the Quality Reform is described as a major current driver of the international activities of the university. The university attempts to stimulate internationalisation at home by 'importing' students and researchers. The Quality Reform encourages this development since the reform puts internationalisation 'at home' up front. Internationalisation at home means that the Norwegian higher education institutions are urged to become more internationally-oriented, not only by sending students and researchers abroad, but also by receiving students and researchers from abroad. The intention is to internationalise Norwegian campuses by hosting foreign students and researchers. The impact of the Quality Reform is also observed by pointing to other improvements the university has introduced. International dimensions are included in teaching and learning by increasing the number of courses taught in English at the university and by increasing the number of international educational programmes. The Quality Reform has also made it more important for the university to send students abroad. Sending students abroad is emphasised by the fact that the Quality Reform introduced a small financial grant to the higher

education institutions attached to the number of students going abroad as part of formal agreements of student exchange. The reform also states that each student who wishes to study abroad as part of the Norwegian university degree should have this opportunity. Student mobility, as part of formal agreements with foreign higher education institutions, is focused in the Quality Reform and there are financial rewards attached to these exchanges. This part of the reform is described as the background for several measures that the university has undertaken more recently. Several new bilateral agreements have been signed. The university has analysed which types of formal bilateral exchange agreements currently applied, and looked at which countries and foreign universities the students wished to visit. Based on this analysis, the university sent delegations representing the University of Bergen to higher education institutions in several countries. These visits are important in establishing good agreements. It is vital that teachers and researchers are represented in the delegations, since many of the agreements were originally established based on academic contact with the foreign higher education institutions. Several other measures have been introduced in order to increase student mobility. An information strategy has been developed, regarded to be a central instrument in the drive towards increased student exchange. The strategy has included brochures, the employment of student counsellors at a central level, a campaign week as well as several information meetings, both general and more specific, 'stunts' at the beginning of lectures, the development of a web page for outgoing students, and the establishment of a central office and information room (Maassen et al. 2004:120; see also UoB 2002a; UoB 2003a).

In addition to the importance of the Quality Reform, it was emphasised in the interviews that the university has long traditions with international activities also profiled as 'the most international university of Norway' (Larsen 1995:68; Olsen 1999:24). It is pointed out that the external drivers of the internationalisation strategy (i.e. the Quality Reform) must be compared to the university's tradition of relating to Europe and the rest of the world. The university had international students at Bergen Museum as early as the late 18th century. Already in 1977, a guest researcher programme was established at the university. English language master programmes were established in 1986, primarily for students from developing countries (Maassen et al. 2004). Consequently, the internationalisation strategy of the university, accentuated by the national policy, builds on its international tradition and draws on its global engagement.

The university integrates an international dimension in its main activities. This is described as naturally linked to their research activities. In the interviews, it was pointed out that researchers have been included in the delegations from the university that went to establish contact with foreign associate universities. The aim was to ensure quality in the educational programmes their students attended (UoB 2002a; UoB 2003a). It is asserted that the academic quality of the formal agreements improve when researchers participate in the delegations compared to those agreements previously established exclusively by the rector and administrative staff (UoB 2002b; UoB 2003a). The research tradition of the university is used as a resource in the development of the internationalisation strategy.

The informants experience increased competition in the area of internationalisation. Nevertheless, the increased competition is not seen mainly as contributing to increasing the academic quality of the university. Geographic and private competition have each played a role in the declining participation of students in the Erasmus programme at the university. Commercially-oriented higher education institutions around the globe have recruited a number of students; both free-movers and exchange students (Maassen et al. 2004). It is a concern that commercialisation of higher education conflicts with higher education as a public good. The informants point out that higher education is increasingly treated as a commodity. This point is also made in university policy documents on internationalisation (UoB 2000). In the strategic plan, it is noted that the university expects to have to compete in an international market of education (UoB 2000:1). The university seeks to combat aggressive marketingby, for example, foreign agencies in Norway, through ensuring the quality of the international educational programmes the university offers their students. By means of collaboration agreements, tuition fees are negotiated to offer students quality educational programmes at reasonable costs (UoB 2003a). An increasing marketisation of knowledge is also discussed in terms of the costs related to searching for literature and published research results. The key actors reflect upon strategies to cope, combat and tackle market conditions.

The university has a global orientation in its international activities. The aid dimension in internationalisation is a long tradition framed with reference to global solidarity and actions undertaken in the 1980s to profile research interests and activities in development research (Forland and Haaland 1996:459). Emphasis on international collaboration has led to expertise in the organisation that European exchange activities have also benefited from.

Internationalisation is high on the agenda at the university, and as such, deeply integrated in both the university's strategic plans and the action plan (UoB 2002a; UoB 2003a). This attention is not new and may be said to have been developed since the beginning of the 1980s. The formal structure of the university has changed over time due to internationalisation. The Office of International Relations dates back to the 1960s (Olsen 1999:36). In the spring of 2003, the university looked into the administrative structure of internationalisation. The Office of International Relations deals with issues relating to international programs for research and education. This is a well-established structure that has mainly been concerned with research. The Office of International Relations cooperates closely with the Office for Foreign Students, which also assists outgoing students. The student counsellors in the faculties also play an important role in student exchange activities (UoB 2003a). The university underlines the departments' responsibility in accomplishing the infrastructure in relation to student exchange (UoB 2003a:5). Already in 1990, the university stated that internationalisation should be an integrated dimension of the organisation with respect to departments, faculties and the boards' actions and plans (UoB 1990:2). With the process of implementing the Quality Reform, the councils for education and research are looking into the aims and organisation of internationalisation. Extra resources for a project aimed at facilitating the process of internationalisation at the university have also been set aside. The intention of the project is to lead

to closer cooperation across traditional structures of the university to improve the international activities (Maassen et al. 2004). Based on these data, the university has a fairly well-established organisational structure to promote internationalisation. Resources have also been allocated to foster these activities, which could indicate that the strategy is more than talk, also action.

Internationalisation at the university is described in the data as a process conducted in the interplay of an international research tradition, a long history of cooperation with research fellows and universities in the southern hemisphere (the South), and the current changing environment, which are due both to national reform – the Quality Reform, and international arenas which are undergoing change (UoB 2002b; UoB 2003a). The university seems to have responded to the changing environments such as increased global competition and national policy aiming at improving and facilitating Norwegian higher education international engagement. This profile encompasses two major features: first, a historically-based international research tradition (UoB 2003a), and second, a newer attention and focus on collaboration with developing countries (Forland and Haaland 1996:495; UoB 1988). The interviews with key actors in internationalisation at the top of the organisation reflect the historical roots of their international profile at the same time as current changing global environments and national reforms are reflected as inputs to the organisation's work on internationalisation.

When analysing the driving forces of the internationalisation strategy at the University of Bergen, the external rules and regulations clearly emerge as important drivers of the strategy. The establishment of the European exchange programmes, as well as the promotion of student mobility through the student loan system, is perceived as fostering increased exchange activity in the 1990s. Currently, the Bologna process is expected to imply major changes in European higher education. The comparable educational programmes and credit systems are considered to facilitate student mobility.

Finally, the strategies are related to the university's core tasks. Traditionally, the international activity was undertaken in close relation with research activities, students, and researchers coming to Bergen to conduct and participate in research, and researchers collaborating with foreign colleagues. This tradition is still a strong point of reference when talking about internationalisation. Data from the University of Bergen reveals a picture of a traditional international university which, from its very establishment, received international researchers. Foreign researchers at the campus stimulate both research relations and inspire students to go abroad. To attract students from abroad may serve as a link in foreign research collaboration (UoB 2003a). The university's international activities were traditionally driven by research relations and by the university administration. The University of Bergen implemented activities at an early stage geared to integrating an international dimension into their educational programmes by changing curricula, the establishment of new educational programmes, and by collaboration with foreign universities (UoB 1988). To establish courses taught in English, develop master programmes both for foreign students and national students, and to motivate teachers to teach in English, has been quite high on the policy agenda for a long time (Olsen 1999:96,

103), these activities are currently encouraged by the attention given to increased internationalisation in the national reform.

6.5 Internationalisation Strategy at a University College

To promote increased international activity, Oslo University College (OUC) has developed an international strategic plan. In this plan, focus is placed on the exchange of students and staff together with improvement of the capacity to receive students from abroad. In the strategy, increased teacher and student mobility, increased recruitment of international students both though the EU exchange programmes and, through bilateral agreements with countries outside the EU, are stated goals. In addition, a reorganisation of the educational programmes to facilitate student mobility, better integration of international students and improved routines on receiving them, are prioritised objectives. Finally, it is stated that all educational programmes should offer at least one course in English. A new strategy is under development which also underlines internationalisation at home.

Internationalisation means mainly activities connected to student exchange, something which was underlined in the interviews. It was also emphasised how the EU programmes are important in these aspects. Concerning harmonisation of degree structure, it is recognised that it is important to understand foreign courses and educational programmes so that students can take courses abroad which fit into the Norwegian educational programmes. External inputs to the strategy of internationalisation are visible also in terms of the university college participating in the mobility programs of Leonardo da Vinci and Socrates/ERASMUS.

Efforts undertaken at the university college to increase the international dimension are also currently strongly connected to implementation of the Quality Reform. In the interviews, it was underlined that the importance of student mobility is underscored in the reform, and that national policy emphasises the need for formal collaboration agreements with foreign higher education institutions. The university college seeks to integrate an international dimension in the educational programs.

There is also another justification for increased internationalisation at the university college: knowledge dissemination is becoming increasingly international which encourages the university college to participate in international research. Furthermore, the students themselves desire to study abroad thereby urging the university college to facilitate student exchange.

In the interviews, reference was also made to internationalisation as a means of increasing the academic quality; having international qualities is a means by which to compete for students. Another point made is the fact that national funding is increasingly linked to international contacts and activities. This is seen as motivating the university college to expand its international activity.

The main aim of internationalisation at Oslo University College is to increase quality in education and research. The university college as a whole has not set a goal with respect to how many mobile students they would like annually, but

each faculty has been asked to do so. The university college adjusts to the Quality Reform that requires all students are to be able to spend a period of their degree studies abroad. Mobility schemes are seen as the most effective aspect of internationalisation. The other instruments, the organisational structure of the educational programmes and the study environment, recruitment of international students etc., are seen as a prerequisite for increased mobility. Internationalisation at home is considered a goal in itself. Oslo University College would like to increase the number of students that go abroad during their studies at the college; it is also important that there is a balance in the number of incoming and outgoing students.

The internationalisation strategy of OUC also relates to the core tasks of teaching and research. In the interviews, reference was made to the fact that the world is changing, and which is seen as a general push for internationalising the university college. The inherently international features of conducting research are also seen as driving these processes. Nevertheless, the disciplinary variations in this matter are emphasised.

OUC offers professional degrees and courses with mainly a national practice but which are increasingly encountered as being exposed to global and international frames of reference. Oslo University College recognises that it operates in a multicultural society and a global economy. The graduates enter a labour market that seems increasingly to require international qualifications at all levels.

In addition, the informants underlined that researchers have always had international contacts. Research needs to be international, and to further develop the research dimension it is necessary to be international. OUC also experiences that international cooperation is necessary in order to get teachers and researchers to think differently about their teaching and research practice. As a university college, OUC strives to increase research activities, and in that, underscores that these activities are inherently international (OUC 2001a; OUC 2001b). The university college wants to be associated with international research fellowships in order to be able to compete for international funding. Since the university college is becoming increasingly more 'academic', there is also more focus on (international) research collaboration. Concerning teaching, it is argued that the international orientation of the educational programs is important in motivating students to go abroad.

The informants see both cooperation and competition in the area of internationalisation. It is argued that internationalisation means quality development by means of cooperation with other higher education institutions internationally. Furthermore, increased competition for domestic students makes internationalisation a means to attract these students.

Internationalisation at the university college is also a means to aid as well as the university college experiences to be a goal for those who trade in higher education. By trading in higher education, the informants refer to cross-border offers in education, which make it possible for students to follow courses in other countries. Some countries also sell higher education programmes abroad (Frølich 2007). The university college is responding to internationalisation as aid and internationalisation as trade. The university college experiences global solidarity and aggressive marketing in the area of internationalisation.

Improving academic quality includes global solidarity with developing countries, according to those interviewed. OUC chose cooperation partners in developing countries and works to establish collaboration with the South. At the same time, the college observes that education has become a trade commodity in some parts of the world. Consequently, this dimension of internationalisation at OUC is not solely framed with reference to academic quality, but also with reference to solidarity and competition.

Oslo University College has a recently-developed set of goals, plans and instruments to promote internationalisation of the college. The structure at OUC is both centralised and decentralised, with an international council under the board, international office in the student administration of the college, and international coordinators in the departments. The structure is decentralised, the departments have their own resources for internationalisation. Internationalisation of research pushes OUC to work on organisational backing of researchers who are trying to attract external funding. The university college further tries to fulfil the national expectations on student mobility and internationalisation. It works systematically to increase student mobility and international research collaboration. An international orientation is to be further developed in both education and research (OUC 2001a:1).

The university college first established an international office in 2001. The office is responsible for coordinating agreements and programmes on international cooperation as well as advising students, staff, administrative personnel and faculties. OUC has decided on an Action Plan for internationalisation which aims at strengthening the field of international cooperation. The international office cooperates closely with the faculties and their international coordinators. The office has six full-time employees and functions as a policy-developing unit, as well as a service unit for the departments and students (Maassen et al. 2004).

In 2002, the International Council was established to strengthen the integration of internationalisation in the academic activities of OUC. The university college emphasises the importance of information and guidance to the students concerning student mobility. The international office and the departments share this task. The faculties are responsible for information concerning faculty-based agreements, whilst the international office is in charge of information about institutional agreements, as well as the development a good library of information and knowledge on international agreements and opportunities (Maassen et al. 2004). Recently, measures have been undertaken to change the formal structure due to internationalisation. National pressure on higher education institutions to increase competitive research funding from the Research Council of Norway and through the EU framework programmes makes it vital for OUC to rethink the way research activities are organised. The importance of obtaining international funding and international research collaboration is highlighted in the in strategic plans, and by the board. These measures contribute to increasing the efforts departments and faculties undertake to apply for competitive research funding, and increased collaboration with foreign colleagues. The focus on student mobility in strategic plans contributes to increase this activity as well. Thus, there are indications that talk leads to action.

6.6 Drivers and Justifications Reinforced

The internationalisation strategies of the two cases we have discussed so far in this chapter are apparently heavily influenced first and foremost by the current national reform of higher education. The University of Bergen and Oslo University College both signed new agreements with foreign higher education institutions on student mobility. The University of Bergen engages in negotiations on tuition fees that the foreign universities charge. The adjustments the institutions undertake concerning student mobility and formal agreements of cooperation, it is argued, are also a consequence of the current national policy. Both institutions underline that the national policy puts weight on sojourns mediated through formal agreements.

Europe, in terms of research projects and student mobility programmes, is a second important frame of reference. In the case of student mobility, the institutions both relate to the external environment; however, they also take their own steps to increase the impact or quality of these measures. This is also the case concerning research funding. Oslo University College seeks to increase collaboration through the Research Council of Norway in order to increase quality of research; the University of Bergen emphasises that the European networks of research collaboration contribute to increasing the academic quality of their research. To participate in European research is seen as a strategy to remain an internationally recognised university.

When looking into our empirical data more broadly, and taking three other cases into account, the influence of external drivers on the organisational strategies is confirmed. Both international incentive programmes and national rules and regulations play a role in the formulation of the strategies. The national Research Council and the current national reform of higher education figure as the most important environmental features that are perceived as important national environments. Several main points in the strategies are influenced by the national policy, such as student mobility, formal agreements of collaboration, research priorities, the degree structure, attempts to attract foreign researchers, and finally, the establishment of courses taught in English. EU policies are of major importance to the institutions' internationalisation strategies by largely influencing their funding and their student mobility policy. All the higher educational institutions we looked at participate in EU exchange programmes. All focus on the mobility programmes and consider it important to increase the number of exchange students.

At several points, the 'foreign policy orientation' of the higher education institutions is strengthened by domestic polices. Especially in the case of student mobility, there are incentives in the national policy to increase this activity as the higher education institutions are 'rewarded' according to the number of mobile students. The Quality Reform promotes exchange through established collaboration agreements, and to a certain degree influences the strategies. For example, the organisations review their portfolio of agreements, rejuvenate 'dormant' agreements and establish new agreements. The University of Bergen as well as the University of Life Sciences are reviewing their portfolio of formal agreements of collaboration with foreign institutions. The University of Tromsø expects funding to be increasingly connected to

formal exchange programmes; thus, the university puts weight on mobility through these agreements.

The issue of economic competition also plays a role in the institutions internationalisation strategies; the higher education institutions experience increased competition for national students. This, again, may be related to the influence of the national reform which allocates funding to the higher educational institutions according to production of credit points and degrees. All the higher educational institutions perceive themselves as actors in a competitive (mainly national) student market. It is considered that offering an international campus, an international education and an international outlook, is a way of attracting national students. Increased competition for students influences student mobility strategies.

In addition to external influences on the strategies, the institutions also contribute to increasing this impact as when the University of Bergen and the University of Life Sciences seek to ensure the academic quality of sojourns students have abroad.

There are double external drivers regarding research funding. The organisations relate to the funding possibilities of the EU; however, this incentive is strengthened by national policy measures since, to a certain extent, national funding depends on financial support by the EU. The new performance-based funding system rewards the higher education institutions according to the level of grants they receive from the EU. The university colleges observe that budgets are increasingly determined by research activities, and they expect national funding to be increasingly competitive. The national funding policy is also important to the University of Life Sciences' measures for profiling research.

In addition to the influence of the international environments on research, national environments are seen as impacting these strategies. The University of Life Sciences perceives that national research policy gives incentives to profiling research. The national influence on activities that the organisations undertake concerning attempts of steering research activities is thus distinct. This university also notes that the national policy is important in relation to research priorities.

Thus, the higher education institutions adaptation to their environments is clearly confirmed. However, we also observe how they draw the attention to their own tradition and identity: the University of Bergen points to its long-standing international tradition, and Oslo University College to its multicultural self-understanding as being important inputs to the strategies the organisations formulate.

The aim of increasing the academic quality of the higher education institution by engaging in international activity is a main justification in both institutions, although they have different missions. The University of Bergen perceives international collaboration as a necessary quality of research; to be an international university, international collaboration is a prerequisite. Research collaboration is an instrument to remain an internationally recognised university. To ensure the quality of research by participation in national and international evaluations, increased use of international contacts, increased use of guest researchers, and international publishing are the major objectives of the university.

