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Progress in higher education reform across Europe

Funding Reform

Volume 1: Executive Summary and main report

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Progress in higher education reform across Europe

Governance and Funding Reform

Structure of the final reports

Two CHEPS-led consortia were commissioned to undertake parallel studies on higher education governance and funding reforms across Europe and their relation to system performance. With the agreement of DG EAC the literature review, performance overviews, national system analyses and case study components of the two projects were integrated which allowed a broader selection of case studies than originally envisaged. All of these "joint products" can be found in Volume 2 which is a common volume in both project reports. The current volume is shaded for ease of reference.

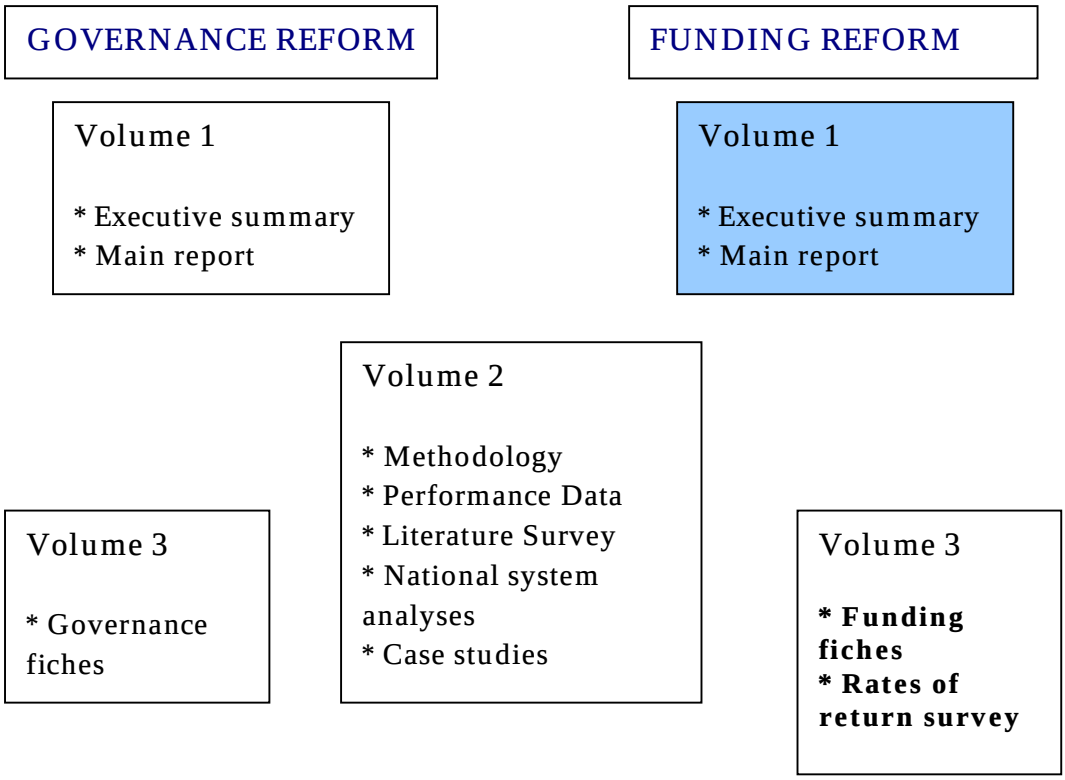

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Table of contents

Executive summary

Research questions and methodology

Higher education reforms reflect the growing recognition of the importance of higher education for economic, social and cultural prosperity and for increasing competitiveness. While it is well established that funding reforms have taken place at various levels and in various policy areas of higher education, what is less clear is how successful they have been in terms of increasing the performance of higher education systems as a whole. This study aims to answer the following questions:

1. *What is the state of implementation of the funding reforms undertaken in the 33 European higher education systems and what do we know about the rates of return to higher education in the 33 countries?*

2. *What is the performance of the 33 European higher education systems with respect to the eight dimensions identified, and how has this changed over the last decade?*

3. *What has been the impact of the funding reforms on the performance of higher education systems?*

4. *What lessons can be learned, i.e. what could be the further courses for action towards the modernisation of higher education institutions towards 2020?*

In answering these questions a mixture of research methodologies has been used to collect and analyse data. The primary date sources to study funding reforms and their effects in thirty-three countries were a comprehensive country questionnaire completed by national experts, interviews with key stakeholders in each of the countries, and two institutional case studies in fifteen countries (including interviews with key institutional decision makers). The secondary data sources included the literature on European funding reforms, rate of return studies, previous comparative studies on governance and funding reforms and EU and national policy reports. With respect to the dimensions of system performance in higher education, this study relied on readily available secondary (statistical) data from a number of international databases (OECD, EUROSTAT and UNESCO). To explore the relationships between funding reforms and system performance we used the outcomes of the questionnaires, the interviews with key stakeholders in each country, and existing literature.

System performance

Based on the terms of reference for this study, eight performance dimensions were selected: access, educational attainment, mature learners, graduate employability, student mobility, research output, capacity to attract funds, and expenditure per student. For describing the performances of higher education systems, each dimension is represented by *indicators*. Between 2002 and 2006, system performance on the dimensions of access, mature learners, attainment, mobility, and the revenues from private households (indicating capacity to attract funds) showed particularly large improvements. Research output in terms of articles increased moderately, while for other areas (employability, the R&D revenues that higher education institutions receive from the business sector) there was no growth, or a decline. In 22 countries, expenditure per student increased over the period 2002-2006, indicating either a decrease in cost effectiveness or a higher priority placed on higher education.

Funding reforms in Europe

There have been significant changes in funding arrangements since 1995 in almost all countries. Reforms are based on the belief that the level, composition and method of funding matter when it comes to the performance of higher education systems. The expansion of higher education systems has brought *budgetary pressures* for many countries. More and more governments have embarked on a policy of cost sharing, where students and the taxpayer share the cost of higher education.

Our study has looked at the *levels of funding* in the 33 European higher education systems and concluded that there exists a substantial funding gap between Europe and the US. Between 1995 and 2008, our data shows that the level of public funds per student increased in almost 60% of the 33 countries; funding was stable in about a quarter; it decreased in the remaining 20%. Total expenditure per student from public and private sources did not deteriorate in most countries, mostly because of a rising proportion of private expenditure on higher education institutions.

Many countries have started to rethink their tuition fee and student aid policies and have embarked on a policy of *cost-sharing.* A number of countries have expanded their *student support systems,* placing more emphasis on the proportion of loan-based student financial support among the public subsidies for students. Two thirds of the countries have a student loans system in place.

The debate on the appropriate levels of public and private spending is informed partly by an assessment of the *social and private returns to investment in higher education*. Based on desk research we conclude that the average private rate of return is 10.2%, while the average social rate of return is 7.9%, indicating that higher education is a profitable investment opportunity, both privately and socially. Still, tuition fees for Bachelor-level students are relatively low across Europe. In 2008, eighteen countries had no fees, seven charged moderate fees and eight had fees above €500 per annum

The *mechanisms for public funding* (distinguishing four different approaches: negotiation; incremental; formula funding; contract funding) underwent many reforms. Incremental funding in many countries has been replaced by formula-based approaches, and contract approaches have been introduced - often on top of formulae. Funding mechanisms place more emphasis on performance. However, input- and cost-related factors remain very important, and no country has a 100% performance-based funding system.

In terms of *research funding*, there are 11 systems where we see a rise in the share of competitive/research council funding. On top of that, *targeted funds* (also for education) are frequently used to encourage institutions to address specific national priorities. The rise of contract/project funding has led to a diversification of funding sources for institutions. In terms of revenues, we see a higher share of tuition fees and third party funds, and a lower share of the core operational grant that institutions receive from public authorities. A third of the countries nowadays have more than a quarter of their revenues coming from third party funds. Many countries have granted more financial autonomy to their institutions – although not so much in the area of setting fees – to encourage a differentiation of institutional missions and diversification of revenues. From our study on governance reform we may add that the growing autonomy of higher education institutions on the various aspects of autonomy was coupled with greater accountability. As with designing funding mechanisms, the challenge is to balance institutional autonomy and public accountability.

Funding reforms and Europe's Modernisation Agenda for higher education

To explore the link between funding arrangements and the various performance dimensions we have taken the European Commission's *Modernisation Agenda* as our point of departure. We see this agenda as a set of recommendations that offers countries and higher education institutions a variety of issues to consider and a range of options for reform that need to be tailored to national and institutional contexts and conditions. We have explored the extent to which the funding arrangements in Europe reflect relevant aspects of the Modernisation agenda, using indicators. The picture that emerges is the following:

- in 14 countries, universities have a high level of financial autonomy in 2008 (compared to 11 countries in 1995);
- in 14 countries we see a high share (≥25%) of revenues from third party funds (6 countries in 1995);
- in 13 countries universities we observe a high share (≥15%) of revenues from tuition fees (8 countries in 1995);
- in 18 countries the degree of performance orientation in the funding mechanism is high (5 countries in 1995);

- in 9 countries, universities have a high share of competitive research funds (≥25% of combined core funds and research council funds) (8 countries in 1995);

- in 18 countries the portability of student grants is high (the same as for students studying at home) (9 countries in 1995).

If the different funding-related aspects of the Modernisation Agenda are considered as a whole for the year 2008, seventeen countries can be characterised as having a high degree of *correspondence to the Modernisation Agenda*, eight countries have addressed quite a few aspects, five countries have tackled a few aspects, and three countries have hardly addressed any aspects of the Modernisation Agenda.

Funding and system performance in higher education

When looking at the funding arrangements and their potential link to higher education system performance one needs to control for the countries' level of public investment in higher education (public expenditure on tertiary level education as a percentage of GDP) as well as for the economic standing of the countries (assessed through a country's position on the Global Competitiveness Index). Having done so, our general conclusion is:

For three of the performance dimensions we find that funding reforms may be linked to increased system performance (graduation, student contributions, research output), for three others there is a weak link (mature enrolment, business contributions, student mobility), while for the remaining dimensions (access, employability) there is no link.

Our findings suggest that *funding policies matter for some areas of higher education performance*, particularly if they go along with sufficient levels of autonomy for the institutions. There appears to be a link between the output of the primary processes (numbers of graduates and articles published) on the one hand and the funding and autonomy conditions on the other. This conclusion is supported by other research. For the other performance dimensions, which are not related or less directly related to the primary processes of higher education institutions, performance is explained more by a combination of other factors, such as societal developments, economic conditions and political cultures.

Compared to reforms in the area of governance, *funding reforms seem to have more direct effects* on system performance. This holds in particular for the introduction of performance-based funding (emphasising research quality and graduation/ enrolment), tuition fees (generating revenues, providing growth incentives for higher education institutions) and competitive funding and targeted/project funds (generating revenues, stimulating quality and productivity). Some funding reforms may only work in an indirect way – such as reforms that increase the financial autonomy of institutions. On dimensions other than educational attainment and

research output (and to some extent the tuition revenues from students) the links between funding, governance and performance may exist *only in specific contexts*. What works in one country may not work in another. Our study shows many interesting country-specific examples of a positive interaction between funding reforms and performance, but more detailed research on a less aggregate level is needed to draw firm conclusions on what matters most in funding.

Policy recommendations

Based on the outcomes of our analyses we offer the following recommendations.

- *To shape the funding of higher education, **cost sharing** between the state and students should be the leading principle. Public subsidies should continue to be provided for higher education, regardless of the sector of provision (public or private). Students should be expected to pay a tuition fee, where the fee level is regulated to ensure cost containment and moderation.*

- *Countries should back up their tuition fee measures with student support systems that consist of **grants AND loans** to cover the students' fees and living costs. The grants will need to be based on assessed need to encourage participation by students from disadvantaged backgrounds. The loans system should be shaped according to the principle of income-contingent repayments (i.e. full debt collected in accordance with a graduate's ability to repay) and debts carrying an interest rate that is partly subsidised by government. Loans and grants need to be made available also for students studying in accredited private higher education institutions.*

- *For their funding mechanisms, countries should rely mostly on **formula-based approaches** (that include both inputs and outputs as funding drivers), but on top of that they may wish to consider a **contract-based approach** that includes more targeted and project-based funds – not in terms of an array of separate funding streams each with different accountability requirements[1], but more in the shape of an integrated package.*

- *Introducing **more performance- and competition-based funding** should go hand in hand with more institutional **autonomy** overall for European higher education institutions. This combination is most likely to contribute to system performance in higher education's primary processes and products.*

- *To increase mutual learning and the spreading of good practices (e.g. through the Open Method of Co-ordination) we need to take account of*

[1] We would like to refer here to the recommendation made in our parallel study on governance reform, where we also touch on the trade-off between autonomy and accountability.

*national **contexts and traditions**. To understand why reforms worked well in some countries, a serious analysis of the individual national contexts needs to be undertaken that goes beyond a mere benchmarking exercise and produces insights for tailored solutions for other countries, taking into account their starting positions or their comparative advantages.*

§ *Reforms based on a broad agenda that encompasses many policy areas make little sense. Reform agendas should **target a more limited selection of weak areas** per country, based on a careful SWOT analysis. Overloading the reform agenda with too many goals (or even instruments) may raise the stakes too high when it comes to the assessment of what has been achieved.*

§ *A **European monitoring system** should be established to address important aspects of reform and performance in higher education systems in constant flux. A European scoreboard for higher education could integrate and further develop important indicators for performance and for the characteristics of higher education systems and their reform. Such a monitoring system would also provide a valuable foundation for the analysis of national systems and the development of tailor-made recommendations for further reform.*

1 The objectives, research questions and design of the study

1.1 Introduction

This study seeks to explore the progress of higher education funding reforms in 33 European countries[2], and to identify potential linkages between higher education funding reforms and higher education system performance in Europe. It was carried out over the period October 2009-January 2010 by a consortium of five European research centres and associated researchers. The study was commissioned by the Directorate General Education and Culture of the European Commission.

The study's rationale lies in the collective ambition of European nation states to create a broader, more powerful European Union that is simultaneously more economically competitive and more socially cohesive. It is becoming increasingly clear that higher education is a critical component to fully realising that ambition. These contributions were spelled out in several EC Communications, such as *The Role of the Universities in the Europe of Knowledge* (EC 2003) and *Mobilising the Brainpower of Europe* (EC 2005). But many scholars and policy-makers also argue that realising that ambition also requires fundamental reform of several aspects of higher education systems. Reforms modernisation – are required not just in the funding of teaching and research or in student finance, but also in the broader governance of the system and the curricula offered in research universities, colleges and universities of applied sciences.

Despite many reforms across Europe to raise higher education systems performance in terms of quality, access, and efficiency, it is not entirely clear whether there is an obvious link between reforms and performance. The European Commission has therefore sought to take stock of the various countries' reform efforts, and to explore any underlying relationships. Since the late 1990s, the rate of change in European higher education has accelerated, due largely to the Sorbonne and Bologna Declarations (1998, 1999), which sought to make study programmes more compatible across European systems, and the Lisbon Strategy (2000), seeking to reform the continent's still fragmented knowledge-production systems into a more powerful and more integrated, knowledge-based economy.

The Lisbon strategy was renewed in 2005 through the European Commission's New Lisbon Partnership for Growth and Jobs. In this document, 'knowledge and innovation for growth' have been designated as one of the three main areas for action. Higher education's role was likewise reaffirmed in the Commission's Modernisation Agenda for Europe's universities (EC 2006).

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[2] The study covers the 27 European Union Member States, plus Iceland, Liechtenstein, Norway, Switzerland, Croatia and Turkey.

A Council resolution on modernising universities for Europe's competitiveness adopted in autumn 2007 determined that the main pillars of the Lisbon Strategy for Growth and Jobs are education, research, innovation and the modernisation of higher education institutions. The 'Modernisation Agenda' is therefore directly related to the EU Innovation Policy and its objectives of innovation and global competitiveness. The Lisbon Strategy lists the following three main fields of reforms:

- Curricular Reform: the three cycle system (bachelor-master-doctorate), competence-based learning, flexible learning paths, recognition, mobility[3]
- Governance Reform: university autonomy, strategic partnerships, including with enterprises, quality assurance
- Funding Reform: diversified sources of university income better linked to performance, promoting equity, access and efficiency, including the possible role of tuition fees, grants and loans

This Modernisation Agenda, presented later in more detail, acts as an important reference point for our study of HE reforms. Although we concentrate primarily on funding reforms, we must also mention that the Modernisation Agenda impinges not only upon funding, but also on reforms in the areas of governance, curricula and degree structures. So, acquiring a complete picture of the modernisation efforts of countries, we advise that this report be read alongside our parallel study on governance reforms, carried out using the same methodology, data sources and network of national experts, and in some areas with the third report in the series, an independent assessment of the Bologna process.

1.2 Research questions

While it is well established that reforms have taken place on various levels and in various areas of higher education funding, much less is known about the degree of implementation of such changes and their success in increasing the performance of higher education institutions and national systems as a whole. There is remarkably little research addressing such issues in a comprehensive way at the European level.

[3] Curricular reforms are also promoted through the Bologna Process, in which 46 countries in the wider Europe are working towards establishing the European Higher Education Area by 2010. The reforms in this Bologna Process are studied in a parallel EU-funded research project carried out by a CHEPS-led consortium consisting of a group of research institutes that is slightly different from our consortium.

Although there are some inventories of the financing systems for higher education (e.g. as part of the study on higher education governance by Eurydice[4] or the large tertiary education OECD's[5]), most are descriptive, focusing on the present, and leaving aside the question of reforms' impact on system performance.[6]

Although we realise the difficulties of fully capturing all the dynamics in the area of funding reforms and in particular of ascribing causal relationships, our study seeks to provide a broader and more encompassing understanding of higher education funding reforms in Europe than hitherto available. We have examined the funding reforms that have taken place in 33 European countries since the mid-1990s and we have tried to assess their relative success. Furthermore – and at our client's request – we also have collected information on the *rates of return* to investment in higher education, which have been used in some countries by policy-makers to underpin funding reforms around tuition fees and student support.

To describe the performance of higher education systems and the impact of funding reforms on that performance, the Commission suggested eight dimensions to measure HE system performance:-

- Access
- Mature learners
- Graduation
- Employability
- International student mobility
- Research output
- Capacity to attract funding
- Cost effectiveness

Indicators have been identified and data collected to allow performance measurement along these eight dimensions. The data refer to the years 1998, 2002 and 2006 and are extracted from existing European/international databases to guarantee common definitions.

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4 Eurydice (2008) *Higher Education Governance in Europe: Policies, structures, funding and academic staff*. Brussels: Eurydice, Retrieved April 14 2009 from: http://www.eurydice.org/.

5 Santiago, P. et al. (2008), Tertiary Education for the Knowledge Society: VOLUME 1: Special features: Governance, Funding, Quality. Paris; OECD.

6 There are some exceptions (e.g. Strehl et al., 2007; Aghion et al. 2009). See next chapter.

In summary, our broad objectives translate into four key research questions:

1. What is the state of implementation of the funding reforms undertaken in the 33 European higher education systems and what do we know about the rates of return of higher education in the 33 countries?

2. What is the performance of the 33 European higher education systems with respect to the eight dimensions identified, and how has this changed over the last decade?

3. What has been the impact of the funding reforms on the performance of higher education systems?

4. What lessons can be learned, i.e. what could be the further courses for action towards the modernisation of HEIs towards 2020?

1.3 The research methodology

To answer these research questions, a mixture of research methodologies have been used to collect and analyse data sources. A detailed description of these methodologies and the operationalisation of the instruments and indicators can be found in Volume 2 of this report. We have drawn on both primary and secondary data sources to address funding and governance reforms and their effects. The primary sources included a comprehensive country questionnaire completed by national experts for each country, alongside key stakeholder interviews in each of the 33 European countries. The primary sources also included in-depth institutional case studies in 15 countries (including key institutional decision maker interviews). The secondary data sources included literatures on European governance and funding reforms, previous comparative studies on governance/funding reforms as well as EU and national policy reports. Included within this is an earlier study on governance reforms, carried out in 2006 for the Commission by a selection of our consortium members.[7] For the eight dimensions that we distinguish to describe higher education system performance, we relied on secondary (statistical) data from international databases (e.g. OECD, Eurostat). This was done to ensure comparability across the 33 countries. To explore the relationships between the reforms and the system performances, we used both existing literatures, alongside key stakeholder interviews in each country at the national and the institutional level.

[7] CHEPS Consortium (2006), *The Extent and Impact of Higher Education Governance Reform across Europe. Part 1: Comparative Analysis and Executive Summary*. Enschede: Center for Higher Education Policy Studies. Available from: http://ec.europa.eu/education/doc/reports/index_en.html.

This data has been analysed and that analysis is reported in a number of project outputs:

- Literature review report; overview of the books, articles and reports on public sector management and higher education governance and funding matters
- A report documenting the latest information available in terms of the rates of return to investment in higher education
- National governance fiches[8] and national funding fiches, containing brief overviews per country on the current situation of governance and funding and on the changes in the period 1995-2008
- System performance overviews: an overview of (changes in) higher education performances per country for each of the eight performance dimensions
- National system analyses: a country report on the governance and funding reforms in the period 1995-2008, their effects and relationships with the performance areas per country
- Institutional case studies: in fifteen countries, two in-depth case studies were undertaken at the institutional level

These materials serve as the basis for this study's outcomes, and are not included in the main text of this report but in Volumes 2 and 3 of the report.

1.4 Outline of the report

In order to answer the research questions outlined above we have structured this report into 5 chapters.

Firstly, we provide an overview (chapter 2) of the major themes and research perspectives in the area of higher education funding. This includes a brief research retrospective, including research on rates of return. We then turn to some of the results of our empirical research and present the results of our survey on the funding reforms in the 33 countries over the period 1995-2008 (chapter 3). We perform a first exploratory analysis in order to establish some stylised facts about changes in European higher education funding and deduce some trends in terms of the types of reform.

In chapter 4 we turn to system level performance, using our eight performance dimensions. We highlight the performance differences between countries as well as the changes in performance within each country, using indicators to quantify aspects of performance. A critical issue arising here is that performance must be evaluated within specific national contexts. Therefore, we also highlight a number of contextual

[8] The governance fiches are not included in this report. The reader is referred to the companion report on Governance Reform

background variables later required when studying the links between reforms and performance.

In chapter 5 the relationships between the implementation of funding reforms and the performance of higher education systems are explored and conclusions drawn. Chapter 5 draws on the range of intermediate project materials outlined in section 1.3 above.

We believe that this study has produced useful insights as well as valuable input for future research and for future policy discussions, such as on the modernisation agenda and the EU 2020 agenda.

2 Higher education funding and performance: the study in context

2.1 Introduction: the calls for reform

It is becoming increasingly clear that higher education is a critical component of societal responses to emerging challenges, and in ensuring increasing welfare and competitiveness (e.g. Van der Ploeg and Veugelers 2007). The 'wisdom' of higher education being a major driver for economic competitiveness in an increasingly knowledge-driven global economy has made high-quality higher education more important than ever (OECD 2008: 23). Both national governments and the European Union have become more concerned and interested in higher education. Policy agendas increasingly stress that higher education institutions (HEIs)[9] are expected to contribute to the operation of pluralist democracies, to efficient and innovative economic processes, to social cohesion and to the development of a highly educated labour force (e.g. EC 2003, 2005a). These changing expectations over the last decade of higher education's contribution to a knowledge-based economy and society have influenced the governance of higher education and its institutions (e.g. Estermann and Nokkala 2009: 6). They also have had an impact on the choice and design of funding policies.

Stressing the importance of higher education for the future can be read to infer a golden age for universities (e.g. Jacobs and Van der Ploeg 2006). However, European higher education faces serious obstacles that prevent it from realising its ambition to make that societal contribution. It is believed that overcoming the obstacles requires reforms in governance, funding and degree structures, reforms put forward in Europe's *Modernisation Agenda*. On 23 November 2007, the Council of the European Union adopted a resolution on "Modernising universities for Europe's competitiveness in a global economy". This reaffirms that modernising higher education and research is a pre-requisite for increasing European competitiveness. It underlines 'the need for universities to have sufficient autonomy, better governance and accountability in their structures to face new societal needs and to enable them to increase and diversify their sources of public and private funding in order to reduce the funding gap with the European Union's main competitors' (Council Resolution 2007: 2). There is, according to the Council, a need to accelerate university reforms to stimulate progress across the whole higher education system and to foster the emergence and strengthening of HEIs which demonstrate their excellence internationally.

[9] We will use the terms *universities* and HEIs interchangeably throughout this chapter. In other words, we include research universities as well as colleges and polytechnics (the Universities of applied sciences).

It implies among other things that HEIs should be granted significant autonomy and greater accountability 'to enable them to improve their management practices, to develop their innovative capacity and to strengthen their capacity to modernise their curricula to meet labour market and learner needs more effectively' (Ibid: 4).

The prevailing policy belief is that universities in Europe should be freed from over-regulation and micro-management, while accepting in return fuller institutional accountability to their host societies for their results (Eurydice 2008, 2000 OECD 2008). In terms of funding we witness a trend from line item towards lump sum funding, implying that HEIs now clearly have more opportunities to make their own decisions, opening new possibilities for HEIs. More autonomy is expected to improve the performance of HEIs and of higher education systems as a whole.

In this chapter, drawing on a large body of existing literature on governance and funding in higher education, we provide a general overview of trends in higher education funding, debates around funding mechanisms, and the potential effects of changing funding mechanisms on system performance. This chapter therefore provides an introduction to our findings subsequently reported upon from chapter 3 onwards. Having presented some basic questions related to funding (section 2.2), we then turn to the debates on funding reforms that touch upon the HE and research providers (section 2.3). We then (section 2.4) outline trends and discussions around reforms relating to student finance and tuition fees. In section 2.5 we present the findings of several studies that considered whether governance (including funding arrangements and funding levels) matters for higher education performance.

2.2 Funding: major themes and research questions

2.2.1 Introduction

Funding of higher education is a multi-faceted issue, more than merely a mechanism to allocate financial resources to universities and students. It is often the foundation of other governance instruments that enforce common goals set for higher education (such as access or efficiency). Funding sets incentives for certain behaviours, for instance through competitive research grants. The funding method as well as the size and composition of resources are often geared to maximizing desired outputs given limited resources. Governance issues (as described in 2.1) and funding systems are therefore often two sides of the same coin. Appropriate levels of autonomy and monitoring for HEIs in order to meet societal expectations is an important funding issue as far as autonomy in internal resource allocation is concerned. At the same time, it is also a larger governance issue in terms of the balance of responsibilities of the HEIs and state. Funding is therefore not an isolated topic but a set of instruments to achieve the goals of higher education.

Our study of funding reforms primarily relates to the question of how in various European countries the objectives of higher education and of its various stakeholders are influenced and realised through reshaping funding arrangements, including financial regulations and incentive structures. The reshaping of funding arrangements can encompass a range of aspects, including:

- Who pays for higher education (including the topics of cost-sharing in higher education and external funding to universities)?
- How is public funding allocated to HEIs, including the question of what incentives allocation mechanisms create?
- How much autonomy do HEIs have for their internal resource allocation?

These key issues also feature in European Commission's communications, such as the Modernisation Agenda. This agenda recommends strengthening universities and making HEI funding more effective in order to handle those challenges currently confronting higher education systems, challenges which have led countries to introduce several reforms in governance and funding. These challenges have been identified in an earlier major study that retains contemporary relevance (Eurydice 2000): (1) increasing demand for higher education, (2) restrictions on public spending, (3) globalization of economies, (4) technological progress, and (5) decentralization. In the next sections we will briefly set out some of the trends in funding reforms that were identified in earlier work carried out by Eurydice (2008) and the OECD (Santiago et al. 2008).

As indicated by Eurydice (2008), the discussion on the funding of higher education in Europe primarily focuses on the following broad items (p. 7), with considerable overlap with the above list of questions about the volume, methods and conditions of funding:

- Increasing public funding for higher education
- Granting more autonomy to institutions for managing financial resources
- Establishing direct links between results and the amount of public funding allocated
- Encouraging diversification of funding sources as well as creation of partnerships with research institutes, businesses, and regional authorities

The first issue is discussed in the following sub-section (2.2.2), showing some data on funding trends. In sub-section 2.2.3, we offer some remarks on financial autonomy. The third and the fourth issues (linking funding to results and diversifying funding sources) are addressed in section 2.3, where we present an overview of the debates on institutional funding. Section 2.4 primarily concerns student finance, part of the fourth item in the above list.

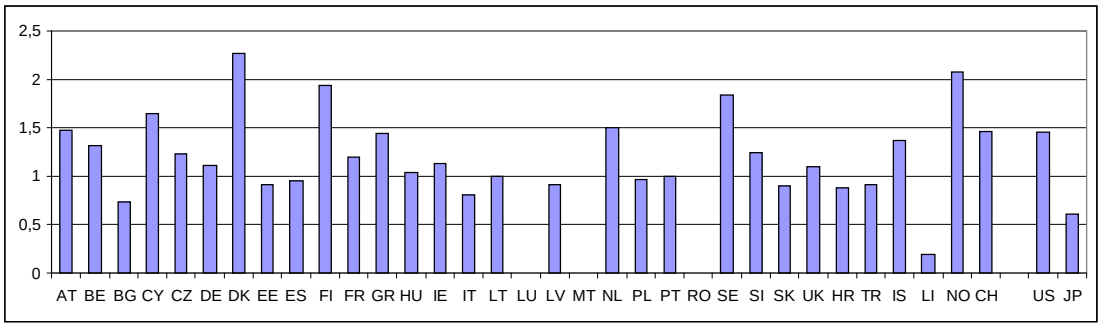
2.2.2 How much funding?

The question of how much resource to devote to higher education can be decomposed into two sub-questions, the question of the proportion of national wealth spent on higher education from the public purse, and the proportion coming from private sources. The relative size of the public share indicates what the country is prepared to invest in its higher education system. In the yearly *Education at Glance* publications, the indicators B2.2 and B2.4 are devoted to 'Expenditure on educational institutions as a percentage of GDP', showing the resources from public and private sources allocated to Tertiary Education.[10] Quoting from the most recent *Education at a Glance* 2009 publication:

> *This indicator provides a measure of the proportion of a nation's wealth that is invested in educational institutions. Expenditure on educational institutions is an investment that can help foster economic growth, enhance productivity, contribute to personal and social development, and reduce social inequality. Relative to GDP, expenditure on educational institutions shows the priority a country gives to education in terms of its overall resource allocation. The proportion of total financial resources devoted to education in a country results from choices made by government, enterprises, and individual students and their families, and is partially driven by the size of the country's school-age population and enrolment in education. Moreover, if the social and private returns to investment in education are sufficiently large, there is an incentive to expand enrolment and increase total investment. (OECD 2009: 210)*

The graph below shows public expenditure on higher education as a share of GDP for the countries in our survey, as well as for the US and Japan. On average the EU27 countries spend 1.13% of their GDP on higher education.

Figure 2.1. Public expenditure on Higher Education as % of GDP, year 2006



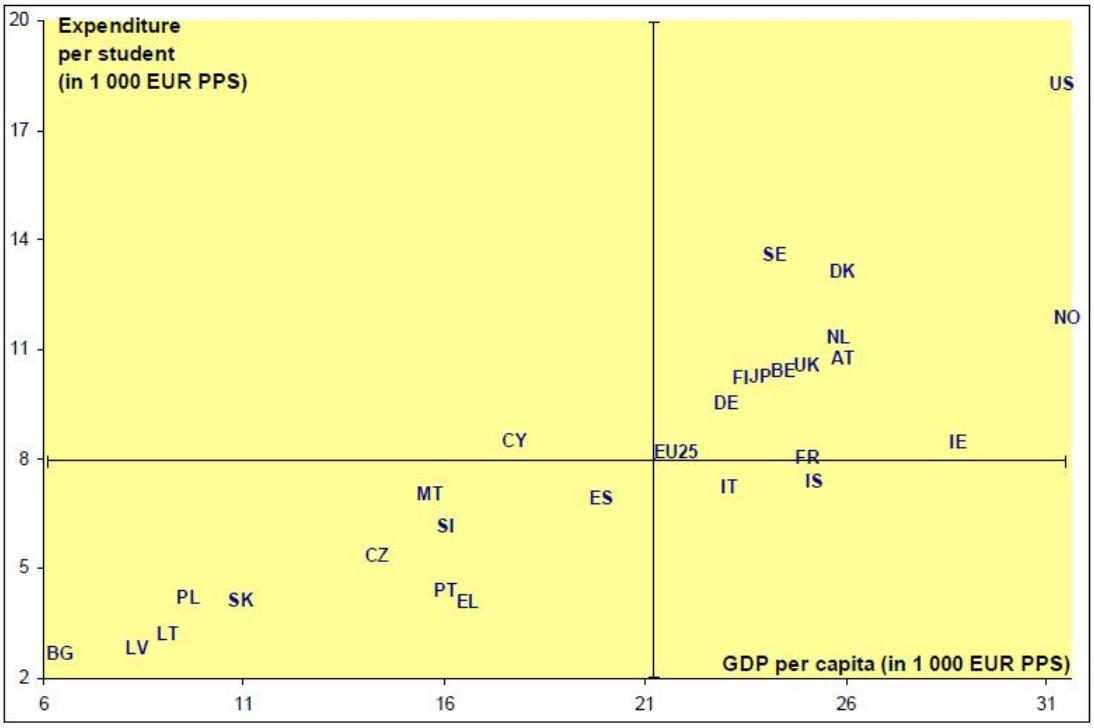
(source: Eurostat (2006), Indicators on education expenditure – table 4)

[10] Please note: we will use the term *Higher Education* instead of *Tertiary Education*. International statistical conventions define tertiary education in terms of programme levels: those programmes at ISCED levels 5B, 5A and 6 are treated as tertiary education, and programmes below ISCED level 5B are not.

The above graph and data does not include the private expenditure on higher education. From the *Education at a Glance* data (OECD 2009:.240) we know that in 2006, the EU19 countries[11] spent on average 1.3% of GDP on higher education, with 1.1% from public sources and 0.2% from private sources. If private expenditure on higher education were included in the above graph, the difference between the EU countries on the one hand and the US and Japan on the other would become more apparent.

Figures 2.2 and 2.3 show the public AND private expenditure on public higher education institutions expressed in Euros per student. Expenditure per student provides a measure of the unit costs of formal education. On average the EU27 countries spent €8,388 per student in 2006. There is considerable variation in spending per student but there is some evidence of a positive relationship between countries' relative wealth (as measured by means of GPD per capita) and their expenditure per student.

Figure 2.2. Expenditure per student in comparison to GDP per capita, 2002

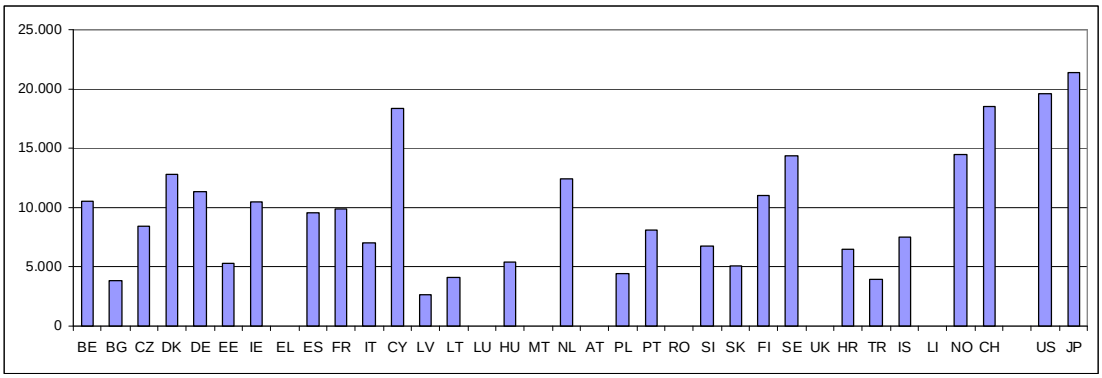


(source: Eurostat (2005), Spending on tertiary education in Europe in 2002)

[11] These 19 countries include Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Spain, Sweden and the United Kingdom.

Over time, spending per student will rise or fall depending on the extent to which countries keep their higher education expenditures in line with changing (often: rising) student numbers. Policy makers must balance the importance of sustaining and improving the quality of educational services with the desirability of expanding access to education. As a result, the question of whether the resources devoted to higher education yield adequate returns to investments figures prominently in the public debate.

Figure 2.3. Annual expenditure on public educational institutions per student in Euro PPS, at tertiary level of education (ISCED 5,6), based on full-time equivalents; year 2006



(source: Eurostat, Indicators on education expenditure – 2006, table 2)

The proportion of total financial resources devoted to higher education in a country is an expression of choices made by government, enterprises, and individual students and their families, partially driven by the overall levels of national enrolment in higher education. Debates on appropriate spending levels are to some extent informed by information on the magnitude of the social and private returns to investment in higher education. This issue of magnitude is a topic to which we will later return in some detail; at this stage, it suffices to say that sufficiently high returns create incentives to expand enrolment and increase total investment.

Although ranking countries by annual expenditure on educational services per student is affected by differences in how countries define full-time, part-time and full-time equivalent enrolment,[12] it is clear that there exists quite a substantial funding gap between Europe and the US and Japan. This funding gap is a major issue in the European Innovation Scoreboard 2007 (INNO-Metrics 2007) and many Commission Communications devoted to higher education and research. The communication 'Mobilising the Brainpower of Europe' (EC 2005) highlights the fact that this investment gap may be an obstacle in meeting the Lisbon goals.

[12] Some countries count every participant at the tertiary level as a full-time student while others determine a student's intensity of participation by the credits which he or she obtains for successful completion of specific course units during a specified reference period.

The objective to seek additional funding from private sources and the goal of increasing investments into higher education up to 2% of GDP by 2010 were further strengthened in the EC's Annual Progress Report on Growth and Jobs ('Time to move up a gear' EC 2006) and an increase in Europe's investments in knowledge and innovation have subsequently remained within the renewed Lisbon strategy for growth and jobs.