Academic values are important to the internationalisation strategies at the university colleges as well. At Oslo University College, it is argued that researchers

have always had international relations. Students and researchers' interests are important for the establishment of bilateral agreements. OUC works to encourage their researchers take part in international knowledge dissemination. The research community is increasingly international and the researchers want to take part in this development. At OUC, formal agreements of collaboration are perceived as increasing the quality of research and education. Furthermore, it is argued that the teachers could preferably convey insights from the international research agenda to improve teaching and learning.

In addition to the influence of external environments, we observe that academic justifications, and thereby a link to the institutions' core tasks, are an important feature of the strategies. International activities ingrained in the academic culture justify the formulation of the strategies. The academic justification of research activities is, however, most evident at the universities. The University of Bergen perceives itself as part of an international network of universities and has both regional and international aspirations, while the University of Tromsø seeks to develop excellent research and obtain international academic recognition in certain fields. The University of Life Sciences seeks maintain its role as a leading international research and educational institution. To integrate international research questions in research activities is considered a means by which this goal can be attained; to stimulate international publishing of research results is another. The University of Life Sciences perceives increased international collaboration as a means to reach the goal of maintaining its role as a well-acknowledged research university internationally. The University of Bergen and The University of Life Sciences state that to attract foreign researchers it is important to increase the academic quality of the university.

The relation between increasing the academic quality in order to increase economic competitiveness is yet not relevant. The economic dimension of internationalisation seems to be viewed more as a threat than an opportunity. The University of Bergen experiences increased competition from long-distance providers of education, and seeks to combat these by offering what they express as a 'high quality of education'. Oslo University College argues that to offer an international campus is important when competing for students.

In addition to academic justifications, global solidarity is an important feature of internationalisation strategies, mainly of the universities. The University of Bergen highlights the importance of obtaining an international position. To contribute to solving global problems and challenges it is necessary to collaborate across scholarly fields. In addition, to strive for a high academic status, there is a commitment to contribute to solving world problems and challenges. The university emphasises that collaboration with developing countries encourages local competence-building. It is important to support the development of research facilities in these countries. The University of Tromsø's priority is to contribute to the development of research in a global perspective. The university aims at increased mobility from the countries of the South, and which is seen as an instrument to increase internationalisation of the university. The University of Life Sciences aims at being an attractive player in the international society with a special responsibility towards countries of the South where the goal is to increase competence in the countries of this region.

6.7 'Paper Tigers'?

Judged by the increasing formalisation and standardisation of the international activities in both institutions – the University of Bergen and Oslo University College – internationalisation seems more institutionalised than mere a 'paper tiger'. One measure of institutionalisation is the efforts to reduce language barriers. Actions are undertaken to increase the use of English in the educational programmes in order to facilitate student mobility. All the universities have Master programmes taught in English, while all the higher educational institutions have courses taught in English. New Master programmes taught in English are to be established both at the University of Bergen and the University of Life Sciences. Oslo University College has established courses taught in English, while the University of Tromsø expects that harmonisation of grades and credits, as intended by national policy, will serve to increase student mobility.

However, there are differences between the universities and the university colleges in terms of how broadly internationalisation seems integrated in the organisation. One indication is the link between funding and the internationalisation strategies the institutions develop. Funding is, of course, crucial in maintaining research activities, and at the universities it is emphasised how international relations promote funding, also the other way around – how funding promotes international relations. At the University of Life Sciences, having international contacts is seen as an asset when searching for funding. At the University of Tromsø, the academic quality of the university is regarded as decreasing if the international funding decreases. Collaboration with high quality higher education institutions abroad is a means to attract international funding.

Another measure of the embeddedness of the strategies is the extent of EU funding. On this point too, there are differences between the universities and the university colleges. Currently, EU funding is high in all three universities (between 4 and 5 per cent of the total research funding), while it is considerably lower at Oslo University College and Agder University College. The University of Tromsø expects the importance of EU funding to increase and the University of Life Sciences seeks to increase international funding with a focus on EU funding. The university colleges as, for example, OUC, are interested in attracting this kind of funding.

There is another distinction between the universities and the university colleges in the use of academic justifications for internationalisation. The universities establish a link between student mobility and academic quality. At the University of Tromsø, student mobility is to be embedded in quality and intended to strengthen all activities of the university. Student mobility at the University of Life Sciences is seen as fostering research relations. Here, exchange of students and researchers is considered a means to receive international inputs.

Increased formalisation at the universities is linked to the aim of increasing the academic quality: this justification is not yet that evident at the university colleges. International collaboration, including formal agreements of collaboration, is a strategy to foster and maintain research activities and research possibilities. At the University of Life Sciences, formal collaboration agreements were established to

facilitate student mobility as well as research relations. The disciplines are important; they are included in the process of establishing the collaboration agreements. Internationalisation is seen as a quality sign: the best disciplines have intensive collaboration, and also the best student exchange agreements. Not to engage in formal collaboration is seen as hampering the possibilities to conduct research.

The weight put on academic justification of internationalisation can be compared to the patterns of international publishing, which of course differ between the universities and the university colleges. Academic international merits have increased substantially in all the institutions during the last ten years. The University of Bergen increased the number of international publications measured by ISI, from about 1800 to 2600 (1991–2002), an increase of 44 per cent. The University of Tromsø experienced an increase from 810 to almost 1200 articles, an increase of 48 per cent, while the University of Life Sciences increase was from 320 to 630, an increase of 97 per cent. The numbers are small at the university colleges and we should interpret them carefully. Oslo University College has about the same number of international publications (ISI), 36 in 1994–1996, compared to 46 in 2000–2002. Agder University College has experienced an increase from 19 to 49.

Finally, the aid dimension justifies the formalisation of the international relations – mainly at the universities, and can be observed in the co-authored articles at the universities with African researchers as well. When looking at co-authored publications with Africa at the University of Bergen, we observe that they remain constant at between 3 and 4 per cent of the total number of co-authored articles incorporating researchers at the university. The number of co-authored articles with African colleagues as a share of the total number of co-authored articles at the University of Tromsø has increased from 0.4 to 1.6 per cent. At the University of Life Sciences, cooperation with researchers in Africa resulting in co-publications has increased from 8.4 to 10.4 per cent. Oslo University College has 7.4 per cent co-publications with Africa in 2000–2002, but none in 1994–1996. Agder University College had 2.5 per cent African co-publications, but none in 1994–1996.

6.8 Context and Core Tasks Interplaying

This chapter has presented an analysis of the influence of external environments and internal values for the internationalisation strategies in higher education institutions in Norway. The analysis is based on a study of five Norwegian higher education institutions. On several indicators, international relations are strengthening: international research publications are increasing as are co-authored research articles with African colleges. EU funding is increasing, as is student mobility.

This study has demonstrated how external expectations are important to these higher education institutions by offering guidelines on how to be perceived as legitimate. The external environment of the organisations is perceived as influencing the internationalisation strategies the institutions develop. Economic justifications of internationalisation are also referred to. An increasingly competitive (national) student

market, together with the fact that the higher education institutions are rewarded for the number of outgoing students, imprints the internationalisation strategies. When comparing the influence of the EU and the national environment, the national policy seems still quite influential on the institutions' internationalisation policies. The importance and the impact the current Quality Reform in Norwegian higher education has on the internationalisation strategies, leaves the impression that these institutions are still nationally embedded. However, these national policies themselves relate to international policy developments in higher education. The institutions strive to reflect and relate to the expectations. The expectations are expressed in several forms: changing rules and regulations, norms and values. The higher education institutions clearly try to formulate strategies that echo the claims of the environment. In this perspective, it becomes necessary for the higher education institutions to respond to international initiatives and national polices in order to 'dress up' in an international outfit, also in order to contribute to ensure that the amount of resources and funding is sustained.

Nevertheless, higher education institutions' international academic traditions and their institutional 'robustness' enable them to formulate autonomic strategies. In this sense, the internationalisation strategies are also based on academic values and identity. This observation goes mainly for the universities, but also for the university colleges, academic ambitions are important justifications of the internationalisation strategies.

We observe that the organisational strategies are not solely embedded in academic values and linked to the core tasks of the organisation: both solidarity and economic values play a distinct role when the higher education institutions are arguing why internationalisation is desired. All these values are important, and they provide the rationale for responding to the international incentive programmes and national policy measures.

We conclude that expectations in national policy and the international environments, and the reference to the research activities inherent international profile drive the internationalisation strategies of the higher education institutions. The top level of the organisations direct and support increased international activities by referring to this double justification. Internationalisation in higher education institutions in this way is a case of match between the inherently international character of academic activities and external demands and changing environments. These pressures push the organisations to formulate both a more explicit internationalisation policy, and to engage increasingly in borderless activities. However, the universities seem to have more conditional features in which to embed the strategies, while the university colleges also relate to the idea of inherently international research as justification of internationalisation.

Concerning external influences on the internationalisation strategies, EU relations are justified as a means to increase academic quality, and the current national reform of higher education in Norway puts internationalisation high on the agenda. Institutional theory expects changes to be more easily implemented if the normative basis of the change converges with the values of the organisations. This seems to be the current situation when trying to understand our cases.

The findings indicate several features which consequently fit into an institutional interpretation of the case. These findings seem to relate to the fact that these organisations are typical institutions – i.e. organisations infused with value. Internationalisation becomes a case of match between the environmental change and basic values and identities. In cases of such match, the organisations neither have to resist, translate nor decouple the environmental changes. The case study indicates that the organisations formulate strategies both with reference to external drivers, and internal basic values and tradition. The national policy as expressed in the Quality Reform, and supplemented by new international regulations, has been observed to promote and strengthen the internationalisation of the higher education institutions. However, the institutional strategies can also be seen as an acknowledgement of the basic values of these institutions where the internationalisation of both research and education is fundamental to their status and role in the global society.

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Chapter 7
Translation of Globalisation and Regionalisation in Nordic Cooperation in Higher Education

Peter Maassen, Agnete Vabø, and Bjørn Stensaker

7.1 Introduction

Norwegian research and higher education are positioned in a number of international arenas, including the Nordic region consisting of Denmark, Finland, Iceland, Norway, Sweden and the autonomous areas of Greenland, the Faroe Islands and Åland.

Nordic cooperation in higher education has a long tradition. As such, it can be characterised as a specific form of internationalisation in higher education, i.e. regional cross-boundary cooperation. In an increasingly internationalised and globalised sector, Nordic cooperation in higher education is an interesting object of study, especially since it was established well before the current interest in higher education as an economically important sector. As such, it is an example of the many ways internationalisation is manifested in higher education. While the traditional rationale for Nordic cooperation in higher education was culturally and academically based, in this chapter we discuss how such traditions are challenged by emerging new rationales for internationalisation; those related to economy and market competition.

Based on a number of studies of Nordic cooperation in higher education (Maassen and Uppstrøm 2004; Stensaker and Danø 2006), data analysing institutional behaviour and strategies, Nordic cooperation schemes within the sector, and recent Nordic policy initiatives concerning future cooperation, a discussion is made of the factors that hamper and stimulate current cooperation. In addition, the relevance and potential effects of suggested future strategies for the survival of Nordic cooperation are analysed.

The chapter is organised as follows. In the next section, a short history of the Nordic cooperation is presented including how the Nordic higher education systems participate in European integration efforts through the Bologna process and the Lisbon agenda. Thereafter, data from a study on how Nordic higher education institutions participate in various Nordic and international cooperation schemes

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and initiatives are presented, including institutional views on future options and strategies. These findings are then discussed in the light of recent policy initiatives concerning internationalisation, both at the European and Nordic levels. In the conclusion, a discussion is made of whether Nordic cooperation is changing, and what the future of this kind of regional cooperation is in a more globalised higher education sector.

7.2 Nordic Cooperation

The Nordic Council was founded in 1952 as an organ for parliamentary cooperation between Denmark, Finland, Iceland, Norway and Sweden. In 1971, the Nordic Council of Ministers was established as a forum for Nordic governmental cooperation. This Council of Ministers has a formal constitution which varies according to the theme to be dealt with. All in all, the work of the Council is subdivided into about 20 separate councils, including one which is responsible for education and research. Decisions by the Council of Ministers have to be unanimous, and they are binding for the members states. In some cases, decisions must also be approved and ratified by the national parliaments.

Comparable to the EU with its Lisbon Agenda, in 2000 the Nordic Council of Ministers also adopted a Nordic Agenda and a strategy for Nordic cooperation. The Nordic Agenda highlights five areas of special importance for Nordic cooperation:

1. Technological development with special reference to information society and Nordic research.
2. Social security and the possibility for Nordic citizens to live, work and study in another Nordic country. Questions of demography and migration.
3. The internal Nordic market and cooperation for abolishing border obstacles.
4. Cooperation with neighbouring countries and neighbouring regions.
5. The environment and sustainable development in energy, transport, forestry, fishery, and trade and industry. (Nordic Council of Ministers 2002)

As a consequence of the agreements reached in the Nordic Council and Nordic Council of Ministers over many years, the Nordic countries have had a common labour market, have established common institutions in various policy areas, and have developed cooperation schemes and programmes. With respect to education, this has resulted in various mobility programmes for pupils, students, teachers and researchers (including the NORDPLUS programme for students and teachers, described below), agreements for the mutual recognition of degrees and study programmes, simplified admission requirements for Nordic students throughout the region, and various expert committees for policy issues and cooperation initiatives. Further, a number of cooperation programmes have been implemented relating to research. The Nordic Science Policy council was established in 1983, and cooperation in the area of research training has existed since 1990.

The socio-economic, political and cultural similarities between the Nordic countries form a solid foundation for their long-term cooperation. Although there are clear political, economic and historical differences between the countries, policy-making in this region is often characterised as being a result of the 'Nordic Model' (see, for example, Fägerlind and Strömquist 2004:45–48; Christiansen 2006; Nordic Council of Ministers 2007). With respect to higher education, typical ingredients of this model are state-owned higher education institutions but with institutional autonomy in many areas, high levels of state investment, strong emphasis on equality concerning the institutional landscape, and the way in which public resources are allocated throughout the system. To complement this picture, the state has traditionally also offered quite favourable student support schemes with the aim of stimulating high participation rates in the sector.

The Nordic countries are also part of other international trade and cooperation agreements. Since three of the five countries are EU-members, and the remaining two are part of the European Economic Area (EEA), all countries are especially well-integrated into European reform and cooperation initiatives at various levels. With respect to higher education, the two most important of these are the Bologna process and the Lisbon agenda (Maassen and Olsen 2007). All Nordic countries have signed the Bologna Declaration and are active in reforming their higher education systems within the framework provided by this declaration and the biennial ministerial Bologna meetings. Hence, since 2001 all Nordic countries have amended their legal frameworks with respect to higher education, and changed the higher education degree structures, as well as having introduced a number of other 'Bologna-related' changes.

Important overall aims of the Bologna Declaration are the development of a European Higher Education Area (EHEA) and promotion of European systems of higher education throughout the world. For this to be achieved, among other things, the following objectives will have to be attained:

- Adoption of a system of easily readable and comparable degrees in order to promote European citizens' employability and the international competitiveness of the European system of higher education.
- Adoption of a degree system based on two cycles.
- Establishment of a system of credit transfer – preferably based on the ECTS system.
- Promotion of mobility overcoming obstacles to the effective exercise of free movement for students and teachers, researchers and administrative staff.
- Promotion of European cooperation in quality assurance with a view to developing comparable criteria and methodologies.
- Promotion of the necessary European dimensions in higher education, particularly with regards to curricular development, inter-institutional cooperation, mobility schemes, and integrated programmes of study, training and research. (European Ministers Responsible for Education 1999)

One might argue that European integration represented by these processes poses a special challenge to Nordic cooperation in higher education, especially since some

of the Nordic cooperation activities, e.g. student and teacher mobility schemes, and recognition of degrees and mutual recognition of study programmes, have also been very high on the agenda in Europe. Therefore, it is an interesting issue whether Nordic higher education institutions have managed to maintain the traditional Nordic cooperation when confronted with high-profiled European initiatives in this field.

7.3 Institutional Practice in and Perceptions of Current Cooperation Schemes

In 2004, NIFU STEP was asked by the Nordic Council of Ministers to study the effects on Nordic higher education of the changing context for internationalisation (Maassen and Uppstrøm 2004). For that purpose, nine Nordic higher education institutions were selected for a comprehensive analysis of the dynamics of their Nordic cooperation strategies and practices. The study showed that all universities and colleges included were involved in cooperation activities with other Nordic institutions; further, that Nordic cooperation is well integrated into the general internationalisation activities and structures of the institutions, in most cases with a clearly identifiable separate position. The latter does mean that in practice in most institutions one administrator is responsible for all 'Nordic issues' in the central administration of the institution.

Furthermore, only a few of the academic staff interviewed at the institutions expressed doubts about the importance and relevance of Nordic cooperation in higher education in comparison to other forms of internationalisation. In their opinion, the Nordic countries are historically committed to Nordic cooperation and hold on to its traditional roots – even if the world outside this region is changing. In general, academic staff showed a broad support for, and appreciation of, Nordic cooperation in higher education. The developments in the environments of the institutions, including, for example, the Bologna process, did not seem to have influenced the appreciation of Nordic cooperation as such; the positive attitude towards Nordic cooperation can be regarded as an intrinsic part of the basic academic and organisational culture in Nordic higher education. However, despite the general appreciation of Nordic cooperation, nowhere does it form the 'core' of the focus on internationalisation in individual higher education institutions.

As is also the case for other similar activities related to internationalisation of education (at all levels), international exchange of staff, pupils and students is marked by many challenges and obstacles. The barriers to mobility are many, and it takes considerable resources to reach the goals for such programmes in a satisfactory manner (Teichler 2002; Vabø and Smeby 2003; Tjomsland 2004; Vabø and Nerdrum 2006). In higher education and research, the internationalisation practice has the character of a 'battlefield' in a number of ways since various programme actors compete for attention and participation from students, staff and educational authorities. At stake also is the question which countries, regions and institutions

are regarded as being politically the most important, and academically and socially the most attractive from a student perspective, and what type of measures serve the internationalisation aims in the most efficient manner. In the informal hierarchy of possible internationalisation programmes, the funding possibilities, procedures, destinations, target groups, etc., of Nordic programmes compete with other programmes, implying that the Nordic region as a destination for students and staff competes with other regions, not least the UK and Australia, but also attractive countries and institutions in other parts of Europe. On the other hand, to take part in a Nordic programme also functions in certain respects as preparation for an eventual participation in European programmes.

7.3.1 Respondents' View on Nordic Cooperation in Higher Education

The question can still be raised what the main practical and formal arguments are for Nordic cooperation in higher education. For those involved in Nordic cooperation, the answer to this question might be obvious. From a political and bureaucratic perspective, the arguments for Nordic cooperation might be taken for granted. However, given the rapidly changing nature of the international dimension in Nordic higher education as well as in the rest of Europe, it is of interest to identify the main practical and formal arguments for the Nordic cooperation in higher education.

When interviewees were asked to reflect upon what they felt were the main arguments for the special focus on *Nordic* cooperation in higher education, the following main reasons were put forward:

- The 'historical and cultural ties' between the Nordic countries.
- The quality of higher education in the Nordic countries, which makes cooperation with the 'neighbours' attractive and natural.
- In a number of academic fields, for example, health care and nursing, Nordic languages, history, and culture, educational and pedagogic sciences, and law, there are specific Nordic aspects that distinguish the Nordic teaching and research programmes from non-Nordic programmes, and make cooperation obvious.
- Especially in Denmark, Iceland and Norway, the size of the Nordic countries was seen as an issue. It was argued that it was difficult for the individual countries to be good in all academic fields.
- Many students mentioned the relative safety of the Nordic countries. Especially mature students with families saw this as a possible 'pull factor' for going to one of the other Nordic countries.

In addition, it has to be mentioned that for some, 'the common Nordic languages' formed an argument in favour of Nordic cooperation in higher education. However, for many interviewees in Iceland and Finland the use of any of the 'core Scandinavian languages' (Danish, Norwegian, and Swedish) is hampering Nordic cooperation. They preferred English as the language of communication in Nordic cooperation.

7.3.2 Formal Rationale for Nordic Cooperation in Higher Education

How do these arguments given by actors in the practice of higher education compare to the 'formal rationale' of the Nordic cooperation agreement as emphasised by the Nordic Council? The elements that are argued to shape the Nordic identity and as such form the rationale for Nordic cooperation in general are:

- Geographic location and climate.
- Common language and religion.
- Comparable politics.
- Specific societal dimensions, such as the mixed economy, the focus on equality, the welfare state notion, the focus on a clean environment, and a common legal conception.

With respect to the Nordic dimension in higher education the NORDPLUS programme is aimed at creating a foundation for Nordic interdependence in higher education. This programme has three specific goals:

- To support and intensify the cooperation between Nordic higher education institutions in order to establish a Nordic educational higher education community.
- To increase the number of Nordic higher education students undertaking the whole or part of their studies in another Nordic country.
- To increase the exchange of teaching personnel with the aim of improving the quality of higher education in the Nordic higher education institutions.

Main instruments for achieving these goals are student and staff stipends, and grants for short study visits as well as for the planning and the implementation of cooperation networks. Priority is given, amongst other things, to small fields that would not survive without a joint foundation, to applications with a clear and balanced division of labour between the various participants, and to applications which manifest a good balance between student and staff exchange.

Looking at these formal arguments, goals, instruments and criteria, Nordic cooperation in higher education has traditionally been aimed at strengthening the Nordic identity. Main arguments for a specific Nordic cooperation agreement for achieving this aim are geographical ('closeness'), cultural ('commonness'), political ('democratic tradition'), and social ('equality and welfare'). The main goals of NORDPLUS are, for example, linked to the Nordic identity (*nordisk samhørighet)*, although academic objectives also are part of the rationale for this programme.

7.3.3 Practical and Formal Arguments Compared

The study showed that there is a large overlap between the arguments for Nordic cooperation mentioned in the practice of higher education, and the formal arguments. However, the study also revealed that arguments justifying Nordic cooperation in

higher education that are related to the 'new internationalisation' realities (Gornitzka et al. 2003; see also Chapter 1 in this book), were rather marginal in the institutions studied. For example, economic arguments were not mentioned by academic staff as important despite the formal importance of the link between higher education and the Nordic labour market. Only indirectly, when referring to the Nordic characteristics of certain fields such as nursing and pedagogics, did some interviewees mention the labour market link. The competitive, and in some respects, commercial orientation of the 'new' internationalisation was not seen at all as a relevant element affecting Nordic cooperation.

7.4 The European Union as the New Competitor for Nordic Cooperation

7.4.1 Nordic Cooperation and the European Union

If we move up one step from the institutional level to the national political level in the Nordic countries, Norway seems to be the country that values Nordic cooperation the most. One of the reasons is that Nordic cooperation in higher education is seen as a possible instrument for giving Norway (indirect) access to EU decision-making processes with respect to higher education. The assumption underlying this position is that the more the Nordic countries cooperate in higher education, the more they are potentially seen by the other EU member states and the European Commission and its staff as 'one relevant bloc'.

Traditionally, i.e. in the 1970s and 1980s, Nordic cooperation was seen as an alternative to intra-EU cooperation (Friis 2007). The Nordic countries for long took the position that Nordic cooperation was to be preferred over cooperation within the framework of the EU. After the EU membership of Denmark, and later Finland and Sweden, the situation has changed. Now the starting point is no longer how to position the Nordic region in the best possible way as an alternative to the EU, but rather to what extent and how the Nordic countries can cooperate within the EU. This position needs to be further reconsidered as a consequence of the recent enlargement of the EU (Nordic Council of Ministers 2003). The former Finnish Prime Minister Paavo Lipponen (Aftenposten 2004) has, for example, indicated that the relative influence of the Nordic countries in the enlarged EU will diminish if the Nordic policy institutions of the Nordic countries are not adapted accordingly. These institutions, including the Nordic Council of Ministers, have been established in another era to cover other requirements than the current needs in international cooperation the Nordic countries are facing, according to Lipponen. Perhaps, as a response to this call for reform, the structure of Nordic cooperation is changing, and similarly to the case of the EU, is expanding geographically. Together, the three Nordic EU members and the three Baltic countries form a potentially influential bloc in the EU, that is if they manage to coordinate their points of view with respect to the main joint areas of interest, and agree to emphasise

their 'jointness' in EU summits and other relevant EU arenas. For Norway, a major challenge in this is whether, and if so, how it will be allowed to participate in the development of the joint views for setting a 'Nordic fingerprint' on EU policies (Friis 2007).

The EU membership of Denmark, Finland, and Sweden has made it easier, and in that sense, more natural for the higher education institutions in these countries to strengthen cooperation activities with institutions in other EU member states. As such, they regard EU cooperation at least as important as cooperation activities with the institutions in the other Nordic countries. There may also be another reason for what seems to be a developing strategy of expansion and cooperation beyond the traditional Nordic area. When going back to the study of the nine Nordic institutions (Maassen and Uppstrøm 2004), it is interesting to note that especially the Finnish and Swedish higher education institutions included clearly were more interested in European cooperation than in specific Nordic cooperation.

7.4.2 The Nordic Cooperation and the Bologna Process

With respect to the internationalisation of higher education in Europe, few actions have been more influential than the signing of the Bologna Declaration in June 1999. The Bologna process, which follows the signing of the Bologna Declaration, seeks to create a 'European Higher Education Area' (EHEA) without barriers. The EHEA is expected to contribute to a higher goal, i.e. to strengthen Europe as a unity, necessary for improving its competitive power compared to other parts of the world. This is supposed to contribute to economic progress, a better functioning labour market and larger internal social cohesion. There is a commitment to implement a clear set of objectives and an accompanying action plan embodied in the process. For those countries that signed the Bologna Declaration in 1999, the whole reform is intended to be implemented in 2010.

It can be stated that a common Nordic Higher Education Area already exists, and as such, the main aim of the Bologna process, creating an open European Higher Education Area, has been realised in the Nordic region. However, while the Bologna process is aimed at taking away structural barriers for European cooperation in higher education, Nordic cooperation was far less based on a structural homogenisation process, for example, a harmonisation of the degree structures. In that respect, Nordic cooperation in higher education is streamlined even more by the Bologna process. Nordic collaboration was previously hampered by significant systemic and political differences with respect to higher education in the Nordic countries. For instance, during the 1990s attempts to increase Nordic cooperation in the area of researcher training were subject to national limitations on the realisation of internationalisation policies (Vabø 2003). More recently, processes of convergence could take place due to Nordic countries' adjustments to European processes of standardisation of higher education – the goals of the Bologna process. This seems to make Nordic cooperation in higher education more coherent and efficient, at least in terms of dominating political ideologies.

Since the signing of the Bologna Declaration, many meetings have taken place at which the Bologna process has been discussed, also at the Nordic level. Nordic university leaders met in Tromsø in August 2002 'to discuss the challenges of the Bologna process to the higher education systems of the Nordic countries and ways for Nordic higher education to contribute to the Pan-European process with and Bologna process based on mutual understanding between governments and universities' (Nordic University Leaders 2002). The core issue, according to the so-called Tromsø Statement, is that the Bologna process must be focused on recognition, not on harmonisation. In addition, it should be a process of convergence, not of uniformity. The main challenge for the involved authorities is to prevent harmonisation and uniformity/homogeneity, and to maintain and protect diversity. The other issues included in the Tromsø Statement represent the general European university leadership interpretation of the Bologna process, as well as more specific Nordic dimensions. Among the first is that university leaders expect the authorities to respect institutional autonomy (in line with the *Magna Charta Universitatum* of 1988). Further, that with regard to the WTO/Gats negotiations, the university leaders support the statement in the Prague Communiqué that higher education is a public good.

More specific Nordic aspects include the emphasis on the involvement and participation of students in the governance of higher education institutions, and the emphasis on the importance of lifelong learning. In addition, the Nordic university leaders want to make the Nordic Space for Higher Education an area of easy transition. A first level degree from any Nordic country should be accepted as a sufficient condition for a second level degree in any other Nordic country, not only formally but also in practice. Further, it was indicated that there is a shared understanding of academic quality and quality assurance in the Nordic countries. The Nordic university leaders would like to develop a Nordic platform for quality assurance in higher education. It is important that this work is done in collaboration with the national agencies in this field, the higher education institutions and the students.

7.5 A Changing Nordic Policy Vista

Nordic cooperation in higher education seems to be rapidly changing its agenda and partly also its rationale for cooperation. Some of the main developments taking place suggest that the traditional academic and cultural motives are being supplemented by economic and more market-based motives.

One of the events that support this argument is the report '*Norden som global vinderregion'* [The Nordic Region as a Global Winner Region] published jointly by the Nordic Council and the Nordic Council of Ministers in 2005. It is argued that the Nordic region is under pressure from globalisation and increased international competition from China and India, and that this prompts the question as to what the Nordic region will live by in the future.

A point is made that it may seem paradoxical that small Nordic countries with high taxation, large public sectors and comprehensive welfare systems can

still achieve top positions in various economic rankings, such as competitiveness indexes, the World Bank's knowledge economy index, economy growth rates, and adaptation of ICT in society. Interestingly, the arguments used when trying to explain this situation are mostly related to social and cultural factors (Nordic Council of Ministers 2005:91). Common Nordic values are the basic factors claimed to result in the top positions, and include equality, proximity to power, inclusion, and flexibility, as well as some basic shared conditions related to the social systems in each country: linguistic similarities, identical level of self-realisation with respect to socio-economic dimensions, and the fact that the Nordic countries often use each other as a frame of reference, Although not claimed to be scientifically validated, the report attempts to make a link between these values and the level of competitiveness in the region. The suggested links between values and economic strengths are:

- Welfare products (linked to equality).
- Innovation (linked to trust).
- Management based on procedural strengths (linked to proximity of power).
- Broad, strong skills base (linked to inclusion).
- Adaptability (linked to flexibility).
- Sustainability and a holistic approach (linked to respect for nature).
- Industry, personal responsibility and efficiency (linked to the Protestant work ethic).
- Design and functionality (linked to aesthetics). (Nordic Council of Ministers 2005:92)

However, it is interesting that while the 'Nordic values' are emphasised as directly or indirectly influencing the strengths above, a rather different conception concerns the education system. When specifying general recommendations for the future, typical measures mentioned are 'mutual learning', 'marketing the Nordic welfare model', and 'branding the Nordic region' (Nordic Council of Ministers 2005:93–95). With respect to education, the objective stated is that the region should have 'the world's best education system'. This rather ambitious goal is followed by suggestions for 'exploiting the brightest talents' and 'investing more heavily in high-level research than currently is the case' (Nordic Council of Ministers 2005:95). As such, the idea of regional development through collaboration in education, research and innovation is increasingly important.

Given the growing interest in the role of regions in the economic literature, this may not come as a surprise. It is rather typical for the spreading of ideas (Kohler-Koch 2005; Gornitzka 2007), as well as illustrative of how the ideology about the value of cross-national educational cooperation develops among actors in the field (Corbett 2005). Another related development is that in recent years the Nordic Council of Ministers has also recruited leading administrative staff with professional experience from the European Commission.

Although the idea of 'Nordic benefit' has gradually developed as a part of the political vocabulary of the Nordic Council of Ministers since the mid-1990s (Brofoss et al. 2003), the report 'The Nordic Region as a Global Winner Region' takes a further step. This document is concerned not only with the cultural and academic

rationale for cooperation between the Nordic higher education systems and absorbing typical contemporary ideas about 'regional cooperation', but also focuses on turning the attention of the Nordic cooperation from an introvert Nordic/Baltic focus to an extrovert, global approach. In line with this new rationale, the Nordic Council of Ministers now seriously considers closer collaboration with actors in the Asian region due to the heavy investments in science and technology currently made in these regions.[1]

Without regard to how ethnocentric the ideas about genuine Nordic qualities as discussed above as well as in other publications, might appear, they seem to serve as a symbolic universe – myths – of which ideologies can justify the Nordic policy initiatives that are put into practice. It should also be mentioned that this symbolic use of politics is also justified by widely- shared concerns about the needs of the future knowledge based economy, in terms of skills, knowledge, as well as due to possible effects of academic migration, demographic patterns (ageing).

In addition to the 'regional ideology' and the 'EU higher education ideology' (Maassen and Olsen 2007), the idea of the Nordic higher education region as a global winner is also nourished by a growing international acknowledgement of the Nordic region due to the emphasis of the Nordic countries on combining expansive national policies for innovation with goals and values of the welfare state (Kallerud 2006). Finland and Denmark are considered as particularly successful examples in this respect.

7.6 Talk Followed by Action

In recent years, talk has been followed by action when trying to implement this emphasis on research and education. For example, NordForsk, as an independent institution responsible for Nordic cooperation in research and research training, and operating under the Nordic Council of Ministers for Education and Research, was established January 2005. NordForsk sponsors Nordic Centres of Excellence (for example, in Molecular Medicine, Welfare, and Food, Nutrition and Health), research programmes, networks, researcher training schools, particularly where Nordic collaboration is assumed to produce added value. Central participants in NordForsk are the national research councils. NordForsk also cooperates with the Nordic Innovation Centre, as both organisations work for the positioning of the Nordic research and innovation area.

In higher education, several initiatives have also been taken. Since 2004, the NORDPLUS programmes cover five different sectors within the system of education. In addition to NORDPLUS Higher Education come NORDPLUS Junior, NORDPLUS Adult Learning, NORDPLUS Neighbour and NORDPLUS Language. In many respects, NORDPLUS now mirrors its EU counterpart – SOCRATES, and

[1] Norden og Asien: 'Globalisering og partnerskap'. Nordisk ministerråd. København 24. januar 2006.

not only because of the inclusion of all educational sectors within one programme. In previous periods of the Nordic cooperation involving schemes in education and research, economic support was granted on the basis of very little competition and/or evaluation of output. Nordic networks and institutions were supported on a more or less regular basis. Since 2004, and in line with the economic and market competitive rationale for such Nordic cooperation, the NORDPLUS activities have been transformed into programmes subordinate to strategic goals of which 'Nordic benefit' (contra the European dimension) is the overall goal. Actors receiving support on a more or less regular basis, such as within the sector of lifelong learning, now have to compete with other actors.

Although somewhat disputable, it is argued that Nordic countries form a distinct region closely related with the Baltic region (Estonia, Latvia, and Lithuania). Historically, particularly Finland (especially with Estonia), and Sweden, have had many bounds to the Baltic region. Similar to the Nordic countries, the Baltic States are also nations with relatively small populations, and are therefore believed to benefit from collaboration in education and research. The Baltic countries as well as North-West Russia have had access to Nordic collaboration and funding through the NORDPLUS Neighbour programme.

Whilst the NORDPLUS Neighbour programme originally had the 'character of aid', since it was not based on co-founding with the Baltic or Russian governments, the Nordic Council of Ministers has now decided that as from 2008, the Baltic States should be invited to participate in programme cooperation on equal footing within NORDPLUS Higher Education, NORDPLUS Adult Learning and NORDPLUS Junior. For the years to come, Nordic collaboration in education and research with North West Russia, will be followed up through other programmes and agreements.

For more than 20 years, the Nordic Council has supported research and teaching within the academic field of Nordic language and literature. Whether Nordic collaboration should be based solely on the Nordic/native languages or should allow the use of English, has been highly disputed among various actors. In order to keep up the support for collaboration in Nordic languages, the NORDPLUS Language programme is closely associated with it, even though it is not formally part of the Nordic Baltic NORDPLUS cooperation. It is too early to say whether this is to be considered an ad hoc solution to achieve a compromise between conflicting interests, or whether it is to be regarded as a differentiation of international activities necessary for the Nordic countries in order to keep up with the needs at both the traditional Nordic and the wider Nordic level. If the latter is the case, we may expect further differentiation of the needs for closer collaboration with other regions in Europe as well as Asia. It depends, we believe, on how these challenges are interpreted and translated at both the national and the Nordic levels. There are already many signs of the Nordic countries developing cooperation with Asian countries and institutions in the years to come. Undoubtedly, in the Nordic context there is competition between different discourses on how to internationalise education and research with respect to the languages used, rationale for cooperation, but also with regard to region – for instance, to what extent it should be directed towards aid and solidarity with more underdeveloped regions (Frølich and Stensaker 2005).

The Nordic Council of Ministers has also suggested launching 'Nordic joint degrees' in areas where the Nordic region has specific and high-level expertise (Stensaker and Danø 2006). This measure is meant to be an initiative in the recruitment of the best talent from inside and outside the Nordic region, and the suggestion is also made that the whole area of quality assurance associated with these new degrees should be part of an integrated Nordic region. This would mean that national quality assurance agencies from one Nordic country could operate in another Nordic country, a procedure that would be rather innovative, also in a global context (Stensaker and Danø 2006:28).