The 2006 Communication on the modernization agenda includes funding as one important aspect, and raises the issue of the necessity of *cost-sharing* (Teixeira *et al.* 2006). The Communication suggests that member states should 'critically examine their current mix of student fees and support schemes in the light of their actual efficiency and equity', pointing to the positive rate of return as justifying increasing investment levels.

As illustrated in *Education at a Glance* 2009 (OECD 2009: 209), some non-European countries such as Canada, Korea and the United States spend between 2.5% and 2.9% of their GDP on tertiary institutions. Korea, the United States, and Chile (1.7%) show the highest proportions of private expenditure at the tertiary level (between 1.4% and 1.9% of GDP). Relative to GDP, the United States spends over three times more on tertiary education than Italy and the Slovak Republic and nearly four times more than Turkey.

In particular during times of financial crisis, there is a realisation amongst national governments that their already overstretched public budgets can no longer fully meet the financial demands of continuously expanding higher education systems. This requires both new financial steering instruments and diversification of resources. Partly as a result of this, many countries have reviewed or are reviewing their higher education funding systems, with many having implemented some kind of reform. Some reforms target funding mechanisms driving public funds allocated to HEIs (*institutional funding*), to encourage HEIs to operate more efficiently or to seek private funding by working more closely with the private sector (see section 2.3). Other reforms target students via mechanisms for raising tuition fees or awarding student support (the *cost sharing* discussed in section 2.4), which is also related to the issue of *rates of return* to higher education. In the next sections we will return to these reform discussions, but a critical precondition for generating private sector funding for universities is financial autonomy – an issue to which we now turn.

2.2.3 How much autonomy?

The degree of institutional autonomy for individual higher education institutions across Europe differs widely. A recent study by the European University Association (Estermann & Nokkola 2009) highligts a high degree of diversity in the framework conditions, regulations, and implementation processes governing the way in which Europe's universities operate. To prevent an overlap with our parallel (*cf.* 1.1) study on governance reforms, we restrict ourselves to autonomy in deciding on matters of finance although, clearly, financial autonomy often extends to non-financial matters such as staffing and setting academic salaries.

The following elements of financial autonomy can be distinguished (Estermann & Nokkola:.18):

- The extent to which universities can accumulate reserves and keep surplus on state funding
- The ability of universities to set tuition fees
- Their ability to borrow money on the financial markets
- Their ability to invest in financial products
- Their ability to issue shares and bonds
- Their ability to own the land and buildings they occupy
- The type of public budget provided to the universities by the main funding authority

This final issue refers to the question whether the budget is a line-item budget or a block-grant (lump sum) budget. Block-grants (or lump sum funds) are financial grants covering several categories of expenditure such as teaching, ongoing operational costs and/or research activities, leaving universities responsible for dividing and distributing such funding internally across the various units and activities as they see fit. By contrast, line-item budgeting means that universities receive their funding already pre-allocated to cost items and/or activities, severely restricting their scope to make allocation decisions.

The notion of autonomy also extends to universities' opportunities to generate external funds, from business and industry as well as tuition fees from students in continuing professional development. Autonomous universities may generate resources through fund-raising or efficiency measures, with the freedom to orient their strategy towards available funds, potentially focusing on specific research themes or shifting the balance between education and research. However, national systems can leave quite different degrees of freedom to individual higher education institutions in this respect.

Moreover, the composition of funds does influence HEIs' internal governance, since some instruments, such as grants and contracts, are attributed directly to individual units, thereby strengthening their autonomy and strategic capability with respect to their overall institutional direction.

Some European countries increasingly treat their public service sector organisations as corporate enterprises with a goal of increasing efficiency and effectiveness by giving them more autonomy in exchange for more accountability. The extent of this varies across sectors, in HE as much as in other areas of public service (Pollitt & Bouckaert 2000). Empirical evidence suggests that the rise of New Public Management (NPM), an organisational approach that supports the notion of public services being run as private businesses, has been influential in 'modernising' public services (de Boer et al. 2006). NPM is a generic tool for a set of instruments, rationales and changes stressing 'value for money', introducing (quasi) market conditions and, most importantly, implementing 'management by objectives' using contracts where organisational performance is explicitly linked to budgets. We will discuss the rising use of contracting in the next section.

2.3 Current debates on institutional funding

We now turn to the public funding of higher education providers and the mechanisms (the 'funding models') that are used for determining the budgets that are distributed by public authorities to universities and colleges in higher education systems. Public funding mechanisms can be used to embed important incentives to achieve higher education's three main goals, namely quality, efficiency and equity. Funding modes and funding models not only serve to allocate resources for given ends, they are increasingly being used as governance or management tools. Changes in funding mechanisms constitute a central package of measures related to public management reforms, and often go hand in hand with changes to other steering instruments.

HEIs generally receive *block grants* (or *lump sum* funding) that are intended to cover several categories of expenditure, granting HEIs considerable autonomy to decide on internal allocation of their public resources. Countries are increasingly reliant on using formula funding to determine overall institutional levels of block grants. It is possible to classify funding systems according to two main dimensions:

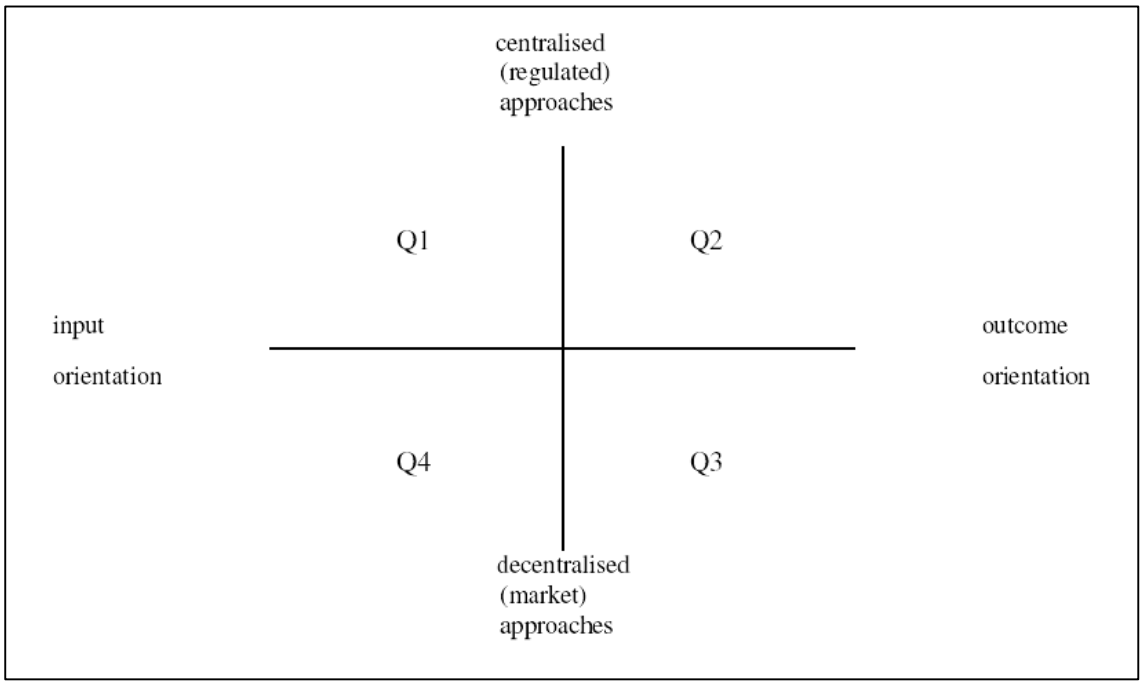
- The degree of outcome (or performance) orientation and
- The degree of regulation.

These two dimensions can be represented on a graph (*cf.* figure 2.4) which offers a four-fold typology of funding mechanisms. The first dimension (the x-axis) relates to the issue of whether institutional budgets are tied to specific teaching and research outcomes of the institutions' activities (performance-based funding). The second dimension (the y-axis) relates to the degree of competition implied by the funding mechanism. The question here is 'Who decides student numbers and research funding for individual institutions? Are these centrally planned or driven by client decisions (students, private firms, research councils/foundations)?'

Given the worldwide trend towards deregulation and marketisation in the public sector, we observe a gradual clockwise movement from the 'north-western' quadrant (Q1) of figure 2.4 towards the 'south-eastern' quadrant (Q3). This move may be interpreted as a step in the direction of a 'state supervising' system (Van Vught, 1989), where more room is established for market-type co-ordination. Many central and Eastern European countries have rapidly reshaped their funding mechanisms and moved away from bureaucratic planning and negotiations-based approaches , today making more use of market-based approaches.

In a more market-type co-ordination system it is individual decision-making by providers and clients that is essential. The result of this movement is an increased reliance on market-type co-ordination mechanisms in the higher education sector - with decision-making left more to individual 'agents' (students, institutions) who make their choices on the basis of incentives and preferences rather than directives issued from above.

Figure 2.4: Classifying funding mechanisms



(source: Jongbloed, 2004)

In higher education, public funders and university management traditionally resorted to a system where the funding provided to universities for teaching and research was primarily driven by input measures such as student enrolments or staff positions (Q1 in figure 2.4). Recent years have witnessed the introduction of competition, user fees, and the stressing of performance-based funding (see Jongbloed & Vossensteyn 2001). HEIs' government core funds are increasingly based on institutional performance measures (Q2 and Q3), in a combination of either or both of these two options:

- Budgets are based on actual results,
- Budgets are based on projected results.

An example of option 1 is funding according to a formula that is driven by the number of degrees or credits accumulated by students (quadrant Q2). An example of option 2 is allocating grants and contracts in a competitive process, such as through a research council that selectively awards project funds to proposals submitted by research groups (quadrant Q3).

A further approach within option 2 is the allocation of public funding according to a *performance contract*. Performance contracts between individual universities and their relevant funding authorities define institution-specific (or 'mission-based') objectives in line with national strategic priorities. Institutional contracts may be very broad, based on framework agreements, but also can be more detailed. In such cases, they may tend towards the traditional funding approach where specific budget lines are negotiated with public authorities in a system of line item funding.

The 2008 OECD study on tertiary education states:

> *'one of the more pronounced trends in tertiary education around the world over the past decade or more: the shift to allocation mechanisms that are more performance-based. This shift can take several forms including setting aside a portion of funds to be paid on a performance basis; establishing performance contracts between government and institutions; creating competitive funds to stimulate greater innovation, higher quality, and improved management of institutions; and implementing processes in which institutions are paid on the basis of results, not inputs.' (Santiago et al. 2008: 197)*

Table 2.1 shows three types of financial steering instruments utilised for HEIs' public funding: formula-based approaches, project-based funding, and contracts. This categorization was used by the German higher education research centre Hochschul Informations System (Leszczensky & Orr 2004).

In the HIS report, the three types are further categorised:

- *Funding-formulas* are sub-divided into formulas with: 1) a fixed amount that increases incrementally, 2) formulas based on input indicators, and 3) formulas based on output indicators. Most funding formulae comprise a mix of these types.

- *Project-based funding* can be divided into projects awarded competitively and those awarded non-competitively. In the latter case, funds are distributed equally across institutions or negotiated between government and (a selected number of) HEIs if proposals meet project criteria. Competitive project proposals are awarded (through a tendering or bidding process) to institutions best meeting the criteria.

- *Contract-based funding* can be divided into two types: 1) contracts in which intentions are formulated (often laid down in framework agreements), and 2) contracts in which agreed activities or performances are specified in detail.

Table 2.1: Types of financial steering instruments

Formula			Project		Contract	
Fixed amount	***Input***	***Outputs***	***Competitive***	***Non-competitive***	***Intentions***	***Agreed performance***

Source: Leszczensky, Orr et al. (2004)

It is common to see a mix of funding options used in practice, with every country having its own mix reflecting historical and political developments. In most, alongside a formula-based component, project funds are awarded competitively as part of the total public funding. This is common for funding academic research, with research councils and national academies selecting proposals that best meet criteria in terms of quality, relevance and price. Project proposals are prepared by teams of researchers and often are of a bottom-up nature. Such competitive funds differ from *targeted project funds*, where the public authorities are more prescriptive about activities to be carried out for a particular purpose.

This is a common practice among countries to encourage improving teaching quality, promoting innovation, fostering better management practices, modernising infrastructure, encouraging partnerships with the private sector, supporting particular fields, and improving quality assurance processes (Santiago et al. 2008: 197).

In the following chapter we investigate in detail funding reforms carried out over the period 1995-2008 in the 33 countries in our study. Using our typology, we consider the use of different funding approaches, the extent of reforms over this period, the changing proportion of funds allocated competitively for research, what type of targeted project funds have been awarded and what indicators have been driving formula funds.

2.4 Trends in student finance

The European Commission's proposals for student funding issues included in its Modernisation Agenda encompass the following issues:

- Allowing students to make use of national loans and grants wherever in the EU they decide to study or do research
- Reviewing national student fee and support schemes so that the best students can participate in higher education and further research careers whatever their background.

Both issues are inspired by the belief that financial reform in the student funding area should contribute to students realising their potential, removing financial barriers to their participation in higher education – either in their own country or abroad.

With respect to this second issue, the EC Communication *Delivering on the Modernisation Agenda for Universities* declared:

> *Student support schemes today tend to be insufficient to ensure equal access and chances of success for students from the least privileged backgrounds. This applies equally to free access, which does not necessarily guarantee social equity. Member States should therefore critically* ***examine their current mix of student fees and support schemes in the light of their actual efficiency and equity****. Excellence in teaching and research cannot be achieved if socio-economic origin is a barrier to access or to research careers. (EC 2006: 7).*

From this quotation, the student issue is clearly decomposed into two elements, firstly issues of student costs (in particular tuition fees) and secondly, those of student financial support (student financial aid).

Cost-sharing between participants in the education system and society, or between students and taxpayers, is an issue under discussion in many countries. Governments must mobilise the necessary resources for education whilst determining the equitable allocation of costs and benefits. As a result, public funding usually provides only a part (albeit a substantial part) of education investment , with the role of private sources becoming increasingly important (OECD 2009: 224).

Research by (in particular) the OECD and by our research consortium[13] has suggested that there is evidence of substantial private benefits from a higher education degree. These high private returns in the form of better employment and income opportunities suggest that greater contributions by individuals and other private entities to the costs of education may be justified so long as governments can ensure accessibility of funding for students irrespective of their economic background.

We will now summarise evidence on private and social rates of return in the countries of the project (for the latest year available). Returns on investment in higher education were identified in 31 out of 33 countries.[14] There are more private returns estimates relative to social rates, because the estimation of social rates of return is more demanding, requiring direct cost data by level of education. The average private rate of return is 10.2%, while the average social rate of return is 7.9%. Therefore, private returns exceed the social returns by 2.3 percentage points. All returns (private or social) exceed any reasonable opportunity cost of capital, say 5%. The returns are highest in 'new countries' such as the Czech Republic, Poland, Hungary and Turkey, and lowest in Scandinavian countries such as Denmark and Sweden.

Using slightly different (but more comparable) data, the averages turn out to be 12.3% (private) and 7.9% (social), confirming the difference between private and social rates (4.4 percentage points on average). This difference is in turn an indication of the degree of public subsidisation of higher education.

Next to the rate of return estimates, the earnings difference between a university graduate and a secondary school graduate could also be considered as a 'return to education' On average, our desk research shows that university graduates have a 61% earnings advantage over secondary school graduates. Again, our survey confirms that the earnings advantage of university graduates is highest in the 'new countries' and lowest in the Scandinavian countries.

Thus, higher education in Europe continues to be a profitable investment opportunity, both privately and socially. This evidence is often used to propose that increased resources for HEIs should come from private sources, such as increased student fees. Such a statement is reinforced by the regressive incidence of public financing of higher education systems: in higher education, most students are from medium to high socio-economic backgrounds implying that a system of zero or low fees would disproportionally favour the families that are well to do. Despite this, and clearly established in the following chapter, most full-time students in continental Europe only pay a modest fee or no tuition fee at all. In the Czech Republic, Hungary, Iceland, Poland, the Slovak Republic, the Nordic countries and Switzerland, HEIs charge low or no tuition fees.

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[13] The report on rates of return written by George Psacharopoulos for this Funding Reform project is included in Volume 3 of this report.

[14] The two exceptions are Malta and Liechtenstein.

There are also no general tuition fees in many German HEIs, although six German states have introduced fees following a recent federal court ruling. In Italy, the Netherlands, Portugal and the United Kingdom (excluding Scotland), annual tuition fees are substantial. Where there are fees, these are mostly set by the government. However in some countries (e.g. Portugal, UK, the German state of North Rhine Westfalia) the fee level is determined by HEIs with government setting a fee ceiling for domestic and EU students.

The introduction or the increase of tuition fees has been one of the most widely debated issues in higher education funding (Teixeira et. al. 2006), but reality shows that, with the exception of UK, undergraduate fees do not yet cover a substantial share of educational costs in European countries (Lepori et al. 2007). The OECD shows that cost sharing is increasing across the world (Santiago et al. 2008) Private households' contributions to higher education are rising with some countries allowing HEIs to charge fees to part-time students, students that take more than the stipulated time to graduate, or students that are admitted to the institution above the capacity funded by the government. This latter phenomenon is known as the *dual track* system, with a mix of students in publicly funded places studying for free (or almost for free) alongside others paying a cost-covering fee.

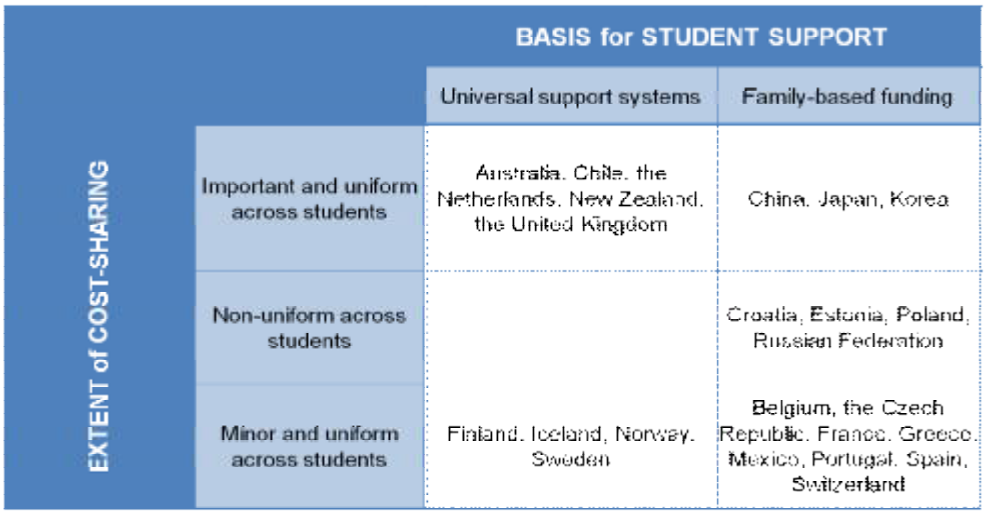
The presence of fees naturally leads to the question of whether this discourages access to higher education for some (potential) students. Government subsidies to students and their families serve as a means by which governments encourage participation in higher education – particularly among students from low-income families – by covering part of the cost of education and related expenses. In this way, governments can address issues of access and equality of opportunity. OECD data shows that the rising share of private contributions comes along with a greater proportion of public expenditure on higher education going to student financial aid. Financial assistance is most common in the form of grants or a combination of grants and loans. However, cost sharing is also evident within financial assistance, as the proportion of loan-based aid among total public subsidised financial aid to students is indeed rising (e.g. in the Netherlands and the UK).

There is a large variety in student support mechanisms, resulting partly from different policy choices concerning the financial status of students with respect to their parents. In general, across Europe, HE financial support systems can be differentiated between those following the 'principle' of financial independence (or dependence) on the one hand, and on the 'principle' of universal support (or targeted assistance) on the other.

The principle of universal support in the distribution of assistance prevails where young people are considered to be independent of their parents. Conversely, support is more targeted on the basis of parental income where the principle of dependence to a higher age is maintained . Student financial support may be awarded to all, or nearly all, students without distinction. Only a student's personal income, or part of it, may constitute an obstacle to assistance. This system rests on the principle of 'universal financial support'. Conversely, central authorities may directly target assistance on a smaller group of the student population; generally benefiting students whose parental income falls below a certain level. In both systems, continuing support may be conditional on students' continuing success in their studies.

Figure 2.5 shows this distinction between student support systems and segments it by the extent of cost sharing.

Figure 2.5: Country approaches to student support and cost sharing



(Source: Santiago et al. 2008)

Where students are considered to be completely financially independent from their parents, the central authorities do not award any assistance to parents and only take the personal income of students into account when deciding whether to award financial support. At the other end of the spectrum, where parents are expected to take full financial responsibility for students, they may be granted tax relief or prolonged rights to family allowances. Such assistance is provided from the central government's social welfare or tax system rather than the education budget. Following the same principle of financial dependence, the socio-economic origin of students is taken into account in the criteria for the distribution of financial assistance. Parental income is a determining factor in the amount, the method and types of assistance to which students are entitled.

We now turn to the evidence on the impact of cost-sharing on students' higher education participation, completion and drop-out rates, and equity of access. The tertiary education reviews carried out by the OECD have provided some summary conclusions, based on a review of the research literature (see Santiago 2008):

- Lower tuition fee levels do not necessarily lead to 'better' access to tertiary education
- There is evidence that students are responsive to net price variation
- There is evidence that students from more disadvantaged backgrounds are more sensitive to net price changes
- There is some evidence that financial support has an impact on tertiary education participation
- Students are more sensitive to changes in grants than to changes in loans or in the availability of work opportunities during studies
- Student loans can improve the accessibility of tertiary education
- Expanding cost-sharing with a parallel development of the student support system does not have a negative impact on the participation rates of disadvantaged students
- There is strong evidence that financial aid affects study persistence in tertiary education, particularly for more disadvantaged groups
- More disadvantaged individuals tend to underestimate the net benefits of tertiary education

2.5 Funding and performance

To investigate the relationship between governance and funding reforms on the one hand, and performances of higher education on the other we draw on the work of Aghion and colleagues (2007, 2008 and 2009) and Van der Ploeg and Veugelers (2008).[15] We then turn to the institutional level to explore potential university-level links between performance and funding reforms.

Aghion and colleagues (Aghion et al. 2009) analysed the relationships between governance (including funding arrangements) and performance of universities. They measure performance as the position of a university on the Shanghai Academic Ranking of World Universities (Jiao Tong University 2008), therefore primarily emphasising research performance.

[15] Much of this section is also included in our report on the Governance Reform project.

Governance is mainly defined in terms of institutional autonomy, looking at public/private status, and autonomy with respect to budgets, buildings, hiring and salary setting. The data on governance are derived from a questionnaire sent to all European universities in the 2006 top 500 of the Shanghai ranking, resulting in a sample of 66 European universities. The outcomes suggest that university research performance is positively correlated with university autonomy and funding. Moreover, size ('big is beautiful') as well as age (reputation effect) matters for research performance (i.e. position on the Shanghai ranking). The researchers also detect an interaction effect: higher levels of funding per student have more impact when combined with budget autonomy. They also argue that their findings suggest a positive relationship between competition (for research grants) and university output (i.e. position on the Shanghai ranking). They did this on the basis of US university data and defined research in terms of numbers of patents. From these American data, the researchers 'would (…) like to suggest' a causal relationship between public university autonomy and competition on the one hand and research output in terms of patents on the other hand (Aghion et al. 2009: 24).

Other interesting observations are that 'a striking fact is thus the high variance in university governance across European countries, even among those which are performing well in terms of research' … 'there is more than one model of university system that appears to work'(Aghion et al. 2007: 5 and 7). Moreover, while they conclude that research output from research universities can be improved by more autonomy and stronger competition, they also mention that 'the results for states far from the technological frontier tell a cautionary tale. Giving autonomy to and introducing competition among institutions of higher education may be ineffective in countries far from the technological frontier' (Aghion 2009: 24).

Van der Ploeg and Veugelers (2008) also show an interest in the relationships between governance, funding and performance of Europe's universities. Primarily based on secondary analyses, using for example data from the Global Competitive Index of the World Economic Forum, the Shanghai and Times Higher Education rankings, OECD indicators and the Bruegel group, they note that the evidence shows a high variance in university governance across the European countries. This makes governance in principle an interesting factor for explaining differences in performances, but 'a bird's eye view already suggests that the link between governance and performance will be complex and bodes badly for the quest for a unique optimal governance model' (Van der Ploeg and Veugelers 2008: 110). They observe some indications that some of the better performing countries have high levels of autonomy (albeit along different dimensions of autonomy) and weak performing countries seem to be low on autonomy, although - again - there is a large dispersion of governance characteristics. The most important conclusion 'that can be drawn from the available evidence is that more research is needed to pin down the drivers of university performance' (Van der Ploeg and Veugelers 2008: 110).

The issue whether the changes in resourcing and resource composition have had an effect on the level of the individual university and their performance was also studied in the CHINC project[16] (Salerno et al. 2005), the OECD's IMHE programme (Strehl et al. 2007) and the European University Association (Conraths and Smidt-Södergard 2004). While the findings suggest that developments in the national funding environment are mirrored by developments inside the universities (Salerno et al. 2005) these studies do not really touch on the issue of performance in the sense of education and research output. What the studies do show is that universities' internal policies may be characterised as their efforts to behave as 'strategic actors' (Bonaccorsi et al. 2007). Universities are trying to more clearly position themselves in the European research landscape. Some have developed a strategy of improving research performance through more interventionist research management practices, performance-based funding and selecting priority areas for research. Others are creating large (often multidisciplinary) research units where the best researchers co-operate and produce high quality output with the potential to reap economic rewards as well. Many have introduced a performance-oriented internal resource allocation complementary to their income-generation strategies. Whether such strategies actually pay off was not the subject of their studies. What the findings do suggest is that funding matters – it does produce change inside the institutions, but the impact of that change on performance is very much a matter for further research.

[16] CHINC is an acronym for Changes in University Incomes and their Impact on University-based Research and Innovation.

3 Funding reforms in Europe in the period between 1995 and 2008

3.1 Introduction: funding and governance reforms

Now that we have presented the trends and issues relating to funding reforms in the previous chapter, it is time to look more in detail at the funding reforms per country as reported by our national experts and confirmed by interviews with key stakeholders in the 33 countries. While this chapter addresses funding reforms, we are aware that funding arrangements often go together with the broader governance arrangements in higher education. Governance and funding reforms are very much like two sides of the same coin. Funding is part of the set of tools and other governance instruments that enforce common goals set for higher education (e.g. access, efficiency, quality), set incentives for certain behaviours (e.g. competitive research grants), and attempt to maximize the desired output with limited resources. Governance reforms are the topic of the companion report to this report and therefore will not be presented here in detail. However, other policy oriented analyses of higher education systems (e.g. Santiago et al., 2008) convincingly show that certain principles of funding bring expected results only if they are coupled with certain principles of governance (e.g. output based contractual and competitive funding largely improves the performance of the entire system and its overall efficiency if it is coupled with institutional autonomy allowing for competition among higher education institutions). Therefore, this chapter cannot avoid paying attention to those issues of governance that directly deal with financial matters.

Consequently, the next section (3.2) will present the reforms that may be observed in the area of financial autonomy.[17] Section 3.3 then looks at funding reforms in Europe in more detail, showing the developments in the revenue composition of higher education institutions, funding mechanisms and their drivers, research funding, targeted funding and the changes in the area of student fees and student financial support. In section 3.4 we attempt to relate the funding reforms to the European Commission's modernisation agenda. This agenda is the major European policy document concerned with higher education reform and the improvement of European higher education and research performance. Section 3.5 presents some other observations on higher education reforms across Europe, including governance reforms and reforms related to the structure of the higher education sector (the position of the University of Applied Sciences sector next to the research universities, the emergence of private higher education). Finally, an overall description of governance and funding reforms by country is presented in Appendix 1.

[17] We leave aside the topics of organisational autonomy, policy autonomy, and interventional autonomy. For this, the reader is referred to the parallel study Progress in Governance Reforms across Europe.

3.2 Financial autonomy of public universities in Europe

Financial autonomy is generally perceived as being a very important characteristic of autonomous organisations (see chapter 2). Financial autonomy is one of the four dimensions of autonomy analysed in the EU Governance Reform project. Table 3.1 lists the underlying dimensions of financial autonomy.

Table 3.1 Aspects of financial autonomy

Financial autonomy	§	Are public universities free to decide on the internal allocation of public and private funds?
	§	Are they free to borrow funds on the capital market?
	§	Are they free to build up reserves and/or carry over unspent financial resources from one year to the next?
	§	Are they free to determine how they spend their public operational grant?

Data with respect to these four dimensions of financial autonomy was gathered primarily through an extensive questionnaire completed by national experts from the 33 countries.[18] The answers from the questionnaires were converted into scales that range from low to high institutional autonomy on a particular item.

In table 3.2 we present a summary of our questions on financial autonomy dimensions. The table looks at the public university sector in 32 countries. It shows the current state of financial autonomy across Europe and what the changes have been in the period between 1995 and 2008. The table indicates that in 2008, public universities in 14 European countries have medium levels of financial autonomy while in a further 14 countries universities have high levels of financial autonomy. In 2008, there were only four countries where financial autonomy was low. In 1995, in contrast, there were twelve countries where financial autonomy was low.

Since 1995, sixteen countries have implemented funding reforms; almost all of them granting more financial freedom to public universities. Particularly Austrian, German, Norwegian and Swiss public universities have gained more freedom on financial matters over the last decade. Our conclusion is that, although public universities in eighteen countries do not have high levels of financial autonomy, the overall level of financial autonomy across Europe has increased significantly over the last decade.

[18] In Volume 2 of this report a description is given of the methodology used for this study.

Table 3.2: The financial autonomy of European public universities (N=32)

Level of autonomy	1995	2008
Low	Austria, Cyprus, France, Germany, Greece, Hungary, Lithuania, Norway, Romania, Slovakia, Switzerland, Turkey	Cyprus, Greece, Lithuania, Turkey
Medium	Croatia, Denmark, Finland, Malta, Poland, Portugal, Slovenia, Sweden	Denmark, Finland, France, Germany, Hungary, Latvia, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland
High	Belgium, Bulgaria, Czech Republic, Estonia, Iceland, Ireland, Italy, Latvia, Netherlands, Spain, United Kingdom	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Iceland, Ireland, Italy, Netherlands, Norway, Slovenia, Spain, United Kingdom
Legend: categorisation based on a multiple index with average scores per country based on four items (internal allocation of funds, borrowing funds on the capital market, building up reserves and spending of the operational grant).		

- When we look in greater detail at the financial autonomy of public universities, the following observations can be made:

- In 2008, public universities in twenty-one countries could freely decide on the internal allocation of both private and public funds; in 1995, this number was seventeen. Changes in the direction of more flexibility took place in Austria, Germany, Norway and Slovenia. In the other countries, the flexibility to internally allocate private or public funds is restricted by ministerial regulations

- In 2008, public universities in eight countries were free to borrow funds on the capital market; in 1995, this was possible in six countries. In 2008, in thirteen countries this was not allowed

- In 2008, in sixteen countries public universities were entitled to build up reserves and/or carry over unspent financial resources from one year to another; in 1995, the number of countries where this was possible was thirteen. In 2008, there were three countries where public universities were not allowed to build up reserves; in 1995, this was the case in eight countries

- In 2008, in twenty-two countries lump sum funding was in place, allowing universities to decide themselves how to spend the public operational grant; in 1995, this was the case for public universities in fourteen countries (see table 3.3). It is particularly in this area that many reforms have taken place: line item budgeting existed in twelve countries in 1995 but this was reduced to six countries by 2008

Table 3.3: The level of flexibility of European public universities in using their public operational grant (N=33)

Level of flexibility	1995	2008
Low	Austria, Croatia, Cyprus, Finland, France, Germany, Greece, Romania, Slovakia, Slovenia, Switzerland, Turkey	Bulgaria, Cyprus, France, Greece, Slovakia, Turkey
Medium	Bulgaria, Hungary, Lithuania, Norway, Poland, Sweden	Latvia, Lithuania, Poland, Slovenia, Sweden
High	Belgium (Flanders), Belgium (Wallonia), Czech Republic, Denmark, Estonia, Iceland, Ireland, Italy, Latvia, Malta, Netherlands, Portugal, Spain, United Kingdom	Austria, Belgium (Flanders), Belgium (Wallonia), Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Spain, Switzerland, United Kingdom
Legend: low flexibility = the public grant is allocated under expenditure headings (e.g. staff, operational expenses, infrastructure) that have to be strictly complied with; medium flexibility = the university is free to use the grant, but the grant distinguishes broad activity headings that need to be complied with; high flexibility = the university can use the grant flexibly to cover different categories of expenditure.		

Looking at financial autonomy and the situation for 'Europe as a whole' in 2008, we may conclude that, in general, the level of *financial autonomy* is high. Public universities in most European countries are able to manage their own financial affairs. There are examples of restrictions on the financial autonomy of public universities but, as concluded in other higher education studies (e.g. Eurydice 2008, OECD 2008), it is clear that over the past 15 years public universities' the financial autonomy has increased significantly.

3.3 Funding reforms in Europe in greater detail

Based on the trends described in the previous chapter, we now present an overview of the reforms that took place in the funding of higher education institutions in the 33 countries. We will pay attention to the level, and the composition of funding (section 3.3.1), the method of funding (3.3.2), research funding (3.3.3), targeted funding (3.3.4) and issues of student support (3.3.5) and student contributions (3.3.6). We will not describe the arrangements in detail,[19] but primarily pay attention to the changes over the period 1995-2008.

3.3.1 Level and composition of funding: changes over the 1995-2008 period

We will start by providing some information on the countries and the question whether, according to our 33 national experts, there were any substantial reductions or increases in public funds per student. Table 3.4 shows that in 19 of the countries the funding per university student in 2008 had increased more than 5% compared to the year 1995. In seven countries funding decreased more than 5% during the same period. In about a quarter of the countries the funding remained more or less stable.

[19] The reader is referred to the funding fiches (in Volume 3 of this report) that provide more details on the funding arrangements for teaching and research in each country (for the research universities as well as the Universities of Applied Sciences).

Table 3.4: Direction of change in government funding per student in European public universities, 1995-2008 (N=34)

	decreased	stable	increased
Number of countries	7	8	19
%	21%	24%	56%

Notes:
1. Belgium-Flanders and Belgium-Wallonia are counted as two separate countries.
2. See table 3.7 for more detailed information per country.

Table 3.5 provides information on the *composition* of the revenues of public universities. The three main categories of revenues are:

1. *The operational grant* (or core funding) allocated by public authorities for ongoing teaching and/or research activities

2. *Tuition fees* (from national students and students from abroad)

3. *Third party funding* (all project and contract funding received from public, international and private sources, such as: research council funding, ministry programmes, EU funds, contract research, contract teaching)

In 2008, public universities received on average two-thirds of their funding from public sources through direct funding – their operational grants. About 12% was from private households in the form of tuition fees. Third party funds represent the remaining 21%. Third party funds derive from private as well as public sources, and also include funds from not-for-profit organisations and international sources. Usually the majority of third party funds (about two-thirds on average) has a public origin. In 2008, the UK was the country with the lowest share of direct government funding. Malta had the highest (95%).

Table 3.5 shows the difference between the years 1995 and 2008 (for the countries that we have data for). Part of the move towards a higher share of tuition fees (from 8 to 12%) and third party funds (from 15 to 21%) may be explained by deliberate reform policies, such as the raising (or introduction) of tuition fees, the introduction (or rise) of project funds, or the relaxation of regulations that govern the entrepreneurial activities of higher education institutions.

Table 3.5: Average proportion of public universities' main revenue components, 1995 and 2008

	2008 (N=32)	1995 (N=26)
Operational grant	67%	78%
Tuition fees	12%	8%
Third party funds	21%	15%

Table 3.6: Frequency distribution of public universities' revenue shares across the various countries

Share of operational grant	year	0-50%	51-75%	76-100%	N
	2008	7	16	9	32
	1995	1	10	15	26
Share of tuition fees		0-5%	6-15%	16-100%	
	2008	14	8	10	32
	1995	16	4	6	26
Share of 3rd party funds		0-10%	11-25%	26-100%	
	2008	12	10	10	32
	1995	12	9	5	26

Over the period 1995-2008, the number of countries where tuition fees represent a quite sizeable proportion of revenues (above 5%) has grown from 10 to 18 (see table 3.6). Third party funds also have become more important: a third of the countries now have more than a quarter of their revenues coming from such sources.

The tables 3.7 and 3.8 show more detailed information per country for the public university sector and the universities of applied sciences (UAS) respectively. Please note that we cannot show the variation in a country. Compared to the universities, the operational grant in the UAS sector on average is about 10% points higher and third party income is 10% points lower. The latter is caused by the lower level of research activity in UAS.