In sum, these changes may have a profound impact upon Nordic cooperation in education and research, and may also be a sign that the overall rationale for Nordic cooperation is undergoing a transformation.

7.7 Conclusions

Nordic cooperation in higher education has a long tradition. Even though it is not the core area of internationalisation at the institutional level in the Nordic countries, it is appreciated by academic staff and students, and seen as an important dimension by the institutional leadership. Nonetheless, the changing political and economic context of the Nordic region, and especially EU membership of three of the Nordic countries and many neighbouring countries such as the Baltic States, has potentially far-reaching consequences for the position and nature of Nordic cooperation in higher education.

While the traditional rationale and motivation for Nordic collaboration in higher education continues to be emphasised at all relevant levels, one can also see clear contours of new ideas underlying Nordic cooperation in higher education. This first concerns the way in which the old cooperation structures, such as the Nordic Council of Ministers, should be adapted in order to make them more flexible and effective (Aftenposten 2004; Friis 2007). Second, the way in which the Nordic region is 'split' between the intra-Nordic collaboration and the strategic alliances between the Nordic EU members and other countries/regions, with the aim of adding a Nordic flavour to EU policies in areas of strategic, political importance to the Nordic countries. A third aspect has to do with the renewal of traditional views and the introduction of new cooperation initiatives. A clear example of the former concerns the *Norden som global vinderregion* policy document (Nordic Council of Ministers 2005). With respect to the latter, we can point, for example, to the initiatives for developing joint Nordic degree programmes in higher education (Stensaker and Danø 2006).

The coming years will show whether Nordic collaboration can find a specific, at least partly new, niche in the changing European and global higher education landscapes. For this to be successful and more than symbolic it is, among other things, of importance that the Nordic countries develop joint policy views on a number of areas where a 'Nordic fingerprint' might be of relevance. This concerns,

for example, a joint Nordic policy on tuition fees (or lack thereof) for EU citizens as well as non-EU citizens; the promotion of Nordic strengths in higher education related to the current focus on learning through disseminating information on best practices (Gornitzka 2007); and a convincing presentation of the advantages of a strong public foundation in the governance of higher education as an alternative to the global promotion of the marketplace.

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Chapter 8
The Internationalisation of National Knowledge Policies

Promoting Interests, Following Rules, or Learning from Abroad?

Åse Gornitzka and Liv Langfeldt

8.1 Introduction[1]

Knowledge policies are an expression of national political intentions, legacies and perspectives on education and research of national political institutions. As such, they also express the framework that defines the boundaries of national research and higher education systems in deeply entrenched national policy traditions and administrative practices. Under what conditions do these nationally entrenched aspects of research and higher education internationalise, and what forms do they take? The focus in this chapter is on domestic adaptation to internationalisation environment at the policy-making level. We analyse the international linkages of the national ministry responsible for education and research and how the national administration and policy areas are affected by internationalisation. The national ministry is the key nodal point that connects policy-making to international policy arenas. We analyse the motivation and organisation that underlie such connections, and the consequences for the organisation and content of domestic research and higher education policies.

Since the birth of the modern nation state, education and knowledge institutions have been part of the core areas of national public policy. This is evident in the Norwegian political–administrative history. The first Ministry to be established

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after Norway gained independence from Danish rule in 1814 was what became the Ministry of Church Affairs and Education.[2] Despite the international orientation of academic activities, historically, higher education and research were *domestic* policy areas – the setting of aims of policy and the choice of means to implement them are the prerogative of the nation state and its political institutions. The international interface of the nation state was administered by the Ministry of Foreign Affairs and belonging to the realm of diplomacy. Especially after the Second World War, the internationalisation of domestic policy and national administrations accelerated. The administrative division of labour between internal versus foreign policy has, for several decades, been hard to maintain (Egeberg 1978), and national administrations in general have increasingly developed international contacts and dealt with international issues in their policy-making (Egeberg and Trondal 1996).

This has also been the case for the national administration of research and higher education policy – these are sectors where there has been a significant intensification of multilateral and bilateral cooperation (Borrás 2000; Huisman and van der Wende 2004). This intensification has taken place in particular within the context of the EU, especially from the mid-1980s. Here, we argue that the increase and institutionalisation of EU cooperation in research and higher education represents a major restructuring of the international environment to the domestic system of policy-making. Norway's approach to European cooperation and changes in the relationship towards the European Common Market, later the European Union, has significantly altered the international interface of its higher education and research policies. When Norway entered into negotiations for membership of the EU prior to the 'no' referendum in 1994 and the subsequent European Economic Agreement (EEA) (Archer 2005), this implied that a new layer of governance was added also in these sectors. Hence, we focus in particular on national adaptation to the EU and analyses of the European connections that have affected other types of internationalisation.

We analyse what is termed 'domestic adaptations' along the following dimensions of how the national administration manages its international 'business'. First, we look at Norwegian *participation* in European and international policy arenas, analysing the motivations, roles and intentions that underlie them. Second, we look at how this participation is *organised* and the *organisational* consequences of internationalisation. Finally, we enquire into the interplay between the changes in the content of domestic policies for research and higher education, and Norwegian participation in international arenas. We discuss the way in which Norwegian research and higher education policies are influenced by international and European policies. More specifically, we ask to what extent Norwegian policies in research and higher education are affected by European level policies, and discuss how this compares with influence from other core international policy arenas in these areas.

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[2] It was referred to as the '1. Departement', i.e. Ministry number 1, and its establishment was followed by ministries for core nation-state function, notably the Ministries of Justice, Police, Interior, and War.

We commence by spelling out our theoretical points of departure. Next, we examine the Norwegian adaptation to institutional developments at the European level in the areas of research and higher education in terms of Norwegian motivation, interests and roles related to participation in these arenas, and the domestic coordination of such participation. Then we investigate the impact of this participation on the substantive elements of domestic sector policies, and ask what imprint the European interface has left on Norwegian research and higher education policies. Finally, we draw conclusions in relation to our theoretical points of departure.

The empirical basis of the study includes analysis of Norwegian government policy documents and personal interviews with central Norwegian representatives in European and international policy arenas. The interview data consist of semi-structured in-depth interviews with key informants who are Norwegian participants in European and international research and higher education policy arenas.[3] We use in particular core national policy documents in research and higher education, Green Papers and White Papers on research and higher education.

A note on the temporal dimension is also required here. When we talk about international adaptation in Norwegian R&D and higher education policy, we need to consider changes over time. In this chapter, we use both informant interviews and a comparison of public documents over time to approach the issue of change and adaptation. We do not presume to provide an analysis of the degree of convergence of Norwegian policy in these sectors as compared to the policies found in other countries. Our aim is much more limited – we examine whether and how the links to international, and in particular the common European processes, have left an imprint on Norwegian policies in these sectors. We are particularly concerned with the period after 2000, yet we draw on relevant studies of prior periods (especially Skoie 2005; Trondal 2005; Gundhus 2007).

8.2 Analytical Points of Departure: Interest, Rules and Ideas in Domestic Adaptation

There is a large academic scholarship discussing the nature of international cooperation and how to understand the institutional development involved in regional cooperation and integration, and the significance this has for the nation-state politics, polity and policies. This study is based on only a fraction of this scholarship.

[3] Interviews lasted between 1 and 2 hours. For research, the informants include key personnel in the Ministry of Education and Research, the Research Council of Norway and the Norwegian Delegation to EU, as well as high-level scientists representing Norway in various international arenas (in total 10 informants). Several of them had seen the internationalisation of research policies from different organisations and over several decades. In this way. the Ministry of Trade and Industry is also covered by the informants. The international areas covered included OECD, EU, UNESCO and other UN arenas, ESF, NATO and Nordic cooperation arenas. For higher education, informant interviews were conducted with officials in the department responsible for internationalisation, and with officials who have participated in the EU and OECD (Gornitzka 2006; Gornitzka 2007).

Drawing on Claes and Tranøy 1999, Sverdrup 2000, Claes 2003, Olsen 2003 and Checkel 2004, we use three analytical perspectives which we adapt to the purpose of this study. They represent three major mechanisms and dynamics by which domestic policies may relate to their international environments, and are inspired by different explanatory social science perspectives and logics. But we believe they can provide complementary insights into different aspects of the same processes.

Firstly, international participation and adaptation of national policies can be seen as a consequence of *rational calculation* – that national policy makers follow a logic of consequence when they engage in the international/European cooperation. They participate in order to promote their interests and reap the awards that accrue from participation in cooperative activities and from adjusting and aligning their policies. In this perspective, international participation aims strategically to promote nationally-defined interests. The rewards may not only be material, such as access to markets and funding structures, but they may also be social (Checkel 2004:3). They can, for example, include the intrinsic value of recognition or national reputation. The reputation of being an attractive and reliable partner may be seen as paying off in future cooperative efforts. In this perspective, participation and adaptation are seen as political–administratively controlled and designed (Sverdrup 2000:60–62).

In the second perspective, *rule-based adaptation to the international environment*, we assume that actors are non-calculating and have limited possibilities to foresee the cost/benefits of participation and adaptation. Participation in international arenas is based on role enactment and rule-following. When nation-states engage in international arenas they act according to the role that they see as appropriate for them to take on in an international context, and domestically their policies are adjusted to conform to the rules of the international arena in which they engage. 'Action is obligatory, derived through a process of the interpretation of an identity, codes of conduct and the obligations and rights that follow from them in different situations' (Olsen 2003:927). National adaptation to international regimes is mediated by political and administrative institutions, their rules and norms (Bulmer and Burch 2005). This perspective consequently assumes that international arenas of cooperation embody norms and values, practices and ingrained habits. Yet, 'the rules followed' by the national representatives in the international arenas will most likely be a combination of the rules of conduct that are established as part of the international arena and nationally defined roles. The way in which national administrations organise their attention towards their international environments and policy arenas is important from this perspective. According to a rule and role-based perspective, the organisational capacities, resources and permanent manpower devoted to a policy area are decisive for participation in, and adjustment to, international policy arenas.

The final perspective, learning from abroad or *idea-based adaptation*, would see participation in international policy arenas significantly mould and change the mentality, ways of thinking and underlying policy theory within a policy sector. There are several versions of this mechanism, ranging from the wholesale transmittance of entire policy paradigms within a sector, diffusion of normative underpinnings of policies, framing of policies (Ugland 2003), to more limited learning and diffusion

of policy components within a sector. Various versions of idea-based adaptation may also generate instances where the policy objectives are adopted[4] but instruments are not, or where policy instruments borrowed from the international environment are used as solutions to policy objectives of another nature (Banks et al. 2005). In cases where common values, ideas and causal beliefs are shared across different political-administrative systems, and including staff and secretariats of international organisation, one can talk of trans-national 'epistemic communities' as carriers of international idea-based convergence in a policy area (Haas 1990; Haas 1992). However, we do not see the existence of an epistemic community as a necessary precondition for idea-based adaptation of domestic policies. All participation in international policy arenas represents an exposure to 'international information', to other nation-states' experiences, as well as to commonly defined categorisations, and 'policy language'. Learning from abroad may entail fundamental changes in underlying policy ideas, also when these ideas are not carried or promoted by any trans-national epistemic community.

These mechanisms or dynamics of policy adaptation do not necessarily have the same strength and longevity. Rational calculated participation and adaptation can be seen as the least stable and 'loyal' – the moment the calculus tilts the balance and costs exceed benefits, then we would expect to see deflection and non-adjustment. There is no intrinsic value in participating in international cooperation and engaging in domestic adaptation unless it pays off. When participation and adjustment is role-enactment following rules and standardised procedures, then a type of behaviour, we assume, has become set in its ways and is not readily changed. However, the participation might be routinised and standardised yet producing very little substantive change in domestic policies – participation is a ritual of little domestic consequence. Idea-based participation and adaptation is both more elusive and subtle, but yet potentially more profound as it can involve the change of entire cognitive maps that guide policy development.

8.3 Connecting Internationally: Domestic Adaptation to International Developments

8.3.1 The Overall Picture of Participation

The number of international arenas that Norway's higher education and research policy is connected to is high compared to other policy areas. Memberships and relations with international organisations proliferate along with multilateral cooperative

[4] We differentiate between adaptation and adoption in the following way. Policy adaptation may include any kind of policy change to adjust to international environments; Policy adoption, on the other hand, denotes a specific form of policy adaptation resulting in policy similarity as policy elements from abroad are copied into the national policy-making arena. All three perspectives may be employed both for studying adaptation and adoption.

efforts and agreements. In this respect, the domestic policy area is perforated by numerous international interfaces (see Table 8.1).[5] As illustrated, the proliferation of international policy arenas has occurred after the end of the second World War, and also an extension of the activities by international organisations into the research and higher education domain. In the research policy domain, the 1980s brought two momentous events: the establishment of EUREKA and the EEC RTD Framework Programmes. Especially the latter, together with the geographical expansion of the EEC/EU, implied a significant restructuring of the European science policy architecture (Borrás 2000). For higher education policy in Europe, such major transformation occurred later, towards the end 1990s, with the advent of the Bologna agreement and the subsequent process of cooperation towards establishing a European Higher Education Area.

There are two distinct features of Norway's international interface in research and higher education at the policy level that set it apart from most other European countries. First, there is the long tradition of neighbourhood regional cooperation among the Nordic countries. The Nordic Council of Ministers' involvement in research and higher education policy are arenas of institutionalised regional integration that have both preceded and run parallel to European and global cooperation processes. Albeit, on a limited scale in terms of financial resources and legal commitments, these arenas have brought together ministers of education/research and their civil servants and national research councils in the Nordic countries on a regular basis (Skoie 2005).

Second, on two occasions (in 1972 and in 1994), the Norwegian electorate defied the recommendations of its government by voting down membership of the EEC/EU. In this way, Norway has avoided formal membership, but not integration as such. The general political development in Norway's relation to the EEC/EU has had considerable implications, also for its international interface in research and higher education policy. In the 1960s and 1970s, Norway was somewhat hesitant towards active participation in the research cooperation that emerged in Europe at the time (Skoie 2005:254). From the latter part of the 1980s, there was a significant shift and a more active approach to European research cooperation in Norwegian research policy. Especially the wave of EU adjustment, instilled by the prospect of membership in 1994, signalled a strong focus on participation in the European arenas in research and higher education (Gundhus 2007). Since 1994, the European Economic Agreement (EEA)[6] has been extraordinarily important as it includes the right to participation in the research and education programmes of the EU. This has led to a shift in the budgetary appropriation for international activities in the ministry's portfolio for research. From the time Norway started to participate fully in the EU Framework programmes in 1994, the state appropriations for EU research have

[5] The table only includes general R&D policy arenas, and not the manifold sector arenas such as ESA, CERN, EMBC/EMBL, IPCC, IIASA and CGIAR. Cf. Chapter 7 concerning the geographical scope of the 'Nordic' arenas.

[6] Norway's signing of the EEA agreement incorporated Norway into the Single Market, but not on an equal footing with the full EU members. The EEA agreement obliges Norway to implement directives which, in reality, are determined by the full EU members and the EU institutions.

Table 8.1 Norwegian participation in main international HE and R&D policy arenas

Arenas			Background and scope
General R&D policy	Nordic	Nordic Council of Ministers for Education and Research (MR-U).	Part of Nordic cooperation dating back to formation of Nordic Council (1952), and Nordic Council of Ministers (1971).
		NordForsk - Nordic Research Board.	NordForsk replaced part of former Nordic R&D structures in 2005.
	European	EU: Scientific and Technical Research Committee CREST	Since 1974. Includes several working groups.
		EU: RTD Framework Programme	Since 1984. Norway fully participates since 1994. Includes a large number of committees.
		ESF: European Science Foundation	Since 1974. Pan-European association. 78 member organisations.
		COST: European Co-operation in the field of Scientific and Technical Research.	Since 1971. Managed by ESF (until 2003 by the European Commission). 34 member states.
		EUREKA	Since 1985. 35 member states.
	International	OECD/CSTP Committee on Scientific and Technological Policy	Since 1961/972. 30 member states, 4 subcommittees.
		UNESCO	Established 1945. Norway member since 1946. 191 member states. Several committees.
Higher education policy	Nordic	Nordic Council of Ministers for Education and Research (MR-U).	Nordplus staff and student mobility programme. Agreement on Access to higher education (1994).
		Nordic Advisory Committee on Higher Education HØGUT	Committee of Senior Officials preparing ministers' meetings and follows up on their decisions. Development initiatives and advising the ministers.
	European	EU: Education Programmes	Since 1976 (Erasmus/Socrates), from 2007 'Integrated Lifelong Learning Programme'.
		EU: 'Education and Training 2010'	European cooperation linked to the Lisbon Process. Norway associated member.
		Bologna Process – towards establishing the European Higher Education Area (EHEA)	1999 the Bologna declaration.
		Council of Europe – Committee for higher education and research (CF-HER)	Cooperation based on The European Cultural Convention (1956). Cooperation on mutual recognition of degrees and study programmes ('Lisbon Convention' est. 1997).
	International	OECD – Education Committee (From 1 January 2007 renewed mandate and renamed Education Policy Committee)	Since 1970. Policy review and advice, information exchange, cooperation on indicator development (INES).
		UNESCO	Established 1945. Norway member since 1946. 191 member states. Several committees.

increased considerably. In ten years, the share of the EU Framework programme increased from 12 to 34 per cent of the total budget of the Research Council of Norway for international cooperation (Table 8.2).[7] This is already strong evidence of the significance of the European level for domestic policies in these sectors.

European cooperation within the EU is a nesting ground for organised linkages between different levels of governance, connecting in particular national administrations to the EU institutions. This is particularly the case in the areas of research and education as policy domains – the European Commission's Directorate-General for Research organises more committees and working groups than any other Directorate-General (Gornitzka and Sverdrup 2008). Hence, the EU represents considerable opportunities, also for national administration, to connect to the European level, not least for Norwegian officials in the Ministry and in the Research Council.

On average, for the Ministry of Research and Education as a whole, the European contacts are at the level of most ministries in other sectors. According to a survey of the Ministry of Education and Science, one in three ministry officials works on EU dossiers, and almost half report that they are affected by the EU and/or the EEA agreement, and about a quarter of the officials claim that the European Commission has become more important for their portfolio; 10 per cent are in contact with the

Table 8.2 The Research Council of Norway's budget for international research collaboration, Mill NOK 1996–2005

Arena/ organisation	1996	1998	2000	2001	2002	2003	2004	2005	Per cent increase 1996–2005
EU	35.4	35.8	57.5	57.1	58.8	72.3	134.0	188.3	432
EUREKA	20.0	19.7	33.0	20.3	21.0	18.0	24.5	25.2	26
COST	3.8	2.0	2.5	2.0	2.9	3.2	2.6	2.6	−31
CERN	11.2	9.0	11.3	11.3	13.1	13.1	14.0	13.5	21
EMBL	5.7	7.2	7.6	8.4	9.4	4.4	22.0	22.0	286
ESA	10.2	6.2	6.0	7.5	8.1	8.1	12.1	11.6	14
Nordic cooperation	10.9	14.9	21.2	16.5	15.5	18.0	24.1	25.2	131
Other*	190.6	226.5	249.5	242.9	239.4	216.5	252.6	260.4	37
Total	287.8	321.3	388.4	365.8	368.1	353.4	485.8	548.8	91
EU as per cent of total	12	11	15	16	16	20	28	34	

Source: Figures provided by the Research Council of Norway. 1996–2001 are figures from Sundnes et al. 2002: Table 3.4. 2002 to 2005 figures were provided by RCN in April 2007. Figures for 1996–2004 are estimated expenditures. Figures for 2005 are budget figures.

*Includes other international collaboration at the RCN budget, both other multilateral collaboration as well as bilateral, and institutional and person-based collaboration.

[7] The Norwegian contribution to the 6th Framework Programme amounts to 75 per cent of the total Norwegian contingent under the EEA agreement (UD 2006:15).

European Commission very often, or fairly often (Trondal 2005). These mean figures, however, fail to capture significant differences between the various departments within the ministry. The departments dealing with universities and colleges, as well as the research policy department, have had a much more international and European orientation compared to departments with compulsory and vocational education dossiers (Gundhus 2007). The average figures therefore depreciate the internationalisation of ministerial policy-making in research and higher education.

8.3.2 National Motivations and Aims in International Policy Cooperation

8.3.2.1 Research Policy

From Norwegian government documents on R&D policy, we can identify several key issues in the internationalisation of research and participation in international research policy initiatives. They have to do with *industrial interests*: globalisation implies that the industry is increasingly dependent on expert knowledge and research of high international quality in order to compete, and international cooperation is the main source of developing and obtaining knowledge. They concern *quality issues*: international research cooperation promotes high quality research and is a requirement for (access to) research at the scientific frontier. There are questions of *national reputation:* international participation and emphasis on comparative advantages promotes Norway as a country with attractive research sites. Promoting Norway's competences in research policy also contributes to the national reputation. There is also a question of *moral obligation:* Norway has a responsibility to contribute to competence relevant to societal, economic and democratic development in developing countries. There are also *geographically related interests:* strategies for regional research cooperation are needed, not least with Nordic and neighbouring countries.[8] We may call these consequence-oriented rationales for participation and adaptation, as well as for promoting Norwegian interests and viewpoints at international arenas. In total, these arguments express a high political priority given the internationalisation of research. This priority is backed by an increasing emphasis on domestic policies and efforts to direct and increase the internationalisation of R&D (see also Chapter 3).

When it comes to EU R&D policy, official documents reveal a rich set of expressed Norwegian interests. There is an interest in influencing the EU Framework Programme – promoting Norwegian priorities such as oil, gas and marine sciences on the one hand, and ethics, environment and cooperation with developing countries on the other. There is an interest in having an image as an active and relevant

[8] Summarised from Norwegian White Papers on research: *St.meld. nr 39* (1998–1999) and *St.meld. nr 20* (2004–2005).

participant in EU R&D policy, and there is an interest in profiting from the European R&D policy cooperation to improve national policies.[9]

As Norway is a not a member of the EU, but still fully participates in the EU R&D cooperation, there are some additional concerns attached to its participation in this arena. As one interviewee puts it: 'If we are not participating with full force, we will be marginalised – especially because Norway is not an EU member, so here we need maximum effort.' The interviewed government officials describe the EU as the number one priority in international research cooperation, and point to several extra efforts intended to compensate for the lack of EU membership. The importance of EU cooperation may also be illustrated by public statements from the ministry's political team, according to which there is hardly any alternative for Norway not to participate in the EU Framework Programme on R&D.[10]. In our interviews, this priority is explained by the size and scope of the EU Framework Programme for research and technology. It is the largest and most comprehensive international research cooperation in which Norway participates, and with the development of a European Research Area and the 7th Framework Programme including the European Research Council funding basic research, it will be even more comprehensive.

The high priority and broad set of Norwegian aims and motivations attached to participation in EU R&D policy may thus be explained by particular characteristics of the arena. The size and scope of the EU R&D effort includes more formalised and regularised organisational capabilities and more effective incentive structures than, for instance, in OECD R&D policy cooperation. The OECD develops benchmarking indicators and provides R&D policy advice, but does not have the kind of structural incentives for policy adoption as found in EU R&D policy. The key term of EU R&D policy is 'financial incentives' and no *juste retour* principle. By making participants invest in large programmes without any guarantee for a return on their investments, EU R&D policy entails powerful incentives for adjusting and improving domestic policy to best ensure that the domestic research communities are able to profit from the investments. In addition, there seems to be some kind of 'ideational hegemony' attached to participating in EU R&D. Some of the informants spoke quite passionately about the importance of this participation. Moreover, there has been no significant public or parliamentary debate in Norway in the last 10 or 12 years questioning this importance. Contrary to the period prior to the EEA agreement, the research policy-making community in the Ministry of Education, the Research Council and the parliamentary committee no longer voice hesitation nor the need to participate on a limited and *á la carte* basis (the so-called menu-principle) (Skoie 2005).

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[9] A two-sided objective, of promoting national interests on the one hand, and providing a better basis for national policy formulation on the other, is put forward in the 'EU Strategy' of The Ministry of Education and Research. According to this document, a central objective is to 'participate in the dialogue on European research policy with a view to promoting Norwegian interests and gaining insight into the ranking of priorities at the European level as a link in the development of Norwegian research policy' (UFD 2004).

[10] Bjørn Haugstad 2005, 'Muligheter og utfordringer i EUs 7. rammeprogram' *Forskning* 3/05:23.

8.3.2.2 Higher Education

The internationalisation of higher education has increasingly become a policy object in its own right in Norwegian higher education policy. As with research policy, there are several rationales underlying the need for the internationalisation of higher education. The policy ideology contains reference to the inherent international character of higher education, more general cultural arguments for student mobility, and internationalisation of teaching as promoting cultural understanding among nations and people. The explicit industrial–economic argument for internationalisation is less explicit for higher education than research. The two policy domains converge, however, in such a way that internationalisation is couched in the language of quality. Exposure to international competition will be quality-enhancing for domestic colleges and universities. Amplifying arguments for internationalisation of higher education policy found in major policy documents from the 1970s and 1980s, the major reform of Norwegian higher education of the 2000s put extraordinary emphasis on the internationalisation of teaching and learning (NOU 1988, 2000, 2003; UFD 2003) (see also Chapter 6), student and staff mobility in particular.

This reform also represented a significant shift in the type of internationalisation that was promoted; it represented a definite turn to multilaterally organised cross-border activities in higher education. At the policy level, this implies that Norway's participation in international multilateral arenas which enable internationalisation of higher education is cemented. In order to have significant incoming and outgoing student mobility, an international system of mutual recognition of degrees and diplomas is a prerequisite. An international market for higher education services which domestic institutions are encouraged to enter, entails international regulatory regimes to handle cross-border activities. Promotion and participation in international programmes that enable short term, organised student mobility and staff exchange are preferred over unilateral and 'free moving' students and staff. The policy goals and instruments of national higher education policy and the international participation of the policy level mutually feed each other's *raison d'être*. This favours the organised multilateral internationalisation of higher education policy, akin to the higher education cooperation that developed in Europe, especially in recent decades. At the policy level. the international interface of Norwegian higher education has followed the overall trend in the internationalisation of Norwegian policy, i.e. a definite trend toward increasing multilateral internationalisation (Egeberg and Trondal 1996).

For higher education policy, the interface to Europe has a different foundation than in research as it is not based on a common pooling of resources. The main bridge to Europe has primarily consisted of cooperation in the area of mutual recognition of degrees, and by participation in the education programme Socrates–Erasmus. Through this programme, the Ministry of Education has developed a relationship between the Ministry and the Commission. Among the EU institutions, the Commission is Norway's formal link to the European level. The Council structure and the European Parliament have no Norwegian nodes that can be

used as bridgeheads to the European level and its institutions. The European education cooperation that takes place within the Council of Ministers[11] and in the European Parliament, is also out of bounds for Norwegian policy-makers in higher education. Yet, many of the activities and policy-development activities that the European Commission has organised in the area of education have sprung from the Erasmus/Socrates budget. Consequently, the Norwegian contribution is founded in the EEA agreement, and activities funded over Socrates-budget can then also be argued as legitimate Norwegian participation. Yet, the interviewees acknowledge that Norwegian participation is hard work – it demands resources and attention, and is heavily reliant on support and attention from the top political leadership in the ministry. So far, the Norwegian Minister of Education has been invited to informal ministerial conferences of the European education ministers and has also hosted their conference in Oslo in 2004. There, the Norwegian minister met with the Commissioner for Education and for Research on a bilateral basis. The lack of access to decision-making in the EU institutions, however, is still a major impediment to accessing the political process relevant to higher education.

At the level of civil servants, interest and competency are key resources for both gaining access and being noticed. This is what it takes to be acknowledged in the EU education policy arena. One has to be 'interested to be interesting' and be represented by people with experience and expertise in the relevant fora created under the auspices of the European Commission. The latter might sound obvious, but also reflects a deeper experience in connecting to the European Commission. The Ministry's experience with the Directorate-General for Education is that it is open when you prove yourself as attentive, professional and knowledgeable. At the same time, expertise should include knowledge about the arena – having insight into, and respecting the codes of conduct, traditions and conventions. Here 'arena know-how' includes insight into more non-formal relations such as networking and developing a flair for knowing what goes on 'behind the scenes'. This may be especially the case for non-EU members, and in this sector the Ministry seems to be compensating for its 'outsideship'.

Why would a non-member put so much emphasis on this participation? There is an overall perspective that in education Norway basically has shared interests – 'we are, after all, European'. There is a perception that the challenges that face higher education in a knowledge economy and society are similar, and require concerted efforts. Likewise, considerable political emphasis is put on higher education's international interface in general. With respect to the EU education programmes, the Ministry clearly seeks to make an imprint so that these match Norwegian national priorities, and participation is argued in a logic of consequentiality. Yet, the money available from EU funding in this arena is much less, and of far less strategic importance compared to research. As part of the EEA agreement, Norway's participation in EU education programmes is not the object of rational calculus every time a

[11] Education Council at the ministerial level, and Education Committee at the level of senior civil servants.

budgetary decision is made. The original decision to join the programme might have been so, but the subsequent commitment to the programmes is institutionalised and according the EEA agreement. Furthermore, when extensions and new elements (e.g. Erasmus Mundus) have been added to the EU programmes, Norway has latched on to these developments according what seems to be a standard operating procedure of the ministry.

Political developments at the European arena changed European education cooperation with the launch of the Lisbon strategy of the EU in 2000, and the introduction of the so-called Open Method of Coordination (Gornitzka 2006). This has been an experiment in how to enhance cooperation within education as a nationally sensitive area based on agreement of common goals, common quantified targets, and mutual surveillance of national policies and performance. European cooperation in the area of education got a boost that also has reverberated within the Norwegian ministry. For strategic considerations, the Norwegians declared their interest in being part of the Lisbon process in education. The ministry has clearly put time and effort and consideration into Norwegian participation. A considerable structure has been set up as part of the application of the open method of coordination in education (Gornitzka 2007). As stated by the interviewees, this is also an experiment in European coordination for Norway.

In the Norwegian Ministry of Education, there is a strong and clear idea that it is important to be part of and connected to the activities at the European level. The ministry harbours some concerns of being left out of the education policy salons of Europe as in other international policy arenas where Norway's roles have been played out traditionally and seem to be losing some significance. Nordic cooperation in higher education is an obvious example. Formal Nordic coordination in international arenas used to be a foundation for the visibility of Norway, but some of Norway's strength in its international position was lost when Sweden and Finland joined the EU. Likewise, the 2004 enlargement also has meant a further concern for being sidelined as a non-member in the EU arena as the new fully fledged member states fill up committees and working groups.

In light of this condition, the fact that the process towards realising a European Higher Education Area (the Bologna process) proceeded on an intergovernmental basis outside the frame of the EU, was extraordinarily significant for Norway. This process has been defined as probably the most significant reform of European higher education in 900 years of university history (Neave 2003). The Bologna process was heavily accentuated, especially after the Norwegian Ministry hosted the secretariat for two years covering the period when the fourth meeting of the Bologna process was being prepared and to be held in Bergen in 2005. The political peripherality of Norway as a non-member of the EU might have made Norway's attention to the Bologna process more pronounced. Norway could participate and excel in this arena without being encumbered by the lack of membership status that is undeniably a hindrance or, at best, a challenge to the participation in the EU-led processes that refer to higher education. Norway could freely enact her role as a good, competent and committed European, while promoting the core interest of internationalisation of higher education.

8.3.3 Domestic Political–Administrative Capacity and Organisation of the International Interface

We note two main observations concerning the organisation of international participation and the political–administrative capacity attached to internationalisation. The first observation concerns the degree to which the national executive coordinates its international participation. This may be taken as an indication of policy priorities. It is also an indicator of capacity for interest-promotion and policy-adaptation. Comparing the structures for coordinating Norwegian activities in different policy arenas, we found that the participation in EU R&D and education policy is by far the most coordinated. According to most of the informants, interaction with EU R&D arenas was based on extensive and systematic work and was well-coordinated. This coordination is also visible in the organisational structures, as both the ministries and the Research Council of Norway have internal[12] groups or offices dedicated to such coordination. Moreover, the frequency of domestic coordination meetings on EU issues has increased during the last decade, as has the frequency of meetings in Brussels. In the educational domain, the ministry's extensive participation in the EU Open Method of Coordination (OMC) process includes coordination meetings organised by the ministry's international unit for various Norwegian representatives. Likewise, a forum for European education policy has been established that includes a number of national stakeholder organisations. None of the other international policy arenas have given rise to similar domestic structures. Hence, the domestic organisation of the EU participation should provide better conditions for interest promotion, as well as for policy adaptation, than the domestic organisation of participation in other international arenas. All the same, there is an emphasis on the need for further coordination and strategy development, both to increase the imprint of the national interest in the EU arena and to coordinate the activities of all the international interfaces of the ministry, and, on the other hand, the need to anchor the international activities in regular portfolios of the ministry more securely. Consequently, we see both a high willingness to attend to the European arena, and the development of an organised capacity to deal with the European interfaces of the Ministry and the Research Council of Norway.

Second, internationalisation at the policy level has been increasingly integrated into the overall research and higher education policy. The sector ministry is the dominant carrier of the internationalisation of higher education and research policy. Participation in international fora on behalf of the sector is not the responsibility of the Ministry of Foreign Affairs and not organised according to the diplomatic route. Organisation and coordination are, moreover, conducted according to sector logic rather than to 'nation-state logic'. The national administration in this sector is increasingly responsible for managing the sector's international and European interface leaving a very limited role for the Ministry of Foreign Affairs as the

[12] In addition, there is an inter-ministerial group ('The EEA Special Committee for Research'), but informants attach little importance to this group in terms of coordination.

locus of coordination. We underline that the national agencies at the level below the Ministry have very important roles in the internationalisation of higher education and research. Not only does this apply to the Research Council of Norway, but also the more recently established Norwegian Agency for Quality Assurance in Education (NOKUT, see below) and the Norwegian Centre for International Cooperation in Higher Education (SiU). The latter has the national responsibility for administrating the EU's education programmes and consequently is a key actor in the Europeanisation of Norwegian higher education. The EEA affiliation also makes the Commission the ministry's major European link-up. As the Commission is an institution that works primarily on the basis of a sectoral logic, the Norwegian European link might also serve to encourage cross-sectoral coordination of participation in the EU arenas. It might even underpin national fragmentation of public policies as the link to the sectorally-organised Commission in the Norwegian case is not balanced by governmental coordinated participation in the EU Council (Egeberg and Trondal 1999).

8.4 Policy Substance – Adapting to Europe?

National research policies and higher education policies have not developed without reference to a larger international environment. External impulses were crucial for the shaping the post-war build-up of research systems. In particular, these were channelled by Norwegian scientists' experiences, especially in Britain and the US (Skoie 2005). Monitoring policy developments in other countries has also had a long-standing tradition as a natural part of domestic reform and policy process. The almost mandatory sections in government Green and White papers referring to developments in other countries, are tangible expressions of this external orientation. According to a survey at level of civil servants in the Ministry of Education and Research, 45 per cent report that they copy models and practices from abroad (Trondal 2005). Considerable unilateral lesson-drawing has thus not been uncommon in these policy areas, as has been the case in many domestic policy domains (Egeberg and Trondal 1996).

Likewise, the impact of international organisations on domestic policy substance has also been part of this sector's policy traditions. The OECD national and thematic reviews have been heeded by policy-makers in research and higher education policy for decades, and according to interviews, these remain an important impetus. They were important legitimising factors in higher education reforms and for the establishment of new research policy bodies, especially in the 1960s which saw a significant expansion of the Norwegian research and higher education system (Eide 1995). However, considering the substantial shifts in the international environment of research and higher education that we have pointed to above, we could assume that this change in orientation has made substantive impact on the Norwegian research and higher education policy that is of a different nature than a unilateral process of lesson-drawing. In the following, we look at convergence and divergence between European policy and Norway regarding the underlying rationales of policy, policy

priorities and policy instruments. What imprint has the European interface left in Norwegian research and higher education policies, and may the underlying processes and mechanisms best be characterised as interest-based, role/rule-based or idea-based?