Table 3.7: Change in funding per student and composition of revenues for public universities, year 2008

Country	Nature of change in government funding per student 1995-2008 (in real terms)	Share of Operational grant from public authorities (%)	Share of Tuition fees (%)	Share of Third party funding (%)
Austria	ù	78	6	16
Belgium – Flanders	ñ	45	5	50
Belgium – Wallonia	ò	50	5	45
Bulgaria	ñ	55	20	25
Cyprus	ù	80	15	5
Croatia	ñ	70	30	0
Czech Republic	ñ	75	5	20
Denmark	ñ	73	2	25
Germany	ñ	NA	NA	NA
Estonia	ò	48	13	39
Finland	ñ	65	0	35
France	ñ	87	5	8
Greece	ñ	NA	NA	NA
Hungary	ò	70	15	5
Ireland	ò	40	35	25

Country	Nature of change in government funding per student 1995-2008 (in real terms)	Share of Operational grant from public authorities (%)	Share of Tuition fees (%)	Share of Third party funding (%)
Iceland	ñ	65	0	35
Italy	ñ	65	12	23
Latvia	ñ	50	15	35
Liechtenstein	ñ	55	35	10
Lithuania	ñ	65	25	10
Luxembourg	ñ	92	2	6
Malta	ò	95	3	2
Netherlands	ù	66	6	28
Norway	ñ	75	0	25
Poland	ñ	71	22	7
Portugal	ù	60	10	30
Romania	ñ	70	25	5
Slovakia	ù	94	1	5
Slovenia	ù	50	25	25
Spain	ñ	76	21	3
Sweden	ò	88	0	12
Switzerland	ò	76	2	22
Turkey	ù	57	4	39
United Kingdom	ù	38	24	38
Average	ù	67	12	21

Legend:
ñ = funding per student increased by more than 5% over the period ca. 1995-2008
ù = funding per student more or less stable over the period ca. 1995-2008
ò = funding per student decreased by more than 5% over the period ca. 1995-2008

Table 3.8: The composition of revenues for universities of applied sciences, year 2008

Country	Share of Operational grant from public authorities (%)	Share of Tuition fees (%)	Share of Third party funding (%)
Austria	70	8	22
Belgium – Flanders	80	5	15
Belgium – Wallonia	80	5	15
Germany	88	2	10
Estonia	NA	NA	NA
Finland	86	0	14
Greece	NA	NA	NA
Ireland	50	45	5
Netherlands	68	18	14
Portugal	75	10	15
Switzerland	83	10	7
Average	76	11	13

3.3.2 Funding mechanisms: character and importance

For the mechanisms in place for determining the amount of the public operational grant, we distinguish the following categories, following the recent Eurydice governance study (Eurydice, 2008) and the discussion in chapter 2:

1. *Negotiated funding*: The grant is based on negotiations between the ministry/agency and an individual institution about the amount to be awarded and the amount is based on a budget estimate submitted by the institution

2. *Incremental funding*: The size of the grant is based on previous years' allocations (and therefore will reflect past costs in particular)

3. *Formula funding*: There is a formula-based approach, which means that the size of the public grants to the institutions for teaching and/or ongoing operational activity and, in certain cases, research is calculated using standard criteria (such as normative unit costs, input criteria and performance indicators) that are equal across all institutions

4. *Contract funding*: The grant is based on the outcome of a performance contract, meaning that each institution and the ministry/agency negotiate and agree on a number of strategic objectives to be achieved by the institution (such as a predetermined number of graduates by field of study) and in return the institution receives a budget. To evaluate progress, a set of performance-related measures is used

Looking at the methods used in the various countries for determining the amount of the public operational grant allocated to individual institutions, tables 3.9 (universities) and 3.10 (UAS) indicate the extent to which each of the four mechanisms is in use at present compared to the mid 1990s. As such the tables identify the funding reforms that have taken place. It is clear that countries are using a mix of funding options with hardly any country relying on a single funding method. Moreover, even within countries one sees variation. Federal states (Germany, Spain, Switzerland) and countries such as the UK and Belgium actually consist of a number of separate higher education systems. In the tables we have tried to give an overall impression for such states but we realise the picture is more complicated.

Incremental funding, where historical allocations play a large role, is clearly being applied less at present. Only in six countries (Austria, Croatia, Lithuania, Slovenia, Sweden, Switzerland) it is of very large importance in the university sector. In many countries it has been replaced by formula-based approaches. In 20 of the countries, formulae are of very large importance in 2008, whereas in 1995 only seven countries attached a large importance to it. In the Universities of Applied Sciences sector (table 3.10), formula funding is the most important funding mechanism by far.

Table 3.9: Funding mechanisms for determining the amount of the public operational grant for public universities: 1995 versus present

Country	Negotiation		Incremental allocations		Formula		Contracts	
	1995	current	1995	current	1995	current	1995	current
Austria	XX	XXX	XXX	XXX	0	XX	0	XX
Belgium Flanders	0	0	XX	0	XX	XXX	0	0
Belgium Wallonia	0	0	XX	XX	XX	XX	0	0
Bulgaria	XX	XX	XXX	X	0	XXX	0	0
Cyprus	XXX	XXX	0	0	0	0	0	0
Croatia	X	X	XXX	XXX	0	0	0	0
Czech Republic	0	X	XX	XX	XXX	XXX	0	X
Denmark	X	X	XX	X	XX	XXX	0	0
Germany	XX	XXX	XXX	XX	XX	XXX	X	XXX
Estonia	0	0	0	0	X	X	XXX	XXX
Finland	X	XX	XXX	X	X	XXX	X	XXX
France	0	X	0	0	XXX	XXX	X	XX
Greece	X	XX	XX	XX	XXX	XX	0	XX
Hungary	XXX	0	XXX	XX	XX	XXX	0	X
Ireland	X	0	XXX	X	X	XXX	0	0
Iceland	0	0	XXX	X	0	XXX	0	X
Italy	0	0	XXX	XX	0	X	0	0
Latvia	0	0	XXX	0	0	XXX	0	X
Liechtenstein	0	XX	0	XX	X	XX	0	XX
Lithuania	X	X	XXX	XXX	XX	XX	0	0
Luxembourg	-	XX	-	0	-	X	-	XXX
Malta	XXX	XXX	0	0	0	0	0	0
Netherlands	0	0	0	0	XXX	XXX	0	0
Norway	X	XX	XXX	XX	X	XX	X	X
Poland	0	0	X	X	XXX	XXX	X	X
Portugal	0	0	0	0	XXX	XXX	X	X
Romania	XX	0	XXX	0	0	XXX	0	X
Slovakia	0	0	XXX	0	0	XXX	0	0
Slovenia	XX	X	XXX	XXX	XX	XXX	X	X
Spain	0	0	XXX	XX	X	XXX	X	X
Sweden	XX	XX	XXX	XXX	0	X	XX	XX
Switzerland	X	XX	XXX	XXX	X	XX	X	X
Turkey	X	X	XXX	X	X	XXX	X	XX
United Kingdom	0	0	0	0	XXX	XXX	X	X

Legend:
0 = not important;
X = minor importance;
XX = important;
XXX = extremely important.

Tables 3.9 and 3.10 illustrate that negotiated funding is still in place in quite a few countries (both universities and UAS), but contract approaches have been introduced on top of existing arrangements. In contracts, agreed between ministries and individual institutions, part of the institution's budget is tied to a performance agreement. Nowadays contracts are an important allocation mechanism (next to a formula) in ten countries.

Table 3.10: Funding mechanisms for determining the amount of the direct public operational grant for universities of applied sciences, 1995 versus present

Country	Negotiation		Incremental allocations		Formula		Contracts	
	1995	current	1995	current	1995	current	1995	current
Austria	XXX	XXX	XX	XX	XXX	XXX	0	0
Belgium Flanders	0	0	XX	0	XX	XXX	0	0
Belgium Wallonia	0	0	XX	XX	XX	XX	0	0
Germany	XXX	XX	XXX	XX	X	XXX	X	XX
Estonia								
Finland	XX	XXX	0	0	XXX	XXX	XX	XXX
Greece	X	XX	XX	XX	XXX	XX	0	XX
Ireland	XXX	XX	XXX	XX	0	XX	0	0
Netherlands	0	0	0	0	XXX	XXX	0	0
Portugal	0	0	0	0	XXX	XXX	X	X
Switzerland	0	XX	XXX	XX	0	XXX	0	X

Legend:
0 = not important;
X = minor importance;
XX = important;
XXX = extremely important.

3.3.3 Funding drivers

As argued in the previous chapter, the underlying criteria (the 'drivers') that determine the size of the public operational grant to public higher education institutions reflect the goals that the public authorities wish to stress. As such the funding criteria may affect institutional behaviour.

In this section we will inspect the character of the funding criteria in the sense of the extent to which the criteria are oriented towards the *performance* or towards the *costs and inputs* of the higher education institutions. In doing this we will test the idea that funding has become more performance-based over the period 1995-2008.

Input-related criteria in funding mechanisms relate to the following drivers:

- Number of enrolled students (grouped according to field and level of study) registered during the previous or current year
- Number of state-funded study places available at the higher education institution as agreed with the ministry/agency (grouped by field & level of study)
- Number of staff in the institution; surface area of buildings, rental costs of institutions, past costs, or estimates (or projections) of costs
- Number of PhD candidates/doctoral students

— Previous years' (historical) allocations, including allocations that remain largely fixed from one year to the next

Output-related criteria concern the following:

- Criteria related to students' results (such as: the number of BA and MA degrees conferred, ECTS credits accumulated, students' success rates, number of students completing their studies within a stipulated time)
- Results from national evaluations of teaching quality (e.g. from peer reviews or accreditation exercises) that address the institution as a whole or that are conducted for different subject areas
- Results from periodic national research assessments that address the institution as a whole or that are conducted for the different subject areas
- Number of PhD degrees awarde.
- Number of academic research publications
- Number of quoted references/citations in academic journals
- Indicators related to the university's success in winning competitive research grants from research councils and other national/international bodies
- Indicators related to the number of contract research projects undertaken
- Indicators related to the commercial use of research results (licenses, copyright, services provided, patenting activity, etc.)
- Awards, prizes and distinctions received by the institution.
- Outcomes of rankings
- Participation in international scientific research projects

The importance of input and output drivers in determining the operational grant for teaching, research and ongoing activity is shown in tables 3.11 and 3.12. In the 10 countries that have a binary system of higher education we make a distinction between the (public) university sector on the one hand and the colleges/ Fachhochschulen/ polytechnics/ universities of applied sciences (UAS) sector on the other (table 3.12).

It is clear from the overview that input-related factors remain very important in all countries. Although some countries have decreased the weight they give to student numbers in favour of the more performance-related factors, there is no single country that has a 100% performance-based system. However, compared to 1995, when there

were only 5 countries where output-related criteria played an important (or extremely important) role (Denmark, Netherlands, Poland, Sweden and the UK), there are now 19 countries where elements of performance are driving the budget of a higher education institution: Austria, Belgium (Flanders), Denmark, Germany, Estonia, Finland, France, Greece, Iceland, Italy, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.

Table 3.11: Number of countries and importance of input- versus output-related funding drivers of operational grant (for publicly funded universities and Univ. of Applied Sciences): 1995 vs. 2008 (N=45, i.e. 34 university systems and 11 UAS systems)

	Number of countries and relative importance of **input-related drivers**		Number of countries and relative importance of **output-related drivers**	
	1995	2008	1995	2008
Extremely important	38	24	3	8
Important	4	18	3	16
Minor importance/ unimportant	3	3	39	21
Total	45	45	45	45

Table 3.12: Drivers in the direct public operational grants allocated to public universities and universities of applied sciences: 1995 versus 2008

Country and system	Input-related criteria (e.g. students, study places, staff, past costs, etc.)		Output-related criteria (e.g. degrees, credits, assessments, publications, grants, etc.)	
	1995	2008	1995	2008
Austria – uni	XXX	XXX	0	XX
Austria – uas	XXX	XXX	0	0
Belgium – Flanders - uni	XXX	X	0	XXX
Belgium – Flanders – uas	XXX	XX	0	XX
Belgium – Wallonia - uni	XXX	XXX	0	0
Belgium – Wallonia – uas	XXX	XXX	0	0
Bulgaria – uni	XXX	XXX	0	X
Cyprus – uni	XXX	XXX	X	X
Croatia – uni	XXX	XXX	0	0
Czech Republic – uni	XXX	XXX	0	0
Denmark – uni	X	X	XXX	XXX
Germany – uni	XXX	XX	X	XX
Germany – uas	XXX	XXX	0	X
Estonia – uni	XXX	XX	0	XXX
Estonia – uas	XXX	XX	0	XXX
Finland – uni	XXX	XX	X	XX
Finland – uas	-	XXX	-	XX
France – uni	XXX	XXX	X	XX
Greece – uni	XXX	XX	X	XX
Greece – uas	XXX	XX	X	XX
Hungary – uni	XXX	XX	0	0
Ireland – uni	XXX	XX	0	X
Ireland – uas	XXX	XX	0	X
Iceland –uni	XX	X	X	XXX
Italy – uni	XXX	XX	X	XX
Latvia - uni	XXX	XX	0	X
Liechtenstein – uni	XXX	XX	0	0
Lithuania – uni	XXX	XXX	X	X
Luxembourg – uni	-	XXX	0	0
Malta – uni	XXX	XXX	0	0
Netherlands – uni	XX	XX	XX	XXX
Netherlands – uas	XX	XX	XX	XX
Norway – uni	XXX	XX	X	XX
Poland – uni	XXX	XXX	XX	XX
Portugal – uni	XXX	XXX	0	X
Portugal – uas	XXX	XXX	0	X
Romania – uni	XXX	XXX	0	XX
Slovakia – uni	XX	XX	0	XX
Slovenia – uni	XXX	XXX	X	XX
Spain – uni	XXX	XXX	X	XX
Sweden – uni	XXX	XX	XXX	XXX
Switzerland – uni	XXX	XXX	0	X
Switzerland – uas	XXX	XXX	0	X
Turkey – uni	XXX	XXX	X	X
United Kingdom – uni	XXX	XXX	XXX	XXX

Legend for table 3.12:

0 = not important
X = minor importance;
XX = important;
XXX = extremely important

3.3.4 Research funding

In many higher education systems, the public funding of *research* takes place through a *dual support system* (see chapter 2). This means that research is funded both through a recurrent (operational) grant and through competitive public research grants. The recurrent/operational funds for research can either be part of a block grant for teaching and research or consist of a separate block grant for research. The competitive public research grants are allocated by research councils, national academies or other national/federal intermediary bodies and take the form of project funds provided to (teams of) researchers.

Through our national experts network we have collected information on the shares of the public funds for research coming from operational grants and competitive grants respectively. Given the total public research funds available to public universities, the table provides a rough indication of the proportions represented by the operational grant for research and competitive public research funds respectively. For some countries it was difficult to make an estimate of the part of the operational grant to be attributed to research (e.g. Belgium, France). In such cases we do not present any numbers in the table.

Table 3.13: Number of countries and the shares of their public research revenue components for the public university sector: 1995 versus 2008 (N=20; N=23)

Share of Operational grant for research	0-25%	26-50%	51-75%	76-100%	N
2008	4	6	6	7	23
1995	5	3	3	9	20
Share of Competitive public research grants	0-25%	26-50%	51-75%	76-100%	N
2008	8	6	5	4	23
1995	10	3	2	5	20

Table 3.13 presents some summary information. Table 3.14 shows more detailed information on the research revenue shares per country. As table 3.14 illustrates, the average share of competitive research council funding in European universities has increased from 44% to 47% over the period 1995-2008. Behind this (rather modest) change, however, lies a wide variety of developments.

Table 3.14: Shares of public funds for research from operational grant and from competitive research council sources: 1995 versus 2008

country	Operational grant for research %		Competitive public research grants %	
	1995	2008	1995	2008
Austria	90	78	10	22
Belgium – Flanders				
Belgium – Wallonia				
Bulgaria	50	33	50	67
Cyprus	70	70	30	30
Croatia				
Czech Republic	0	0	100	100
Denmark	75	60	25	40
Germany		73		27
Estonia	62	34	38	66
Finland				
France				
Greece				
Hungary	95	90	5	10
Ireland		60		40
Iceland		60		40
Italy	84	88	16	12
Latvia	0	40	100	60
Liechtenstein				
Lithuania	80	80	20	20
Luxembourg				
Malta	1	1	99	99
Netherlands	90	86	10	14
Norway	82	75	18	25
Poland	90	80	10	20
Portugal				
Romania	0	0	100	100
Slovakia	90	78	10	22
Slovenia	0	0	100	100
Spain				
Sweden	45	46	55	54
Switzerland	80	72	20	28
Turkey				
United Kingdom	40	33	60	76
Average	56	54	44	47

In 2008, there are four countries where all public research funds are awarded in competition (i.e. the share of competitive research funds is 100%): the Czech Republic, Slovenia, Romania, and Malta. In 11 out of the 34 higher education systems included in table 3.14 we see a rise in the share of competitive/research council funding. We therefore conclude that over the period 1995-2008 the competition for public research funds has increased in Europe. Countries are introducing more competition to improve research quality. In some countries more funds were made available through project funds while in others the research component of the direct operational grant for universities decreased or funds were transferred to the research council.

3.3.5 Targeted funding

Having shown developments in the shares and mechanisms of the operational grants for teaching and research as well as the competitive funding through research councils, we turn to the issue of dedicated or *targeted public funds*. As indicated in section 2.3, targeted funds are often allocated as project funds, ministry contracts, subsidies, or programme funding. These are awarded either competitively or equally across institutions with the explicit aim of encouraging institutions to address specific national priorities. Targeted funds may be provided for teaching as well as research. We will treat the two separately.

First, we address the targeted funding of teaching & learning. In our survey we have identified the countries where in the period 1995-2008 targeted public funding was made available to public higher education institutions to encourage them to work on specific national objectives. The four areas (or targets/goals) we distinguished are:

(1) Access

(2) Efficiency and cost reductions

(3) Increasing educational quality

(4) Student mobility

For the area of *access* the following initiatives are distinguished:

- Enhance the provision of higher education in specific regions
- Encourage participation by students from socially disadvantaged or non-traditional backgrounds
- Encourage lifelong learning

For the area of *efficiency* the following initiatives are distinguished:

- Encourage mergers and amalgamations of institutions

- Encourage a reduction in the time students take to complete a degree
- Encourage an increase in student success rates (i.e. reducing drop outs)
- Reward institution that bring in funding from the private sector

Targeted funds for *quality improvement* may have the following objectives:

- Encourage excellence in teaching (aimed at the best students/graduates)
- Encourage innovations in curricula (e.g. new programmes, broadening programmes, introducing short-degree programmes)
- Protect strategically important subjects
- Reward institution that demonstrate a high quality of teaching (as shown in national teaching evaluations or other assessments)

Student mobility is about the following:

- Encouraging institutions to enable their students to take (part of) a programme abroad
- Encouraging institutions to attract students from abroad

Targeted funding for these initiatives may be allocated on the basis of:

- Competition (tendering) between institutions (C);
- Negotiations between the government and (a selected number of) higher education institutions (N);
- Equal distribution of the funding across the institutions (E).

Table 3.15 lists the targeted funding initiatives on the area of teaching. We list the most important targeted funding initiatives per country, along with the way the funds are made available. The initiatives relate to targeted funds that involve extra direct funding for higher education institutions and disregard (as far as possible) funds allocated directly to students. The table displays a wide variety of initiatives undertaken across the 33 countries. Most targeted funds are awarded competitively. Funds often concern the targets of improving access for disadvantaged students (from the lower socio-economic strata – SES) and the enhancement of teaching quality and curriculum innovations.

Table 3.15: Targeted funding to address education-related goals: areas where initiatives took place, 1995-2008

country	Initiatives on area of **Access**	Initiatives on area of **Efficiency**	Initiatives on area of **Quality**	Initiatives on area of **Mobility**
Austria	-	-	-	-
Belgium – Flanders	Participation SES (E)	Rationalisation of programmes (N)	Excellence & Curriculum innovations (N)	
Belgium – Wallonia	Student success (E)	-	-	-
Bulgaria	-	-	-	-
Cyprus	-	-	-	-
Croatia	-	-	Curriculum innovations (C)	
Czech Republic	SES participation (C)	-	-	-
Denmark	-	Completion & Time to degree (E)	Excellence (C)	Attracting int'l students (E)
Germany	Regional provision; study places (N)		Excellence, Innovation (C)	
Estonia	SES participation (N, C)	-	Curriculum innovations & strategic programmes (N,C)	-
Finland	Special programmes (C)	Mergers (N)	Quality of teaching (C)	
France	-	Mergers, student success (N,C)	Curriculum innovations (C,N)	-
Greece	Regional provision, Lifelong learning (C,N)	-	-	Student exchange (C,N)
Hungary	-	Mergers (C,N)	Innovation, strategic studies, quality assurance (C)	Sending abroad (E)
Ireland	Capacity, lifelong learning, participation low SES (C)	Student success & Cooperation (C)	Curriculum innovation, Excellence, Quality assurance (C)	-
Iceland	-	-	-	-
Italy	-	-	-	-
Latvia	Enhance capacity (N)	-	-	Sending abroad (N)
Liechtenstein	Enhance capacity (N)	-	-	-
Lithuania	-	-	-	Sending abroad (N)
Luxembourg	-	-	-	-
Malta				
Netherlands	Participation SES (N)	Mergers (N)	Excellence & Innovation (C)	
Norway	-	-	-	Student exchange (E)
Poland	-	-	Strategic programs (E)	-
Portugal	-	-	-	-
Romania	Low SES (N)	Student success (C)	Excellence (C)	Sending abroad (N)
Slovakia	Low SES, Lifelong learning (E)	-	Staff promotion (E)	-
Slovenia	Low SES, Lifelong learning (C)	Mergers & Revenue generation (C)	Curriculum innovation (C)	Sending abroad (N)
Spain (Catalonia)	-	-	Curriculum innovation & Excellence (C)	Sending abroad (E)
Sweden	Capacity, Low SES, Lifelong Learning, E-learning (C,N)	Mergers (C,N)	Curriculum innovation, Strategic programs (C,N)	Student exchange (C.N)

country	Initiatives on area of **Access**	Initiatives on area of **Efficiency**	Initiatives on area of **Quality**	Initiatives on area of **Mobility**
Switzerland	-	-	Curriculum innovation (C,E)	Student exchange (E)
Turkey	-	-	-	-
United Kingdom	Low SES (E)	Revenue generation, Amalgamations (E)	Strategic programs (N)	-

Legend:
C indicates *competitive*;
N indicates *negotiations-based*;
E indicates *evenly distributed across institutions*

Turning to the *targeted funding for research-related activities*, table 3.16 lists the initiatives over the period from ca. 1995 to 2008. It shows where targeted public funds were made available to public higher education institutions to encourage them in achieving specific national objectives in the areas of:

1. Research concentration
2. Public-private partnerships in research
3. Research quality and relevance
4. Internationalisation and researcher mobility

Research concentration is about the following objectives:

- Broadening the set of research-active higher education institutions
- Encouraging research cooperation between public higher education institutions
- Encouraging mergers and amalgamations of research groups
- Strengthening the organisational basis for the training of young researchers e.g. through graduate and doctoral schools

In the category of strengthening *public-private research partnerships* we include:

- Encouraging applied research activities
- Specifically rewarding higher education institutions that bring in research funding from the private sector
- Setting up public private research partnerships/networks and joint research programmes between higher education institutions and private sector organisations

Targeting research quality and the relevance of research is about:

- Encouraging excellence in research (aimed at the best researchers/groups)
- Encouraging innovations that stem from research outcomes (e.g. encouraging academic spin-offs, research commercialisation)
- Encouraging research in strategically important areas
- Encouraging institutions to increase the quality of PhD training
- Rewarding higher education institutions that demonstrate a high research quality (as evident from research assessments and similar exercises)

The goals in the area of *internationalisation* in research concern the following:

- Encouraging researchers to carry out (part of) their research in a higher education institution abroad
- Encouraging higher education institutions to attract researchers from abroad
- Encouraging higher education institutions to engage in research cooperation with higher education institutions abroad

Targeted funding for these initiatives may be allocated on the basis of:

- Competition (tendering) between higher education institutions (C)
- Negotiations between the government and (a selected number of) higher education institutions (N)
- Equal distribution of the funding across the higher education institutions (E)

Table 3.16: Targeted funding to address research-related goals: areas where initiatives took place, 1995-2008

Country	Initiatives on area of **Concentrating and/or widening research activity**	Initiatives on area of **Public-private partnerships**	Initiatives on area of **Research quality and Relevance**	Initiatives on area of **Mobility, Internationalisation**
Austria	Broaden research & mergers (C)	Applied research & collaborations (C)	PhD training (C)	Sending abroad & collaboration (C)
Belgium – Flanders	Research cooperation (C)	Joint research (C)	Excellence (C)	Attracting researchers (C)
Belgium – Wallonia	-	Joint research (C,N)	Concentrating on strategic areas (C,N)	-
Bulgaria	-	Integrative research centres (C)		Sending abroad (C)
Cyprus	-	-	-	-
Croatia	Cooperation & PhD training (C)	Applied, strategic & research networks (C)	Innovation, excellence, PhD training (C)	Sending abroad, collaboration (C)
Czech Republic	Broaden research activity (C)	Applied research (C)	Excellence, innovation, PhD training (C)	-
Denmark	Young researchers (C)	Joint research (C)	Excellence & PhD training (C)	Staff exchange (C)
Germany	Excellence Initiative; graduate schools (C,N)	Excellence Initiative (C)	Strategic areas, Excellence Initiative (C)	-
Estonia	-	-	Strategic areas (C)	-
Finland	PhD training (C)	Applied research & partnerships (C)	Innovations, high research quality (C)	Attracting int'l researchers (C)
France	Cooperation, PhD training (C,N)	Partnerships (C)	Strategic areas, PhD training (C)	-
Greece	-	-	-	Going abroad & collaboration (C)
Hungary	Broaden research, PhD training (C)	Applied research (C)	Innovation, strategic areas, PhD training (C)	Attracting int'l researchers & collaboration (C)
Ireland	Cooperation, PhD training, mergers (C)	Applied research, collaboration (C,N)	Excellence, Innovation, PhD training (C,N)	Attracting researchers & collaboration (C)
Iceland	PhD Training, Cooperation (N)	Applied research (C)	Overall research quality (C)	Internationalisation (N)
Italy	-	Joint research (C)	Strategic research & Innovation (C,E)	Exchange of researchers (C)
Latvia	Cooperation with Acad of Science (N)	Applied research (C)	Excellence & Strategic areas (C)	Attracting int'l researchers & Collaboration (C)
Liechtenstein	Research volume (N)	Applied research (N)	Strategic areas (N)	-
Lithuania	-	Collaboration with private sector (C)	Strategic areas (C)	Staff exchange (C)
Luxembourg	Increase capacity (N)	Partnerships (C)	Excellence, Strategic areas (C)	Attracting researchers & cooperation (C)
Malta		Applied research (C)	Innovation & strategic areas (C)	Sending staff abroad (C)
Netherlands	Graduate schools (C)	Commercialisation, strategic subjects (C)	Broadening research in UAS sector (E)	
Norway	Widening & concentration, PhD training (C)	Rewarding and supporting collaborations (C)	Quality reform (C)	Staff exchange and collaboration (C)
Poland	-	Commercialisation (E)	-	-
Portugal	-	-	-	-

Country	Initiatives on area of **Concentrating and/or widening research activity**	Initiatives on area of **Public-private partnerships**	Initiatives on area of **Research quality and Relevance**	Initiatives on area of **Mobility, Internationalisation**
Romania	Cooperation & PhD training (C)	Applied research (C)	Excellence, Strategic areas, PhD training (C)	Sending staff abroad (C)
Slovakia	-	-	Strategic areas (E)	Int'l collaboration (E)
Slovenia	PhD training (C)	Applied research (C)	Excellence (C)	Staff exchange (C)
Spain	Cooperation, Amalgamations & PhD training (C)	Applied research, Revenue generation, Collaboration (C)	Excellence, Innovation, strategic areas, PhD training (C)	Staff exchange (C)
Sweden	Broadening research, Cooperation, PhD training (C,N)	Applied research, Revenue generation, Collaboration (C,N)	Excellence, Innovations, Strategic research (C,N)	Staff exchange & Collaboration (C,N)
Switzerland	Cooperation & PhD training (C)	Applied research (C)	Excellence, Innovation, PhD training (C)	Staff exchange (C)
Turkey	Broaden research activity (N)	-	-	-
United Kingdom	Concentrating research (N)	-	Strategic areas (E)	-

Legend:
C indicates *competitive*;
N indicates *negotiations-based*;
E indicates *evenly distributed across institutions*

Targeted research funds (see table 3.16) cover a wide spectrum of goals. Many of the goals are overlapping, with project funds being awarded to encourage the formation of public-private partnerships and enhancing research excellence on areas of national strategic interest. Collaboration in national or international networks is another target that is encouraged with the use of targeted funds.

Both in education and research, countries may encourage institutions to achieve national objectives not through targeted funds or by setting themes and agendas, but by removing legislation or particular barriers to cooperation, mobility, etc. This may also have the effect of encouraging institutions to engage in particular activities.

3.3.6 Student contributions

Continuing our description in section 2.4 of trends in student finance, we will now provide information on the issue of tuition fees and their levels for the various groups of students (full-time Bachelor students, full-time Master students, doctoral students, full-time non-EU students and part-time students). The information is derived from the surveys in the 33 European countries. The data for the bachelor and master students refer to full-time students that are studying in publicly funded student places. This is the largest group of students.

Table 3.17 illustrates that tuition fees for Bachelor-level students are relatively low across Europe, even though some countries have started to introduce fees in recent years. On average, the fees for Master's level students are higher, particularly in the UK, Ireland, Greece, Cyprus, Malta and Spain. In a few countries, differentiated fees are in place (Italy, Spain, Portugal, UK-England), sometimes with governments

setting a minimum and maximum level. In table 3.20 we provide some more information on fee setting.

The full extent of the variability in fees is not shown in the tables, because in many countries public higher education institutions are allowed to admit additional students over and above the number of publicly funded study places. In such cases, public authorities allow higher education institutions to charge the 'above quota' students tuition fees that the institutions can determine themselves. Such *dual mode* students are admitted as part-time students, evening students, or 'lifelong learning' students, and are charged market prices mostly based on the full cost of the programme. This is the case in the Czech Republic, Bulgaria, Hungary, Croatia, Poland, Romania, Estonia, Lithuania, Latvia, Slovenia, and Slovakia.

Table 3.17: Tuition fees in public universities (uni) and universities of applied sciences (uas): Situation for the year 2008 (in Euro)

Country	Bachelors students	Masters students	Doctoral	Non-EU students	Part-time students
Austria					
uni	726	726	726	1452	726
uas	726	726	-	1452	726
Belgium – Flanders					
uni	55-540	55-540	256	540	NA
uas	100-540	100-540	-	540	NA
Belgium – Wallonia					
uni	108-811	108-811	31-811	NA	NA
uas	108-811	108-811	31-811	NA	NA
Bulgaria	200-500	250-500	200-500	2500-3300	150-300
Cyprus	0	2500	1500	0	1500
Croatia	0	0	1000-6500	2000-3500	740-6500
Czech Republic	0	0	0	0	0
Denmark	0	0	0	6000-16000	1300-2000
Germany					
uni	0-1000	0-1000	0	0-1000	0-1000
uas	0-1000	0-1000	-	0-1000	0-1000
Estonia	0	0	0	0	0
Finland	0	0	0	0	0
France	169	226	342	169-226	NA
Greece					
uas	0	1000-6000	-	0	0
uni	0	1000-6000	0	0	0
Hungary	0	0	0	2000-4000	500-2500
Ireland					
uni	0	3000-25000	3000-8000	3000-30000	1500-3000
uas	0	3000-12000	-	3000-15000	1500-3000
Iceland	0	0	0	0	0
Italy	80-2600	80-2600	0	80-2600	80-2600
Latvia	1500	1500	1000	4500	500-1200
Liechtenstein	950	950	950	950	950
Lithuania	150	150	0	1000-5660	800-4530
Luxembourg	0	17500 (one case)			
Malta	0	360	600	4500-24000	Proportional to load
Netherlands					
uni	1565	1565	0	1565-9000	800-1600
uas	1565	2000-6000	-	2000-7000	800-1600
Norway	0	0	0	0	0
Poland	0	0	0	0	1000
Portugal					
uni	700-900	variable	variable	variable	NA
uas	700-900	variable	-	variable	NA

Country	Bachelors students	Masters students	Doctoral	Non-EU students	Part-time students
Romania	0	0	0	3200-3500	0
Slovakia	0	0	0	2000	0
Slovenia	0	0	2500-4000	2500-4000	2000-3000
Spain	600-1000	1000-3000	1000-3000	1000-3000	Proportional to study load
Sweden	0	0	0	0	0
Switzerland uas uni	 800-1300 800-1300	 800-1300 800-1300	 - 0	 800-1500 800-1500	 800-1300 800-1300
Turkey	70-200	100-300	140-400	250-1400	35-75
United Kingdom - England	3500	4000-8000	4000-6000	6000-10000	2000-4000

Notes: The table only concerns the publicly funded research universities (uni) and Universities of Applied Sciences (uas). Fees for BA students relate to students in government-supported places. Administrative fees (e.g. for student unions or registration/examination fees) are not treated here.

The ability that higher education institutions have or do not have to set fees and decide on their amount relates to the issue of financial autonomy, discussed in section 3.2. Having the possibility to charge a fee constitutes an important part of the institutions' financial room to manoeuvre and the generation of new funding streams. As indicated earlier in section 3.3.1, some countries have seen the average share of revenues from tuition fees reach levels that are quite substantial and exceeding 20% (UK, IE, IT, ES, BG, HR, PL, RO). In some of these cases the fees are charged to students in private institutions or students studying in the non-government funded study places. Across Europe, fees on average represent 11% of the institutions' revenues.

Students' private contributions may consist not only of the tuition fees that cover all or part of tuition costs in higher education, but they may also extend to administrative fees such as entrance fees, registration fees, and certification fees. While the level of such contributions is usually lower than tuition fees, these administrative fees may nonetheless have a significant impact in terms of funding in some countries, in particular in south-eastern Europe (Estermann & Nokkala, 2009).

3.3.7 Student support

Having discussed the levels of the contributions that students have to make to meet the costs of their studies, we turn to the issue of student support. We do this by referring to table 3.18, which includes the arrangements and developments both of the student support system and the tuition fee situation in each country. The table provides an overview of arrangements and developments in both areas.

There is a wide variety of support schemes in place across Europe and we cannot present here the full detail for all 33 countries in our study.[20] Most countries have means-tested grants for undergraduate students. Such grants cover part of a student's living costs and (where relevant) the tuition fees. In many countries students are regarded as dependent on their parents, meaning that in some countries their parents also qualify for tax relief or child allowances. Some countries have only

[20] The reader is referred also to the *Funding Fiches* included in Volume 3 of this report.

recently introduced a student loans system (Bulgaria, Hungary, Poland, Portugal, Slovenia), while others still lack such a system (see Table 3.18). At present, two-thirds of the countries have loan systems in place, with some charging a market-based interest rate and other setting the interest rate at the rate of inflation.[21]

Table 3.18: Availability of student loans for covering students' living cost: 1995 versus 2008 (N=34)

	1995	2008
No loans	AT, BE-fr, BE-nl, BG, CY, CZ, ES, GR, HR, HU, IE, IT, LU, LV, MT, PO, PT, RO, SI, SK	BE-fr, BE-nl, CY, CZ, ES, HR, IE, IT, LU, MT, RO, SI
Loans to cover living costs	CH, DE, DK, EE, FI, FR, IS, LI, LT, NL, NO, SE, TR, UK	AT, BG, CH, DE, DK, EE, FI, FR, GR, HU, IS, LI, LT, LV, NL, NO, PO, PT, SE, SK, TR, UK

Table 3.19 shows some of the student support arrangements for students going abroad. The portability of student support is a mechanism for promoting international student mobility, which is an important item in European policies with respect to higher education. The table shows that, compared to the middle of the 1990s, in more than half of the countries in Europe students who go abroad for a limited period or for an entire programme largely receive the same support as students who remain in their home country.

Table 3.19: Financial support for BA students going abroad (N=34)

Type of support	1995	2008
No financial support	BG, HR, CY, CZ, ES, HU, IS, LT, LV, MT, NL, PT, RO, SI, SK	BG, HR, CZ, LT, LV, PT, SK
Special grants or loans earmarked for mobility	AT, EE, GR, IT, LU, NO, PL, TR, UK	EE, ES, GR, IT, LU, NO, PL, TR
Support for students abroad is largely the same as for students studying in their home country	BE-nl, BE-fr, CH, DE, DK, FI, FR, IE, LI, SE	AT, BE-nl, BE-fr, CH, CY, DE, DK, FI, FR, HU, IE, IS, LI, MT, NL, RO, SE, SI, UK

Tuition fees and student support are among the most controversial issues in higher education. The main argument used against fees is that they create social barriers in access to higher education (the question of equity). Proponents of tuition fees often emphasize their positive effects on the *accountability* of institutions and *competition* between them, on the one hand, and *responsibility* of students on the other (assuming that - in the long run - the combined effect is the increased quality of education). Resolving this debate poses many challenges and needs to take note of the fact that tuition fees often go hand in hand with more complex and intense student financial aid. One can refer here to case studies showing that steadily increasing tuition fees, accompanied by an efficient student support system (e.g. as in the Netherlands), do not generate inequalities in access, whereas tuition-free systems accompanied by mainly indirect (parent-based) student support do not succeed in reducing high inequalities in participation (e.g. the Czech Republic) (see Matějů et al., 2009).

[21] To learn about the interest rates and other student support-related conditions, the reader is referred to the Funding Fiches included in Volume 3 of this report.

Table 3.20: **Student contributions and student support: reforms across Europe**

Country	Tuition fee issues and reforms		Student support issues and reforms	
Austria	Fees were introduced in 2001. Starting with March 2009 only students who exceed the standard duration of the study by more than 2 semesters must pay. Government decides on the level of the fees for BA and MA students. No fees in 1995	See left. Students pay fees: for the student union as well.	All bachelor and master students are eligible for receiving grants, but not loans. Parental income, study progress / performance and part-time earning are the key criteria for eligibility.	
Belgium - Flanders	Legislation defines the minimum and maximum amount of tuition fees. The universities, through the inter-university council, come to an agreement about the actual amount.		All Bachelors students are eligible for means tested grants to cover tuition fees. No loans. Students receiving a grant also receive other advantages (e.g. a reduction on enrolment fees, child allowance and tax reduction for their parents, the use of the welfare facilities of the universities).	New legislation in 2004 and in 2007 introduced a system of study allowance credits. Students receive two Bachelor's credits; one Master's credit; one wild card; one credit for a preparatory programme; one credit for a bridging programme; one credit for a teacher-training programme in the form of a follow-up programme.
Bulgaria	Government decides on the level of BA and MA fees. Introduction of fees in 1999. The range is from 200 € (BA) / 250 € (MA) to 500 €.		All BA and MA students are eligible for a grant and a loan for maintenance and fees. Loans were recently introduced.	Grants used to be performance-oriented, since 2000 they are also means-tested.
Cyprus	There are no tuition fees at undergraduate programmes. The level of fees for MA and PhD programmes is set by the institutions.		All students are regarded as scholarship holders by the government and, therefore, the government pays their fees. No loans.	Students who fail to complete their studies within six years start paying tuition fees. For Masters students there is no support. Students pay their own fees, unless they can get a scholarship from the Cyprus Scholarship Foundation
Croatia	No fees for government supported places. Tuition fees for full-time students in study places that are not state-supported study places and fees for part-time students are decided by the Rectors' Conference and approved by the ministry. All other cases are decided within the institution by the faculties.	The level of the tuition fees is decided on the faculty level. No government regulation for the many new professionalised studies and graduate-type degrees (specialized masters etc), resulting in a wide range of tuition fees.	All BA students are eligible for grants based on social criteria, merit, special needs. The primary student support are tax benefits to students' parents and subsidised housing, meals and travel expenses. There is no loans system and no financial support for part-time students.	Scholarships also specifically target students willing to accept employment in areas of special state protection.

Country	Tuition fee issues and reforms		Student support issues and reforms	
Czech Republic	Basically no tuition fees (some exceptions). In 1998 a special fee was introduced for students that take more time to degree.	In 1998 a special mode was allowed for public HEI: the so-called *life-long learning mode*, allowing institutions to charge participants fees and let them recognize up to 60 credits provided they get accepted as regular students.	No special overall student grant or support for students. There are social benefits and family income support. Full time students up to 26 are entitled to this, depending on family income. Another direct allowance is the accommodation grant - depending on a permanent address. Other support is indirect - tax reduction, meal, etc.	Direct allowance for accommodation was introduced in 2005. Full time students can use various reductions and discounts offered by public and private institutions (transport, etc.) and services (meal vouchers). An age limit of 26 was imposed.
Denmark	No tuition fees charged for EU/EEA students.		All BA students are eligible to receive grants and loans to cover living costs.	
Germany	Tuition fees were introduced in six German states in 2006. The state governments capped the level of tuition fees at 500€ per semester. In Nordrhein-Westfalen and Bavaria institutions can decide to stay below the threshold. Hessen implemented fees and abolished them again. In 1998 fees were introduced for long-term students. Five states have such fees.	Tuition fees were introduced in 6 states (Baden-Württemberg, Bayern, Hamburg, Niedersachsen, Nordrhein-Westfalen and Saarland) after a 2005 constitutional court decision. The majority of the state governments set a threshold of at most 500 € per term. Only in Nordrhein-Westfalen, institutions are free in their fee setting.	All Bachelor students are eligible to grants and loans for living costs and tuition fees. There are also tax benefits for students' parents.	
Estonia	Some places are state-financed. For the other places the HEIs charge tuition fees.		Students are eligible for loans (covering tuition and living costs) and their parents to tax benefits. Loans are based on performance.	The terminology and differentiation of full-time, part-time students (if one's progress is less than 75% of the level of progress determined in the curricula) was introduced, which has been taken as a criterion for eligibility for financial support as well as for loan.
Finland	Finnish legislation does not allow tuition fees for degree students.		Tax benefits for parents of students. All students are eligible for loans and student benefits for public transportation and meals subsidy. Only university students are eligible for grants.	New financial programmes are established.

Country	Tuition fee issues and reforms		Student support issues and reforms	
France	Government decides on the level of the fees for national BA and MA and doctoral students.	It is more and more frequent for some universities to offer selective "university degrees" (not accredited by the ministry and not labelled as "national degrees") for which tuition fees are much higher and are set by the universities.	There are grants to cover living costs, but only for students with low income.	Some changes occurred on the level of the grants (higher) and merit grants have been adopted, mostly for merit low income students
Greece	There are no fees for undergraduate programmes. For MA programmes the fee setting depends on institutions.	(Before 1995 MA students did not have to pay fees.)	The state provides scholarships, interest-free loans and various types of economic assistance to low-income students.	There are various kinds if in-kind support (medical insurance, accommodation, meals)
Hungary	Fees are only paid by self-financed students studying in the places not supported by the government. These fees are set by institutions. The HE Act 2005 declares that the fee for self-financed students can not be lower than half the state support.	Part-time studies were self-financed until 2005. The HEA 2005 gives the possibility for the Ministry to support part-time studies from the state budget, as well: a small proportion of the budget goes to create state-supported places in part-time study programmes.	All students are eligible for a grant per semester based on his/her grade point average. Students from low income families can get means-tested grants for living cost and pay a reduced dormitory fee. There is a state supported loan system available for all students	The most significant change was the introduction of the state supported loan system, available for all students. There was a tax allowance system from the 1990s, but the system has been getting more and more rigid: now deduction can be done for the families in the lowest tax rate category only.
Ireland	In 1997, when government started paying the fees in lieu of the bachelor students, it set the level of the fees. For all other students (Masters, Doctoral, etc) the fees are set by the institution and always have been.	There are ranges of fees for all other student categories: Masters, Doctoral, non-EU, Part-time, Students who repeat a year pay fees for that year. Students taking 2nd academic degree pay fees, non-EU students pay fees in line with real costs.	Full-time Bachelor students whose parental/family income is below a certain threshold qualify for student support and grants to cover living costs, the levels of which depend on a number of variables. Fees are paid for by the government.	Masters students must pay their own tuition fees or obtain a scholarship or sponsorship.
Iceland	There are no tuition fees (private HEIs can determine fees independently)		All BA students are eligible for loans to cover living costs. (currently loans are also provided for students wanting to study abroad)	

Country	Tuition fee issues and reforms		Student support issues and reforms	
Italy	Universities are free to determine the tuition fees level, but a general threshold is established by the government (fees revenues should not exceed 20% of the government core funding). Fee levels can be differentiated by category.	From 1997 universities became autonomous, determining the level of tuition fees up to the threshold. Within this limit, universities can differentiate fee levels, taking into account criteria such as: special categories of students, the socio-economic environment, where the university is located, competition for student attraction, costs of fields (use of laboratories, libraries and other infrastructures), etc.	All BA students receive support if parent's income is below a threshold (but support is largely ineffective due to the low amount of money devoted to grants).	
Latvia	Students at all levels pay tuition fees (also part-time). Tuition fees set by the individual HEI (all levels)	The fees differ among the universities, not among the subjects. The level is dependent on branding, reputation, expectations, social and regional factors.	All BA students are eligible for loans to cover tuition fees and living costs. Strategic important national subjects are prioritized.	State or municipality guaranteed student support and study (tuition fees) loans are available since the end of 1990.
Liechtenstein	Fee set by institution.		The State offers educational subsidies in the form of scholarships and interest-free loans, dependent on citizenship, residence, income and assets.	A residency criterion was introduced in 2004.
Lithuania	State funded student pay a token fee. HEIs decide on the level of the fees for BA and MA students that are not state funded. The levels differ because of the different costs of studies.	In 2000, an annual registration fee of 290 EUR was introduced. The fee is waived for 50 percent of the best students.	Bachelor students can get loans. They or their parents can also get tax benefits if they pay full tuition fees.	
Luxembourg	No tuition fee, except for the Master in Banking and Finance.		All BA and MA students are eligible for receiving grants and loans (with a fixed 2% interest).	
Malta	The government decides on the level of tuition fees. Government decides following recommendations by university on tuition fees. Science-based and Management degrees are generally more expensive than Arts-based degrees.	Fees are different for local and foreign students. Since 1995 there were slight changes for local full time MA and for part-time students.	All BA students are eligible for grants to cover living costs. Students can apply for competitive, publicly-funded scholarships to cover tuition.	Favourable loan schemes are available from commercial banks.

Country	Tuition fee issues and reforms		Student support issues and reforms	
Netherlands	Government decides on the level of the fees for BA and MA students. Uniform fees are paid by all BA/MA students.	Universities are allowed to set the level of the fees for part-time students and students that enrol at an age of 30 years or older, but there is a minimum rate set by the government.	All BA and MA students receive a grant and a loan. The grant (consisting of a basic grant and a supplementary grant) was made conditional on students' performance in 1996. This performance grant is not means tested but the supplementary performance grant is.	If students take less than 10 years to graduate, their performance grant does not have to be repaid. The loan (bearing an interest) is independent of parental income. In 2000, support for fees was separated from other support.
Norway	No tuition fees charged. Continuing education schemes may have tuition fees		All BA and MA students receive a grant. Students may also take out a loan.	From 2008 all student support is initially given as loans, but part of this may be transformed into grants depending on a student's academic progress.
Poland	All full-time studies are free. Only part-time studies are fee-based (weekend students). HEIs decide on the level of such tuition fees.		All BA students are eligible for grants and loans for living costs, and also qualify for merit based scholarships. State financed scholarships are divided into means-tested and merit based.	Student loans were introduced in 1997. Students at private HEIs were incorporated into the system in 2001.
Portugal	Institutions decide on the level of the fees for BA and MA students (differentiated fees).	Since 2003 the government defines a minimum and a maximum level and the institutions then set their value.	Grants are available to cover fees and living costs. Since 2007, a student loans system is in place.	
Romania	There are state budgeted places for which no tuition fees are paid and there are additional places for which tuition fees are paid. For the latter, HEIs decide on fee levels.	Before 1998 there were no tuition fee paying places.	Some scholarship support (based on competition) to cover living and study costs. Criteria include parental income and academic achievement. There are no loans.	Additional students enrolled on non-subsidised places do not benefit from student support.
Slovakia	No fees for students in state-supported places. Only fees for students in additional places ('self-funded students'), which prior to 1995 did not exist. HEIs decide on the level of fees for such students.	Also fees for students taking longer that the stipulated time to degree and students doing a second degree.	All students are eligible for grants to cover living costs and tuition fees. Grants conditions refer to parental income and academic ability. No loans.	
Slovenia	Full time students do not pay tuition fees. Only part-time students and self-funded students pay a fee. HEIs decide on tuition fees for the latter.		All students are eligible to means-tested grants to cover living costs, as well as for loans to cover tuition fees and living costs. There are also merit-based scholarships and tax benefits for parents of full-time students.	Both full and part-time students have the right to medical assurance and other benefits (public transportation, food). Loans were introduced in 1997 and depend on academic achievement.

Country	Tuition fee issues and reforms		Student support issues and reforms	
Spain	Regional governments decide on the level of the fees for Bachelors programmes with slight differences by discipline. But they make agreements at national level to avoid high differences.	For Masters, universities may choose the fee between a broader range. Fees for Master programmes are in some cases considerably higher	There is a means tested grant system for students. This grant covers fees and living costs, as well as transportation.	A loan system for Master students has been introduced recently. It is interest-free.
Sweden	There are no tuition fees		Student finance covers living expenses and the cost of study material. Everyone below the age of 54 has the right to apply for student finance for a maximum of 240 weeks. Student finance comprises a grant and a loan.	
Switzerland	In many cases Cantons decide on fees, in others universities can decide. No national rules, but a gentlemen's agreement to have fees at a similar level. In the past, probably the government decided in almost all cases.	For example: in Basel the University board decides, in Bern minimum and maximum fees are determined by law, in Fribourg the cantonal government decides.	All BA and MA students receive a grant and a loan to cover fees and living costs. The exact rules and the amount of the grant vary from Canton to Canton.	The federal government allocates funding for grants and loans to all cantons according to their population. The overall sum cannot exceed the sum the Cantons allocate themselves. Every Canton is then competent on eligibility conditions and amount granted
Turkey	Government decides on the level of the fees for BA, MA and doctoral students. Some studies have higher fees. Part time students' level of fees is decided by the institution.		All BA and MA students are eligible to receive loans for covering tuition fees and living cost. Loans depend on parental income. No student grants.	
United Kingdom	Government sets an upper limit (which is charged by most HEIs) on BA fees. Other fees reflect market conditions. Current fee regime introduced in 2006.	Fees payable "upfront" were first introduced for bachelors degrees in 1998. Higher ("variable") fees, with maximum of GBP 3000, were introduced in 2006, since uprated for inflation to GBP 3200. These are not upfront, but recovered via the tax system when the graduate is earning.	Means-tested grants are provided to cover fees and accommodation. All BA students are entitled to a loan. Most students receive a mixture of grants and loans.	Since 2006, universities offer a bursary package. MA students have no entitlement to support.

3.4 Europe's modernisation agenda and funding reforms

Now that we have presented an overview of higher education funding in Europe with a particular focus on the changes that have occurred in revenue composition, institutional funding, tuition fees and student finance, it is time to relate these reforms to the European Commission's Modernisation Agenda. This Agenda (EC, 2006a) is the major European policy document concerned with higher education reform and the improvement of European higher education and research performance.[22]

Table 3.21: The funding aspects of Europe's modernisation agenda

- Ensure real autonomy and accountability for universities. Universities should be responsible and accountable for their programmes, staff and resources. Institutional autonomy is a pre-condition to adequately respond to changes
- Provide incentives for structured partnerships with the business community. Structured partnerships contribute to economic development, improve the career prospects of researchers, increase the relevance of education programmes, create more possibilities for patenting and licensing, and can bring additional funding
- Reduce the funding gap and make funding work more effectively in education and research. As put forward in its Annual Progress Report on the Lisbon Strategy, the Commission proposes that the EU should devote at least 2% of GDP (including both public and private funding) to a modernised education sector
- States should examine their current mix of student fees and student support schemes in the light of actual efficiency and equity. Free access does not necessarily guarantee social equity. Money spent on obtaining university qualifications pays returns higher than real interest rates. Student support schemes today tend to be insufficient to ensure equal access and chances of success for students from the least privileged backgrounds
- University funding should be focused on relevant outputs rather than on inputs. Funding should be adapted to the diversity of institutional profiles. Research-active universities should not be assessed and funded on the same basis as others weaker in research but stronger in integrating students from disadvantaged groups or in acting as driving forces for local industry and services. Apart from completion rates, average study time and graduate employment rates, other criteria should be taken into account for research-active universities: research achievements, successful competitive funding applications, publications, citations, patents and licences, academic awards, industrial and/or international partnerships, etc
- States should strike the right balance between core, competitive and outcome-based funding (underpinned by robust quality assurance) for higher education and university-based research. Competitive funding should be based on institutional evaluation systems and on diversified performance indicators with clearly defined targets and indicators supported by international benchmarking for both inputs and economic and societal outputs
- Break down the barriers around universities in Europe. National grants/loans should be fully portable within the EU

The European Commission sees the modernisation of Europe's universities as a core condition for European competitiveness in an increasingly global and knowledge-based economy as well as being 'necessary in order to reinforce the societal roles of universities in a culturally and linguistically diverse Europe'. In table 3.21 the

[22] Please note: We do not use the modernisation agenda as a normative benchmark. What we are interested in here is the extent to which higher education governance and funding arrangements across Europe match those advocated by the modernisation agenda.

funding elements of the modernisation agenda are summarised. We note that this table does not represent the entire agenda, as it leaves out recommendations related to governance and curriculum reform.[23]

In table 3.22 we relate the trends in funding reform outlined earlier in this chapter to the different aspects of the modernisation agenda.

Table 3.22: The modernisation agenda and funding reforms in European higher education

Aspect of the modernisation agenda	Funding reforms in Europe
Financial autonomy	In most countries public universities enjoy significant financial discretion; they can by and large freely decide how to allocate their financial resources. In many countries reforms took place between 1995 and 2008, usually shifting from line item to lump sum funding systems. In about three-quarters of countries public universities do not have the possibility to borrow money from the capital market or can do so only within ministerial regulations. In half of the countries public universities cannot build up financial reserves.
Partnerships with business	In the vast majority of countries public universities have significant opportunities to enter partnerships with other HEIs and/or with the public or private sectors. In some cases specific regulations must be taken into account, but in general public universities are able to establish such partnerships at their discretion. Targeted funding was made available in many cases to encourage HEIs to set up partnerships/networks and joint research programmes with private sector organisations.
Reduce the funding gap. 2% of GDP to higher education sector	Public spending in higher education in the EU, at 1,13% of GDP in 2004, is close to US levels (1.32%) and well ahead of Japan (0.65%), but private spending on higher education in the EU, at 0.23% of GDP, is much higher in both Japan (0.76% of GDP) and the US (1.91%) .The EC's Annual Progress Report shows wide differences in public spending on higher education across Europe. In the Nordic countries it is over 2% of GDP, while in several southern and eastern European countries it is less than 1%. Total public expenditure as a percentage of GDP increased in 12 EU countries while decreasing in 13.
Student fees and support schemes	Tuition fees for Bachelor-level students are relatively low across Europe, even though some countries have started to introduce fees in recent years. On average, the fees for Master's level students are higher. Only in a few countries, differentiated fees are in place, but mostly with governments setting a minimum and maximum level. There is a wide variety of support schemes. Most countries have means-tested grants for undergraduate students and support for the students' parents. Some countries have only recently introduced a student loans system (Bulgaria, Hungary, Poland, Portugal, Slovenia), but a third of the countries have no such system yet.
Funding more based on outputs (performance) than on inputs	Incremental funding, where budgets are based on previous year's allocations, is clearly being applied less these days and in many countries has been replaced by formula-based approaches. Contracts, where funding authorities agree a budget conditional on HEIs meeting specific goals, are an important allocation mechanism in 10 countries. In the underlying criteria that are built into the funding formulae and funding contracts the input-related factors remain very important in all countries although some countries have decreased the weight they give to student numbers in favour of the more performance-related factors. Compared to 1995, when there were only 5 countries where output-related criteria played an important role, there are now 19 countries where elements of performance are driving the budget of a HEI. In all countries, project funds and targeted funds are provided – mostly in a competitive way. Targeted funding for education often concerns the goal of improving access for disadvantaged students or the enhancement of teaching quality and curriculum innovations. Targeted research funds cover a wide spectrum of (often overlapping) goals: to encourage the formation of public-private partnerships, enhancing research excellence and establishing

[23] For these other aspects of the Modernisation Agenda the reader is referred to the parallel reports on Governance Reform and the Independent Assessment of the Bologna Process.

Aspect of the modernisation agenda	Funding reforms in Europe
	research networks on areas of national strategic interest.
The balance of core, competitive and outcome-based funding	In 2008, universities on average receive two-thirds of their funding from public sources through core funding, about 12% is from private households in the form of tuition fees, and 21% is from third party funds, originating from private as well as public sources (competitive, third party funding). In the universities of applied sciences; tuition fees represent about the same share (11%); the share of core funding is three-quarters and third party funding makes up the remainder (13%). Looking at third party funding in detail, we observe a rise in the share of competitive/research council funding in a third of the countries. Compared to the year 1995, there has been a move towards a higher share of tuition fees and third party funds, partly as a result of a rise (or introduction) of tuition fees, the emphasis on project funds, and the relaxation of regulations that govern the entrepreneurial activities of HEIs.
Portability of student support	To promote international student mobility one may observe that, compared to the middle of the 1990s, in more than half of the countries in Europe students that study abroad for a limited period or for an entire programme largely receive the same support as students who remain in their home country.

This analysis allows us to offer some *tentative reflections* on the modernisation agenda and a decade of reforms in European higher education. Again, one should regard the funding reforms in tandem with the reforms in governance arrangements and curricula.

While in terms of governance, state regulation is still visible in many countries, there are clear tendencies for states to withdraw from micro-management. Autonomy has come to be regarded as a means to act quickly in a fast-changing, competitive and globalised environment. Financial autonomy, in particular, allows higher education institutions to raise additional funds in a context of stagnating public resources. Financial autonomy has increased significantly over the past 15 years and enabled institutions to manage their own financial affairs. Lump sum funding systems have replaced line item funding in many countries, which has substantially increased the institutional room for manoeuvre. However, in about three-quarters of the countries public universities can not borrow money from the capital market and in half of the countries it is not possible to build financial reserves.

Despite the higher levels of financial autonomy, the possibility for the institutions to set their tuition fees is limited in most countries. Tuition fee levels – if there are any – are relatively modest across Europe. The introduction of more significant fees seems to be awaiting the parallel introduction of student financial support schemes that enable students from different backgrounds to meet the cost (tuition plus living cost) of their education. Student loan systems have not been implemented everywhere, or have been implemented only recently.

As a result of the relatively low level of fees and private spending on higher education, the funding gap between Europe and the US or Japan is still very much a reality. There are tendencies in quite a few countries to increase the institutions' income from private sources, such as business. Often the generation of such revenues is encouraged by means of targeted funding and the elimination of regulatory barriers.

Many countries have introduced clear links between funding and performance. This is reflected in the parameters incorporated in the funding formulae as well as in the tendency to augment such formulae with performance contracts agreed between funding authorities and institutions.

Finally, to encourage mobility, many countries have introduced some form of portability of student support, meaning students abroad largely receive the same support as students who remain in their home country.

3.5 Other observations on higher education reforms across Europe

In this chapter we have focused until now on funding reforms with a particular focus on the changes that have occurred in terms of revenue composition, institutional funding, tuition fees and student finance. To conclude our discussion on funding reforms we highlight a number of other aspects of reforms that emerged from our research and our parallel study on governance reforms.

3.5.1 The timing of reforms

While the drivers of reform (e.g. fiscal constraints related to mass higher education, globalisation, the appeal of new public management approaches; see chapter 2) have been the same in many countries, the timing of reforms has differed significantly across Europe. Some countries such as the United Kingdom, the Netherlands and Sweden started to transform their higher education governance and funding systems before the 1990s. Other countries such as France and Germany are relative late-comers. The former communist countries in Eastern Europe followed in general a different reform path; many changed their higher education systems fundamentally and rapidly in the early 1990s. Later on, new political realities (e.g. entry into the European Union) and the experience gained from the initial reforms led to a new wave of reforms.

3.5.2 Related reform areas

Funding reforms in European higher education do not take place in isolation. In many countries reforms in the areas of quality assurance and governance have been linked with funding reforms. Quality assurance and accreditation have been one of the main reform themes in Europe, particularly after Bologna. In nearly all countries public universities are today obliged to have internal and external quality assurance systems for teaching; in 1995, this was mandatory only for some 'early adaptors' in the field of quality assurance. As regards quality assurance systems for research, we see more institutional freedom. In many countries having external and particularly internal quality assurance systems for research is a matter for universities to decide.

As illustrated in our companion study on governance reforms, institutional autonomy has many dimensions. Some dimensions have direct consequences for institutional

resources and their deployment. We will mention two aspects of autonomy: student recruitment and staffing matters. In some countries, public universities cannot select their students and have to accept all qualified students; or cannot determine salary levels which would allow them to attract the best staff.

In just over one-third of European countries public universities can decide for themselves on the criteria to select their students and on the number of study places. In the other countries – most of them advocating open access policies in the sense that universities have to take all qualified students unconditionally – the possibilities for universities to select their students are more limited. In some countries public universities can select their students only after all state funded study places have been filled up. Over the last 15 years there have been few reforms regarding student selection and the number of study places.

In terms of staffing, we observe that in 11 countries public universities have considerable freedom to select their own academic staff and decide on academic salary levels. In other countries public universities can select their academic staff but salaries are set (or limited) by government. There are eight countries in which public universities have low levels of discretion in staffing matters. In three countries major reforms were implemented to give universities more leeway in staff appointments and setting salaries. In most countries no significant reforms in this area were introduced in the last 15 years.

Empowering universities to take and implement decisions effectively requires top-level leadership and management with sufficient powers. In the vast majority of countries reforms took place that in one way or another are related to internal governance structures. Internal governance structures have changed in such a way that the powers of executive leadership have been increased. While the internal governance of public universities is in many cases still state regulated, these regulations are not as detailed as they used to be. Empowered executive leadership and a stronger emphasis on the strategic profiling of institutions are likely to contribute positively to overcoming internal fragmentation within universities. In the period 1995-2008 strategy development at the institutional level has gained in importance.

3.5.3 Mergers and partnerships

The institutional landscape of European higher education has seen many changes. In a number of countries there have been reforms aimed at the enlargement of the scale of institutions both within and across higher education sectors. These reforms include mergers, integration, structural collaboration and strategic alliances in Norway, Denmark, Finland, Flanders, Hungary and the Netherlands. Many of these processes have been initiated by the state. For example, in Denmark twenty-five universities and research institutions were reduced to eight universities and three research institutions in 2007 as a consequence of the government's globalisation strategy *Progress, Innovation and Cohesion*. The main aim of the mergers is to

strengthen Danish higher education and research, sharpen its profile, and improve the competitive edge of Danish universities.

In other countries many public universities have decided themselves to establish lasting partnership relations with other organisations (within and outside higher education). The outcomes of our reform studies show that the vast majority of European countries have granted their public universities significant leeway to establish such relationships, including public-private partnerships for long term research projects, or joint degrees. In 2008, public universities in sixteen countries could enter these kinds of partnerships without significant legal restrictions.

3.5.4 Changes beyond the public university sector

The primary focus of this comparative study of reform across Europe is the public university sector, as this is the only sector that exists in all 33 countries (and is – with the exception of the Netherlands and Belgium - the dominant sector in terms of student enrolment).[24] Nevertheless important reforms have also taken place in a number of European countries that concern the introduction or growth of new higher education sectors – the universities of applied sciences – or the conditions under which private higher education providers are permitted to operate in different countries (see the overall analysis of governance and funding reforms by country in Appendix 1).

3.5.5 Private higher education: governance and funding developments in Europe over the past decade

This section provides an overview of the major trends in the governance and funding of private higher education sectors, in particular in the six countries in our study where enrolments in this sector exceed 20% of total higher education enrolments (Bulgaria, Estonia, Latvia, Poland, Portugal and Romania).

There is a large variety of private higher education institutions in Europe. The majority of them focus on disciplines in high student demand which are relatively inexpensive to provide, such as law, business and languages. Some of the private providers are funded by religious donors, some are off-shore branches of universities in other countries, and some are family-run businesses. In terms of educational programmes, some emulate American liberal arts education, while others try to offer a variety of flexible programmes for adult learners, including through distance education. The private sector has been the fastest growing higher education sector in Central and Eastern Europe for the last decade and is much more prominent there than in Western Europe.

[24] Our aim was that the governance and funding questionnaire(s) for each country should cover a set of institutions that between them enrol 80% of the higher education students in the country. This means that small specialised sectors with particular governance or funding arrangements were ignored (Military Colleges, Music Conservatoires, Fine Art Academies, Church-based institutions…). Also public or private university or non-university sectors were ignored if their enrolments were less than 20% of the total.

In his influential book, Geiger (1986) describes three main roles of private higher education. The first role is to provide *better* services as part of the elite higher education. Such private higher education institutions exist in France, US, and Japan. The second role of private providers is to provide *different* services, such as religious based education. The third type of private providers which is the most prominent in the recent growth in private provision, are institutions that *absorb demand* that is not met by public institutions. Governments lack the resources to fund a massive expansion of the public higher education sector and allow the private institutions as an alternative. This is the dominant role of private higher education in the six countries with the highest proportion of private students in Europe.

Altbach (2005) notes that the private higher education sector is seldom totally private. The state is usually an important actor in assuring the quality and accrediting private higher education institutions and their programmes. In this way the state exerts certain standards and controls. Moreover, in most countries, public funds are available to the private sector through a variety of mechanisms such as competitive research funds, or state subsidised student loans or grants. Such developments are seen in Bulgaria, Poland, Romania, and Portugal, although some of these systems have only recently established student loan systems. However, the bulk of private providers' funds come from students, thus, private universities are highly dependent on student tuition for the major proportion of their income.

Given the wide variety of private higher education providers it is very difficult to generalise about governance and funding arrangements. Rapid deregulation of the higher education sector occurred in five of the countries after the fall of communism. In the 1990s the five Central and Eastern European countries allowed private providers to enter the higher education sector (Portugal had done this in the mid-1980s) and to fill in the growing demand for higher education in the societies. This led to a substantial expansion of the higher education sectors. During the first years of their establishment in the 1990s private universities in the five countries functioned in more or less of a legislative vacuum and were in large part free to decide on their internal governance structures and modes of operation. In Bulgaria for example, the recognition of private universities and the requirements for their establishment were legislated in 1995. All five governments increased requirements for the accreditation and other quality assurance procedures, both for public and private providers. In all countries national bodies for quality assurance and accreditation were established which play a major role in institutional and programme accreditation of private higher education institutions. Quality assurance has shifted in general from input control to more output control.

In all six countries the role of the Ministry responsible for higher education in relation to the establishment of new private institutions is to ensure that they meet legal, financial, capacity and programme offering requirements. In Portugal, for example, once established, private higher education institutions are free to determine their own missions and strategies but subject to the important provision

for private institutions that all new study programmes need approval from the Ministry.

In general, private institutions are free to determine their own internal governance structure, their own modalities of leadership and management, their own staffing and salary policies (although the number of professors – even if only part-time – is typically a key accreditation criterion), the numbers of students to admit and the selection criteria to employ, and the level of tuition fees. They also enjoy high levels of financial autonomy and (with the exception of quality assurance/accreditation) autonomy in the sense of reporting requirements to the central government. Research programming is not a significant issue for the teaching-orientated majority of private institutions.

The overall trend of the higher education reform geared towards financial autonomy from the state facilitated the access of private higher education institutions to public resources through competitive research funding as well as student loan schemes. The generosity of the public purse is different for each individual case. In Poland, students were incorporated into the state student financial support system in 2001, which includes merit based scholarships, means tested scholarships and student loans. The other countries have been less active in this respect and only recently have discussed the introduction of student loans which are also applicable for students studying in the private sectors. European governments have increasingly encouraged research consortia with public and private partnerships, which potentially benefits private higher education institutions. For example, in Romania public and private higher education institutions can enter local, regional, national and international partnerships with other public and/or private organisations when bidding for national research funds from Research Councils.

3.5.6 Universities of Applied Science: governance and funding developments in Europe over the past decade

This section provides an overview of the major trends in the governance and funding of the university of applied science sectors, in particular in the ten countries in our study where enrolments in this sector exceed 20% of total higher education enrolments (Belgium, Denmark, Estonia, Finland, Germany, Ireland, Lithuania, Netherlands, Portugal and Switzerland).[25]

Looking at the European universities of applied sciences sector (UAS)[26], we can see many commonalities across the countries, but there are also some important differences and peculiarities.

[25] Estonia and Portugal both have significant private university of applied science sectors. This section focuses on the public sectors while the discussion in the previous section relates to the private sectors (including universities of applied science where applicable).

[26] This is the preferred international name for the sector in the majority of European countries with binary higher education systems. (European Network for Universities of Applied Sciences)

In Europe the UAS are financed mainly by the state and primarily have a teaching mandate. The research function is not as prominent but is growing in importance in many countries. UAS research usually has an applied focus and is related to educational programmes. Traditionally, UAS were more regulated by the state than universities and had less autonomy in determining their internal governance structures and in financial and human resource matters. As a result of the professional nature of their teaching and applied research, UAS have tended to have strong links with local industry and business, which can be also seen as an important factor for the employability of UAS graduates as well as for external stakeholder participation in their steering of educational programmes and research.

The major differences in the UAS sector across the countries include history, the share of UAS in the overall higher education system, the varied size of the institutions, entrance requirements and the types of degrees offered. As noted by de Weert and Soo (2009), the history of UAS differs. Some institutions have a long history and originated from mergers of smaller institutions. In other countries the sector has only been recently established (Austria, Finland, Switzerland). The UAS differ in terms of the degrees they offer. In some systems, UAS offer only bachelor level education such as in Estonia and Lithuania. However, the majority of countries offer both first and second cycle degrees. For example, UAS in Germany, Portugal, Belgium, Austria, Switzerland, Finland, and the Netherlands also offer master's degrees. However, the number of master's programmes is quite restricted and limited to particular subject fields. In most countries governments decide which master's programmes will be eligible for public funding, such as in health sciences (De Weert and Soo, 2009).

Planning of UAS funding and development by the national/regional authorities is increasingly done on a contractual basis. UAS in some countries are under the authority of the Ministry responsible for higher education (Estonia, Portugal), in other countries they are accountable to local authorities (Cantons in Switzerland, Länder in Germany), the Flemish or Walloon communities in Belgium, municipal authorities in Finland).

The major change in funding of UAS over the past decade is a shift from input based to output based, performance-related funding (see table 3.12 and section 3.3.3). This development is coupled with the diversification of the institutional funding base, where UAS can charge tuition fees (in most of the countries with large UAS sectors, except for Finland) and can receive funding from third parties (see section 3.3.1). These multiple sources of funding have brought a degree of financial flexibility for UAS management. Tuition fees are accompanied by some form of student financial aid, usually need-based. The common forms of student aid are student grants and loans, which are interest free or have low state regulated interest rates (e.g. the Netherlands, Portugal and Germany). Belgium (Flanders) has developed a new learning accounts system for student financial aid, where the emphasis is put on the student learning outcomes and aid is in a form of a grant rather than a loan.

It is fairly common for the Ministries to have contractual arrangements with the UAS determining the number of study places and funding them according to a formula, which is based not only on the number of students but also on a variety of output indicators. The countries vary substantially in terms of performance based funding. In Germany, a system with a large UAS sector, performance based funding from the *Länder* constitutes up to 20% of the public appropriation.

Differences also exist across countries in terms of financial autonomy, often mirroring differences between their public university sectors. For example, in Germany in 2008, UAS are permitted to build up reserves and carry them forward from one year to the next, while in Estonia the UAS do not have such flexibility.

Finally, as the role of UAS in some countries is perceived mainly as teaching, they are not eligible for research funding from the national research councils (e.g. Estonia). However, in those systems which see UAS as important actors in applied research, competitive research funds are made available, for example in Belgium (Flanders) and Switzerland.

4 Higher education system performance

4.1 Introduction

This chapter introduces the performances of the 33 higher education systems that are studied in our research projects on governance and funding reforms.[27] Performance is a multi-dimensional issue which cannot be reduced to a single number. Therefore, and following the suggestions from the European Commission, we describe the performance of higher education systems along the following eight dimensions:

- access
- mature learners
- graduation
- employability
- international student mobility
- research output
- capacity to attract funding
- cost effectiveness

Although we are using eight dimensions, system performance can never be captured fully; it has many more qualitative and quantitative aspects. The eight dimensions do capture the key activities of higher education: teaching, research and knowledge transfer. Moreover, for each dimension, two or more indicators were identified to represent the dimension in more detail. For each indicator, data for the years 1998, 2002 and 2006 was retrieved from existing international databases to guarantee international comparability.

Detailed information on indicators, definitions and data sources can be found in a *Note on Methodology* in Volume 2 of this report. This chapter concentrates on the differences between higher education systems as far as their performance is concerned. In the following sections, we show where improvements in performance have taken place. This performance information will be used in the next chapter, where we explore the links between performance and reforms.

[27] The same performance dimensions, performance indicators and contextual background factors were used in both the governance reform study and the funding reform study. This chapter is therefore common to both reports.

The use of performance indicators always requires some caveats.[28] The first is that performances and their links to policies have to be evaluated within countries' specific national contexts. Therefore, we also present some contextual background variables including demography, economic climate and investments in R&D and higher education.

Before presenting the indicators on system performances and background variables, we provide an overview of other attempts at measuring system level performance (section 4.2). Section 4.3 presents the performances of the 33 European higher education systems with respect to the eight dimensions. Using performance quadrants, we visualise changing performance in the period 2002-06. In the final section, we present contextual, background information on the 33 countries.

4.2 Indicators, rankings and visualisations of performance

A clear shift towards more quantitative evidence-based policies and reforms in higher education systems is now evident (Gornitzka, 2006). With the introduction of the Lisbon Strategy and the Open Method of Co-ordination in Europe, the need for system level performance evidence to assess progress is evident. The European Council has set the objective of "making European education and training systems in Europe a world quality reference by 2010". It has specified several quantitative EU objectives relating to higher education:

- An increase in the number of mathematics, science and technology (MST) graduates by at least 15% by 2010 (compared with 2000) whilst simultaneously reducing the gender imbalance
- Investing 2% of GDP in higher education (currently 1.3%), from public and private sources combined.
- 3 million Erasmus students by 2012.
- Spending 3% of GDP on research and development by 2010 (the 'Barcelona' objective) has implications for higher education, since about 22% of R&D spending in Europe goes into university-based research.
- The objective that 12.5% of the adult population should participate in lifelong learning also relates to higher education, since it incorporates all levels of education (i.e. including ISCED5 and ISCED6).

To monitor progress towards the Lisbon objectives in education and training, the European Commission releases an annual Progress report, examining performance

[28] See the Note on Methodology (in Volume 2) for detailed specific comments on the individual indicators.

and progress using a system of core indicators (EC, 2008). The most recent *Progress report* (EC, 2008) uses the following indicators directly related to higher education:

- Public expenditure on tertiary education as a percentage of GDP (including R&D spending)
- Private payments to tertiary education institutions
- Household payments to tertiary education institutions
- Number and growth of tertiary students
- Number and growth of tertiary graduates
- Number of MST students and MST graduates (including breakdown by gender)
- Higher education graduates (ISCED 5 & 6), also per 1000 population aged 20-29 and 25-34 and further distinguished into 5A first degree and 5A second degree
- Foreign students enrolled in tertiary education (ISCED levels 5 and 6) as a percentage of all students enrolled in the country of destination, by nationality (European country or other countries)
- Percentage of students (ISCED levels 5 and 6) from the country of origin enrolled abroad (in a European country or other countries)
- Inward mobility of Erasmus students (students sent)
- Outward mobility of Erasmus students (students received)

To assess the quality of higher education at the institutional level, the European Commission makes use of two well-known international university rankings in its Progress report: the ***Academic Ranking of World Universities*** (ARWU) from Shanghai's Jiao Tong University[29] and the ***World University Ranking*** (WUR) from the Times Higher Education (THE).[30] To assess how well a nation's higher education system performs, the Progress report and the Breughel group (Aghion et al., 2008) count the number of universities that a country has in the Shanghai Ranking's Top 50 (or Top 500), correcting for country size (in terms of its population or student enrolment) to produce a ranking of country performance.

[29] Released for the first time in 2003. The most recent ranking covering all subject areas was released in November 2009. See: www.ARWU.org.