8.4.1 European Impact on Research Policy

8.4.1.1 Research Policy Rationales

In Norwegian policy documents, as in our interviews, the most prominent argument for the internationalisation of research is connected to the role of international collaboration for improving scientific quality. In the EU, on the other hand, arguments for internationalisation and Europeanisation of R&D and R&D policy are clearly focused on economic–political objectives. The objectives of the European Research Area (ERA), and the Framework Programme as part of it, relate to economic growth and a conceived need to increase the competitiveness of European industry in a knowledge-based economy.[13] To what degree do such EU rationales influence the basic thinking underlying Norwegian R&D policy? Does the EU in any way cause a move from academic and cultural rationales, to more economic and industrial rationales in Norwegian R&D policy? We find no clear indication of such a move. Neither are documents specifically addressing European research policy such as the 'EU Strategy' of The Ministry of Education and Research, focused on economic rationales. The economic rationales in Norwegian R&D policy concern foremost policy addressing industry – a part of policy that, by its nature, is and has been based in economic rationales. The government even seems concerned with emphasising that policy similarities in this sector do not mean Norwegian adaptation:

> Although the same things are being done in Norway and EU, this does not result from the Lisbon Strategy, but from sharing, for various reasons, the same political objectives within many areas. Employment, qualifications and macroeconomic stability have all featured in the Norwegian agenda since long before the EU formulated its strategy. (NHD 2003 'The EU Lisbon Strategy – The Norwegian Response' p. 7).

On the other hand, interviewees were concerned about how policy objectives and ambitions disseminate. As a result of the increased EU focus on R&D and the target of increasing R&D investments to 3 per cent of GNP in 2010, Norwegian R&D politicians get backing for increased Norwegian focus on R&D and stronger support for the aim of increasing R&D investments, informants maintained. The EU 3 per cent target makes a Norwegian target of reaching the average OECD-level appear insignificant, and there is some fear of lagging even more behind her European neighbours.[14] The 3 per cent target was adopted in the 2005 Norwegian White Paper

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[13] See, for example, Commission of The European Communities COM (2000) 6, or http://europa.eu.int/comm/research/why.htm

[14] However, some meant we might be less affected by EU R&D policy than other countries, because Norwegian politicians are not involved in the policy processes on the same level as the member countries. They still saw clear effects.

on research, the official argument being a need to keep up with international trends (i.e. to other countries' growth in R&D investments and ambitions, *St.meld. nr 20* (2004–2005) p. 21). Central actors still emphasise other aspects of the Norwegian 3 per cent target – it is intended to give more force to research priorities in domestic Norwegian politics.[15] In other words, EU policy is adopted instrumentally to serve particular interests in national politics.

Consequently, we conclude that Norwegian policy-making is affected by EU objectives, but that policy-makers have only partly adopted the economic rational underlying the objectives, and that objectives may be adopted instrumentally. Looking at the adoption of the 3 per cent target more specifically, several sets of mechanisms may account for the Norwegian adoption. First, the adoption has a strategic aspect which is in accordance with a 'rational calculation'/consequence-oriented explanation. The 3 per cent target serves domestic R&D policy interests in terms of reinforcing arguments for an increase in R&D budgets and ensuring persistent priority to R&D in national politics. Still, the involved actors seem not to believe that the target is attainable – as it implies increasing R&D investments from 1.75 to 3 per cent within five years, well knowing that Norway has never been able to arrive at its previous, less ambitious, growth target which was to reach the OECD average R&D investment level (about 2.3 per cent of GNP). There might be some kind of symbolic significance to this when the OECD-target is replaced by the Barcelona/EU target. This subtly signifies the group to which Norway wants to associate itself with – the larger Western world or the European area.

Here, we may supplement the 'rational calculation' explanation with an understanding of the adoption of the 3 per cent target as 'rule following'. A broad exposure to, and frequent interaction with, EU R&D policy seems to have given rise to the view that the 3 per cent target is the appropriate policy aim regardless of its feasibility. Norwegian policy-making thereby conforms to what is perceived to be appropriate at the European arena where expressing 3 per cent ambitions without believing one will succeed, is common policy. In other words, unrealistic targets appear as an appropriate and fully legitimate R&D policy; more appropriate, in fact, than realistic targets some seem to think. At least, the adoption of the 3 per cent target to some extent indicates a new way of thinking – a changing of the perception of the meaning and functions of policy targets. To the degree that such views are internalised, this explanation also opens for the possibility of 'ideational convergence'. There seems, however, to be some limits to supporting unrealistic targets. In 2007, the Director of the Research Council of Norway (RCN) stated that adopting the 3 per cent target *has* had a positive mobilising effect on Norwegian research funding, but that its unrealistic short time-span now implies pessimism and lack of credibility, and may in fact, undermine the possibility of growth (Hallén 2007:5). Such statements clearly contradict an 'ideational convergence' of the 3 per cent target.

There still seems to be another aspect of ideational convergence behind the 3 per cent target – a shared European fear of lagging behind the rest of the world if

[15] Stated by a high level official in Ministry of Education and Research (in a public seminar discussing the White Paper).

not investing more in R&D, or more specifically, a shared belief in an underlying policy perspective concerning the importance of R&D. The underlying perspective includes, of course, some ideas about the consequences of investing and not investing in science, but in terms of a shared European fear of lagging behind the main convergence mechanism is likely to be more related to adoption of the policy perspective than 'rational calculation'. Unrealistic policy targets may be said to be more consequence-oriented. As far as the purpose with unrealistic targets is to achieve more than one would with a realistic target, the adoption of the target is at least partly consequence-oriented. So, on the one hand, the Norwegian adoption of the 3 per cent target seems clearly instrumental and aimed at serving particular interests in national politics (stronger support for increasing R&D investments); on the other hand, the adoption, to some extent, also seems to have entailed adoption of underlying ideas about the importance of R&D and a fear of lagging behind – as well as some acceptance of unrealistic targets as appropriate and meaningful.

8.4.1.2 Research Policy Priorities

Our data indicate that Norwegian research policy priorities are affected by EU policy in several ways. The sheer *amount* of EU-funded research in Norway is sufficient to state that Norwegian research priorities cannot be unaffected by EU R&D priorities. This argument was used by our informants when we asked about EU influence on Norwegian priorities. Many Norwegian researchers participate in EU research and adapt to the priorities of the FP. In addition, Norwegian authorities are explicitly concerned about strengthening and coordinating Norwegian research to ensure a good national return of the Norwegian contribution to the FP and to create synergies. The Framework Programme and ERA, as well as increased competition in general, present new challenges, and policy makers realise a need for better coordination, clearer priorities, and better framework conditions for Norwegian research. One of the Norwegian policy initiatives explicitly dealing with the relationship to EU priorities is a proposed strategy process involving a wide scope of actors and organisations to discuss challenges related to EU research cooperation, need for task divisions and Norwegian parallels to EU programmes and initiatives (*St.meld. nr 20* (2004–2005) p. 53).

Several more concrete effects of EU research priorities on Norwegian priorities were specified by informants, including the effects of the ICT priorities in the 6th Framework Programme on the Norwegian ICT priorities, EU initiative on security research causing Norwegian initiatives to coordinate and prepare this field,[16] as well as effects of Norwegian participation in particular initiatives such as the EDCTP (European and Developing Countries Clinical Trials Platform).[17] On the other hand,

[16] Security research is a key priority in the 7th Framework Programme.

[17] It should also be noted that when presenting Norwegian research policy, the RCN emphasises the agreement between Norwegian and EU priorities. See, for example. *Forskningspolitikken i et internasjonalt perspektiv* [Research Policy in an International Perspective], Hans M Borchgrevink, RCN, at UNIO conference Mars 2007, available at www.unio.no (Downloaded 21st June 2007, text is in English).

some also emphasised that regardless of the EU, 'the whole world' was talking about the same research fields as important in the future, e.g. nanotechnology, biotechnology and environmental research. As the EU and Norway are affected by the same international policy trends, priorities may be similar without much direct influence from the EU.

In total, two different general dynamics seem to account for the Norwegian convergence towards the EU R&D priorities: a consequence-oriented EU convergence, and a more general international idea-based convergence. The consequence-oriented EU convergence and adaptations are reflected in the argumentational emphasis on the amount of money invested in EU R&D, in the opportunities for output, and in ensuring a good national return from the investments. There is also a perceived need to participate and to adapt. There is, moreover, a belief that small research communities would be disadvantaged if they are not up to date on major international and regional priorities, adapt their national R&D niches and succeed in being attractive R&D partners. Such arguments emphasise the intrinsic international character of science and a perception of dependence on the environment, in particular the European surroundings which include the world's largest international research programme. In addition to being consequence-oriented, these emphases may also be taken to be beliefs and rhetoric arising from a broad European R&D policy interface – which indicate an idea-based convergence. As shown above, there is much organised Norwegian attention towards EU R&D policy priorities and hence massive exposure to its ideas and causal beliefs.

As mentioned, the adaptations are also part of a more general international convergence of policy priorities. There are internationally shared beliefs in the importance of R&D investments in particular areas, which indicate that what we see is not a case of Europeanisation (alone), but more general international trends. This idea-based convergence may also be explained as some sort of international R&D bandwagon effect. Everybody tends to try be part of (i.e. find a seat/niche in) the leading wagon (i.e. the main priority areas) because this is where one expects the major future important research to take place – and as a result, the conceived important areas also manifest themselves as important areas.

8.4.1.3 Research Policy Instruments

In many cases, European and domestic policy instruments will tend to have different scopes and purposes (e.g. European cooperation vs. domestic capacity building), and direct domestic adoptions of EU R&D policy instruments may therefore seem unlikely. Neither do we find any cases of Norwegian adoption of EU R&D policy instruments *per se*. Yet, there are several Norwegian policy instruments and organisational units that are direct effects of the interfaces with EU research, including schemes co-financing Norwegian institutions' EU FP-activities, the EU office at the Research Council of Norway (RCN), the RCN Brussels office, the Science Counsellor at the Mission of Norway to the European Union and separate EU working groups in the ministries, as well as Norwegian Centres of Excellence (CoE) established partly to increase the Norwegian competitiveness in relation to EU research

and internationalisation in general. These are examples of EU influence on Norwegian policy instruments and organisation, but not of policy similarities as such. In sum, there seems to be a general concern to adjust domestic policy instruments so as to handle challenges from the European research cooperation in a better manner. In this respect, the impact of the European institutions and actions have been the development of domestic organisational capabilities and a research policy administration with permanent attention on the European arena.

When it comes to similarities in policy instruments, Norway is probably more influenced by general international trends in the use of policy tools such as research evaluation, foresight studies and schemes supporting 'excellence' – more so than the EU policy instruments as such. However, the effects of the international trends may still be strengthened through all the direct links with EU R&D. Moreover, some informants pointed to how the RCN often learn from, or are inspired by, the EU when they set up programme descriptions, contracts, intellectual property rights and similar documents. In other words, at the operational level EU procedures and documents serve as models for the way of doing things. For those dealing with RCN policy instruments, such as researchers applying for grant or reviewing applications, the RCN may therefore appear to be copying the EU, as policy instruments are wrapped in a more standard European outfit. But in most cases, this does not involve convergence in the choice of policy instruments or their overall design.

When trying to understand the dynamics and mechanisms behind the Europeanisation of Norwegian policy instruments we need to distinguish between adaptations and adoptions. Adaptations, as establishment of organisational units and instruments to handle challenges from the European cooperation, may easily be understood as consequence-oriented efforts, supplemented in many cases by inspiration from similar policy efforts in other countries. Such inspiration is part of a general and broad international attention aimed at policy learning, and may be said to be partly 'idea-based' and partly 'rule-based' – depending on the degree of internalisation of epistemic frames.

Adoptions of operational elements or standards, on the other hand, appear to be more directly influenced by what we may call EU hegemony in operational standards. We expect that a motivation for adopting European 'standards' in domestic instruments is to appear more up-to-date and professional – apart from the fact that EU 'standards' are easily available templates. In this way, EU operational standards may serve as a 'bandwagon'.

8.4.2 European Impact on Higher Education Policy

8.4.2.1 Parallel Rationales and Convergence of Goals

The most recent and most influential White Paper on higher education underlines the national ambition of being a leading 'knowledge nation' (KUF 2001) and with heavy emphasis on the quality of higher education as a prime concern. In this respect, it echoes the ambitions and rationales that are commonplace within the European Union and so explicitly stated in the EU Lisbon agenda, and also the Treaty of

Amsterdam's article on education (article 149.1) that states the EU responsibility is for the quality of European education systems. It would probably be an overstatement to see the rationales of the Norwegian higher education policy as a *response to* the EU. For instance, the most recent government White Paper heavily underlines the multiple functions of higher education and the multiple rationales that include the emphasis on the social and cultural functions of higher education. The latter is probably stronger in Norwegian higher education policy argumentation than can be found in EU policy documents, especially the Commission's more recent documents on the role of universities (see, for example Commission of the European Communities 2005). Yet, there are distinct parallels in part of the rationales. However, there is no strong evidence for attributing causality to the EU in this matter. The overall perception among policy-makers is that Norway and 'Europe' have common ambitions and goals for this sector. In fact, it might be argued that massive emphasis on internationalisation and mobility makes Norwegian higher education policy just as, or even more, compatible with the European Union's higher education policy perspective than is the case for national higher education policy of most EU member states (Gornitzka and Stensaker 2004; Huisman and Wende 2004). There is a rather remarkable emphasis in the current major reform in Norwegian higher education (the 'Quality Reform') compared to the prior reform regime of the 1990s reflected in the way in which internationalisation of higher education has been put at the centre stage of policy goals, especially in the shape of the EU version of internationalisation i.e. mobility of students and staff through multilateral, organised programmes and/or agreements.

In terms of convergence of goals, the Lisbon process and the Norwegian association is an interesting case of the blending of an interest-based and idea-based adaptation. The knowledge society/knowledge economy discourse was, of course, not invented by the EU and the summit in Lisbon – but it is fair to say the Lisbon process and the procedures set in motion through the introduction of the Open Method of Coordination have amplified it and institutionalised it in a political context. The process has also formally fixed a set of goals to the recurring higher education policy agenda. These goals have been approved by the European ministers of education and heads of states as common to member states (Education and Training 2010, see Gornitzka 2007). The Norwegian Ministry of Education has subscribed to these goals and taken them 'aboard' domestically. This illustrates some of the challenges with ascertaining the mechanism associated with this kind of adaptation to the EU level processes – it fits the perception of the Norwegian interest to focus on equivalent goals, and it represents a certain degree of ideational convergence especially with respect to converging agendas of education policy. This kind of adaptation is experimental and can hardly be said to represent a rule-based adaptation to the EU-level processes, unless we see this as an example of 'everything the EU does, Norway will do too' standard operating procedure of the Ministry of Education. As we have seen earlier, this has been the subject of considerable strategic effort of the part of the ministry. It is a strategic effort argued on the basis of the need for accessing arenas of learning and for making sure that Norway is present in core European policy arenas. Also, we might argue that the Ministry's work on and connection to

the Lisbon goals for education is used domestically to add to the position of the education portfolio. That would be parallel to similar processes at the European level. The Education portfolio (both the Commission's Directorate-General for Education and Culture and the Education Council) has used the Lisbon agenda to argue for their portfolio. Similarly, domestic agendas have given stronger focus on the area of education in Europe – with more political and public attention to education at all levels.

8.4.2.2 European Adaptation and Higher Education Policy Instruments

Analysing the more specific effects of the Norwegian participation in the Lisbon process on the substantives of higher education policy is still premature, although in terms of agenda-setting the effect of and attention to Europe is already discernible. However, the other major process at the European level – the Bologna process – has already left a measurable imprint on Norwegian higher education policy. In the following we use the example of the Bologna process and Norwegian higher education reform to demonstrate the nature of Europeanisation of domestic higher education reform. Methodologically, this process has the advantage of containing some readily identifiable markers that can be traced to the substance of domestic policy (see above). As a result of European level eagerness in monitoring and comparing developments, Norway has been officially recognised as having implemented Bologna (Eurydice 2003). The most specific items on the Bologna agenda are clearly recognisable in the current domestic higher education reform, the *Quality Reform*. This includes the introduction of the Bachelor/Master degree structure, the use of the European Credit Transfer System (ECTS) and of a new standardised grading system, and the establishment of a national agency for quality assurance and accreditation in higher education (NOKUT). As such, this could be seen as an instance of rule-based Europeanisation of domestic policy content. The Bologna declaration and the subsequent documents, are expressions of intent and cannot be counted as hard law in the sense that the items in the declarations are intended for transposition into national law. Nevertheless, the Norwegian ministry has acted to honour the agreement and commitment made through this process, and adjusted its policy for higher education according to the 'rules' established through the Bologna process. Yet, this should not be seen as a case of simple and 'clean' domestic implementation of a European commitment, i.e. rule-based adoption of common European standards. The story of 'Bologna in Norway' points to the following qualifications of the 'adaptation as rule-following perspective'.

First, we should be aware that national reform had been scheduled prior to the Bologna Declaration being signed. The domestic reform process thus provided an opportunity that made it possible to incorporate the European cooperation efforts into a national change process. Some items on the Bologna agenda (introduction of the ECTS and the Ato-F grading system) are clearly cases where the role of Norway as a reliable and committed European have dictated specific changes in Norwegian higher education regulations. Comparatively speaking, introducing a new European standard grading scale and system of credit transfer is rather marginal as part of

extensive area of higher education policy. When we move to the issue of degree structure we are at the core of higher education policy instruments. And there, the Europeanisation process is first of all characterised by national policy-makers using the European agenda as a *menu of solutions* to domestic problems. In the Confederation of EU Rectors' Conferences and the Association of European Universities' (CRE) explanation to the Bologna Declaration it is stated that the declaration 'reflects a search for a common European answer to common European problems'.[18] In the context of the Norwegian degree reform, domestic problems have been linked to a European solution. The Bologna process cannot be seen as the only driving force of the domestic process of reform (Gornitzka 2006). The work towards reforming the degree structure in Norwegian higher education was well under way before the efforts to construct a European Higher Education Area were set in motion.

The situational contingency that Bologna and the national reform processes represent does play a role in explaining why Norway introduced the bachelor/master degree system. In other words, the combination should not be interpreted in itself as a temporal accident, but rather as an attempt to add legitimacy by reference to (1) the trends outside the national system, and (2) the obligatory aspect of the Norwegian signature. The Bologna process represents more than 'international trends' in higher education; it is a formally acknowledged political commitment. The reference to it served as political clout when the degree structure reform was adopted. Furthermore, the Bologna process offered a major international definition of what constitutes an appropriate degree structure for a national higher education system that aspires to strong international connections. Peripherality and strong ideological support of internationalisation as a policy objective in the *Quality Reform* served to increase the political effectiveness of Bologna and general international references. Thus, the case of Norway's response to the Bologna process illustrates how national interest, roles, rules and ideas on the European arena blend with a domestic logic of policy change.

The latest case at hand is the potential establishment of a *national qualifications framework* which, if adopted, would represent an entirely novel element in the Norwegian higher education policy tool box (KD 2007). This proposal comes directly as a result of development within several European policy arenas in education. These are partly promoting, partly overlapping, partly competing solutions for describing qualifications according to learning outcomes. As part of the Bologna process, the Conference of Ministers in Bergen, May 2005, decided to establish a meta-framework within the European Higher Education Area that the national qualifications framework should be modelled upon. All members of the Bologna process committed themselves to developing such national qualifications framework within 2010. Meanwhile, the European Commission worked on a European Qualifications Framework for lifelong learning (EQF) (proposal adopted in September 2006), that encompassed the entire range of post-compulsory education, including higher education, vocational education as well as informal learning. The EQF was also

[18] http://www.crue.org/eurec/bolognaexplanation.htm

proposed as a common framework for comparing and measuring competences acquired within the formal education system with informal qualifications. The proposal is currently undergoing a 2-year consultation across Europe. The national political process involved in the Norwegian Qualifications framework is already a case where national policy instruments are in the process of being fashioned in direct response to European commitments made – albeit somewhat straddled between the partially competing concerns offered by the two main European education policy arenas.

As with research policy, we can also discern the more diffuse and indirect impact of European developments and general international trends on the higher education policy discourse domestically. These include the import of perceptions about the roles of universities and colleges, the underlying values that are promoted, commodification of higher education, the import of new public management-inspired organisational principles for higher education, and the introduction of market discourse in higher education. A general observation based especially on the case of the Bologna process, is that the more tangible European processes have been important agenda-setting developments, also in the Norwegian domestic higher education policy arena. If the Norwegian case has a lesson to offer, then it must be that understanding the dynamics of Europeanisation within a national higher education system is impossible without considering the local circumstances that translate the European 'menu' and agenda into domestic change.

The circumstances in this case are marked by the following characteristics. There was a strong political emphasis on internationalisation as a goal in itself – an ambition largely shared by the national higher education community. This, we might argue, made national policy-makers and a small higher education system in the Northern periphery open and attentive to the Bologna process. Second, the decision opportunity was provided by the broad general national reform process that ran parallel to the Bologna process. In other words, while ministers were signing the Bologna Declaration, the national Norwegian Commission on Higher Education was writing a Green Paper that, after some modification, became the White Paper of 2000/2001 (KUF 2001). Thus, the events on the European arena contributed to the national agenda setting; they provided one menu of solutions to the concurring domestic problems and challenges in higher education.

8.5 Conclusions

There has been a significant Europeanisation of the international interface of Norwegian higher education and research policy. However, Norwegian attention to the EU arenas' intensified involvement in research and higher education and new European cooperative processes, most notably the Bologna process, has not meant a withdrawal from the other international arenas. It is more a case of layering of international and regional cooperation where the EU and European arena have received considerably more attention since the beginning of the 1990s. The core policy-making institutions domestically, the Norwegian Ministry of Education and

Research and the Research Council of Norway, have adapted to the developments in the European policy arenas by developing organisational capacities and devoting attention and interest to participation on the European arenas. The participation in these arenas is characterised by various dynamics. First of all, the participation is seen as being in accordance with the national interest, or rather, a complex set of national interests. There is no cost-versus-benefit analysis of every single interface that Norway has to all of these arenas. Maybe it is more correct to say that the interest Norway has in adjusting to these arenas has become an overall 'rule of thumb'. The overall recognition is that the European arenas are important and increasingly so, and that they need active and strategic attention. Although the developments within these arenas are hardly controllable by national policy makers, Norwegian participation is marked by the intention to have a strategic and 'premeditated' grip on the way in which Norway participates.

Our analysis also suggests membership status matters for Norway's adaptation to the EU. In these sectors, it is tremendously important because it frames Norway's participation. The EEA agreement is the formal 'ticket' to access core European policy arenas. Yet policy makers acknowledge that Norway needs special compensatory strategies so as to perform as good as, or possibly better than, the proper member states. There is a basic interest attached to being included and noticed, especially underlined because of Norway's 'outsideship'. This is not merely the consequence of wanting to promote the national interest, but it also contains a significant component of role enactment, i.e. acting in the national role as the good European. In this respect, there is a clear difference between Europeanisation of R&D policy on the one hand, and the Europeanisation of policies for higher education on the other. In the intergovernmental Bologna process, Norway has the same status as all other participating countries and plays the role of an active forerunner. It has been an arena where Norway can enact a role of an interested and informed participant in the process towards the goal of a European Higher Education Area. We also note that participation is argued from the perspective that European arenas are important venues of information exchange, and places where one can be updated and informed about policy developments, and also be seen. The perception in national higher education and research administrations is that these are arenas where significant things are going on, and being left in the dark is a serious concern.

We might argue that the interest which Norway has in participation in the EU research and higher education arenas (and in the Bologna process) is in the process of acquiring a rule-like status in these sectors that has been reinforced through the permanent organisational attention directed at these arenas. The Norwegian ministry is attempting to balance what is perceived as the key factors in effective participation. In fact, effective participation is seen as dependent on curtailing the overt promotion of 'the national interest'. As a non-member small country, making a difference in the European arenas is dependent on compensatory strategies and the ability to prove oneself as able to contribute to the common cause. This compensatory logic is a noteworthy finding that underlines the impact that formal membership status has in a domestic decision-making. It might also indicate a vulnerability of the policy sectors' European interface. This merits further analyses in future studies.

Furthermore, the extent to which the Europeanisation of the international interface of Norwegian R&D and higher education is running according to a sector logic, and according to a sectoral organisation, is striking. There is very little evidence of coordinated cross-sector efforts. The participatory links are directly forged between the sector ministry and agencies to the EU. The connections between the national ministry and the Commission take the shape of (sub-)policy networks. We hesitate to call it a 'policy community'; the term suggests too strong and too permanent links. We have seen that Norwegian policy-makers are involved in organised and sustained interaction. This interaction is more politically sanguine than the type of interaction we find in other arenas. The interests that are promoted are defined sectorally, not primarily as part of 'a national interest'. Such an interest might be an overarching idea. If this is the case, then we have not found that such an overarching idea has much consequence in actual cross-sectoral coordination in our case. Rather, we have seen some evidence of European sectoral links being used domestically to strengthen the sector in the national political arena.

Despite the strong Europeanisation of the international interface of sector policies, any equivalent impact on substance is much harder to ascertain. The bulk of public policy for R&D and higher education is domestically determined. Yet, we still contend that changes in research and higher education policies during the last ten years cannot be understood without reference to the European arenas. The influence is marked by ongoing long-term iterative processes rather than single-event moments of impact. The closest we come to Europeanisation as *adoption* would be some of the elements of the Bologna process and in some research policy aims and priorities. Also, there are few instances where we can observe domestic policy change as a consequence of rule-based adaptations that run contrary to perceived national interests.

Norway is clearly being much more affected by EU R&D priorities than having possibilities to influence EU priorities. The adaptation to EU R&D policy is voluntary and does not seem to worry Norwegian R&D establishment and policy-makers. On the contrary, several informants point to favourable effects for Norwegian R&D policy. It is a question of having the domestic research and higher education priorities mirrored in the priorities commonly defined in the European arenas. It should be noted that the question of national R&D adaptation to EU policies is very different from the question of adoption of EU regulation found in some other policy sectors. The Europeanisation of R&D policy is more about 'bandwagon effects' (an aspect of rule-based convergence), national positioning and coordination to increase one's competitiveness (consequence-oriented adaptation), the 'Open Method of Coordination' (OMC as idea-based convergence), and common efforts to increase European competitiveness, than it is about regulation.

We find a high level of 'EU influence' in Norwegian R&D policy, but not a high level of convergence to EU policy. The data indicate that EU R&D policy is an important premise for the formulation of Norwegian policies and priorities because EU policy affects Norwegian R&D surroundings, options and leeway, for example, by affecting the priorities of other countries as well as Norwegian researchers' collaboration and funding patterns. Still, EU 'convergence' so far seems limited to the adoption of the 3 per cent target (and partly the rationale behind it), the

adoption of some priorities (e.g. security research) and imitation of some routines at the operational level. On the other hand, effects of EU policy include adapting Norwegian priorities to EU priorities, setting up new organisational units to deal with EU research, and a shift in the focus of policy processes, in policy documents and in policy debates.

Similar processes are evident in the higher education policy arena. There are parallel priorities and a perception of common interests. In general, it is not uncomfortable for Norwegian policy-makers to join hands with the European ambitions and goals for higher education. There is also a growing attention to the commonly-set EU agenda for education that reverberates within domestic education policy. We have seen that this sector is subject to the impact of European processes of setting rule-like standards. In the Bologna process especially, there is evidence of the harmonisation and convergence of policy instruments that we do not see in the research policy sector. Given that higher education is a sector with a weaker legal framework for EU action, and a higher level of national sensitivity than the research sector, this might be somewhat unexpected. It is an illustration of Europeanisation as rule-based adaptation without hard law. The story exemplifies how domestic higher education policy cannot be understood within a solely national framework of analysis on the one hand, and on the other, how understanding the impact of Europe cannot be severed from a firm analytical grip on the domestic circumstances under which European processes penetrate the national level and produce change.

Finally, we note that ideational aspects are a key to understanding processes of adaptation of domestic policies to the EU. This applies to both higher education and research policy. We have seen from this case how accessing policy ideas is being defined as a core interest for participation and adaptation. It is not merely a matter in the realm of lofty and vague ideas about mutual learning in international arenas. Being cut off from policy arenas would entail not only a lost opportunity for promoting national interests, but also being cut off from the circulation of ideas and information. However, idea-based adaptation, both as a cognitive and normative activity, is hard to trace. To give causal attribution to one international arena rather than another is even harder. In our case European policy arenas can hardly be said to represent the only nesting ground and site for dissemination of ideas about higher education and research policy. That makes the parallel analysis of other international policy arenas even more important for the understanding of international policy learning in the field of R&D and higher education.

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Chapter 9
Crossing the Borders

Changing Patterns and Forces of Internationalisation

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9.1 Introduction

This chapter recaptures and elaborates the main arguments from the different studies presented in this book. We first summarise the main indications of the porosity of territorial borders of knowledge as a basis for a general discussion where we take the following questions as our point of departure:

- What is the current nature of internationalisation? Are there real or important differences between the new and the traditional forms of internationalisation of R&D and higher education, or does the lowering of the territorial borders of research and higher education represent a (re)turn to the 'natural state' of borderlessness for scientific inquiry and teaching and learning?
- What can the nature of internationalisation tell us about the main driving forces underlying the patterns we observe?
- What are the underlying tensions?
- What are the consequences of internationalisation on domestic higher education and research?

9.2 Porous National Borders: The Main Evidence

The following main indicators give evidence of the extent to which territorial borders are perforated in research and higher education. In 2004, 52 per cent of all scientific articles published by Norwegian researchers were co-authored by international colleagues, which is a very strong indication that ideas are not contained within

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national borders. This is also the strongest evidence of a fundamental structural change in Norwegian research production, given that the share of internationally co-authored articles has risen from 16 per cent in 1981 (cf. Chapter 2). The development is similar for universities, colleges, research institutes and industrial research and development. This is robust empirical evidence for a fundamental transformation of the way in which research is conducted in a small knowledge system. It means that every second article will have involved cross-border co-production of knowledge. Furthermore, we note that behind these overall figures we see a convergence between disciplines; for example many social sciences which previously had comparatively few international co-publications, are now approaching the levels found in the natural sciences and medicine. Data on the overall contact patterns of university researchers also demonstrate how national borders are very easily, and increasingly, crossed. In 2000, the normal state of affairs in universities was to engage internationally – less than 25 per cent of academic staff will not have participated in international conferences in the course of an academic year, and about half will be engaged in international research collaboration. On both indicators, there is a significant increase over the last 20 years.

Likewise, we see a similar development in private sector R&D in Norway: R&D is increasingly purchased from, or carried out in collaboration with partners in other countries, particularly the European Union.

The funding streams in domestic research on the other hand, are less prone to cross national borders – in 2001, 7.2 per cent of funding of Norwegian R&D came from sources outside the country. The free flow of academic communication is much more prevalent than the free flow of research funding. Yet this is a considerable increase in the foreign influx of money for research compared to the negligible role such funding played in the 1970s and 1980s. In addition, it may be argued that 'money at the margins' may alter behaviour more easily (Slaughter and Leslie 1997). Even though the magnitude of international funding is not extensive, it may constitute a *critical resource* to the recipients (Pfeffer and Salancik 1978). All types of research funding, including international competitive funding, create 'organisational fields' through coercive, normative and mimetic processes, which in turn influence scientific norms and behaviour (Benner and Sandström 2000).

In 2005, approximately 10 per cent of the Norwegian student body studied abroad as 'free movers', or as part of an international student exchange programme, and the ratio of mobile students is higher than in the bulk of OECD-countries (Chapter 5). In contrast to most other Western countries, the majority of Norwegian students abroad are 'free movers' that do not undertake their studies abroad as part of organised student exchange programmes. The share of Norwegian students travelling abroad as 'free movers' has been stable since the 1970s at around 6 per cent of the total student population. In this respect, the Norwegian student body has been part of a global higher education market over a very long period. Yet, with massification of higher education, the total numbers of students crossing national borders to acquire an education has been increasing. This also implies that the domestic labour market is faced with a growing number of candidates educated abroad. The evidence presented in this book shows that when these students cross national borders to take

up a career in the domestic labour market, their transition to work seems somewhat harder than for those educated within the national education system, at least in the initial stages of their careers. For a domestic labour market, the transport of skills and competences across national boundaries is not without friction. Even in a system with a long tradition for having mobile students, national boundaries are still a salient factor for the integration of graduates in national labour markets.

The internationalisation of governance of higher education and research is most evident at the level of national policy making. Over the last 20 years, there has been increase in the international involvement of the Ministry of Education and Research in a growing number of international policy arenas, and a clear tendency towards multilateral internationalisation. The number of international commitments in these policy areas has increased. Signing the Bologna declaration has been a quantum leap in the international interface of Norwegian higher education policy, but also in research policy the commitments of European research cooperation has implied an increase in public research funding channelled through supranational or intergovernmental research cooperation schemes. In addition, the recent decision of 2006 to make Norway a member of the European Patent Office (EPO) may have implications for industrial research as well as for the commercialisation of public research.

9.3 Increasing Cross-Border Activities: More of the Same or New Patterns?

In this section, we discuss the nature of the observed increased internationalisation of research, higher education and innovation. An important characteristic of research and higher education, especially in Europe, is that these are domains which have long and established traditions for performing activities that cross national borders. It has earlier been argued that universities' internationalisation is a return to the 'renaissance model' (Geuna 1998). Industrial production and R&D has also been highly international throughout many periods, although parts of the 20th century were perhaps more characterised by national control, not least following the two world wars. If it makes sense to see 'borderlessness' as a dominant and inherent feature of science and academia, then the two centuries of 'nationalisation' of research and higher education and creation of territorial boundaries (Neave 2001; also Crawford et al. 1993), should be seen as a period of 'deviation' from these fundamental characteristics.

From such a perspective, what we are experiencing now should be seen as a return to a phase with one common language (English rather than Latin) – both in science, training and companies with activities in many countries – and a predominantly international workforce and audience of science and academia. Going by the evidence presented in this book, such a development is most clearly visible in the data on scientific co-publishing. As mentioned, more than half of all Norwegian registered scientific publications in 2004 were written in collaboration with author(s) in

one or more other countries. In many disciplines, international partnerships seem to be becoming the norm rather than the exception. Similar figures are found in other advanced small countries. Even Norwegian industrial R&D, the research sector with the strongest traditional 'local needs orientation', had more than 40 per cent international co-publishing according to the latest figures.

This view is a fair reminder of the fallacy of interpreting relatively recent phenomena without due reverence to their historical roots. However, some core aspects of the patterns of internationalisation we have seen in this book allow us to argue against interpreting the internationalisation we see now as the return of academic activities, research, teaching and learning to its 'natural state' of borderlessness.

9.3.1 Formalisation and Institutionalisation

The modes of internationalisation have shifted, from non-routinised and individually-based processes towards more institutionalised, routinised and systematic processes of internationalisation. Of course, internationally organised collaboration has long been quite common in some types of large-scale 'big science' projects, for example, in physics and military technology. What seems to be the current trend is, however, that international cooperation is becoming more formalised and institutionalised in all disciplines and all sectors, regardless of their history and special characteristics. New sub-national, national and international actors are increasingly involved, and activities are often found under the umbrella of formal support mechanisms. Industrial R&D collaboration and student mobility are two examples of activities prioritised and organised by actors like multinational companies (not only their individual research units), higher education institutions, national government, and intergovernmental and international non-governmental organisations. Participation in formalised international R&D and standardisation projects are important to companies (cf. Chapter 4), as they are for higher education institutions which also have formed a large number of bilateral collaboration agreements. Student mobility has definitely become more formalised. The recent 'Quality Reform' in Norwegian higher education emphasises the need to facilitate the progress of student exchange, and where increased participation in institutionally-anchored exchange programmes is encouraged. Moreover, Norwegian education institutions produce separate plans for internationalisation and establish separate offices for internationalisation. Although student mobility is most often seen as the traditional way of internationalisation, the considerable administrative capacity at the level of universities and colleges signals that even traditional ways of internationalisation (student mobility) come in the guise of formalisation and regulation. While internationalisation 15–20 years ago was often taken care of by (enthusiastic) individuals, the present tendency is to centralise, and partly professionalise decision-making and responsibility concerning internationalisation (Chapter 6). Thus, what some decades ago was primarily seen as micro-level decisions and tasks, now forms part of the institutional level through offices for internationalisation. At the national level we see a similar trend, especially

with the establishment of a separate government agency for internationalisation and in the new national Quality Assurance Agency. These national agencies and institutional level administrative capabilities are linked in European and international agency networks and network of administrators that develop and administer programmes and regulatory regimes for the mutual recognition of degrees and standards for quality assurance.