[30] First released in 2004. Latest ranking (the Times Higher Education-QS World University Rankings) was published in autumn 2009. See: http://www.timeshighereducation.co.uk.

ARWU and WUR rankings shortcomings are well-known: an overemphasis on Nobel laureates and natural sciences, and a neglect of the education and knowledge transfer activities of higher education institutions. Rankings thus mostly cover research-intensive universities or specialised institutions, neglecting universities of applied sciences. Rankings are also extremely sensitive to the way nations organise their national research effort, whether within universities or public research laboratories. Moreover, using university rankings to assess a country's research performance is also biased as it is highly sensitive to game-playing, where some countries have decided to concentrate their higher education and research resources into a few universities specifically to boost their ratings. Aggregating national institutional ranks from one country into a national performance rank therefore fails to recognise that intra-system differences may well be larger than inter-system differences (Halffman, 2009).

The European Innovation Scoreboard (EIS) and The World Economic Forum's Global Competitiveness Index (GCI) are two frequently used benchmarking tools for comparing national innovation performance (*cf.* WEF, 2008). Both the EIS and GCI regard quality higher education and human resources as crucial for economies that want to compete in today's globalising economy. The GCI regards higher education and innovation as 'pillars of competitiveness'[31] and ranks countries on the basis of indicators ('hard data') and survey outcomes ('opinions') that measure aspects such as tertiary enrolments, availability of scientists, and patenting. The EIS distinguishes seven dimensions in its scoreboard, including Human Resources. This dimension captures the availability of high-skilled and educated people using indicators such as the number of Science & Engineering and Social Science and Humanities graduates per 1000 population, tertiary attainment, public-private co-publications, and patenting. The difference between the EIS and the GCI is that the EIS is based primarily on hard data, obtained from Eurostat (mostly its *Community Innovation Survey*) and Thomson ISI (publications data), while the GCI also relies heavily on a survey of business executives in the various countries.

As illustrated in the following subsections, the higher education-related indicators used in the Commission's progress report, and the EIS and GCI indicators based on hard data do overlap with our selection of performance dimensions. Our performance indicators relate to aspects of the quantity and quality of education, lifelong learning, research and innovation. Quantity is measured through tertiary enrolment and the number of graduates in the population. Quality is difficult to capture by means of hard data, elements are approximated by considering graduate employment and earnings. In order to pay attention to HE's research and innovation functions, we incorporate publication and patenting data. Because the European Commission in its Modernisation Agenda has underlined the importance for HEIs of securing and diversifying their financial resource base, our dimension 'capacity to attract funds'

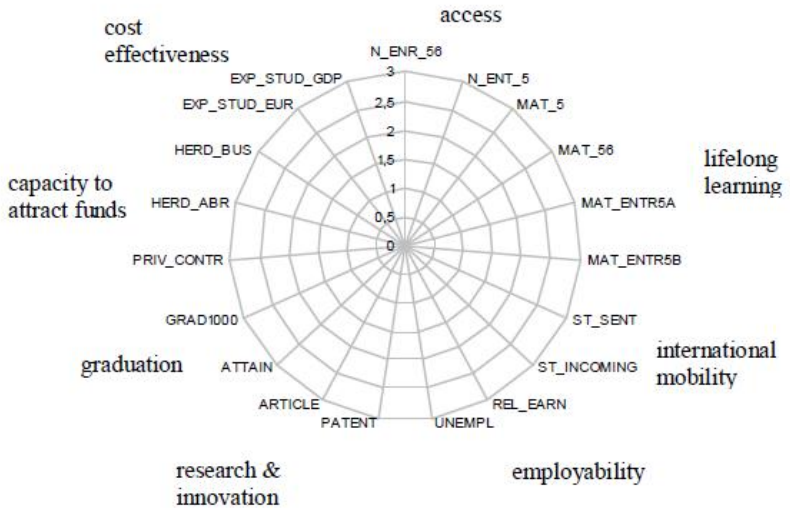
[31] The twelve pillars are: (1) institutions, (2) infrastructure, (3) macroeconomic stability, (4) health and primary education, (5) higher education and training, (6) goods market efficiency, (7) labor market efficiency, (8) financial market sophistication, (9) technological readiness, (10) market size, (11) business sophistication, (12) innovation.

reflects funds from households and third parties generated by higher education institutions. In addition, the 'cost effectiveness dimension' looks at measures that reflect the cost per student.

For describing the performances of HE systems, each dimension will be represented by at least two indicators.[32] To visualise performance and progress, we make use of radar charts and performance quadrants.

For each of the 33 countries in our study, a ***radar chart*** presents the changes in all 19 indicators that underlie the 8 performance dimensions (see figure 4.1). The changes refer to the period 2002-2006. The radar charts show ***index numbers***, taking the 2002 score as the base (=1). The 33 radar charts are included in the section on ***National higher education performance data*** in Volume 2 of this report together with tables showing the exact values. Radar charts allow a visual inspection of where performance changes are located for a given country. As far as performance change is concerned, we concentrate on changes in the recent period (2002-06) on the basis of the argument that reforms take time to sink in and have an effect.

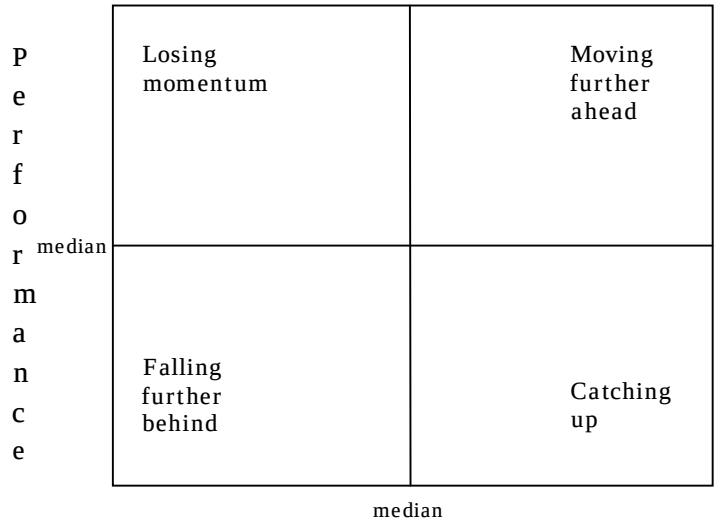
Figure 4.1: Outline of a radar chart



Having calculated national indicator scores on the 'current situation' (2006) and on the 'rate of change' over four years (2002-2006), we draw up *performance quadrants* that simultaneously present performance and progress across the 33 national higher education systems for each performance indicator. The 2006 performance is measured along the vertical axis. The change over the period 2002-2006 is shown along the horizontal axis. The performance quadrants categorize the countries into four groups, using the averages (the *median* values) of 2006 performance and the change over 2002-2006 as the cut-off points (see figure 4.2).

[32] We do not construct a composite index based on a weighting of indicators or dimensions, because it unduly reduces information and requires attaching arbitrary weights to the various dimensions.

Figure 4.2: Outline of a performance quadrant



On the basis of their values per particular performance indicator in 2002 and 2006, the quadrant categorises the countries' higher education systems into four groups:

1 Countries that are doing well in 2006 and that have further improved over the period 2002-2006 ('*moving further ahead*'),

2 Countries that are still doing well in 2006 but that over the period 2002-2006 have improved less than the average for the 33 countries ('*losing momentum*'),

3 Countries that in 2006 are performing below average, but that over the period 2002-2006 have improved more than other countries ('*catching up*'),

4 Countries that in 2006 are performing below average and that over the period 2002-2006 have shown a change that is less than the average for the 33 countries ('*falling further behind*').

The performance quadrants form the basis of the analyses in the following chapter, where we investigate possible links between reforms and system performance across the 33 European higher education systems. The next section presents performance quadrants for the nine performance dimensions. Using the performance quadrants one can identify the *high performers* (that is: the countries having the highest absolute value for the given performance indicator) and the *high improvers* (the countries showing the largest change over the period 2002-2006). In the section on *National higher education performance data* (see Volume 2) we have included tables containing the detailed data on performance and progress for each indicator.

4.3 Performance in European higher education

To show performance in European higher education for our nine dimensions we have inspected 19 indicators that relate to the years 2002 and 2006. Since we cannot show the performance quadrants for all, we only look at a selection of indicators. The selected indicators and the performance area to which they belong are shown in the table below.

Table 4.1: Performance dimensions and selected indicators

Performance area	Indicators
Access	Net participation rate
Lifelong learning	Mature (> 30 years old) enrolment rate
Graduation	Share of population with tertiary degree
Employability	Relative graduate earnings
	Graduate employment
Research	Scientific articles
Capacity to attract funds	HE R&D income from business;
	Private (households') expenditure on HE
International mobility	Incoming EU+ students
	Outgoing EU+ students
Cost-effectiveness	Expenditure per student in Euro

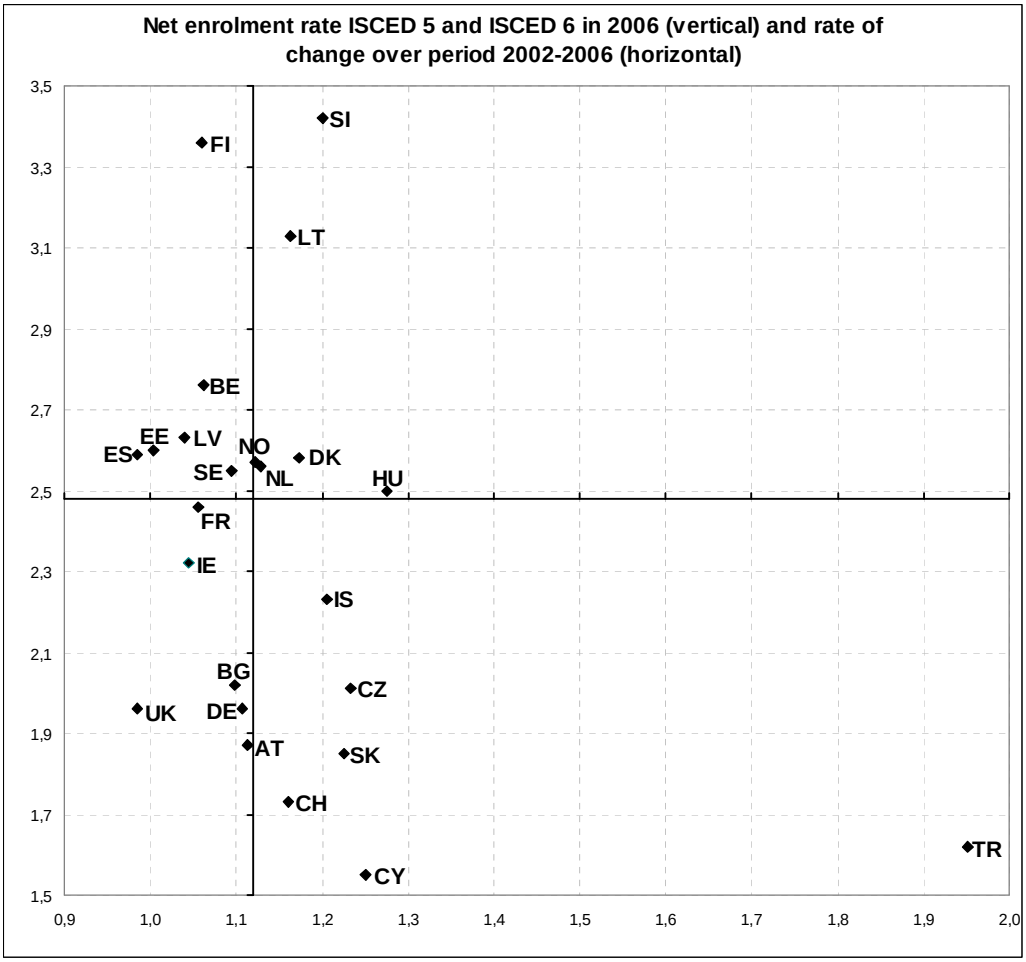
4.3.1 Access

To assess the countries' performance on the access dimension we make use of the following indicators:

- Entry rate of new entrants (17-29 year population cohorts)
- Net enrolment rate (17-29 year-olds), ISCED 5 and 6.

In the performance quadrant (figure 4.3) we present data on the second indicator only.

Figure 4.3: Performance quadrant for the Access dimension



The access indicator measures the combined shares of the age cohorts enrolled in higher education. The graph illustrates that participation increased in almost all countries (in 22 out of the 24 we have data for). The median change over the period is 12%, with Turkey almost doubling the enrolment rate.

4.3.2 Lifelong learning

Europe's ambitions regarding the growth of higher education can be met only if more mature age students are enrolled. Our performance dimension Lifelong Learning looks at four indicators that measure the proportion of mature students (over 25, or over 30 years of age):

- The share of ≥30 year old students (ISCED 5, respectively ISCED 5&6) in total higher education enrolment
- The ratio of entry rates for 25-45 year old new entrants and 17-25 year old entrants (ISCED 5A, respectively ISCED 5B)

Figure 4.4: Performance quadrant for the Lifelong Learning dimension

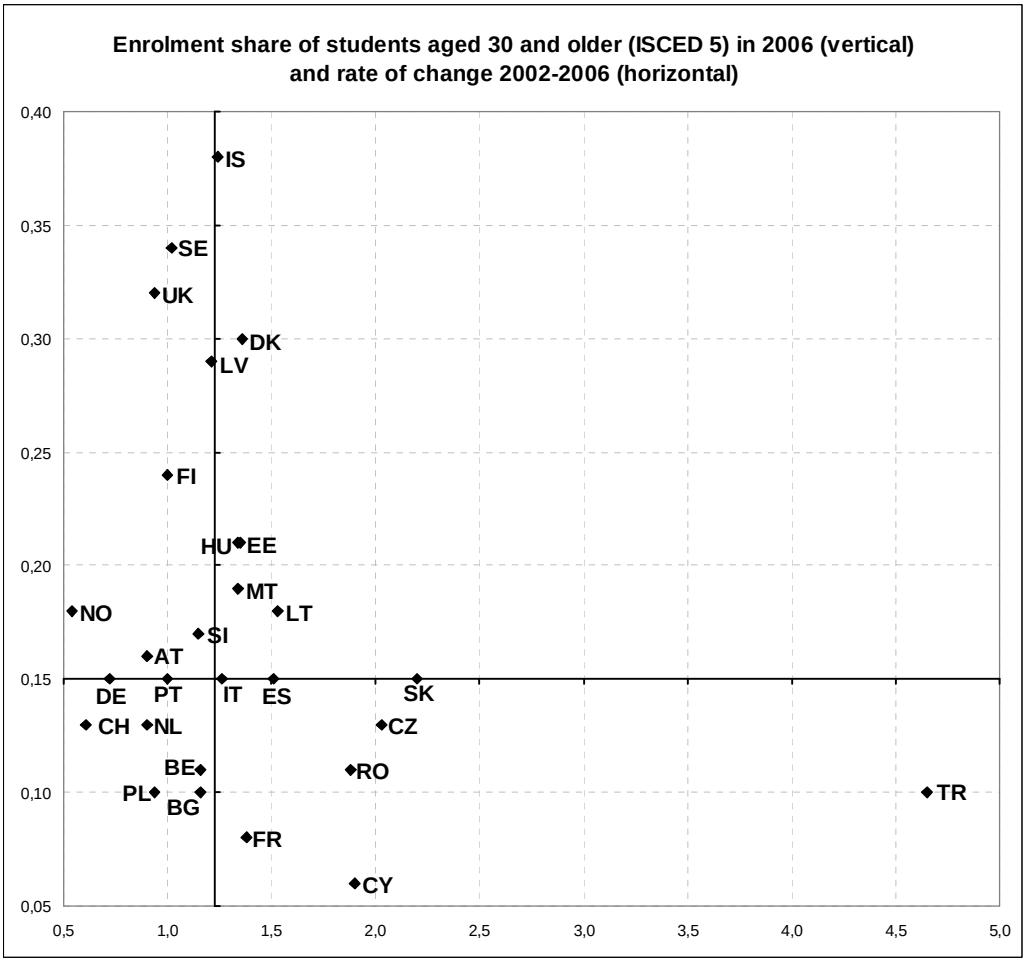


Figure 4.4 shows a performance quadrant based on the first indicator (for ISCED 5 students only). Out of the 28 countries for which we have data, there were 19 that increased their share of mature students (i.e. the index of change exceeds 1). The median change over 2002-2006 is 23% (as shown by the position of the vertical axis).

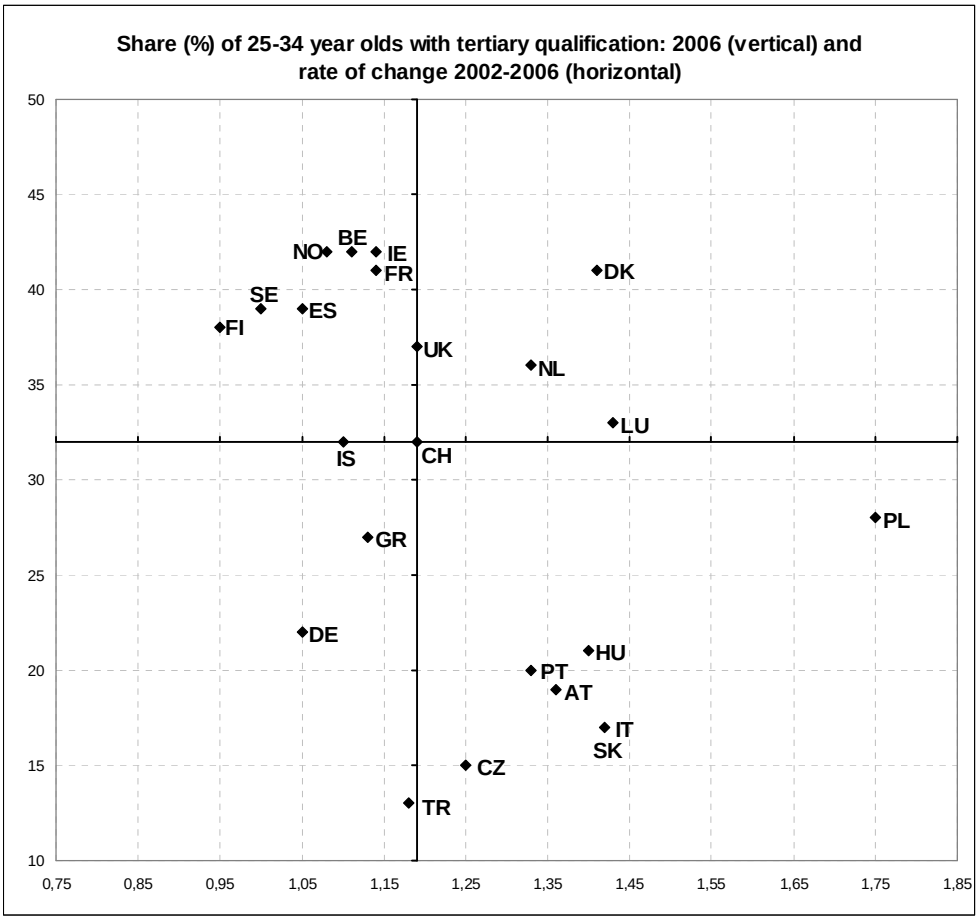
4.3.3 Graduation

The performance dimension *graduation* refers to educational attainment in terms of the following two indicators:

- Share of the population (25-34 year olds) with a higher education qualification.
- Share of graduates (ISCED 5&6) in population aged 20-29.

The performance quadrant (figure 4.5) relates to the first indicator. Out of the 23 countries in the quadrant, 21 have increased their educational attainment. The median change is 19% over the period 2002-2006.

Figure 4.5: Performance quadrant for the Graduation dimension



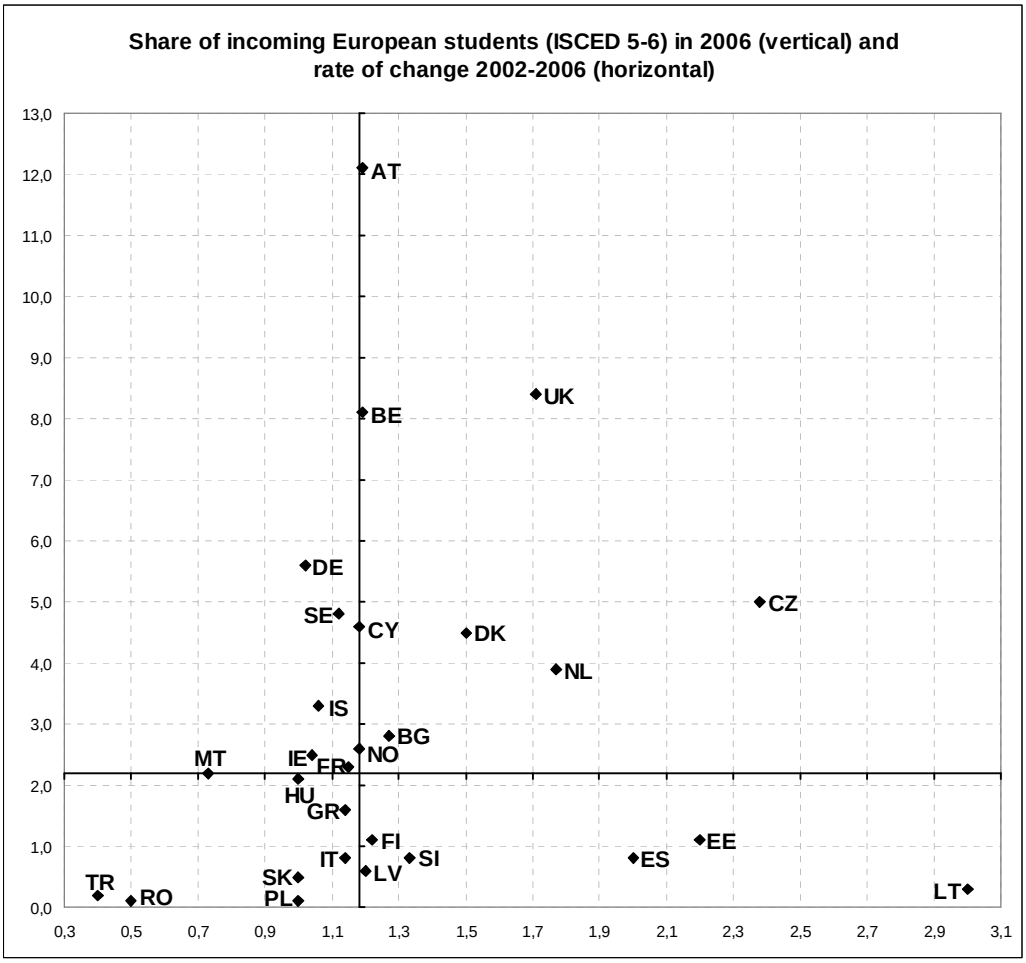
4.3.4 International mobility

High international student mobility is seen by policymakers as contributing strongly to the performance of the system. There are two types of international student mobility:

- Share of students incoming from other EU/EEA countries.
- Share of students sent out to other EU/EEA countries.

For both indicators we present performance quadrants (figures 4.6 and 4.7).

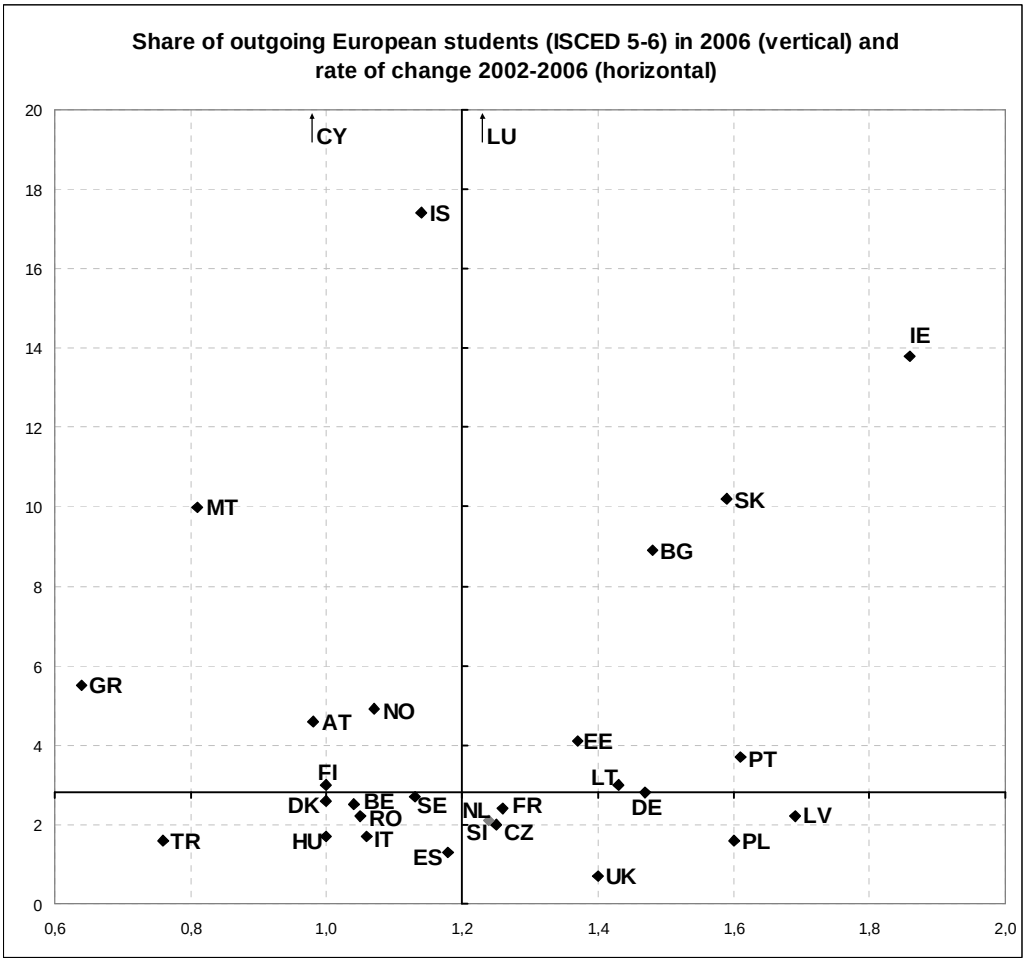
Figure 4.6: Performance quadrant for the International mobility dimension: incoming students



Out of the 28 countries in the quadrant for incoming mobility (figure 4.6), 22 have seen their international attraction towards others European countries grow. The median change is 18% over the period 2002-2006.

Out of the 30 countries in the quadrant for outgoing mobility (figure 4.7), 23 have seen a growth in the numbers of students going to other European countries. The median change is 20% over the period 2002-2006. Luxembourg (81%) and Cyprus (51%) have the highest shares of outward mobility.

Figure 4.7: Performance quadrant for the International mobility dimension: outgoing students



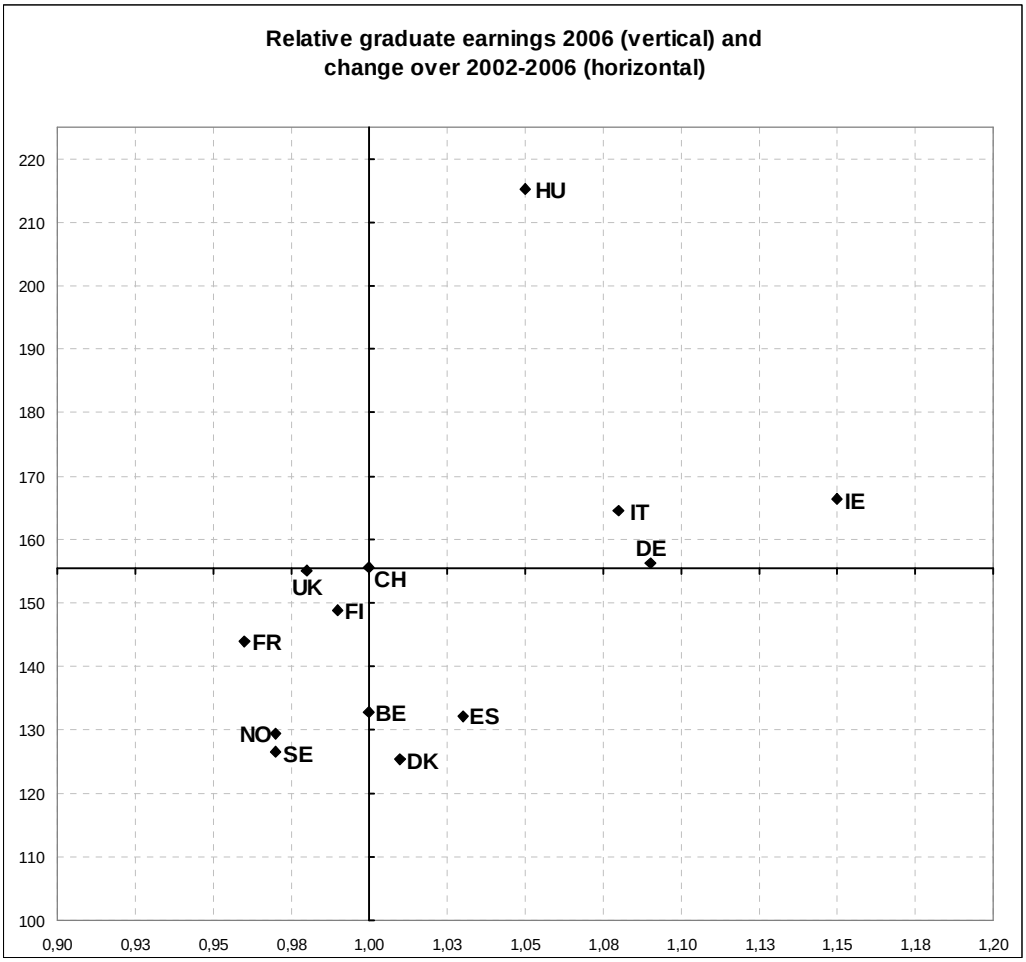
4.3.5 *Employability*

The Employability dimension captures the value of a higher education degree on the labour market. Indicators are:

- Relative earnings of tertiary education graduates (compared to upper secondary graduates)
- Relative unemployment of higher education degree holders (compared to upper secondary graduates).

For both indicators we show the performance quadrants (figures 4.8 and 4.9).

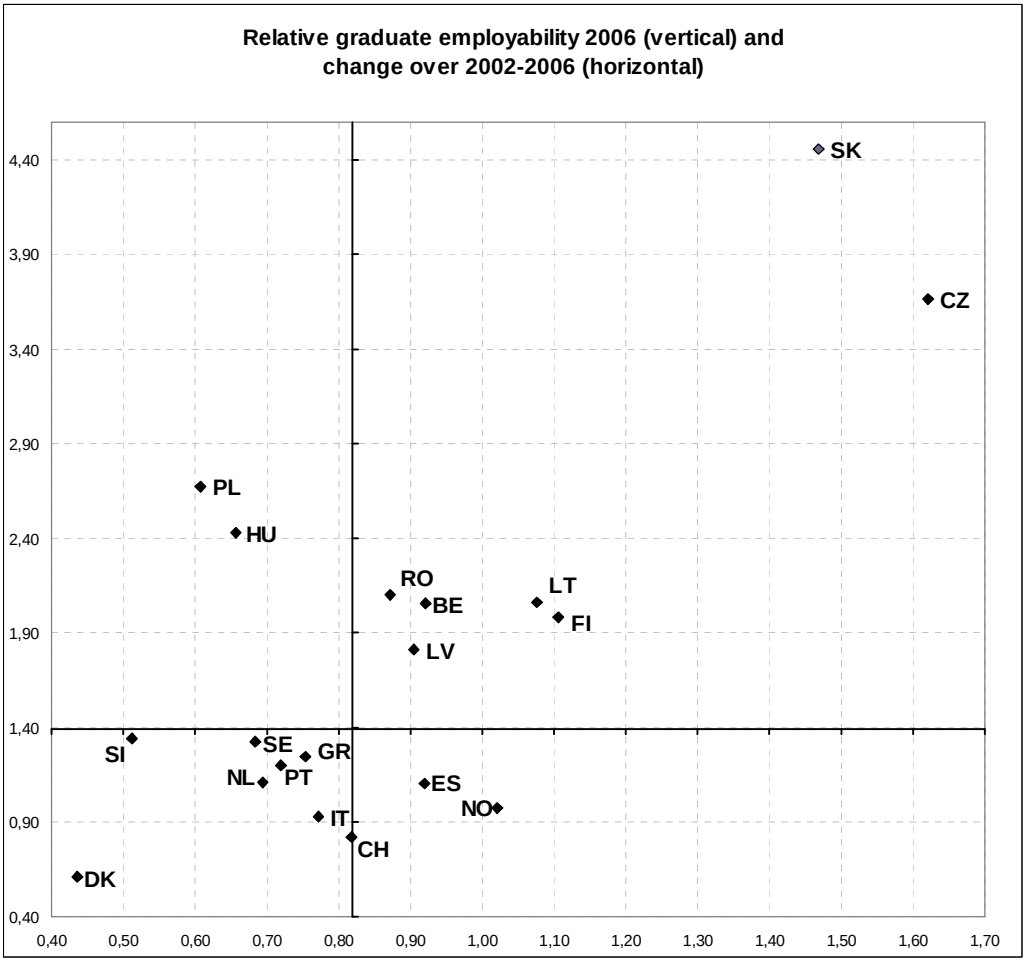
Figure 4.8: Performance quadrant for the Employability dimension: graduate earnings



In all of the 13 countries included in figure 4.8, graduates earn more in 2006 than those having an upper secondary degree (all values are above 100). Six countries have seen relative graduate earnings rise in the period 2002-2006; five experienced a decline; in two (Switzerland and Belgium) graduate earnings remained stable. The median growth is zero. Because data are derived from the OECD's Education at a Glance, many central and eastern European countries are not represented.

On average the unemployment rate of those holding an upper secondary degree is 40% higher than the unemployment rate for those having obtained a higher education degree (figure 4.9). In other words, employability is higher for graduates. The exceptions are Denmark, Switzerland and Italy, where the employability indicator lies below unity. In 5 out of the 19 countries that we have data for, graduate employability has increased over the period 2002-2006. As shown in the graph, in most countries graduate employability decreased. The median change is minus 18%.

Figure 4.9: Performance quadrant for the Employability dimension: graduate employability



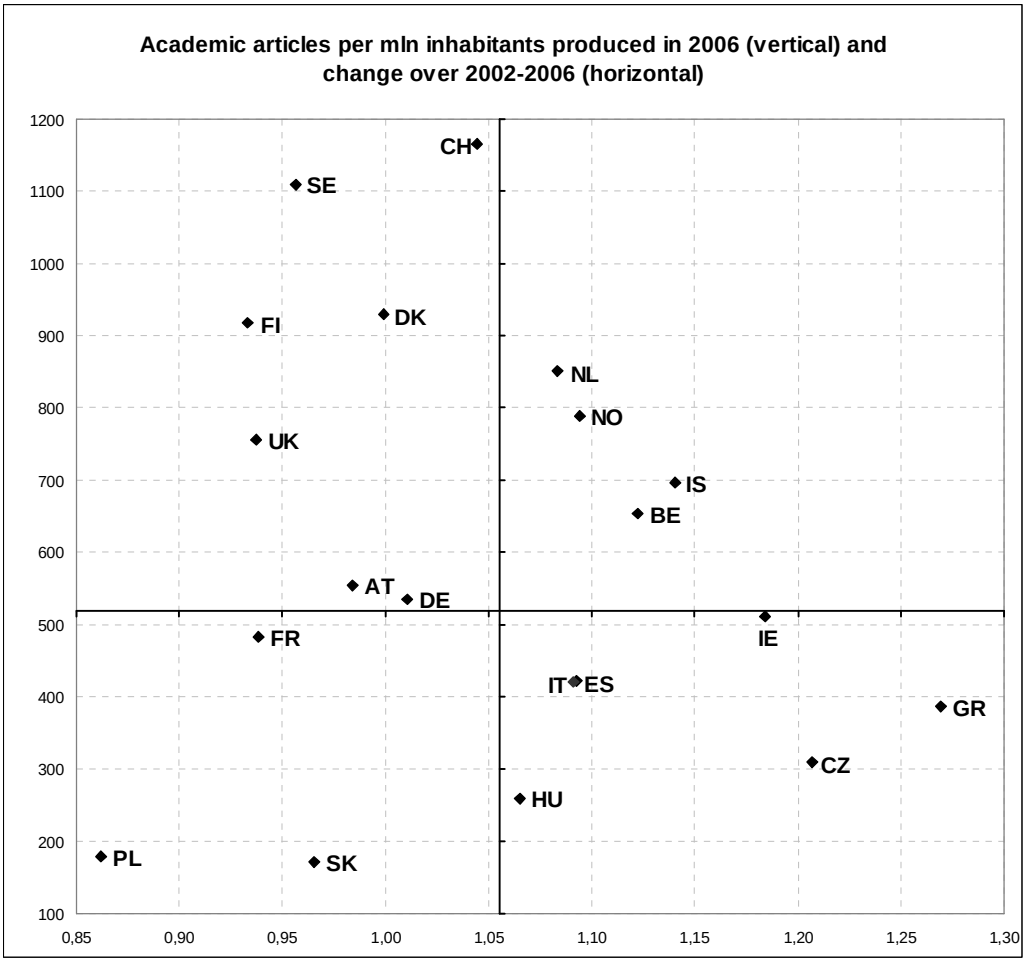
4.3.6 Research and innovation

The dimension 'Research and Innovation' captures research performance and some of the innovation activity in countries. Indicators are:

- Scientific articles per million inhabitants
- Patent applications to the European Patent Office (per million of inhabitants).

Figure 4.10 pictures the performance quadrant for the number of articles published in the countries that we have data for. In 12 out the 20 countries the scientific production increased over the period 2002-2006. The median change is slightly over 5%.