The development is therefore not just escalating self-organisation driven by increasingly cosmopolitan scholars, footloose students and multinational companies. Of course, the development may easily be related to trends of improving 'quality' in research and education, increasingly professionalised academic support functions, and a focus on scholarship regardless of national borders. To some extent, companies increasingly seek out 'the best' knowledge sources wherever they may be located. On the other hand, it is obvious that the development is strongly influenced by programmes and initiatives, like EU funding, requiring international networking. The development is partly strategic and partly path-dependent, based on existing strengths, competences and cooperation patterns. In this respect, the return to a form and level of internationalisation found in the medieval university, for example, is clearly also externally driven and desired. Territorial borders may mean less today than only a few decades ago, but this is at least partly a political decision and not merely the sum of micro-level trends.

9.3.2 Changes in Geographical Orientation

The above implies that formalisation and institutionalisation have relatively strong effects on the geographical orientation as well as the frequency of international mobility and cooperation. Internationalisation is related to regionalisation, referring both to regionalisation concerning cooperation between at least two countries as well as regionalisation in the sense of cooperation efforts covering an entire, or large parts, of a continent. The most important manifestation of the latter found in this book is the Europeanisation of research and higher education. It is generally acknowledged that the EU programmes have initiated and promoted a 'European dimension' in higher education and research. This change is highly visible at many levels and sectors of the Norwegian knowledge system. We see its impact reflected in changing academic practices of university research, in industrial R&D and in the research that goes on within the institute sector. Undoubtedly, the weight and significance of the supranational level has increased substantially in the area of higher education (De Wit and Verhoeven 2001; Van der Wende and Huisman 2004). For Norwegian research and higher education, the development of European programmes also represents a relatively new and important aspect of structured international cooperation and interaction. The conditions for internationalisation in Europe are affected by the EU Framework Programmes as well as by the introduction of the European Research Area and the Bologna process aiming at coordination of research policies and the higher education systems across Europe.

Along with the tight connections to Britain and the US, collaboration with its Nordic neighbouring countries was of considerable importance historically in Norway's foreign policy. In science as well, trans-Atlantic and Nordic collaboration was important. While for the UK and US, grants and project funding were most important, the establishment of collaborative research institutes and funding schemes were most central in the Nordic context. In the first post-war decades the re-bordering processes of Norwegian research was thus oriented in two directions. Since the emergence of the EU, and especially EU membership of the Nordic countries, the role of both the Nordic and Atlantic dimension has obviously decreased in relative importance, and the second re-bordering phase has had a European focus. This is again visible in all parts of the research system, including industrial R&D. We see, however, that the Nordic collaborative funding scheme is important to some disciplines, especially within research institutes. As new political initiatives to re-enforce Nordic scientific collaboration occasionally enter the scene, the re-bordering processes should not be considered as having ended. The tension between maintaining traditional foreign relationships and supporting new ones is most likely obvious in many countries across the world, perhaps not least the smaller countries. It may be argued that the only way to maintain Nordic collaboration while at the same time increasing the collaboration of European and developing countries, is to have a steady growth in inputs (funding) and outputs (publications etc.) of the research system – which is also what has happened with Norwegian university research the last 20 years. At the policy level, the European dimension not only adds to the international dimension, but makes a *unique* difference.

First of all, this uniqueness relates to the research side cooperation that has become institutionalised as a supranational research policy toolbox. This policy area has gradually been equipped with administrative capabilities for research policy-making and implementation which might represent a challenge to the nation-state responsibility in this area. It also puts a strain on other international research policy cooperation. Faced with such political and administrative adaptations to changing international cooperation in research and higher education, the traditional Nordic cooperation at the political level has taken a toll, as demonstrated in Chapter 7 and as observed for the impact of European integration on Nordic cooperation in general (Olsen and Sverdrup 1998).

Second, although formally fashioned as an intergovernmental and pan-European process for regional integration of knowledge systems – the Bologna process has already left its footprint on fundamental systemic characteristics in the Norwegian case. These footprints are especially visible in the changes of the degree system and the in the organisation of national agencies for quality assurance, and also in the national reform programme for higher education. The evidence of a turn towards Europe in *practices* of teaching and learning, of students and teachers, is less obvious than at the research–performing level. Nevertheless, the fate of the European dimension and how it has been translated into national policy strongly underpins the significance of the *political* dynamics of internationalisation of national knowledge systems.

9.3.3 Marketisation

Finally, it should be noted that increased 'marketisation' or market control of research and higher education is another important change in the conditions for internationalisation. Again, this is partly related to new policies and mechanisms, and partly related to a strengthening of long-standing developments. To some extent, R&D has always been a sector subject to international competition. With new supranational funding mechanisms, the opening of national support programmes to foreign participants as well as increasing belief in market control and competition more generally, this is ever more the case. De-regulation and opening of markets, which formerly were subject to strong national control, is another underlying trend – for example, those related to energy, food and telecommunications. The establishment of a European patent office (EPO) deserves mention here. Higher education is also subject to increasing market-like competition, even in a country with a predominantly public system with no tuition fees for students. As is the case with Europeanisation of the patent regime, standards that enable and ease the provision of cross-border education and migration of skills have become the object of common European systematisation and standardisation through the Bologna process and the EU. This is exemplified in the system for recognition of degrees, the European credit transfer system. We also see the impact of European standards in the general Europe-wide introduction of national system of qualification based on a common European model. This is a simple, yet poignant illustration of the interplay between competitive and cooperative forces in the internationalisation of research and higher education.

Also the Norwegian case, more so than in other national systems, similar interplay is at work when there is an increasing number of students looking to other countries for education opportunities. But this market behaviour is significantly conditioned by the generous public support system (cf. Chapter 5). In many countries, such as Australia and the UK, curtailment of government financial commitments has lead to increased competition for income, and higher education institutions are trying to recruit full fee-paying students from abroad. This is one of the reasons why higher education is increasingly becoming a commodity in a global educational market. The generous support system for Norwegian students abroad is known to many foreign higher education institutions, and marketing activities targeting Norwegian students increased sharply during the 1990s.

On the other hand, the transformation of the Norwegian funding structure has also made Norwegian higher education institutions more aware of competition from abroad. Those seeking education abroad are increasingly regarded as potential customers of Norwegian universities and colleges, and many institutions try to make themselves more attractive by, for instance, promoting exchange sojourns abroad as a part of a Norwegian degree course. Master degree programmes are also established in cooperation with well-known foreign universities, and the names of these institutions are used heavily in promoting the study programmes. It should be noted that the new Norwegian performance-based funding system has generally made higher education institutions more concerned with attracting students. Marketing

strategies are launched, reflecting a climate of increased competition between Norwegian higher education institutions.

There are, nonetheless, limits to this market control. With the exception of the EU Framework Programmes, international funding is of minor importance to higher education institutions in Norway, and we can find little evidence of a global or European market for these institutions (cf. Chapter 2). For some research institutes there is, however, a considerable funding from foreign industry, indicating embeddedness in the international knowledge economy. From other studies, we know this to be funding obtained partly in highly competitive sectors like ICT and energy, while part of international industry funding comes to institutes specialised in areas where Norwegian R&D institutions are highly competent, like geology, fisheries, oil and gas. (Some of this might, in fact, be funding from Norwegian companies' subsidiaries abroad.) Integration in the global or European economy is dependent upon the strengths and weaknesses of the knowledge produced, and in the fields of science and technology. Again, internationalisation is path-dependent and may not just open up new opportunities but also contribute to increasing lock-ins and specialisation. This can be termed the dual nature of internationalisation, which is discussed further below.

9.4 Latent and Manifest Tensions of Internationalisation

The overall pattern of internationalisation leaves us with a puzzle. On the one hand, we see distinct changes of intensity and form of cross-border activities in core parts of the Norwegian knowledge systems. Yet, there are few overt tensions attached to these changes. Internationalisation is seemingly not a controversial issue. Both at the national level and at the higher education institutions, the promotion and facilitation of internationalisation appears to be on the easy-consensus-agenda. One possible explanation comes down to the characteristics of the country case. Norway represents the case of internationalisation under conditions of a small, relatively open flexible economy with political stability that combines political intervention with economic liberalisation, and is placed among the five countries in the world that score highest on the key characteristics of a developed knowledge economy. In this book, this variable is 'held constant' – as it is a single country study – and it may be that we have a robust case in terms of the political institutions' abilities to cushion the tensions involved with transcended national systemic borders. A national economy that operates under the most favourable conditions has the financial capabilities of 'having the cake and eating it', i.e. internationalise without creating any obvious national losers and winners. Even in that part of the research system which is most embedded in the global markets, we can observe cultural factors at play, and actors who display considerable loyalty to national knowledge systems and institutions. The pattern of internationalisation is not merely a 'market choice', but influenced by economic development that has granted the national system and institutions the means to engage internationally and devise incentive

systems that encourage and condition internationalisation. Such a mechanism, on the other hand, presupposes that the impact and drivers of internationalisation in research and higher education can be controlled and designed by domestic (collective) actors.

9.4.1 Control Versus Determinism

Internationalisation as technical, cultural and/or economic change implies some kind of determinism – there is not much that the political authorities, or the involved organisations, firms or individuals, can do to arrest the trend. The internationalisation studied in this book, however, foremost prevails as planned and wanted. Internationalisation in R&D and higher education is largely controlled and planned political change. Moreover, we find little evidence for internationalisation being perceived as a threat to national political control or scholarly autonomy. As mentioned, internationalisation is seen as integrated in academic basic values, and academia seem hardly to need to resist, translate or decouple the environmental changes related to increased internationalisation. Moreover, national authorities are involved in encouraging and directing international activities (by incentives and monitoring). Internationalisation entails national policies for research and higher education, encompassing new issues – such as facilitating international cooperation and promoting Norwegian expertise, research and institutions abroad. Instead of superseding national policies, internationalisation seems to increase the scope and partly also the importance of national policies. In this way internationalisation in research and higher education can be understood as implying closer connections between the national, international and sub-national levels, and that the deliberate efforts to promote and cope with cross-border activities work in concert and not in contrast to each other. The arguments for the need of more sub-national, national and/or international involvement and policies to urge the internationalisation process (internationalisation as a controlled and planned development) signal a strong belief in the Norwegian case of the possibility of matching the 'inevitable' and escalating processes of making national borders more porous.

In the business sector, growth and performance expectations to companies often imply that they have little choice but to seek expansion to other countries and regions. Although the R&D function may be the last to be affected by such changes, in the end this function could also be subject to a trend of decentralisation or at least recentralisation.

For national political authorities, a latent tension is not only linked to loss of control rooted in technological or economic change but also between the different loci of political control over research and higher education. The tension is between the ambitions and objectives at different levels of governance. In the case of research policy, this may relate to the use of public funding for the national purpose. An increase in public expenditures on R&D being channelled through international programmes (foremost the EU R&D Framework programmes) is at present the most

apparent challenge to national political control over funds. Norwegian authorities try to meet this challenge by different kinds of efforts directed at influencing EU R&D policy, but we find little evidence that lack of domestic control is seen as an adequate argument against the internationalisation of R&D.

Taking student mobility as another example, the effects of internationalisation on the possibility of national control are still limited. If wanted, economic incentives may provide powerful measures for political regulation, at least in the Norwegian context; the marketing strategies of foreign institutions will have limited effects if the students cannot bring with them national financial student support.

9.4.2 Co-operation and Competition

There is a tension between international cooperation and competition, as the internationalisation of higher education and research may be understood both as results of needs for sharing costs and workload, and of more competitive and market-oriented environments. Still, in policy statements, cooperation and competition are often tightly combined – arguing for the need for increased international cooperation to increase one's competitiveness. We see increase in cooperation *and* competition at all system levels discussed in this book. The policy efforts at the national and international levels include both initiatives to increase international cooperation and to open for more international competition, i.e. to stimulate both cooperation and competition across borders. Bilateral agreements are set up to facilitate more cooperation, while the Bologna process, the Lisbon strategy and domestic reforms (as the Norwegian 'Quality Reform' in higher education), promote both international cooperation and competition. The competitive element is very visible in the way that internationalisation is used as a measure of performance at universities, and thus *de facto* creating winners and losers domestically – i.e. redistributing national resources according to how individuals, research groups and institutions perform in their cross-border activities.

When we look at industrial R&D, it is interesting to note that the organisation of companies' R&D functions seem to influence the balance between cooperation and competition (cf. Chapter 4). In firms where all R&D units have a niche leadership and high degree of specialisation, the units themselves worry less about competition and downsizing than in companies where R&D units are tailored to the needs of specific markets and production units. Increasing similarities between factories, rationalisation in production, and convergence in user needs, are all trends that increase the internal competition in the companies, making the R&D units fear for their future. We might expect that in cases of 'pure' competition impeding cooperation, the general trends of increased internationalisation of R&D are interrupted or prevented. Future studies may want to focus more on the nature of companies. Do some of them, for example, have truly 'global' R&D? Is the nature of the knowledge base in some sectors changing in a way that makes it easier to decentralise and internationalise R&D?

9.4.3 Convergence and Divergence

The effects of internationalisation processes are combinations of convergence and divergence. We find, for example, that internationalisation leads countries both to adopt and imitate each other's policies and to increased differentiation and specialisation. At the political level, internationalisation entails both convergence and divergence. Comparing domestic and international programmes, both similar trends and more unique niches appear.

At the institutional level (higher education institutions), the Bologna process promotes structural convergence in order to facilitate both international cooperation and competition. This, in turn, may entail convergence in the content of higher education, also clearer international niches for each institution. So far, we have little evidence of such international positioning that can be attributed to the Bologna process or national reforms in the bulk of universities and colleges in Norway (Halvorsen and Faye 2007). At the micro level (core activities), internationalisation may reduce activities that are isolated from other scholarly activities. On the other hand, scholars may more easily find their niche when exposed to international competition.

In industrial R&D, there are few signs of convergence. Successful firms often focus strongly on developing unique competitive advantages and unique niches of knowledge. They are, therefore, on the lookout for specialised providers (which they often find in their vicinity), a trend which could lead to increased specialisation, also in public R&D, rather than increased convergence.

A broader issue may be raised here, however. Small countries face a similar problem whereby most of the world's scientific and technological knowledge is produced abroad. Therefore, countries often aim to create a research and education system that serves the needs of the most important public and private sectors, and at the same time is able to import and diffuse knowledge produced elsewhere. Systems that to a large extent are oriented towards existing needs, may be in danger of negative forms of 'lock-in' and inertia which restrain radical innovation and the development of new industries (see Narula 2002). Internationalisation may therefore be a necessity for firms in industries that are not part of strong national clusters. But the type of internationalisation we have found in this book is probably more oriented towards strengthening areas which are already strong, and where the potential for cross-country collaboration might be highest. This could reinforce path dependencies and perhaps lead to less variety in the national research and education system. At least there is a tension here that clearly demonstrates the two-faced nature of internationalisation.

9.5 In Conclusion: Approaching the Threshold of Fundamental Transformation

A key question is whether the increasing level and formalisation and institutionalisation of internationalisation has fundamental effects on the core activities of research

and higher education. At one level, we have not found much evidence of this in the various chapters. Internationalisation, at least on the surface, seems to be relatively tension-free and uncontroversial. All involved actors are in favour of it – from the policy-makers to the universities, companies and individual researchers. Except for some concern about a decrease in the use of the Norwegian language in research and education (and an increase in English publications and teaching), the effects of internationalisation so far seem uncontroversial in Norway. Internationalisation is generally perceived to strengthen basic processes and characteristics like academic quality, human capital and competitiveness.

We may still ask whether internationalisation is approaching a *threshold*, a level of cross-border relations that leads to more fundamental transformation of education, research and innovation activities. The number of internationally co-authored articles has been steadily increasing over the last 25 years, and probably earlier. This expression of international collaboration is evident not only for Norway, but for most countries irrespective of their geographic or political localisation. We might interpret this as being caused by a general drive for scientific collaboration, driven by new technological opportunities for long-distance interaction. However, this may also be followed by a change in organisation where research work in itself is increasingly carried out in international teams, leading to whole new organisational, managerial and policy challenges; that is, a sign of a more fundamental process of change which has penetrated the inner core of academic practices.

Not all changes in research and higher education are necessarily due to increased internationalisation, however. These sectors have become ever more important to society, not least through the massification of higher education, leading to transformations that may be more profound than may be seen by focusing on internationalisation. The change processes connected to internationalisation should thus be seen in association with general societal transformations.

Changes also link up to a transformation in the *rationales* for internationalisation. Today's arguments are instrumental, where internationalisation represents a means to achieve more wealth/growth/innovativeness etc., while traditional arguments emphasise academic and cultural rationales. Still, the instrumental and the cultural/academic rationales live side by side, and the extent to which they are emphasised seems partly to relate to the audience addressed – opening the possibility that the apparent rationales are rhetoric to legitimise change, and not the underlying 'rationales'. On the other hand, the rationales may be highly interconnected and difficult to distinguish, as positive effects on wealth and economic growth and on academic and cultural matters may be seen to reinforce each other. Both academic and economic goals may benefit from similar processes and mechanisms. Other goals are probably more rhetoric or 'icing on the internationalisation cake'. For example, institutional and national goals of improved relations to developing countries (cf. Chapter 6) could conflict with both the economic and academic rationales. Increased collaboration with developing countries, at least in the short term, might not strengthen academic quality or industrial competitiveness. Nevertheless, an interesting development is that industrial R&D – even from a small country like Norway – is increasingly carried out in, or in cooperation with, non-Western countries.

As we have seen, there are surprisingly few tensions manifest in the process of internationalisation that have come to the fore in this book. A threshold hypothesis states that there could be increasing tensions between the inherently national goals of many policies, and the escalating international nature of research, higher education and innovation. Internationalisation is unproblematic as long as international activities do not threaten national goals and priorities. If internationalisation reaches a level, threshold or pattern where the national public research and education infrastructure is unable or unwilling to cover local/national needs for knowledge and human capital, tensions will arise. We have, however, found little support that this is the case so far. Concern about reduced emphasis on local/national problems, or the threat that industrial R&D will follow mass production and move to low-cost countries, seem to be unfounded so far.

The studies in this book present a mixed picture and give ground for a critical reflection on the concept of internationalisation and the extent to which the forces and consequences of internationalisation represent any fundamental change of core activities in higher education and R&D, and of the role that national borders play in knowledge production and dissemination. It is hard to muster evidence for seeing the present pattern of internationalisation as a fundamental transformation in the way research and teaching/learning takes place, in the way national labour markets for highly education manpower operates, in the way higher education institutions act, and in the public policies directed at this sector. However, there are significant incremental changes that may indicate that internationalisation has reached an extent or a threshold level that might induce more powerful changes in research and education activities and systems.

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