Figure 4.10: Performance quadrant for the Research & Innovation dimension: articles published



4.3.7 Capacity to attract funds

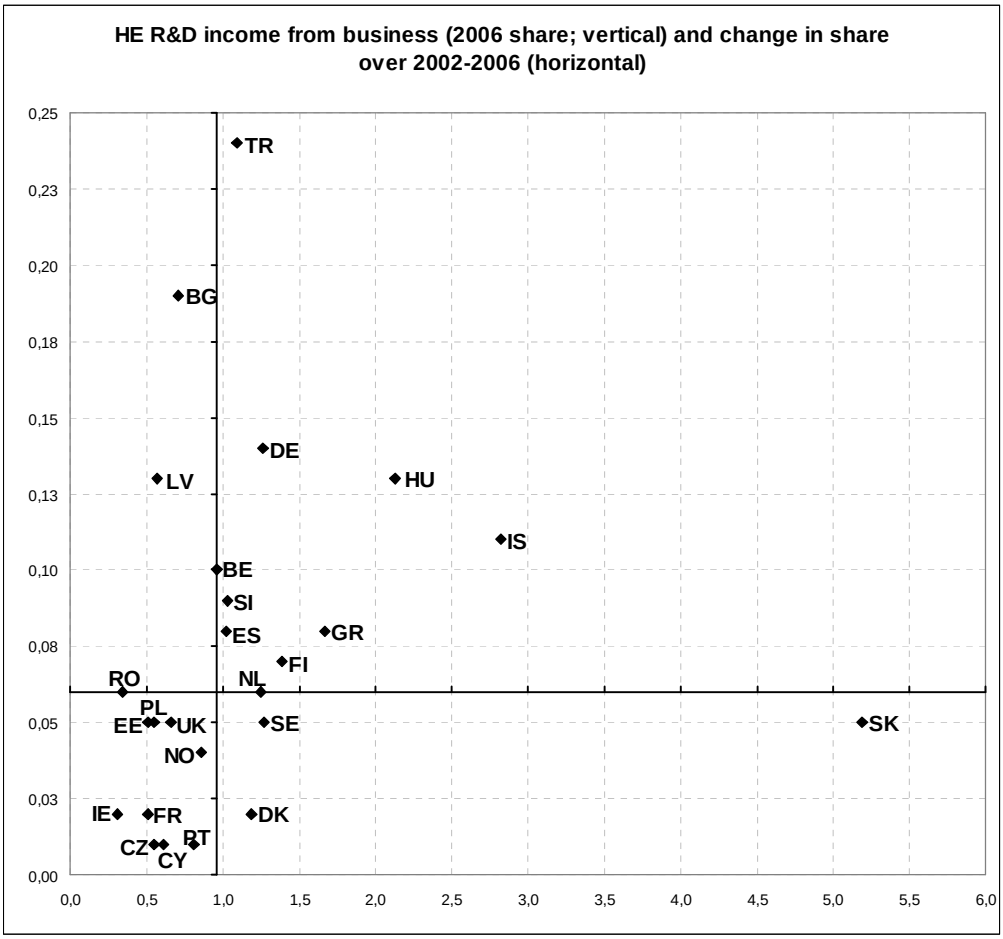
The dimension 'Capacity to attract funds' reflects the extent to which a country's higher education institutions receive revenues from non-government sources. Higher levels of external (third party, private) funding indicate a more financially robust position for higher education. Indicators are:

- Share of higher education institutions' R&D income from business and industry
- Share of higher education institutions' R&D income from international sources
- Share of private expenditure on HE institutions.

We show the performance quadrants for the first and third indicator.

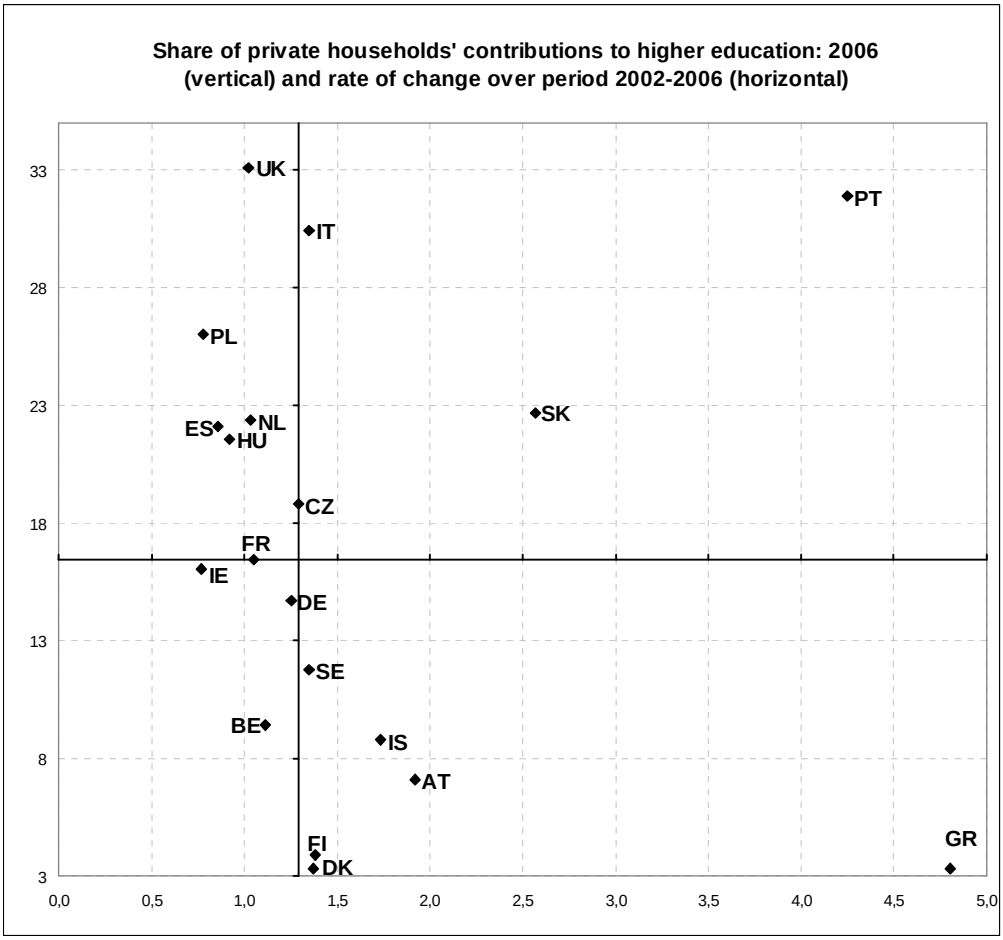
The graph for higher education R&D financed by industry (figure 4.11) contains data for 25 countries. In 12 of these countries, the industry's share increased. In 13, the share decreased. The median change over the period 2002-2006 is minus 4%.

Figure 4.11: Performance quadrant for Capacity to attract funds: % of HERD financed by industry



Private households' contributions to higher education largely consist of tuition fees. Figure 4.12 shows data for 20 countries. The bottom of the graph contains the countries where fees are absent (Nordic countries) or the share of private higher education is very small. In 15 countries, the households' share increased. The median change over the period 2002-2006 is 30%.

Figure 4.12: Performance quadrant for Capacity to attract funds: contributions from households



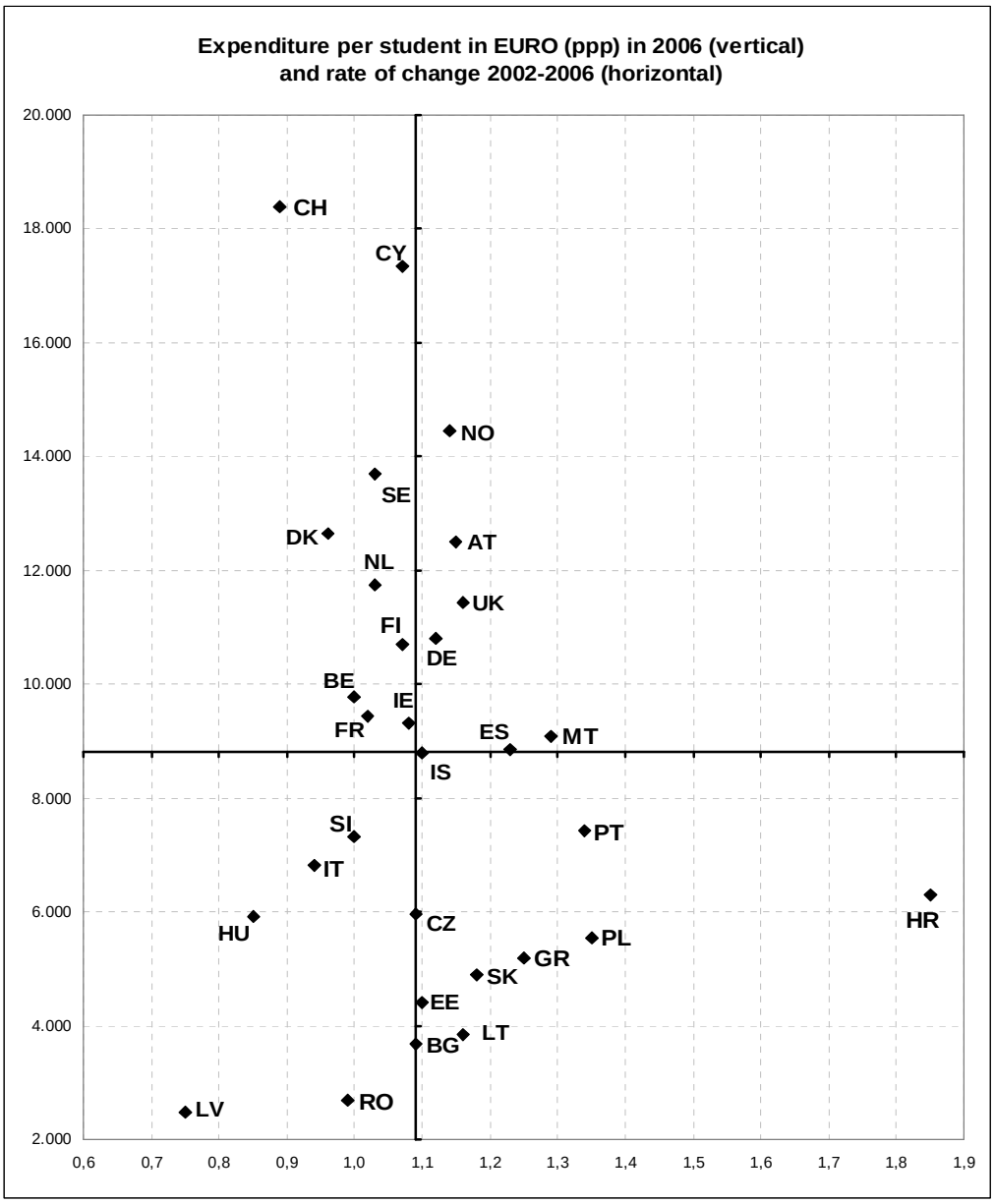
4.3.8 Cost effectiveness

Cost effectiveness is regarded here as a performance dimension since it reflects the expenditure allocated to higher education:

- Expenditure per fte HE student as a % of GDP per capita.
- Expenditure in Euro (PPPs) per student in tertiary-level institutions.

However, instead of a reflection of efficiency, one may also interpret these indicators as showing the importance a country attaches to higher education - thus relating national effort/investment to the student volume. Expenditure per student varies widely across the 29 countries covered in figure 4.13. It ranges from 2,500 Euro in Latvia to over 18,000 in Switzerland. On average, expenditure per student has increased 11% in the period 2002-2006.

Figure 4.13: Performance quadrant for Cost effectiveness dimension: expenditure per student



4.4 Background variables

When making cross-country comparisons based on the indicators presented in the previous section, differences in national contexts should be taken into account. To capture some of these context characteristics, we make use of a number of background variables. We have selected six context indicators:

- National unemployment rate
- Demographic structure

- an index of the competitiveness of the national economy (GCI)
- public expenditure on higher education
- expenditure on research and development activities
- share of Science &Engineering students in the higher education system

The definitions and data sources of these background indicators, together with the country scores on them, may be found in the *National higher education performance data* section in Volume 2 of this report. Below we will give a short description only.

National differences in the general unemployment rates may have an impact on the performance of higher education systems. The impact on the employability dimension is an obvious one, but the labour market situation may also have an effect on performance dimensions such as Access and Graduation, as well as on the Capacity to attract funds. Unemployment rates can be seen as another indication for the general economic context.

The demographic context is taken into account by analysing the change in 18 year olds in the population. Strong fluctuations in the age group of 18 year olds (that constitute the traditional cohort of new entrants) may have a significant impact on the scores on indicators such as Access.

On a similar note, the Global Competitiveness Index (GCI) rank score of a country gives an overall indication of economic competitiveness. This also may have an impact on higher education performance. For instance, a higher GCI may coincide with a higher research output in terms of publications and patents. If competitiveness is high, university and industry may be more inclined to collaborate and this may be reflected in the business contributions to higher education R&D and the higher education system's capacity to attract revenues.

The overall expenditure on R&D (GERD; gross expenditure on R&D as a share of GDP) is an indication of the technology intensity and innovation orientation of a country. Higher levels of R&D are likely to boost higher education's research output.

A similar line of reasoning can be drawn for the context indicator 'public expenditure on higher education'. This indicator reflects the priority a nation places on higher education. The performance of the higher education sector at least partly reflects the level of national resources devoted to teaching and research.

A final context characteristic is the disciplinary mix in teaching and research activities. In countries that have a relatively high proportion of their higher education activities in science and engineering, the performance dimension 'cost effectiveness' may express a lower score. Also other dimensions, like access, employability and research output may be affected.

We are aware that there may be many other potential background indicators that capture aspects of the national context. Institutional frameworks, including a characterisation of the modes of regulation in the national innovation system, also may impact upon the functioning of higher education systems (Amable & Petit, 2001). However, a careful classification of 33 countries according to their modes of regulation would fall beyond the scope of our study.

Traditions, history and the stages of development achieved by a country also matter. Increasing enrolment rates is likely to represent an improvement of performance of higher education in countries that have yet to reach mass higher education, but this interpretation is not that straightforward in countries with already high levels of enrolments. Similarly, a good scientific performance for the most advanced countries is to maintain their share in the world's scientific publications or in the impact of their research, while for less advanced countries good performance would be to increase the total number of publications.

In other words, by taking some of these background aspects into account one may try to produce a more fair – 'controlled' – comparison of national higher education systems and their performances. However, all our performance indicators and background variables provide at best indications: we can offer no precise measures. This does not imply that the indicators we selected and described in the previous section are of no use in measuring performance. Rather, they allow comparisons to be made between countries, a powerful tool indeed when dealing with 33 countries. Yet, it must once more be stressed that much care has to be taken in interpreting data reflective of differing national contexts and priorities for higher education.

5 Possible links between funding and system performance

5.1 Introduction

In Chapter 3 we presented an overview of funding reforms across Europe. The number of reforms and in many cases their comprehensiveness and speed is impressive. Although the US and Japan spend more on higher education (in particular from private sources) compared to Europe, several of the funding-related aspects of the European Commission's Modernisation Agenda have been met. However, the extent to which these aspects are in place differs widely across Europe. The objective of this chapter is to investigate the potential links between the funding arrangements and the performance of higher education systems, where performance is assessed using the different dimensions outlined in chapter 4. The key question to be answered is "Do funding arrangements matter?"

On the basis of the information presented in chapter 4 (and the underlying data in Volume 2) we identified for each of the 33 countries three or four dimensions where the performance improvement of the system was most striking. These dimensions were the focus of the interviews conducted at system level and (where applicable) the institutional case studies in the countries.[33] Interviewees were asked to indicate if they thought that improved system performances were linked to these reforms in funding and, if so, to explain the nature of this linkage. For the analyses in this chapter we have combined various sources of information: (1) information and data from the Governance and Funding Questionnaires summarised in the Funding fiches, (2) the interviews at the system and institutional levels, and (3) quantitative data from international data sources.[34]

In the sections that follow we look at each system performance dimension in turn[35], using the following approach. Other studies on governance, funding and performance, as reported in chapter 2, have suggested that institutional autonomy and funding are likely to be related to performance. In this chapter we therefore categorise the 33 countries into four groups in terms of financial autonomy and funding, using six aspects of the Modernisation Agenda related to funding; the level of public investment in higher education; and the relative position of the countries on the World Economic Forum's Global Competitiveness Index (WEF, 2008). We then

[33] The 33 national system analyses (including two institutional case studies in 15 countries) can be found in Volume 2 of this report.

[34] A more extensive description of our methodology can be found in Volume 2 of this report.

[35] We look at seven performance dimensions, leaving out the cost-effectiveness dimension. The resources allocated to higher education (for instance as reflected in the expenditure per student), however, are integrated in our analysis through the contextual variable "%GDP invested in higher education from public sources". Most of our respondents felt that expenditure per student is not so much a reflection of efficiency but rather an indication of the priority a country attaches to higher education. For the dimension 'international student mobility' we separated incoming and outgoing European students.

analyse the outcomes of the national system analyses to see whether linkages can be found between system performance, funding reforms and the position of the country in terms of its financial arrangements and funding levels. In the analysis we also pay attention to some other contextual variables that relate to the specificities of countries (their size, whether they have a binary higher education system, or a private higher education sector).

In section 5.2 we present the categorisation of the countries in terms of the various funding-related aspects of the Modernisation Agenda. The section also looks at indicators of a country's priority attached to higher education and its competitive position in the global economy. This type of contextual information reveals aspects of the knowledge intensive character and technological state of a country's economy, which is likely to affect the resourcing and performance of its higher education sector.

The sections that follow (5.3 through 5.11) focus on each of the performance dimensions in turn and explore the possible relationships between funding reforms and higher education performance, drawing in other factors such as governance reforms (from our parallel study on governance reform), the levels of public investment in a country's higher education system, and a country's competitive position in the global economy. In analysing the relationships we pay attention to the funding-related recommendations included in the Modernisation Agenda and the extent to which these have been implemented in the 33 higher education systems in our study.

5.2 The categorisation of the 33 European countries

In chapter 3 (section 3.4) we presented seven aspects of the EC's Modernisation Agenda that deal with funding – either directly or indirectly:

- Ensure financial autonomy
- Encourage partnerships with business
- Spend 2% of GDP on higher education to reduce the funding gap
- Revise student fees and student support schemes
- Base funding more on outputs than on inputs
- Examine the balance of core, competitive and outcome-based funding
- Ensure portability of student support

To categorise the countries on these funding-related aspects of the Modernisation Agenda we selected six items that can be approximated using the information from our questionnaires:

- Financial autonomy
- Share of third party funding
- Share of revenues from tuition fees
- Degree of performance orientation in funding mechanism
- Share of competitive research funds in university sector
- Portability of student grants

Before turning to the differences between countries on these six items we make a few comments on this selection of indicators.

Our assessment of the degree of a higher education system's financial autonomy is taken from our parallel study on governance reform. It is a reflection of four underlying items: internal allocation of funds, borrowing money on the capital market, building up financial reserves, and flexibility in spending the public operational grant.

The share of third party funding is an indication both of the Agenda's recommendation to increase partnerships with business and the recommendation to revise the balance of core, competitive and outcome-based funding. We expect that having more partnerships is reflected in a higher share of third party funds. On the same note, a higher share of third party funding indicates that higher education institutions have been more active in generating revenues from sources such as industry, non-profit organisations, and research councils.

The share of tuition fee revenues reflects the choices a country has made in terms of the debate on student contributions and student support.

Portability of student grants is an item discussed in chapter 3, where we showed the reforms introduced across Europe.

The degree of performance in the mechanisms used by public authorities for allocating core funding to higher education institutions is one of the issues discussed in chapter 3, where we showed the reforms introduced across Europe.

The share of competitive research funding in the university sector indicates the extent to which universities have to compete for research funds allocated by research councils on the basis of project proposals submitted by researchers.

We do not explicitly assess the Modernisation Agenda aspect of removing the funding gap, because, apart from the Scandinavian countries and Cyprus, none of the countries in our sample meets the criterion of 2% of GDP spent on higher education.

We argue that these six items taken together are a good composite indicator of the degree to which the funding aspects advocated by the Modernisation Agenda are in place. Table 5.1 presents this information for 1995 and 2008.

The information presented in the table reflects the conclusions of chapter 3: when comparing the situation in 1995 and 2008, the extent to which the European higher education systems meet the funding-related aspects of the Modernisation Agenda has increased on all six indicators. In all countries we observe an increase in the number of full moons or half moons. The countries that show the largest increase are Austria, Romania, Estonia, Ireland and Slovenia.

To categorise the countries we developed a simple index score: the more aspects of the Modernisation Agenda a country meets, the higher its score.[36] Based on these scores one can make a ranking or divide the countries into four groups: countries that meet these aspects of the Modernisation Agenda to a large extent, countries that meet some of these aspects, countries that meet a limited number of these aspects, and those that meet hardly any of the six aspects of the Modernisation Agenda (table 5.2).

In figure 5.1 we have ranked the countries according to the degree to which they have implemented the six aspects of the Modernisation Agenda in the year 2008. The degrees to which the countries meet the governance-related aspects of the Modernisation Agenda are shown in order to investigate the congruence between the 'scores' for funding and governance. The governance scores are taken from our companion study on EU Governance reforms.

A fact that seems to emerge from a visual inspection of the graph is that the Nordic countries have largely similar scores on the funding aspects. The UK meets many of the Agenda's funding and governance aspects, and so do Ireland, the Netherlands and two relatively new EU members: Slovenia and Estonia. Some of the smaller countries (Cyprus, Malta, and Luxembourg) are found in the right hand side of the graph. Overall, there is quite some correspondence between the funding and governance scores.

[36] 2 points for a 'full moon' and 1 point for a 'half moon'- the total score of a country is divided by the number of aspects for which we have data.

Table 5.1: Degree to which the funding-related aspects of the Modernisation Agenda are met in 33 European countries

	FINANCIAL AUTONOMY	SHARE OF THIRD PARTY FUNDS	SHARE OF TUITION FEES	PERFORMANCE ORIENTATION	COMPETITIVE RESEARCH FUNDING	PORTABILITY OF STUDENT SUPPORT	FINANCIAL AUTONOMY	SHARE OF THIRD PARTY FUNDS	SHARE OF TUITION FEES	PERFORMANCE ORIENTATION	COMPETITIVE RESEARCH FUNDING	PORTABILITY OF STUDENT SUPPORT
	1995						2008					
AT	š	š	š	š	š	°	˜	°	°	˜	š	˜
BE	˜	˜	š	š		˜	˜	˜	š	°		˜
BG	˜	š	˜	š	˜	š	˜	˜	˜	°	˜	š
CH	š	°	š	š	š	˜	°	°	š	°	°	˜
CY	š	š	š	°	°	š	š	š	š	°	°	˜
CZ	˜	š	š	š	˜	š	˜	°	š	š	˜	š
DE	š			°		˜	°			˜	°	˜
DK	°	°	š	˜	°	˜	°	˜	š	˜	°	˜
EE	˜			š	°	°	˜	˜	°	˜	˜	°
ES	˜	°	˜	°		š	˜	°	˜	˜		°
FI	°	˜	š	°		˜	°	˜	š	˜		˜
FR	š	š	°	°		˜	š	š	°	˜		˜
GR	š			°		°	š			˜		°
HR	°			š		š	˜		˜	š		š
HU	š	š	°	š	š	š	°	š	˜	š	š	˜
IE	˜			š		˜	˜	˜	˜	°	°	˜
IS	˜	˜	š	°		š	˜	˜	š	˜	°	˜
IT	˜	°	°	°	š	°	˜	°	°	˜	š	°
LI		š	˜	š		˜		š	˜	š		˜
LT	š	š	˜	°	š	š	š	š	˜	°	š	š
LU				š		°	°	š	š	š		°
LV	˜	š	˜	š	˜	š	°	˜	˜	°	˜	š
MT	°	š	š	š	˜	š	°	š	š	š	˜	˜
NL	˜	°	˜	˜	š	š	˜	˜	˜	˜	š	˜
NO	š	°	š	°	š	°	˜	˜	š	˜	°	°
PL	°	š	°	˜	š	°	°	š	˜	˜	š	°
PT	°	˜	š	š		š	°	˜	°	°		š
RO	š	š	š	š	˜	š	°	š	˜	˜	˜	˜
SE	°	°	š	˜	˜	˜	°	°	š	˜	˜	˜
SI	°		˜	°	˜	š	˜	˜	˜	˜	˜	˜
SK	š	š	š	š	š	š	°	š	š	˜	š	š
TR	š	˜	š	°		°	š	˜	š	°		°
UK	˜	˜	˜	˜	˜	°	˜	˜	˜	˜	˜	˜

˜ = meeting the Modernisation Agenda
° = meeting the Modernisation Agenda to some degree
š = not meeting the Modernisation Agenda
Blank = (complete) information not available

Note: Compressing detailed information into symbols requires simplification. The situation behind the symbols varies across the individual aspects.

Financial autonomy: *See EU Governance Reform report - section 5.2.*
high (˜), medium (°) or low (š) autonomy (based on a combination of four items – internal allocation of funds, borrowing money on the capital market, building up financial reserves and flexibility in spending the public operational grant)

Share of third party funding: *See Table 3.7 and Funding fiches in Volume 3.*
high (˜): 25%-100%; medium (°): 11%-24%; low (š): 0%-10% of revenues

Share of revenues from tuition fees: *See Table 3.7 and Funding fiches in Volume 3.*
high (˜): 15%-100%; medium (°): 6%-14%; low (š): 0%-5% of revenues

Degree of performance orientation in funding mechanism: *See table 3.12.*
high (˜):output criteria are important or extremely important; medium (°): output criteria are of minor importance; low (š): output criteria are not important

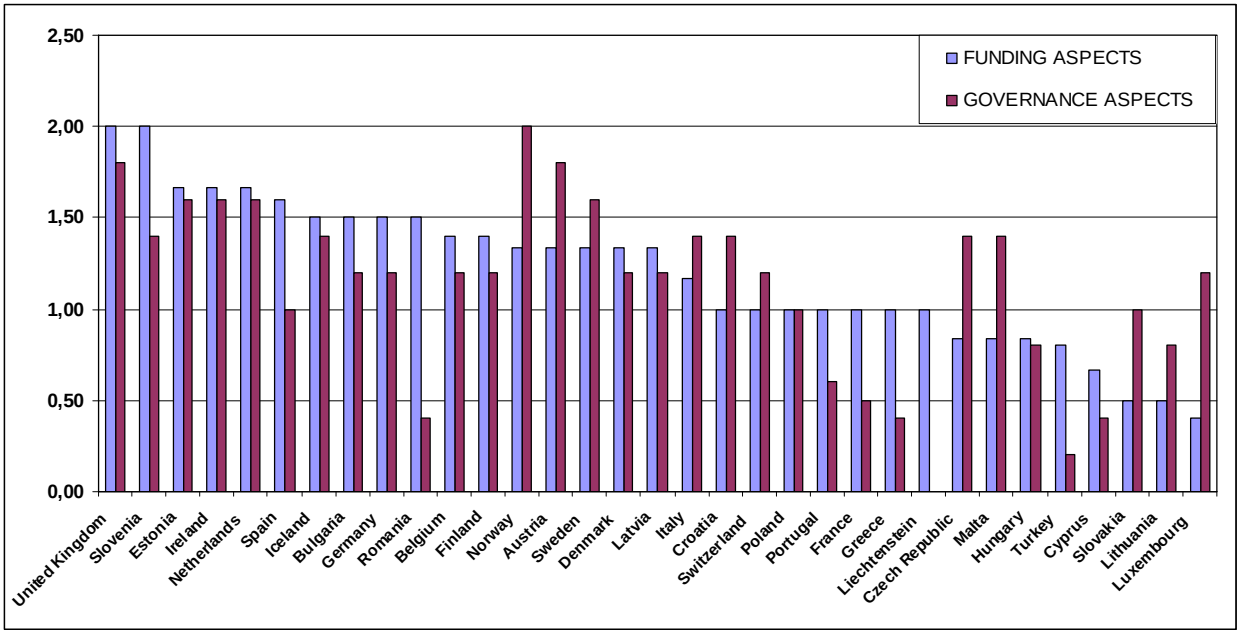
Share of competitive research funds *See table 3.14.*
high (˜): 25%-100%; medium (°): 11%-24%; low (š): 0%-10% of revenues

Portability of student grants: *See table 3.19.*
high (˜): support largely the same as for students studying at home; medium (°): special grants or loans earmarked for mobility; low (š): no financial support for students studying abroad

Table 5.2: A categorisation of European countries in terms of the extent to which six aspects of the Modernisation Agenda are met

Degree of correspondence to Modernisation Agenda	1995	2008
Low	Lithuania, Luxembourg, Malta, Norway, Switzerland, Cyprus, Croatia, Romania, Austria, Hungary, Slovakia (11 countries)	Lithuania, Slovakia, Luxembourg (3 countries)
Low – medium	Poland, France, Turkey, Czech Republic, Greece, Portugal (6 countries)	Czech Republic, Hungary, Malta, Turkey, Cyprus (5 countries)
Medium - high	Bulgaria, Germany, Estonia, Iceland, Italy, Latvia, Liechtenstein (7 countries)	Italy, Croatia, France, Greece, Liechtenstein, Poland, Portugal, Switzerland (8 countries)
High	United Kingdom, Ireland, Sweden, Belgium, Finland, Slovenia, Spain, Denmark, Netherlands (9 countries)	United Kingdom, Slovenia, Estonia, Ireland, Netherlands, Spain, Iceland, Bulgaria, Germany, Romania, Belgium, Finland, Norway, Austria, Denmark, Sweden, Latvia (17 countries)

Figure 5.1: The extent to which countries meet the funding- and governance-related aspects of the Modernisation Agenda, year 2008



The next two tables depict the categorisation (into quartiles) of the 33 countries based on total public expenditure on higher education and their position on the Global Competitiveness Index (for the underlying data see the section on national performance data in Volume 2).

Table 5.3: A categorisation of European countries based on public expenditure on higher education as percentage of GDP in 2006 (N=32)

Level of total public expenditure (%GDP)	Country
Low (0.19 - 0.91%)	Liechtenstein, Bulgaria, Italy, Romania, Croatia, Slovakia, Latvia, Turkey (8)
Low – medium (0.92 - 1.10%)	Estonia, Spain, Poland, Lithuania, Portugal, Hungary, Malta, United Kingdom (8)
Medium – high (1.11 - 1.44%)	Germany, Ireland, France, Czech Republic, Slovenia, Belgium, Iceland, Greece (8)
High (1.46 - 2.27%)	Switzerland, Austria, Netherlands, Cyprus, Sweden, Finland, Norway, Denmark (8)

Note: No data available for Luxembourg

Table 5.4: A categorisation of European countries based on their relative position on the Global Competitiveness Index in 2008 (N=32)

Position	Country
Low	Bulgaria, Romania, Greece, Turkey, Hungary, Croatia, Latvia, Poland (8)
Low – medium	Malta, Italy, Slovakia, Lithuania, Portugal, Slovenia, Cyprus, Czech Republic (8)
Medium – high	Estonia, Spain, Luxembourg, Ireland, Iceland, Belgium, France, Norway (8)
High	Austria, United Kingdom, Netherlands, Germany, Finland, Sweden, Denmark, Switzerland (8)

Note: No data available for Liechtenstein

5.3 Funding and educational attainment

The indicator used for our graduation dimension is educational attainment. The indicator measures the percentage of the population aged 25-34 with a tertiary education qualification. In the period 2002-2006, twenty-one countries (out of the 23 countries we have data for) improved their performance (see chapter 4, figure 4.5). Two countries with already high levels of educational attainment succeeded in improving this substantially (Denmark and the Netherlands) while other high performers also improved but to a lesser extent.

The top ten countries in terms of educational attainment levels nearly all come from the north-western part of Europe. They include all of the Nordic countries, the United Kingdom and Ireland as well as Belgium and the Netherlands. All of these countries, except for one (France) are in the group of countries that meet most of the Modernisation Agenda's funding aspects (table 5.2): Belgium, Ireland, Norway, Denmark, Spain, Sweden, Finland, United Kingdom, and the Netherlands). The only two countries that have quite some degree of congruence with the Agenda and that perform poorly in terms of educational attainment are Germany and Austria. However, Austria increased its educational attainment levels significantly between 2002 and 2006 (36%) and also introduced major reforms in terms of funding between 1995 and 2008 (see table 5.2).

At the other end of the scale, four countries with low or low-medium levels of 'Modernisation characteristics' have low levels of educational attainment (Hungary, Slovakia, Czech Republic, and Turkey). The exception here is Luxembourg, with very few Modernisation elements in place and an above average educational attainment.

In terms of changes in levels of educational attainment in the period 2002-2006, Poland has improved its levels of educational attainment the most in the period 2002-2006. It seems to be catching up rapidly, even though not many funding reforms were implemented. Luxembourg, Italy and Slovakia also saw their graduation levels improve even though they did not implement many funding reforms.

There is a link between a country's position on the Global Competitiveness Index (GCI) and its educational attainment level. With three exceptions (Austria, Germany and Switzerland), countries in the upper half of the GCI have high educational attainment levels. All the countries in the bottom half of the GCI have low educational attainment levels. The level of public expenditure on higher education is also linked to educational attainment levels: high investors have a high percentage of the population aged 25-34 with tertiary education qualifications (Denmark, Finland, Netherlands, Norway, Sweden, and to a lesser extent Belgium, France and Ireland). Here the exceptions are Austria and Switzerland.

Our understanding of the relationship between funding and educational attainment may be enriched when we explore specific funding reforms and their relationship to educational attainment levels. This topic was addressed in eighteen of the national system analyses.[37] In three countries (the Czech Republic, Portugal and Poland) respondents identified a link to overall higher education reforms that enabled private higher education providers to offer tertiary qualifications thus increasing the supply of higher education and the numbers of graduates. For example in Poland, which had a 75% increase in educational attainment between 2002 and 2006, students from lower socio-economic backgrounds benefited from increased private provision of higher education – they form the majority of students in private institutions. In three other countries (Denmark, Germany and Iceland) respondents pointed to a link with funding reforms introducing formula funding driven (in part) by student enrolments and thus providing institutions with a financial incentive to grow. In one case (Sweden) higher enrolments and numbers of graduates were linked to funding reforms that improved the financial support available to students therefore making higher education a more attractive option. In Denmark, respondents pointed to funding reforms creating incentives for higher education providers to increase their (regional) educational offerings (reflecting a general policy goal to improve access). Finally, in Italy, respondents see improved educational attainment as being related to the changing behaviour of universities incentivised by reforms creating more outcome-based funding. Respondents pointed as well to the fact that enrolment in Italy is currently decreasing, mainly due to higher tuition fees that may in the long run negatively affect educational attainment rates.

In two countries (Austria and Portugal) interviewees saw a link between educational attainment and reforms that changed the admission criteria to higher education; making more students eligible for enrolment, which – given adequate numbers of places to accommodate additional students – resulted in increased numbers of students and eventually graduates. Interestingly, in terms of educational attainment levels there is no difference between countries that have open access systems (in which institutions have to admit all qualified students) and countries in which institutions can select their own students.

Respondents across the eighteen countries were also asked to identify factors other than governance and funding reforms that might explain the improved performance

[37] See Volume 2 for the national system analyses.

of their countries in terms of educational attainment. Respondents in eight countries attributed this to an overall growth in their higher education systems – increased supply of higher education – not linked to specific reforms. Respondents from three countries saw a link to increased student demand for higher education while respondents from four countries saw increased labour market demand for tertiary graduates as the primary factor. Respondents from four countries linked the higher number of graduates to the new Bachelor-Master degree structures and the opportunities this provides to graduate in a shorter period of time than in traditional long-cycle first degrees.

These responses suggest that the primary driver of increased numbers of graduates is not surprisingly an increase in the number of students (no interviewees identified improved success and throughput rates). This in turn is driven by a combination of increased student and labour market demand and an increase in the supply of higher education places. Funding reforms have contributed to an increased number of graduates in some countries by providing incentives for institutions to grow and providing financial support to students, while governance reforms have contributed through paving the way for private higher education providers and by extending the number of potential students by changing (minimum) admission requirements.

Apart from these specific drivers, our earlier analysis also indicates that high levels of public investment, a country's competitive position (GCI) and its degree of meeting the funding recommendations in the Modernisation Agenda are linked to educational attainment. Given the right conditions (such as sufficient levels of public expenditure, financial incentives and sufficient capacity to meet demand) autonomous institutions can contribute to an enhanced educational attainment level in the population.

5.4 Funding and access

The indictor used for access is the net enrolment rate (ISCED levels 5 and 6). In the period between 2002 and 2006 net enrolments across Europe have increased; twenty-one of the twenty-four countries for which we have data improved on this indicator (see chapter 4, figure 4.3). In some countries with already high enrolment rates the growth has been marginal (Belgium, Estonia, Finland, Latvia and Spain). Slovenia and Lithuania, that already had high enrolments rates, have increased these even further (by 20% and 16% respectively).

When enrolment rates are related to the degree countries meet the funding–related elements of the Modernisation Agenda a scattered picture emerges. The data do not demonstrate a link between (increased) enrolments and the degree to which the Agenda's elements are in place. Ten countries with high levels of congruence with the Modernisation Agenda have above-average enrolment levels (Slovenia, Finland, Belgium, Latvia, Norway, Denmark, Estonia, Spain, Sweden, and the Netherlands). At the same time, there are six countries with high levels of congruence that have below average enrolment rates (Ireland, Iceland, Austria, Bulgaria, Germany, and

the United Kingdom). Countries with low or low-medium degrees of congruence mostly exhibit low enrolment rates (Czech Republic, Slovakia, Cyprus, Turkey, and Luxembourg). The exceptions are Lithuania and (to a smaller degree) Hungary, that have above average enrolment rates. The Czech Republic, Slovakia and Turkey are catching up, with all three showing an above-average increase in enrolments between 2002 and 2006. When enrolment rates are compared to public investment in higher education and the index of a country's competitive position there is no pattern in terms of enrolment rates.

Therefore, the data do not suggest that there is a link between the level of correspondence with the Modernisation Agenda and enrolment rates. The level of public expenditure on higher education and a country's GCI rank do not explain why some countries have higher enrolment rates than others. Neither does this depend on whether the country has an open-access system or a selective system; in the ten countries with the highest enrolment rates there are two with open-access policies (where institutions have to accept all qualified students), five where institutions have to accept all students up to the number of study places available and four where the institutions select their students.

Possible links between enrolment rates and governance and funding reforms were investigated in ten national higher education systems. In three countries (Austria, Lithuania and Switzerland) the growth in enrolments was attributed to governance reforms introducing a new institutional sector ("Universities of Applied Science"). In these countries the supply of higher education increased and programme offerings diversified. In one country (Lithuania) the introduction of tuition fees was seen as providing an incentive for institutions to admit more students, while in another country (Bulgaria) greater financial autonomy created a similar incentive. Governance reforms enabling the establishment of private higher education institutions increased the supply of places in one country (Cyprus). Improved student financial support was seen to be a contributing factor in another (Norway).

The countries that improved their access most between 2002 and 2006 (Cyprus, the Czech Republic, Hungary, Slovakia and Turkey) are all catching up; their absolute level of access was below the European average in 2002. Growth in enrolment has been driven by the overall expansion of the system, increased student and labour market demand and economic growth. In the Czech Republic, universities have a financial incentive to expand enrolments, while in Slovakia and Cyprus new regulations for the establishment of private higher education providers contributed to increased enrolments. In Turkey a enormous expansion of capacity occurred between 1996 and 2008 through increased provision of distance education and the establishment of 33 private and 41 public universities (although there is still substantial unmet demand).

The primary drivers of increasing net enrolment rates appear to be growth in the number of places and student and labour market demand - although there are links to governance reform (introduction of new sectors) and funding reforms (greater incentives for students to enrol and for institutions to grow). There is no evidence

that the level of autonomy of public higher education institutions, public investment levels or competitive position are linked to (changes in) enrolment rates. Our analysis does not support the assumption that a combination of autonomous public institutions and the existence of financial incentives for growth will lead to high net enrolments.

5.5 Funding and mature student enrolment

The indicator used for Lifelong learning is the number of mature enrolments (>30 years old) as a percentage of total enrolments. Nineteen of the twenty-eight countries for which we have data show an increase in the percentage of mature students (see chapter 4, figure 4.4). The Nordic and Baltic countries as a group are high performers on this indicator but otherwise there is no clear pattern. The Nordic countries are all high public investors in higher education and have high percentages of mature students, but three other high investors do not have high mature enrolments (Cyprus, the Netherlands and Switzerland). Six of the low investors in higher education show low levels of mature enrolments (Bulgaria, Croatia, Italy, Romania, Slovakia and Turkey). The GCI position and the percentage of mature enrolments are not linked: ten countries from the bottom half of the GCI have low percentages of mature enrolments but five show high percentages of mature students. In the upper half of the GCI table eight countries have high percentages of mature enrolments and six do not.

Twelve of the 17 countries with high degrees of correspondence to the Modernisation Agenda's funding recommendations (see table 5.2) have relatively high shares of mature students (Iceland, Sweden, UK, Denmark, Latvia, Finland, Estonia, Norway, Slovenia, Austria and to some extent Germany and Spain) while four do not (Netherlands, Belgium, Romania, Bulgaria). In other words, there seems to be a weak link between funding and mature enrolment.

In the countries with the highest percentage of mature students (Denmark, Iceland, Latvia, Sweden and the United Kingdom) various governance and funding reforms have taken place: increased institutional autonomy, opening up the system to private providers, the establishment of state-university contracts, the introduction of performance-based funding systems, new student support and tuition fee schemes, and mergers. The possible relationship of these kinds of reforms to the number of mature students is not obvious.

Countries with low and low-medium degrees of correspondence to the funding aspects of the Modernisation Agenda either show above average mature enrolment (Lithuania, Malta, Hungary) or below-average mature enrolment (Czech Republic, Turkey, Cyprus)

In Turkey, Cyprus and the Czech Republic a relatively high growth in mature students between 2002 and 2006 can be observed. However, this needs to be assessed against the fact that these countries had a low number of mature students in 2002, which makes achieving a high percentage growth more easy. While the UK, Iceland and Sweden had relatively high percentages of mature students in 2002 (which makes high percentage growth more difficult), a country like the Netherlands did not.

Possible links between improved system performance in lifelong learning and governance and funding reforms were investigated in twelve national system analyses. Reforms linked by interviewees to a higher enrolment of mature students include the introduction of private institutions (e.g. Cyprus and Turkey); and financial reforms – both formula funding and/or tuition fees – that encourage institutions to admit more students in general (Iceland and Turkey) and in some cases mature students in particular where tuition fees are permitted for part-time evening programmes but not for regular full-time students (the Czech Republic and Spain). Apart from the contributing factors identified in the sections on educational attainment and access above, respondents suggested that growing numbers of mature students were linked to the increased provision of distance education programmes (Cyprus, Romania, Spain and Turkey) and demographic changes – a decline in the traditional age cohort encouraging institutions to recruit more mature students (Bulgaria).

The six countries with the greatest improvements in the area of mature students (Cyprus, the Czech Republic, Lithuania, Romania, Slovakia and Turkey) have all expanded their higher education systems either by the establishment or growth of the private sector, the establishment or growth of a non-university sector, the expansion of distance education, or an increase in the number of public universities. Funding reforms targeted at more financial autonomy allowing institutions to generate extra funding by increasing the number of students seem to have had an effect on competition for (mature) students and the diversity of educational programmes offered. In these countries there has been an increase in the variety of study modes offered, including part-time studies, evening studies and distance education. The demand side seems to be important as well. There has been increased interest from mature students to enter higher education as a result of higher demand for higher education qualifications from the labour market. Mature students enter higher education to meet these increasing requirements, to secure their working positions and to advance professionally. In all five countries there is a catching up effect; despite having the highest rates of growth in mature students all remain below the European average.

Our analysis indicates that there is a weak link between the proportion of mature students in a country and funding arrangements as advocated in the Modernisation Agenda. However, there seems to be no obvious link with governance (reforms), investment in higher education or a country's position on the GCI. There are governance reforms that have had a positive impact in several countries (such as

system expansion), but the same reforms have not affected mature enrolments in other countries.

5.6 Funding and private contributions to higher education

The dimension 'capacity to attract funds' is partly covered by the indicator 'share of private household contributions to higher education'.[38] Private contributions to higher education come from various sources, one of the most important being cost-sharing in higher education through the private contributions of students and their families. In fifteen out of the nineteen countries for which we have data there was a growth in the contribution of private households between 2002 and 2006 (see chapter 4, figure 4.12).

There is a strong link between the level of public investment in higher education and the contribution of private households. Countries that are high and medium-high public investors in higher education have relatively low levels of private household contributions (with the Netherlands and the Czech Republic as exceptions) while low and low-medium public investors have high levels of private household contributions. There is at best a soft link between a country's competitiveness position (GCI) and its private contributions to higher education. The countries in the lower half of the GCI ranking have relatively high levels of private contributions. Eight countries from the upper half of the GCI ranking have low private contributions, but there are four exceptions (Italy, the Netherlands, Spain and the United Kingdom).

In the countries having high contributions from private households there is no pattern in terms of their degree of meeting the Modernisation Agenda's funding aspects. In the top ten countries in terms of private contributions there are three countries with a high correspondence to the Modernisation Agenda (the Netherlands, the United Kingdom, Spain), four with a medium-high congruence (Italy, Portugal, Poland, and France), two with low-medium congruence (Hungary, Czech Republic) and one has a very low degree of meeting the Agenda's funding elements (Slovakia). A similar pattern appears for the top ten countries in terms of growth in private contributions: five have implemented many of the Modernisation Agenda's funding recommendations (Austria, Iceland, Finland, Denmark, Sweden), two have a medium-high degree of implementation (Italy, Portugal), one a low-medium degree (Czech Republic) and one a low degree of implementation (Slovakia).

The level of private household contributions to higher education is first of all dependent on whether higher education institutions are free to charge tuition fees. Secondly, it depends on who sets the level of tuition to be charged. If tuition fees are not permitted or the government sets tuition levels then the level of private contributions depends primarily on government policy. If it is possible for institutions

[38] The other indicator is 'Business contributions to higher education research & development' (see section 5.7).

to set tuition levels themselves then institutional policies primarily determine the contribution of private households to higher education.

Government policies on tuition fees explain the high level of private household contributions in the United Kingdom and the Netherlands, where the government allows the institutions to charge relatively high tuition fees. In some other countries institutions are permitted to charge tuition fees to parts of the student population ('dual systems' as in Hungary and the Czech Republic) which explains high levels of private contributions. A third important determinant of private household contributions is the existence of a substantial private higher education sector, for example in Poland and Portugal.

The potential link between governance and funding reforms and increased private household contributions was investigated in nine national system analyses. Increased private contributions to higher education are not surprisingly linked mainly to governance reforms enabling the establishment of private higher education institutions and to the subsequent growth in this sector (Iceland and Portugal), and to financial reforms introducing or increasing tuition fees (Austria, Germany, Iceland, Portugal and Sweden), including in some countries increasing tuition income from mature students. Finally, it is interesting to note that three of the countries that experienced an above average increase in private household contributions in recent years still fall below the European average (Austria, Greece and Iceland). In these cases, increases have been substantial in percentage terms, but have to be seen against the background of low levels of private contributions in the past.

This analysis indicates that the level of private household contributions to higher education strongly depends on government policy on tuition fees and on the role of private higher education providers in the system. It is also related to the level of public investments in higher education (low public investment coinciding with high private contributions). The levels of private household contributions to higher education have been increased by governance and funding reforms that have introduced or increased tuition fees (which remains one of the most controversial issues in European higher education) or which have opened up higher education systems to private providers.

5.7 Funding and the contribution to R&D from business and industry

A higher education system's capacity to attract funds is reflected (partly) through the indicator 'share of higher education institutions' expenditure on R&D (HERD) financed by business and industry'. In twelve out of the twenty-five countries for which we have data the share of HERD funded from business and industry increased between 2002 and 2006 (see chapter 4, figure 4.11). In Slovakia, Iceland and Hungary there has been a particularly high growth in this respect.

There is no clear relationship between the contribution from business and industry to HERD and a country's position on the Global Competitiveness Index (GCI) or a

country's level of public investment in higher education. One tendency worth mentioning is that many countries with low public investment in higher education and a low rank on the GCI have relatively high shares of HERD financed from business and industry (e.g. Bulgaria, Croatia, Hungary, Latvia and Turkey), while a number of high investors have low or modest contributions to HERD from business and industry (e.g. Austria, Cyprus, Denmark, the Netherlands, Norway and Sweden).

Business and industry contributions to HERD and the changes that have taken place between 2002 and 2006 are not clearly related to the degree to which a country has implemented the finance-related recommendations of the EC's Modernisation Agenda. Half of the countries that fall in the highest group in terms of implementation have relatively high shares of business funded HERD (Bulgaria, Germany, Latvia, Iceland, Belgium, Slovenia, Spain, Finland) while the other half (Denmark, Ireland, Norway, Sweden, Estonia, the United Kingdom) have a below-average share of business-funded HERD. Two other countries that have adopted the Modernisation Agenda's funding elements (Romania, the Netherlands) perform 'on average' in terms of business-funded HERD.

Half of the countries with a low to low-medium degree of implementation have high business HERD contributions (Turkey, Hungary) while the other half have a below-average business-funded HERD (Czech Republic, Cyprus and, to a lesser extent, Slovakia).

In the national system analyses, however, respondents from countries with increased business contributions to HERD reported that governance and funding reforms granting public universities greater financial autonomy were seen to have contributed to stronger interaction with business and industry (e.g. Finland and Germany). In Greece, strengthened institutional leadership is believed to have had a similar effect. In three countries, financial reforms introducing targeted funding for joint research projects with industry are seen to have stimulated growth in this area (Finland, the Netherlands and Sweden). In Iceland, government-stimulated innovation policies, the creation of business and science parks and institutional incentives intended to stimulate academic staff to attract funding from private sources, were seen as an explanation for the growth of the R&D contribution from business and industry.

Factors other than governance and funding reform that are believed to have contributed to increased HERD income from industry include economic growth (three countries), growing industry demand for such projects (five countries) and EU programmes that stimulate these activities (Greece).

Similar trends are also apparent in the countries where business contributions to HERD improved most (Finland, Greece, Hungary, Iceland and Slovakia). Governance and funding reforms in these countries have concerned increased autonomy for public universities in terms of lump sum budgeting, staffing issues, and internal governance structures. In terms of funding, a more performance-based funding system has been implemented to replace historically input-based funding. Yet a number of countries

with high autonomy (Estonia, Ireland and the United Kingdom) fall below the European average for both business contributions to HERD, and for improvements in this from 2002 to 2006, so higher autonomy on its own seems an unlikely explanation for the improved performance of the five countries.

Four other countries that improved on this indicator to a lesser degree are Denmark, Sweden, Germany and the Netherlands, which have mature industries and have stimulated university-industry collaboration and related income for higher education via various means. EU structural funds programmes were seen as important in fostering business contributions to HERD in two of the other improving countries (Spain and Slovenia).

This analysis suggests that industry demand for joint industry-university projects is driven by economic growth and the needs of industry. Notwithstanding the fact that reforms increasing institutional autonomy and introducing targeted funding have not led to increasing business contributions to HERD in all countries studied, there are several indications that institutional autonomy and particularly financial autonomy is a necessary condition for universities and universities of applied sciences to respond to this demand and that targeted funding at national and European levels to stimulate such joint projects is seen as an important contributing factor.

5.8 Funding and incoming student mobility

The indicator we use for incoming international student mobility is the number of incoming European (EU/EEA) students as a percentage of the total number of students in a country. Twenty-two of the twenty-eight countries for which we have data increased the number of incoming European students between 2002 and 2006; in three countries this number decreased (Malta, Romania and Turkey). (See chapter 4, figure 4.6)

There is a clear link between the level of public investment in higher education as well as a country's position on the competitiveness index (GCI) and the inflow of European students. The countries that are high investors in higher education also have a high inflow of European students (except Slovenia which has a low inflow). Low investing countries have a low inflow of students (except Bulgaria – slightly above average - and the United Kingdom which has a high inflow). The countries in the top half of the GCI ranking have a high inflow of European students (except Finland). Countries from the bottom half of the GCI ranking have a low inflow of students (except Bulgaria, Cyprus and the Czech Republic).

Eleven out of the 17 countries that have the highest degree of meeting the Modernisation Agenda's funding elements have many incoming students (e.g. Austria, Netherlands and United Kingdom). More than 2.5% of their incoming students are from other EU/EEA countries, with Austria (12%), the UK (8.4%) and Belgium (8.1%) having the most. The other six countries with the highest degree of congruence with the Modernisation Agenda (Finland, Estonia, Spain, Slovenia,

Latvia, and Romania) have a below-average share of incoming international students. When we look at countries that have not met – or hardly have met – the financial elements of the Modernisation Agenda, we get the same picture: half of the countries do well (Czech Republic, Cyprus), the other half perform below average (Turkey, Lithuania, Slovakia). In other words, there is no clear pattern between funding arrangements in this sense and incoming international mobility.

Our parallel governance reform study suggests that there is a link between the level of institutional autonomy and (growth in) the number of incoming European students. Student mobility is however complicated by the case of neighbouring countries: capacity limits in German higher education explain part of the growth in Austria; the Netherlands sees many Dutch students go to Flanders.

Enhanced inward European student mobility was explored in depth in twelve national system analyses. Our interviewees could see no significant links to governance or funding reform other than the provision of targeted funding for this purpose in two countries (Finland and Spain). In some countries there are financial incentives such as tuition fees and public funding per student/graduate for public higher education institutions encouraging the institutions to use their autonomy to increase their enrolments including by operating in the European student market.

Respondents suggest that the major underlying factors for increases in inward mobility are EU accession (Bulgaria and the Czech Republic), the expansion of EU mobility programmes (seven countries), an increased number of programmes taught in English (four countries) and growing student interest in studying in their countries (Spain). Favourable student financial support arrangements are mentioned to be a factor in one country (Norway).

A further look at countries with an above average increase in the numbers of incoming students exemplifies the quite diverse factors that come into play in the area of European student mobility (the Czech Republic, Estonia, Lithuania, the Netherlands and Spain). The Czech Republic provides an example of a country where several of the factors already mentioned play a role (entrance into the EU, improved capacity of higher education institutions to offer courses in English) but the main (idiosyncratic) factor is the fact that Slovak students constituted 60% of all foreign students in 2007/2008.

Increasing the number of incoming European students is a policy objective of a number of regional governments in Spain and is included as a driver in formula funding. This financial incentive would partly explain the rise of incoming European students. Institutions have made particular efforts to attract international and European students and to design internationalisation strategies. At the same time, attractiveness for European students was attributed to the quality of life, the Mediterranean climate, the attraction of learning Spanish, the “Barcelona Brand”, and other external factors.

The analysis suggest that, while countries with high investments of public expenditure in higher education, a good position on the GCI ranking and with high or medium-high levels of autonomy tend to have high levels of incoming European students, it is mainly other factors, often country-specific, that explain the level of incoming European students.

5.9 Funding and outgoing student mobility

The indicator used for outgoing student mobility is the number of students studying in another European (EU/EEA) country as a percentage of the total number of students in a country. In twenty-three of the thirty European countries for which we have data the number of outgoing students increased between 2002 and 2006; in four countries there was a decline (Austria, Greece, Malta and Turkey); and there was no significant change in three countries (Hungary, Denmark and Finland). (See chapter 4, figure 4.7)

There is no relationship between the degree to which a country meets the funding elements of the Commission's Modernisation Agenda and its share of outgoing European students. Seven of the 17 countries that have the highest degree have an above average share of outgoing students while 10 have a below-average share. The same holds for countries that hardly meet the Agenda's funding aspects. When we look at the countries that have the highest share of outgoing students (Luxembourg, Cyprus, Iceland, Ireland, Malta) we do see that four out of these five have implemented portability of student support (see table 5.1). In Slovakia and Bulgaria, however, we do observe high numbers of outgoing students and an absence of portable student support.

No patterns can be observed if countries are grouped by their level of public expenditure on higher education or their position on the GCI; neither is related to the proportion of outgoing students. The number of outgoing students seems to be inversely related to the size of the country and its higher education system. The ten countries with the highest numbers of outgoing students include Luxembourg, Cyprus, Iceland, Slovakia and Malta, whereas large countries such as France, Poland, Spain, Turkey and the United Kingdom all have small numbers of students studying elsewhere in Europe.

The relationship between governance and funding reforms and outgoing student mobility was explored in thirteen national system analyses. Respondents did not identify any links to governance reforms. Student support arrangements in general and particularly the portability of support to other European countries are believed to be the key factors (Germany, Ireland and Sweden). The other major drivers identified are very similar to those identified for incoming mobility, although in one country labour market demand for graduates with international experience is seen to be important (France), while in another the new Bologna degree structures are believed to have encouraged more outward mobility (Romania).

Two countries with an above average increase in outgoing students exemplify the quite diverse patterns that come into play in this other side of European student mobility. Increased outgoing student mobility from Ireland was considered to be the result of more general social and economic factors, the ease and availability of travel, a culture of moving away - particularly to other English speaking countries, and the fact that the right to free tuition is portable to other EU countries. The Irish national qualification framework may also have contributed to increased mobility as it adheres closely to the Bologna framework.

The increase in Latvian students studying abroad was believed to be related to a lack of reform of the student support system and some specific characteristics of it. High tuition fees are another factor triggering students to travel to countries that provide free higher education. EU-membership was seen as another very important stimulus for students from Latvia to go abroad, and the removal of technical visa and other requirements has made mobility easier.

This analysis indicates that governance reforms have had no obvious effects on (changes in) the number of outgoing European students. Enhanced institutional autonomy does not seem to play a role. The most important factors are related to tuition fees and student support arrangements. Reforms in these areas can make a difference to outgoing student mobility.

5.10 Funding and research output

The indicator used for research output is the number of scientific articles published per million inhabitants of the country. In twelve of the twenty countries for which we have data the number of published articles increased between 2002 and 2006 (see chapter four, figure 4.10).

There is a strong link between the degree of implementation of the EC's Modernisation Agenda's funding-related recommendations and the research output of a country. Apart from Spain (and, to a lesser degree, Ireland), all countries that exhibit the highest conformity to the Modernisation Agenda are very productive in terms of research output (Sweden, Denmark, Finland, Netherlands, Norway, the UK, Iceland, Belgium, Austria and Germany). The countries that have implemented less elements of the Modernisation Agenda all have a lower than average productivity. The only exception is Switzerland that in our sample has the highest research output in relative terms, but is part of a group of countries that match less of the Modernisation Agenda's funding elements than the countries just mentioned.

Looking at the countries that have a medium to high share of competitive research funds (see table 5.1) and their research performance, we observe that most are exhibiting an above average research productivity. The only exception is the Czech Republic. The countries that have a relatively low share of competitive research funds (Austria, Hungary, Italy, the Netherlands, Poland, and Slovakia) in all but two cases (Austria and the Netherlands) have a lower than average research output.

From our governance study we have learned that there is a strong link between institutional autonomy and research output. The vast majority of countries with high or medium-high levels of autonomy are also very productive in terms of research output. The group of ten countries with the highest research output does not include any country with a low level of institutional autonomy, whereas five of the ten least productive countries have low or medium-low levels of institutional autonomy. This observation supports in general terms the finding of the research of Aghion et al. (see chapter 2) that there is a relationship between (financial) autonomy and research performance (in their case measured by the number of patents).

There also is a clear link between the research output and the position of countries on the GCI ranking and the countries' expenditure on research & development (GERD). The countries with high GCI scores have a high research output; the top ten countries on the GCI are a close match to the top ten on research output. The countries with lower research output levels are all at the lower end of the GCI ranking. As expected, the level of R&D expenditures in a country also contributes to productivity in research. The same pattern is to be found in terms of the level of public investment in higher education: the top six countries in terms of research output are all high investors in higher education. An exception to this pattern is the United Kingdom which has medium-low investment in higher education and is ranked number seven in terms of research output (after Switzerland, Sweden, Denmark, Finland, the Netherlands, and Norway). Greece and the Czech Republic are two other exceptions: both have medium-high levels of public investment but research output is significantly below the European average.

Public universities in nearly all of the top ten countries in terms of research output have substantial autonomy in selecting their own staff and determining their salaries. This suggests that a university's freedom to appoint and reward staff is important in recruiting and retaining research-active staff.

The relationship between governance and funding reforms and improved research performance was investigated in ten national system analyses. The link most cited by our respondents is to financial reforms that give greater emphasis to performance-based research funding (Belgium, the Czech Republic, Hungary, Ireland, Italy, Norway, Portugal and Spain). Respondents also mention financial reforms introducing targeted research funding (Greece) and reforms that include a significant increase in the resources made available for research (Belgium, the Czech Republic, Greece, Luxembourg and Spain). An increased emphasis on measuring the quality of research (research assessments) has also contributed to a growing awareness on the part of academics that research output is important in contemporary higher education. Increased research performance is also seen to be related to the growth in EU research programmes (five countries), while in two countries the increase in publications is linked to the overall growth of the higher education system.

A greater emphasis on performance-based research funding and the introduction of targeted research funding have not, however, been successful in stimulating increased research output everywhere. In a number of countries research output

decreased between 2002 and 2006 (Austria, Denmark, Finland, France, Poland, Slovakia, Sweden and the United Kingdom). Financial incentives do not by definition lead to better research performance. Nevertheless, five of these eight countries are in the top ten countries as ranked by the number of publications per million of population; they already had a high research output in 2002 and there may be limits to continued growth in productivity. Taking this into account our analysis suggests that financial incentives are very likely to increase research output.

In the countries that have significantly increased their research output (Belgium, the Czech Republic, Greece, Iceland and Ireland), we see indeed that financial incentives have contributed to more scientific output. Two of these countries are catching up and are still in the lower half of research performing countries in Europe (the Czech Republic and Greece).

The most productive countries are the Scandinavian countries, the Netherlands and Switzerland. All six of these countries are small to mid-sized countries with strongly competitive economies that have had well-developed science systems in place for years. Three of these countries further increased their research output between 2002 and 2006 (the Netherlands, Norway and Switzerland); the other three countries could not improve their performance despite (long standing or more recent) reforms incentivising increased publication outputs.

Governance reforms were not mentioned by our respondents as a stimulating factor to increase research output. Public universities in the seven most productive research countries have (medium-) high levels of institutional autonomy, including particularly high autonomy on staffing matters and, to a somewhat lesser degree, financial autonomy. Enhanced institutional autonomy in combination with a growing awareness of the importance of research for a country's competitiveness and reputation (via global rankings) is likely to contribute to a stronger focus on research output. Institutional reputation and prestige (largely driven by demonstrable research-intensiveness), in combination with financial incentives, seems to lead to a stronger research focus.

5.11 Funding and employability

For employability two indicators were used: the relative earnings of higher education graduates and the relative unemployment rate of higher education degree holders (compared to upper secondary education graduates). In six of the thirteen countries for which we have data on earnings the relative earnings of graduates improved between 2002 and 2006 (improvement ranged from 1% in Denmark to 15% in Ireland). In five countries the relative earnings of graduates dropped (the decline ranged from -1% in Finland to -4% in France). In five of the nineteen countries for which we have unemployment data the relative employment position of graduates improved from 2002 to 2006; in other countries the relative labour market position of graduates worsened. (See chapter 4, figures 4.8 and 4.9).

Our analysis did not find any patterns in these two indicators (one has a very limited data set) in relation to the degree which countries match the EC's Modernisation Agenda. Countries that have a high match are scattered across both the lower and the higher ends of the employability spectrum. However, when we look at the countries that have a low to medium degree of congruence to the Modernisation Agenda we observe that most of them exhibit an above average employability for their graduates (Lithuania, Slovakia, Czech Republic, Hungary, and Poland). This phenomenon is difficult to explain and is probably less a result of policies and more of the general economic and labour market conditions in a given country. Some of the factors that are likely to play a role here are labour market conditions (demand in general, as well as for higher education graduates in particular) and increases in the proportion of higher education graduates in the labour force (more graduates may increase the likelihood of unemployment or reduce relative earnings). For more information on issues related to employability we refer to our survey on the rates of return to investment in higher education in Volume 3 of this report.

Our analysis did not find any patterns in the employability indicators in relation to the level of public investment in higher education or a country's position on the GCI. From our governance study we could not detect any links between employability and the level of institutional autonomy of public higher education institutions. Only one of the national system analyses focused on employability and it found no indications of links between governance reforms and employability.

Theoretically we can think of three governance issues that could affect the position of graduates on the labour market. First, higher education systems having universities with external membership from other public sectors or business and industry may be keener to position their graduates well on the labour market. Second, if graduates from the universities of applied sciences sector are better positioned for the labour market than university graduates, given the professional orientation of their programmes, the establishment or expansion of this sector could improve graduate employability rates. Finally, if national accountability requirements include graduate surveys or "first destination data" it is likely that higher education institutions will pay greater attention to this issue. The (limited) employability data used in this study does not allow us to establish whether these theoretical relationships or other links between higher education governance and employability exist.

6 Conclusions and recommendations

6.1 Funding reforms in Europe

In this concluding chapter of the report we return to the main research questions that guided this study, we summarise the main findings of the study and outline a number of recommendations related to these findings. In summarising the main findings we highlight general trends and patterns across European higher education thus neglecting some of the diversity that reigns across these systems.

The first research question concerns funding reforms:

> *What is the state of implementation of the funding reforms undertaken in the 33 European higher education systems between 1995 and 2008 and what do we know about the rates of return to higher education in the 33 countries?*

There have been significant changes in funding since 1995 in almost all countries. In fact the vast majority of European countries are in an almost permanent process of reforming their higher education systems, or at least striving to adapt their higher education institutions to global competition. In this global competition higher education systems and their outputs (competitive graduates and research results) play a key role. In the reform processes, funding reforms are only one part, interacting with other policies, such as reforms in the governance of higher education systems, and reforms in degree structures and curricula. In fact, funding policies interact with broader policies in the public sector, labour market policies and social policies. Funding policies are based on the belief that the level, composition and method of funding matter when it comes to the performance of higher education systems. A well-performing higher education system is regarded as essential in enhancing innovation, producing a high quality labour force and thus strengthening the well-being of countries in many ways.

However, it is clear that the expansion of higher education systems has brought *budgetary pressures* for many countries. The goal of securing sufficient funding levels to enable higher education institutions to meet the growing expectations of society and respond to the growing demand by students is a challenge faced by many governments. Combined with the overall budgetary pressures that many countries experience, it has led to reforms in the funding of universities and other higher education institutions and has also meant that more and more governments have embarked on a policy of cost sharing, where students and the taxpayer share the cost of higher education.

Our study has looked at the *levels of funding* in the 33 European higher education systems and concluded that public expenditure on higher education as a percentage

of GDP on average is about 1.13% in 2006, while private expenditure is about 0.2%. There is quite some variation across Europe, but it is clear that there exists a substantial funding gap between Europe and the US (that spends 2.9% of GDP on higher education). Expenditure per student (from public and private sources) also shows considerable variation across Europe. There is evidence of a positive relationship between a country's relative wealth and its expenditure per student. Between 1995 and 2008, our data shows that the level of public funds per student increased in almost 60% of the 33 countries; funding was stable in about a quarter; it decreased in the remaining 20%. Total expenditure per student from public and private sources did not deteriorate in most countries mostly because of a rising proportion of private expenditure on higher education institutions.

Turning to the composition of funding, we see that many countries have started to rethink their tuition fee and student aid policies. The Commission's Modernisation Agenda has pointed to this under the topic of *cost-sharing* and urges EU-member states to "critically examine their current mix of student fees and support schemes in the light of their actual efficiency and equity" (EC, 2006).

A number of countries have expanded their *student support systems*, placing more emphasis on the proportion of loan-based student financial support among the public subsidies for students in higher education. Two thirds of the countries have a student loans system in place, next to means-tested grants for undergraduate students or tax relief and child allowances for their parents. Some have done so only recently (Bulgaria, Hungary, Poland, Portugal, Slovenia), while some others still lack such a system. Overall, countries face the challenge of shaping cost sharing and student support arrangements which do not harm participation by the most disadvantaged groups. This is done in the light of outcomes from studies done in Europe showing that higher socioeconomic status (SES) students, as measured by the education of their parents, have a much better chance of entering higher education.

The debate on the appropriate levels of public and private spending is informed partly by an assessment of the *social and private returns to investment in higher education*. From our desk study on rates of return we identified estimates for 31 out of 33 countries. The average private rate of return is 10.2%, while the average social rate of return is 7.9%. Using slightly different (but more comparable) data, the averages turn out to be 12.3% (private) and 7.9% (social), confirming the difference between private and social rates (4.4 percentage points on average). Therefore, private returns exceed the social returns by 2.3 to 4.4 percentage points. The combined returns (private and social) exceed any reasonable opportunity cost of capital, say 5%, indicating that higher education is a profitable investment opportunity, both privately and socially.

The returns are highest in "new countries" such as the Czech Republic, Poland, Hungary and Turkey, and lowest in Scandinavian countries such as Denmark and Sweden. The difference between the private and the social return is an indication of the degree of public subsidisation of higher education. Furthermore there is evidence that the private returns to higher education have been rising, meaning that the

demand for higher skills outpaces the increased supply of graduates in the market place. The literature is not very forthcoming on the returns to higher education by socioeconomic background (SES) although we found some evidence that in several countries those coming from a superior socioeconomic background enjoy much higher returns. Looking at fiscal returns, there is evidence that public expenditure on higher education is recovered through the higher tax revenue from those who graduate and have higher incomes.

Next to the rate of return estimates, the *earnings difference* between a university graduate and a secondary school graduate could also be considered as a "return to education". On average, our desk research shows that university graduates have a 61% earnings advantage over secondary school graduates. Again, our survey confirms that the earnings advantage of university graduates is highest in the "new countries" and lowest in the Scandinavian countries.

Because rate of return analyses and debates on cost sharing are often linked to the issue of *tuition fees*, we present some information on the levels of the fees for Bachelor students (table 6.1). The table illustrates that fees for Bachelor-level students are relatively low across Europe, even though some countries have started to introduce fees in recent years. On average, the fees for Master's level students are higher, particularly in the UK, Ireland, Greece, Cyprus, Malta and Spain. In a few countries, differentiated fees are in place (Italy, Spain, Portugal, UK-England), sometimes with governments setting a minimum and maximum level.

Table 6.1: Annual tuition fees for BA-level students and their order of magnitude in 33 countries in 2008

No fees	CY, HR, CZ, DK, EE, FI, GR, HU, IE, IS, LU, MT, NO, PL, RO, SK, SI, SE
Low fees (below €500)	AT, BE, BG, FR, DE, LT, TR
Moderate to substantial fees (above €500)	IT, PT, LI, ES, CH, NL, LV, UK-Eng

The *mechanisms for public funding* contain important incentives to encourage institutions in achieving higher education's three main goals, viz. quality, efficiency and equity. Looking at the methods used in the various countries for determining the amount of the public operational grant allocated to individual institutions, table 6.2 indicates the extent to which each of four different approaches (negotiation; incremental; formula; contract funding) is seen as important. While countries are using a mix of funding approaches, it is clear that in 2008, incremental funding (where historical allocations play a large role) is being applied less compared to 1995. In many countries it has been replaced by formula-based approaches. While negotiated funding is still in place in quite a few countries, contract approaches have been introduced on top of existing arrangements. In contract funding part of the institution's budget is tied to a performance agreement. Contracts and multi-year agreements between the state and higher education institutions are examples of new governance instruments.

Table 6.2: Number of countries and the importance attached to four types of funding: 1995 vs. 2008 (public universities; N=34)

Degree of importance	Negotiated		Incremental		Formula funding		Contracts	
	1995	2008	1995	2008	1995	2008	1995	2008
High/Moderate	9	12	24	15	14	27	2	10
No/low	24	22	9	19	19	7	31	24

Historically-based allocation schemes are losing ground to funding mechanisms with more of an emphasis on outputs. Higher education institutions today are funded more for what they do than for what they are. This trend is shown in table 6.3, where we look at the funding criteria that drive the institutional budgets. We observe a shift towards drivers that capture teaching and research *performance*. Some countries have decreased the weight they give to student numbers in their funding formulas. However, input- and cost-related factors remain very important in all countries' higher education systems (research universities as well as universities of applied sciences) and no country has a 100% performance-based funding system.

Table 6.3: Number of countries and importance of input- versus output-related funding drivers of the operational grant (for publicly funded Universities and Univ. of Applied Sciences): 1995 vs. 2008 (N=45, 34 university systems and 11 UAS systems)

Degree of importance	Number of countries and relative importance of **input-related drivers**		Number of countries and relative importance of **output-related drivers**	
	1995	2008	1995	2008
High	38	24	3	8
Moderate	4	18	3	16
No / Minor	3	3	39	21

Looking specifically at the public funding of *research*, it is clear that most countries make use of a *dual support system*, meaning that research is funded both through a recurrent (operational) grant and through competitive public research grants. The average share of competitive research council funding in European universities has increased slightly, from 44% to 47% over the period 1995-2008. When we look more in detail at research funding, our data reveal that in 11 of the 34 higher education systems[39] one may observe a rise in the share of competitive/research council funding. We therefore conclude that over the period 1995-2008 countries have introduced more competition to improve research quality. In some countries more funds were made available through project funds. New research funds are often attached to specific priorities or to new schemes (e.g. centres of excellence).

Such *targeted funds* are often allocated as project funds, awarded competitively or equally across institutions with the explicit aim of encouraging institutions to address specific national priorities. Most targeted funds for teaching-related purposes are awarded competitively and concern the objectives of improving access

[39] For Belgium we look both at the Flemish and the French Community.

for disadvantaged students and the enhancement of teaching quality. Targeted research funds are awarded to encourage the formation of public-private partnerships and enhancing research excellence in areas of national strategic interest.

This increased competition and targeting for results has led to introduction of new policy instruments (project funding; performance contracts) to achieve particular types of results thus stressing accountability and value for money. However, the increased emphasis on contract funding also allows more room for diversification of institutional missions and, as a result, may lead to more *differentiation* in the higher education system in terms of quality, funding and pricing. From our study (and many other studies of into higher education financing) it is clear that it has led to a diversification of funding sources.

If we distinguish three main categories of revenues (operational grant; tuition fees and third party funding[40]), table 6.4 shows the difference between the years 1995 and 2008 (for the countries that we have data for). The move towards a higher share of tuition fees and third party funds has partly resulted from a purposeful reform policy in this direction or the relaxation of regulations that govern the entrepreneurial activities of higher education institutions. However, it may also be the outcome of the reduction of core budgets.

Table 6.4: Average proportion of public universities' main revenue components: 1995 and 2008

	1995 (N=26)	2008 (N=32)
Operational grant	78%	67%
Tuition fees	8%	12%
Third party funds	15%	21%

Over the period 1995-2008, the number of countries where tuition fees represent more than 5% of revenues has grown from 10 to 18. A third of the countries now have more than a quarter of their revenues coming from third party funds. Private resources have also been mobilised through the commercialisation of research and other private uses of institutional facilities and staff.

Countries are confronted with the challenge to design funding instruments that on the one hand try to achieve accountability and performance-orientation and on the other hand permit a wide scope for institutional differentiation. This has meant that many countries nowadays allow more autonomy to their institutions. As part of this, *financial autonomy* has been enlarged. Financial autonomy is one aspect of institutional autonomy where reforms have taken place. However, institutional autonomy was also enlarged other areas.[41] The general assumption is that higher education systems will benefit also in terms the desired differentiation of

[40] Third party funding includes all project and contract funding received from public, international and private sources, such as: research council funding, ministry programmes, EU funds, contract research, and contract teaching.

[41] For a detailed analysis of governance reforms, please see the parallel study *Progress in governance reforms across Europe.*

institutional missions if higher education institutions are freed from detailed state regulation and control and have substantial discretion to take decisions independently and strategically. This view was largely confirmed in the case studies of individual institutions that were conducted in our project. Financial autonomy is generally perceived to be a very important characteristic of autonomous organisations; it includes the ability to decide on the internal allocation of public and private funds, to diversify sources of income (for example through tuition fees and other private contributions), to build up reserves, and to borrow funds on the capital market.

Public higher education institutions in the vast majority of European countries have medium to high *levels of financial autonomy*. Many countries have implemented reforms that have significantly enhanced the autonomy of institutions in financial matters, particularly through the introduction of lump sum budgeting. From our study on governance reform we may add that the growing autonomy of higher education institutions on the various aspects of autonomy was coupled with greater accountability. As with funding mechanisms, again the challenge is to balance autonomy and accountability.

To give an overall answer to our research question about the trends in funding reforms implemented we may conclude that we observe a move from centralised, input-oriented approaches to more decentralised and performance-oriented approaches.

6.2 The performance of Europe's higher education systems

Having presented an overview of funding reforms, our second research question deals with the goals of the reforms:

> *What is the performance of the 33 European higher education systems with respect to the eight dimensions identified, and how has this changed over the last decade?*

With the introduction of the Lisbon Strategy, the need for system level evidence of performance to assess the contribution of the European higher education systems to the critical Lisbon areas of more research & development, innovation, and investing in people is evident. Higher education performance is a multi-dimensional issue and the terms of reference of our study therefore highlighted eight dimensions:

- access
- mature learners
- graduation
- employability
- international student mobility
- research output

- capacity to attract funding
- cost effectiveness

Performance always needs to be evaluated within the specific national context of a country. Therefore, any analysis requires taking *contextual information* into account, such as the country's demographic situation, its stage of technological advancement, and its public investment in higher education and R&D.

For describing the performances of higher education systems, each dimension is represented by at least two *indicators* (see table 6.5). We used international data sources to measure the performance of European higher education systems in 2002 and 2006 across these eight dimensions. Our selection of indicators shows a strong overlap with the higher education-related indicators used in the Commission's annual progress report to track progress made with the implementation of the education and innovation goals laid out in the renewed Lisbon Strategy.

Table 6.5: Performance dimensions, selected indicators and change in performance

Performance area	Indicator	**Number of countries[1] showing increase over 2002-2006**	**Average[2] growth over 2002-2006**
Access	Net enrolment rate	22 out of 24	12%
Lifelong learning	Mature (> 30 years old) enrolment rate	19 out of 28	23%
Graduation	Share of population with tertiary degree (% of 25-34 year olds)	21 out of 23	19%
Employability	Relative graduate earnings	6 out of 13	0%
	Relative graduate employment	5 out of 19	-18%
Research	Scientific articles per mln. inhabitants	12 out of 20	5%
Capacity to attract funds	Share of HE R&D income from business	12 out of 25	-4%
	Private (households') expenditure on HE	15 out of 20	30%
International mobility	Incoming EU+ students	22 out of 28	18%
	Outgoing EU+ students	23 out of 30	20%
Cost-effectiveness	Expenditure per student in €	22 out of 29	11%

1 out of countries that we have data for[42]),

2 to represent the average we have used the median

[42] The number of countries for which data are available varies for each indicator hence the differing sample sizes per indicator.

On the basis of the values for each particular performance indicator in 2002 and 2006, the countries' higher education system performance can be categorised into four groups (*quadrants*) that include countries that are (1) moving further ahead, (2) losing momentum, (3) catching up, and (4) falling further behind. A country's position is determined by referring to (1) the absolute value for the indicator compared to the group average for the set of 33 countries and (2) the observed growth compared to the average growth for the set of 33. We will not present a categorisation of countries here (the reader is referred to chapter 4), but instead provide some summary information on the performance dimensions (table 6.5).

In terms of these performance dimensions, there is no doubt that in the vast majority of European countries system performance improved over this period.[43]

It should be kept in mind that the outcomes of this assessment of performance are a result of the selection of dimensions and indicators in our study. However, the selection was made with reference to the four main dimensions (quality, investment, graduates and mobility) in the Progress report. In the next research question we address the funding (and governance) policies that, according to the European Commission's Modernisation agenda, are assumed to lead to better contributions by higher education institutions to the general EU Innovation Strategy (the re-launched Lisbon Strategy).

6.3 Funding and system performance in higher education

The third research question of this study concerns the relationship between the funding reforms and the performance of higher education systems:

> *What has been the impact of the funding reforms on the performance of higher education systems?*

Our study explored the possible relationship between funding reforms and improvements in system performance. In doing so we controlled for the level of public investment in higher education (public expenditure on tertiary level education as a percentage of GDP) as well as for the economic standing of the countries (as reflected by the Global Competitive Index, GCI).

Funding arrangements are diverse and are very much of a qualitative nature. To explore the link between funding arrangements and the various performance dimensions we have taken the EC's *Modernisation Agenda* as our point of departure. We see the Modernisation Agenda as a set of recommendations that offers countries and higher education institutions a variety of issues to consider and a range of options for reform that need to be tailored to national and institutional contexts and conditions.

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[43] We use the term 'improved performance' in a neutral way recognising that some would contest whether all of these improvements are desirable.

The following aspects of the Modernisation Agenda relate to issues of funding:

- Ensure financial autonomy
- Encourage partnerships with business
- Spend 2% of GDP on higher education to reduce the funding gap
- Revise student fees and student support schemes
- Base funding more on outputs than on inputs
- Examine the balance of core, competitive and outcome-based funding
- Ensure portability of student support

These aspects in one way or another also emerged from the answer to our first research question.

We have explored the extent to which the funding arrangements in European higher education reflect these aspects of the Modernisation agenda for higher education using the following *six items*:

- Financial autonomy
- Share of third party funding
- Share of revenues from tuition fees
- Degree of performance orientation in funding mechanism
- Share of competitive research funds in university sector
- Portability of student grants

Using these indicators to capture the different funding aspects of the Modernisation Agenda we have addressed the extent to which a particular aspect is in place for a given country. For each aspect we distinguish three degrees: 1. high degree of meeting the Modernisation Agenda; 2. meeting the Modernisation Agenda to some degree; 3. not meeting the Modernisation Agenda.

Looking at the situation in thirty-three countries for the years 2008 and 1995, and focusing only on countries that exhibit a high degree of congruence, the following picture emerges:

- in 14 countries universities have a high level of financial autonomy in 2008 (compared to 11 countries in 1995);
- in 14 countries we see a high share (≥25%) of revenues from third party funds (6 countries in 1995);
- in 13 countries universities we observe a high share (≥15%) of revenues from tuition fees (8 countries in 1995);
- in 18 countries the degree of performance orientation in the funding mechanism is high (5 countries in 1995);

- in 9 countries, universities have a high share of competitive research funds (≥25% of combined core funds and research council funds). (8 countries in 1995);

- in 18 countries the portability of student grants is high (the same as for students studying at home). (9 countries in 1995).

The *timing and breadth of reforms* differ across European higher education systems; there are early adopters as well as late reformers. In some parts of Europe radical political changes drastically changed the higher education landscape in a very short period of time in the early 1990s, whereas for other countries particular aspects of the modernisation agenda have been a reality for years.

If the different funding-related aspects of the Modernisation Agenda are considered as a whole for the year 2008, seventeen countries can be characterised as having a high degree of *correspondence to the Modernisation Agenda*, eight countries have addressed quite a few aspects, five countries have tackled a few aspects, and three countries have hardly addressed any aspects of the Modernisation Agenda. Once again we stress that we do not adopt a normative position here; there is not a single recipe for successfully modernising European higher education. The agenda is not a pill to be swallowed as a whole; rather its recommendations need to be administered after a diagnosis of a country's strengths and weaknesses, taking into account national priorities.

When looking at the funding arrangements and their potential link to higher education system performance we need to control for the countries' level of public investment in higher education (public expenditure on tertiary level education as a percentage of GDP) as well as for the economic standing of the countries (on the Global Competitiveness Index, GCI). Having done so, our general conclusion is:

For three of the performance dimensions we find that funding reforms may be linked to increased system performance (graduation, student contributions, research output), for three others there is a weak link (mature enrolment, business contributions, student mobility), while for the remaining dimensions (access, employability) there is no link.

For the top ten countries in terms of **educational attainment** levels we find that all except for one are in the group of countries that meet most of the Modernisation Agenda's funding aspects. Nearly all are in the north-western part of Europe. Most of these countries are high public investors in higher education and have a strong economic standing (a high GCI) and have public universities with high or medium-high levels of autonomy. Funding reforms have contributed to an increased number of graduates in some countries by providing incentives for institutions to grow and providing financial support to students. In higher education systems where formula funding is driven by student enrolments and their graduation, the levels of attainment are higher. One has to add that governance reforms also contributed through paving the way for private higher education providers entering the market

and by extending the number of students by changing entry routes into higher education.

All countries that exhibit the highest conformity to the Modernisation Agenda are very productive in terms of **research output** (Sweden, Denmark, Finland, Netherlands, Norway, the UK, Iceland, Belgium, Austria and Germany). The only exception is Switzerland (highest research output, but in the group of countries that match less of the Modernisation Agenda's funding elements). Countries that have a medium to high share of competitive research funds mostly exhibit an above average research productivity. There is a strong link between institutional autonomy (human resource matters) and research output. This supports the finding of other research (Aghion et al., 2009) that suggests a relationship between (financial) autonomy and research performance. Financial reforms that place greater emphasis on performance-based research funding and financial reforms introducing targeted research funding seem to be part of the relationship. However, it is not just the way of funding, but also the amount that matters: the public resources made available for higher education and research have an impact as well. The top ten countries in research productivity nearly all are in north-western Europe. In some cases, funding reforms have not increased research output as some of these countries were already high performers in research.

The level of **private household financial contributions** to higher education is first of all dependent on whether higher education institutions are free to charge tuition fees. Secondly, it depends on who sets the level of tuition to be charged. If tuition fees are not permitted or the government sets tuition levels then the level of private contributions depends primarily on government policy. In the United Kingdom and the Netherlands the government allows the institutions to charge relatively high tuition fees. In some other countries, institutions are permitted to charge tuition fees to parts of the student population ('dual systems' as in Hungary and the Czech Republic). A third important determinant has been reform leading to the emergence of a substantial private higher education sector, for example in Poland and Portugal. Furthermore we find that high private contributions in a country often coincide with low public investments in higher education.

For the next three performance dimensions we find only weak links:

Our analysis concludes that there is a weak link between funding reforms and the percentage of **mature students.** Twelve of the 17 countries with high degrees of correspondence to the Modernisation Agenda's funding recommendations have relatively high shares of mature students. Underlying this link are various governance and funding reforms: financial reforms – both formula funding and/or tuition fees – that encourage institutions to admit more students, increased institutional autonomy, opening up the system to private providers, the establishment of state-university contracts, the introduction of performance-based funding systems, new student support and tuition fee schemes, and mergers. The demand side seems to be important as well. There has been increased interest from

mature students to enter higher education as a result of higher demand for higher education qualifications from the labour market.

The share of **R&D investments in higher education from business and industry** cannot clearly be related to the degree to which a country has implemented the finance-related recommendations of the EC's Modernisation Agenda. Governance and funding reforms granting public universities greater financial autonomy may have contributed to stronger interaction with business and industry in some countries. Introducing targeted funding for joint research projects with industry was also seen to have stimulated growth in this area. Higher institutional autonomy on its own, however, seems an unlikely explanation for improved performance. Institutional and particularly financial autonomy is a facilitating factor for institutions in responding to increasing business and industry demand for and investment in R&D.

Intra-European student mobility has been driven by many factors (such as regional proximity, common languages, the attractiveness of a country and the reputation of higher education systems, programmes offered in English, and entrance into the EU). Funding reforms do not have obvious effects on **outgoing student mobility**. However, in some countries there are indications that the portability of student support and issues related to tuition fees have triggered students to study abroad. For **incoming student mobility** we could not detect clear links to either funding or governance reforms. The provision of targeted funding for this purpose is an important factor in some countries while in other countries there are financial incentives such as tuition fees and funding per student/graduate for public universities to use their autonomy to increase their enrolments including by operating in the European student market. However, it is mainly other factors, often country-specific, that explain the level of incoming European students. Our analysis does suggest that countries with high investments in higher education that are economically competitive and have high (or medium-high) levels of institutional autonomy tend to have high levels of incoming European students.

Finally, for **two performance dimensions we do not find systematic links between funding reforms and system performance**. There are indications that other factors and drivers play a dominant role in performance improvements on these dimensions. We do find, however, examples that highlight the facilitating potential of such reforms under specific conditions.

In terms of **net enrolments** in higher education, the primary drivers appear to be growth in the number of study places and student and labour market demand. There are links to governance reforms (the introduction of new sectors in higher education) and funding reforms (greater incentives for students to enrol and for institutions to grow). Our analysis does, however, not support the assumption that the existence of financial incentives in combination with autonomous public institutions systematically leads to high or increasing net enrolments.

Our analysis did not find any relationship between funding and governance reforms and **graduate employability**. Assessing graduate employability by means of the relative employment position of graduates or their relative earnings did not produce any indications of a link to funding or governance reforms inspired by the Modernisation Agenda. The most important drivers of improvements on the employability dimension appear to be labour market conditions and the proportion of higher education graduates in the labour force. Our rate of return study, however, did produce support for the idea that higher education as such matters for employability. Whether higher education *policy* matters is a different issue.

Our findings suggest that *funding policies matter for some areas of higher education performance*, particularly if they go along with sufficient levels of autonomy for the institutions. This holds primarily for those areas of performance that lie closest to the primary processes of higher education institutions – the activities that are within their immediate sphere of control. There appears to be a link between the output of the primary processes (numbers of graduates and articles published) on the one hand and the funding and autonomy conditions on the other. This conclusion is supported by other research. Aghion et al. (2007, 2008 and 2009) argue that university research performance is positively correlated with university autonomy and the level of funding. For the other performance dimensions, which are not related or less directly related to the primary processes of higher education institutions, the findings of our study do not reveal clear links between governance, funding and performance. In these dimensions, performance is explained more by a combination of other factors, such as societal developments, economic conditions and political cultures.

Compared to governance reform, *funding reforms seem to have more direct effects* on system performance. This holds in particular for the introduction of performance-based funding (emphasising research quality and graduation/enrolment), tuition fees (generating revenues, providing growth incentives for higher education institutions) and competitive funding and targeted/project funds (generating revenues, stimulating quality and productivity). Like governance reforms, some funding reforms may only work in an indirect way – we have seen this to be the case for reforms that increase the financial autonomy of higher education institutions. Moreover, it may be easier to catch up than to stay ahead, meaning that some countries that are already at relatively high levels of performance may find it difficult to further increase performance – at least when performance is captured in terms of indicators primarily stressing aggregate volumes instead of qualities.

On dimensions other than educational attainment and research output (and to some extent the tuition revenues from students) the links between funding, governance and performance may exist *only in specific contexts*. What works in one country may not work in another. Our study shows many interesting country-specific examples of a positive interaction between funding reforms and performance, but more detailed research on a less aggregate level is needed to draw firm conclusions on what matters most in funding.

6.4 Policy recommendations

The final research question of our study asks for a summative reflection on our findings as well as for recommendations for future policies.

> *What lessons can be learned, i.e. what could be the further courses for action towards the modernisation of higher education institutions towards 2020?*

Our study shows that European higher education systems are 'living in interesting times'. They are experiencing substantial reform, in terms of funding, governance, autonomy, accountability, and external relations to the state and other stakeholders. Many reforms across Europe reflect aspects of the European Modernisation Agenda. In a way, this is surprising as education in general and higher education in particular have traditionally been driven by well-protected national agendas, national particularities and different developmental paths. It is also obvious and less surprising that the timing, breadth and depth of reforms differ considerably across the more than thirty European countries included in this study. The "European project" is work in progress; some countries are front-runners while others are followers. National contexts and conditions clearly influence the processes of policy formation, formulation and implementation.

What has become apparent from our study is that there are *no general recipes* that can be administered to improve the performance of higher education systems. The national context matters for three reasons: (1) whether a certain change in performance is good/important for the country and (2) whether performance changes are consistent with national priorities and (3) whether there are other variables which can explain the change. The need for contextualization leads to the following recommendation:

> *To increase mutual learning and the spreading of good practices (e.g. through the Open Method of Co-ordination) we need to take account of national* ***contexts and traditions****. To understand why reforms worked well in some countries, a serious analysis of the individual national contexts needs to be undertaken that goes beyond a mere benchmarking exercise and produces insights for tailored solutions for other countries, taking into account their starting positions or their comparative advantages.*

And on the same note:

> *Reforms based on a broad agenda that encompasses many policy areas make little sense. Reform agendas should* ***target a more limited selection of weak areas*** *per country, based on a careful SWOT analysis. Overloading the reform agenda with too many goals (or even instruments) may raise the stakes too high when it comes to the assessment of what has been achieved.*

Our rate of return study has led to the conclusion that higher education in Europe continues to be a profitable investment opportunity, both privately and socially. The size of the social returns to investment in higher education means that the sector is underfunded. The size of the private returns to education means that part of the increased funding could come from private sources, such as increased student fees. Regarding equity concerns, higher education public funding should not be equal across the board, e.g. tuition free for all students, regardless of their socio-economic background. Students from low-income families could receive a subsidy while others would have to pay the full cost of their education. The evidence shows that such costs would be recovered later in life through higher earnings. This leads to the following recommendation:

> *To shape the funding of higher education, **cost sharing** between the state and students should be the leading principle. Public subsidies should continue to be provided for higher education, regardless of the sector of provision (public or private). Students should be expected to pay a tuition fee, where the fee level is regulated to ensure cost containment and moderation.*

Charging fees will free up public funds to be spent on providing support for disadvantaged groups. On the matter of student support we have seen many countries lagging behind in providing student support in the shape of loans. Two thirds of the countries in our study have a student loans system in place, next to means-tested grants for undergraduate students or tax relief and child allowances for their parents. However, some others still lack a loans system. This leads us to the following recommendation:

> *Countries should back up their tuition fee measures with student support systems that consist of **grants AND loans** to cover the students' fees and living costs. The grants will need to be based on assessed need to encourage participation by students from disadvantaged backgrounds. The loans system should be shaped according to the principle of income-contingent repayments (i.e. full debt collected in accordance with a graduate's ability to repay) and debts carrying an interest rate that is partly subsidised by government. Loans and grants need to be made available also for students studying in accredited private higher education institutions.*

Across Europe, funding reforms have been implemented to different degrees in different countries, and this has created increased opportunities for higher education institutions to act as more integrated organisations and to determine their own profiles and strategies. Their level of financial autonomy has increased, although they remain very dependent on public funding. However, there is no doubt as well that higher education institutions need to act within frames set and controlled by public authorities.

Funding mechanisms on the one hand need to achieve accountability and performance-orientation and, on the other, permit a wide scope for institutional differentiation. Such differentiation requires autonomy. As part of their overall governance frameworks, countries are confronted with the challenge to design steering mechanisms that are consistent with national priorities and sensitive to differentiated institutional missions. Our study has seen that more and more countries are using a mix of formula-based funding approaches and contract-based performance agreements. While the formula constitutes the largest part of the budget, the contract parts allows funding authorities to pay attention to institutional targets. This brings us to the following recommendation:

> *For their funding mechanisms, countries should rely mostly on* ***formula-based approaches*** *(that include both inputs and outputs as funding drivers), but on top of that they may wish to consider a* ***contract-based approach*** *that includes more targeted and project-based funds – not in terms of an array of separate funding streams each with different accountability requirements[44], but more in the shape of an integrated package.*

This requires that both governments and institutions need to articulate a long-term strategy. This a challenge, but one that needs to be faced.

Governance reforms granting greater institutional autonomy seem to have the most visible and direct effects on key performance dimensions when they are combined with funding reforms. The two often go hand in hand. More institutional autonomy combined with performance-based funding for research and a more competition-based research system are likely to have positive effects on research productivity. More institutional autonomy combined with financial incentives for higher education institutions to improve graduation rates is also likely to have a positive impact on educational attainment. This underlies the final recommendation:

> *Introducing more performance- and competition-based funding should go hand in hand with more institutional autonomy overall for European higher education institutions. This combination is most likely to contribute to system performance in higher education's primary processes and products.*

Finally, reforms need time to sink into systems and to reveal their potential. The 1995 to 2008 period of reform and the 2002 to 2006 period for assessing changes in performance have limited our capacity to fully understand the implementation of reforms and their effects. Short term effects can be seen, but long term impacts, arguably those that really change systems, are more difficult to observe. In reform processes the transaction costs for higher education systems and institutions are significant; the effects of reforms on performance need to be developed over time. The

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[44] We would like to refer here to the recommendation made in our parallel study on governance reform, where we also touch on the trade-off between autonomy and accountability.

progress made thus far is only an intermediate step; the Modernisation Agenda calls for further implementation and ongoing assessment.

> ***A European monitoring system*** *should be established to address important aspects of reform and performance in higher education systems in constant flux. A European scoreboard for higher education could integrate and further develop important indicators for performance and for the characteristics of higher education systems and their reform. Such a monitoring system would also provide a valuable foundation for the analysis of national systems and the development of tailor-made recommendations for further reform.*

References

Aghion, P., M. Dewatripont, C. Hoxby, A. Mas-Colell and A. Sapir (2007). "*Why reform Europe's universities?*" Bruegel Policy Brief(04).

Aghion, P., M. Dewatripont, C. Hoxby, A. Mas-Colell and A. Sapir (2008), *Higher aspiration: An agenda for reforming European universities,* Bruegel Bleuprint 5;

Aghion, P., Dewatripont, M., Hoxby, C.M., Mas-Colell, A., Sapir, A. (2009), *The governance and performance of research universities: Evidence from Europe and the U.S*. NBER Working Paper 14851.

Altbach, P. (2005), The Anatomy of Private Higher Education. In Altbach, P. and D.C. Levy. *Private Higher Education: A Global Revolution*. Boston: Sense Publishers, pp.13-16.

Amable, B. & Petit, P. (2001), *The diversity of social systems of innovation and production during the 1990s*. Working paper No. 2001-15. Paris: CEPREMAP.

CHEPS Consortium (2006), The extent and impact of higher education governance reform across Europe. Part 1: Comparative Analysis and Executive Summary, Enschede: Center for Higher Education Policy Studies. Available also from: <http://ec.europa.eu/education/doc/reports/index_en.html>

Conraths, B. and Smidt-Södergard, H. (2004), *The funding of university-based research and innovation in Europe. A study for the EUA for the European Commission,* DG Research. Brussels: EUA.

Council of the European Union (2007), Council Resolution on modernising universities for Europe's competitiveness in a global knowledge economy, Brussels: EU Council.

de Boer, H., Enders, J., & Schimank, U. (2006), On the way towards new public management? The governance of university systems in England, the Netherlands, Austria, and Germany. In D. Jansen (Ed.), *New Forms of Governance in Research Organizations- Disciplinary Approaches, Interfaces and Integration* (pp. 1-22). Dordrecht: Springer.

Dill D.D. and F.A. van Vught (eds) (2010) *National Innovation Strategies and the Academic research enterprise,* Johns Hopkins University Press, Baltimore, forthcoming.

Dima, A. (2005). Higher Education in Portugal. CHEPS Monitor report. Enschede, CHEPS.

Duczmal, W. (2005). Access and Private Higher Education in Poland. In Altbach, P. and D.C. Levy. *Private Higher Education: A Global Revolution*. Boston: Sense Publishers, pp. 195-198.

Estermann, T. & Nokkola, T. (2009), *University autonomy in Europe I. Exploratory study*. Brussels: European University Association.

European Commission (2003). *The Role of the Universities in the Europe of Knowledge* (No. COM (2003) 58). Brussels: European Commission.

European Commission (2004). Facing the Challenge. *The Lisbon Strategy for Growth and Employment,* Report from the High Level Group, chaired by Wim Kok. Luxembourg: Office for Official Publications of the European Communities.

European Commission (2005a). *Contribution to the Conference of European Higher Education Ministers in Bergen*. Brussels: European Commission.

European Commission (2005c). *Working Together for Growth and Jobs. A new start of the Lisbon strategy* (No. COM (2005) 24). Brussels: European Commission.

European Commission (2006a). *Delivering on the Modernisation Agenda for Universities: education, research and innovation* (No. COM (2006) 502). Brussels: European Commission.

European Commission (2006b*). Progress towards the Lisbon Objectives in Education and Training* (No. SEC (2006) 639). Brussels: European Commission.

European Commission (2007). *The European Research Area: New Perspectives* (No. COM (2007) 161). Brussels: European Commission.

European Commission (2005b). *Mobilising the Brainpower of Europe: enabling universities to make their full contribution to the Lisbon Strategy*. Brussels: European Commission.

European Commission (2006), *Annual Progress Report on Growth and Jobs* ("Time to move up a gear")

European Commission (2008), ***Progress towards the Lisbon Objectives in Education and Training –Indicators and Benchmarks – 2008***, SEC (2008) 2293. Brussels: European Commission.

Eurydice (2000), *Two decades of reform in higher education in Europe: 1980 onwards*, European Commission (DG Education and Culture).

Eurydice (2008), *Higher Education Governance in Europe. European Commission* (DG Education and Culture).

File, J. (2008). *Higher Education in Portugal.* CHEPS Monitor report. Enschede: CHEPS.

Geiger, R. (2004). *The Publicness of Private Higher Education*. Presentation at CHER conference, Enschede, the Netherlands, September 17-18.

Geiger, R. (1986). *Private Sectors in Higher Education: Structure, Function and Change in Eight countries*. Ann Arbor, University of Michigan Press.

Georgieva, P. (2002). *Higher Edudation in Bulgaria.* Bucarest: Unesco CEPES.

Gornitzka, A. (2006), *The Open Method of Coordination as practice - A watershed in European education policy*? ARENA Working Paper No. 16, December 2006. Oslo: University of Oslo.

Halffman, W. and L. Leydesdorff (2009), *Is inequality among universities increasing? Gini coefficients and the elusive rise of elite universities*. Minerva (forthcoming).

INNO-Metrics (2007), European Innovation Scoreboard 2007 - *Comparative analysis of innovation performance, E*uropean Commission DG Enterprise & Industry, INNO-Metrics: Luxemburg.

Jiao Tong University, *Academic Ranking of World Universities* (2008), Retrieved April 16, 2009, from: www.ARWU.org.

Jongbloed, B. (2004). Regulation and competition in higher education. In: Teixeira, Jongbloed, Dill & Amaral (Eds.), *Markets in Higher Education. Rhetoric or Reality?* pp. 87-111. Dordrecht: Kluwer Academic Publishers.

Jongbloed, B.W.A. & Vossensteyn, J. J. (2001). Keeping up Performances: an international survey of performance based funding in higher education. *Journal of Higher Education Policy and Management*, Vol. 23, No. 2, pp. 127-145.

Kaiser, Frans 2007. Higher Education in France. CHEPS Monitor report. Enschede: CHEPS.

Kaiser, F., & de Boer, H. (2007*), Looking for the remote control in higher education systems. An international quest for instruments to steer higher education at a distance on systems performance*. Enschede: CHEPS.

Lassnigg, L./Unger, M./Pechar, H./Pellert, A./Schmutzer-Hollensteiner, E./ Westerheijden, D. F. 2003: Review des Auf- und Ausbaus des Fachhochschulsektors. Studie im Auftrag des Bundesministeriums für Bildung, Wissenschaft und Kultur (bm:bwk). Wien.

Lepori, B., M. Benninghoff, B. Jongbloed, C. Salerno and S. Slipsæter (2007), Changing models and patterns of higher education funding: some empirical evidence, in: A. Bonaccorsi and C. Daraio, *Universities and strategic knowledge creation, Specialization and performance in Europe*, PRIME Series on Research and Innovation Policy in Europe, Cheltenham: Edward Elgar Publishing Limited.

Lepori, Benedetto 2008. Research in non-university higher education institutions. The case of the Swiss Universities of Applied Sciences. *Higher Education*, forthcoming

Leszczensky, M., D. Orr, et al. (2004). *Staatliche Hochschulsteuerung durch Budgetierung und Qualitätssicherung: Ausgewählte OECD-Länder im Vergleich*. Hannover: HIS GmbH.

Matějů, P. T. Konečný, S. Weidnerová and H. Vossensteyn: "*Student Financing, Opportunity Growth, and Equity in Access to Higher Education. A Czech-Dutch comparative study of student support systems and their effects on the development of inequity in access to higher education*." (currently under review in *Higher Education*, extended version published in Czech in the Czech Sociological Review, 5/2009: http://sreview.soc.cas.cz/uploads/a3cfbb693e42ea4491bb18005af05b432e1189d8_MatejuetalSC2009-5.pdf).

Nicolescu, L. (2005). *Private versus Public in Romania*: Consequences for the Market, pp. 199-202.

OECD (2007), Education at a Glance 2007, Paris: OECD.

OECD 2007. Tertiary Education in Portugal, Paris: OECD.

OECD (2008). Tertiary Education for the Knowledge Society. OECD Thematic Review of Tertiary Education. Paris: OECD.

Pechar, H. (2003). In Search of a new Profession. Transformation of Academic Management in Austrian Universities. In: Amaral, A., Meek, L., Larsen, I.M. (eds.): *The Higher Education Managerial Revolution*? S. 79-99.

Pollitt, C. and G. Bouckaert (2000). *Public management reform: a comparative analysis*. Oxford/ New York: Oxford University Press.

Santiago, P. et al. (2008), Tertiary Education for the Knowledge Society:
VOLUME 1: Special features: Governance, Funding, Quality; and
VOLUME 2: Special features: Equity, Innovation, Labour Market, Internationalisation. Paris: OECD.

World Economic Forum / Porter, M, and K. Schwab (2008), The Global Competitiveness Report 2008-2009, World Economic Forum. Retrieved 16 April 2009 from: http://www.weforum.org/pdf/GCR08/GCR08.pdf

Slantcheva, S. (2005). The Private Universities in Bulgaria. In Altbach, P. and D.C. Levy. *Private Higher Education: A Global Revolution*. Boston: Sense Publishers, pp. 183-190.

Strehl, F., Reisinger, S., and Kalatschan, M. (2007), *Funding Systems and their Effects on Higher Education Systems - International Report.* OECD Education Working Papers No. 6. Paris: OECD.

Teixeira, P., Jongbloed, B., Dill, D.D. & Amaral, A. (eds.) (2004), *Markets in Higher Education. Rhetoric or Reality?* Dordrecht: Kluwer Academic Publishers.

Teixeira P.N., D.B. Johnstone, M.J. Rosa and J.J. Vossensteyn (2006), *Cost-sharing and accessibility in higher education: A fairer deal?*, Douro Series: Higher Education Dynamics, Dordrecht: Springer.

Veugelers, R. and F. van der Ploeg (2008*), Reforming European Universities: Scope for an Evidence-Based Process*, CESIFO Working Paper No. 2298, Retrieved April 16 2009 from: http://www.cesifo-group.de/

Vught F.A. van (1989), *Governmental Strategies and Innovation in Higher Education*, London: Jessica Kingsley.

Weert, E. de, and M. Soo (2009) *Research at Universties of Applied Sciences in Europe. Conditions, Achievements and Perspectives*. Enschede: CHEPS.

Appendix 1: Governance and funding reforms across Europe over the last decades

Note: in some cases the reforms have taken place over more than one time period; these are indicated at the end of the section for the country

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Austria	New national Act 1993: first steps to increase institutional autonomy		New national Act 2002 increases institutional autonomy radically: full legal status of universities, new funding mechanisms – more financial autonomy, new internal governance structure, staff appointed by the HEI, freedom to programme teaching and research; Internal quality assessment mandatory; 2001 introduction tuition fees – abolished in 2008; Establishment of national buffer organizations such as quality assurance agencies, national science council and council for R&D;	2009: mergers of quality assurance agencies for public universities, *Fachhochschulen* and private universities foreseen
	System diversification through establishing *Fachhochschulen* (in PPP), private institutions and *Paedagogische Hochschulen.* There are major differences between these higher education sectors, e.g. for public universities there is in general open access, whilst *Fachhochschulen* can select their students			
Belgium (-Flanders)	1989 state restructuring – Flemish Community responsible for its HE New acts 1991 and 1994: more autonomy HEIs, (partially) lump sum funding, mergers of *hogescholen*		Introduction BaMa system, establishment of associations (collaboration one university and several *hogescholen*), 'upgrading' of study programmes of *hogescholen*, establishment accreditation system; Substantial increase research funding	2008 new funding system: less emphasis on input and more on output funding (student performance-based)
	Introduction of quality assurance in education, second wave of 'democratisation' (higher participation rates), and internationalization of the *hogescholen*			

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Bulgaria		1996 national evaluation and accreditation agency; Internal quality evaluation for teaching and staff; Introduction formula-based institutional funding; Introduction tuition fees, determined by Council of Ministers;	Introduction Bologna principles; Council of ministers has to approve the total number of study places; Minister of Education develops Register of HEIs;	Each HEI should create Board of Trustees; 2008 Adaptation student support system foreseen
	Increase in the research budget allocated by national Scientific Fund			
Cyprus	Establishment of first university 1989		Two new universities;	Establishment of three private universities;
Croatia	1993 establishment of several national agencies; establishment of Universities of Applied Sciences		2001: establishment National Foundation for Science and Higher Education; 2003: Shift from earmarked funding to lump sum funding; Restructuring of study programmes (Bologna); 2003: 'state regulated' standardized quality assessment for teaching and research; 2003 (2007): Increased participation rights for students in institutional decision making 2004: establishment Agency for Science and Higher Education	2009 Act on National Foundation for S&HE and Act on quality assurance 2007: encouragement of entrepreneurialism, research commercialization and third party funding; Establishment of Strategic Council for Science and Technology and the National Innovation System Council; 2007 organizational integration of faculties – not implemented
	Acts of 2003 and 2007 were not fully implemented; university senates determine annual quotas of admitted students; students above the number of publicly funded places are charged tuition fees – some tuition fees set by rector and ministers, others not regulated.			
Czech Republic	Radical change after 1990 – 'full' institutional autonomy; Higher Education Council representing HEIs with many powers; Accreditation Commission	1998 HE Act: introduction private sector, state universities become public legal bodies and get ownership of property, strengthening executive leadership vis-à-vis faculties, introduction of board of trustees (external membership), new powers to Accreditation Committee, introduction of 'strategic plans' of ministry and HEIs	2002 Research and Development Act:	Gradual changes in funding formulas (e.g. number of students as new parameter **à** more performance-based); Changes to R&D Act: funding more output related
	Despite the changes in the legal system (e.g. HE Act 1998) there have not been major changes since 1995			

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Denmark		1999 Contract-based steering	2003 HE Act: new internal university governance system (e.g. rector appointed by institution's board); Introduction of contractual relationship between HEI and state	2007 Mergers of HEIs (including research institutes) – creation of large and multi-campus universities; new independent QA agency (as consequence of Bologna); funding research performance (consequence of 'Globalisation strategy' of state)
	Taximeter system (performance-based funding) has been 'constantly' reformed			
Germany (NRW)			Accreditation of study programmes through external agencies;	Shifts in authorities from federal to state level; new HE act in 2007: more institutional autonomy in funding, HR and internal organisation; introduction of university councils with external members (in NRW with decision making powers); HEIs (in NRW) can charge tuition fees – maximum level set by the state; importance of historically-based funding decreased in favour of more formula funding and contracts between state and HEIs; reforming remuneration system for professors; Excellence Initiative: promoting research excellence; HE Pact: additional state and federal funding to cope with increasing student numbers.
	Gradual shift to lump sum budgeting; more centralization inside HEIs			
Estonia	Reorganization HE and R&D system since early 1990s – Universities Act 1995	1997: reorganization Academy of Sciences and integration of research institutes into universities; 1995: introduction quality assurance framework – institutional and programme accreditation; 1998 establishing professional HE and private HEI and expansion fee-charging education in public universities; Changes in admission procedures of HEIs;	2003: Quality Assurance Committee under auspices of Estonian Rectors' Conference; Introduction Bologna principles; New funding formula based on output (performance-based);	2009/10: introduction of three year contract between state and institution; 2007 significant increase in basic funding of study places; Changes in study allowances and study loans; 2005: introduction of base-line funding for research
	Tuition fees introduced in early 1990s but have become increasingly important as source of income; shift from detailed input line item funding to lump sum allocation system			

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Finland	1994: budgeting based on operational expenditures and performance agreements between state and HEIs;	Universities Act 1997: HEIs responsible for quality assessment; national coordination of quality assurance by Finnish Education Evaluation Council; 1998: professors appointed by institutional leadership instead of by the state; Introduction of Universities of Applied Sciences (polytechnics), started in 1991;	Polytechnics Act 2003	2006: introduction of institution-based new salary system based on work load and performance; 2006: universities can establish university companies; introduction of national and regional innovation systems; 2009/10: new act prepared and might change legal status of universities, internal governance and ownership of property; Mergers of universities and alliances of universities and polytechnics
	Over the last decade a shift from line item budgeting to lump sum funding as well as from historically-based to formula funding;			
France	1980s multi year contracts between HEI and state, as 'side effect' created gradually more administrative autonomy	1999 Innovation act: mobility of teachers-researchers	Introduction Bologna principles (LMD reforms)	2005 Pact of Research e.g. clustering of research and teaching, 'leading' to 2006 Law for Research: increase research excellence and visibility; 2006 LOLF increased efficiency in university management in finance and HR; 2007: introduction Agency for the Evaluation of Research and Education; 2007 Law for Autonomy of Universities (LRU): more institutional governance and funding autonomy.
Greece			2001 upgrading TEIs to HEIs and formation of binary system	2005: new agency for recognition of degrees; 2005: introduction quality assurance, ECTS and diploma supplement; 2007: changes in internal university organization; maximizing study duration; scholarships and student loans, stronger demands for transparency, publicity and accountability; New allocation model for state funding and four year strategic plans for HEIs
Hungary		1995 introduction of 'cost covering' students 1996 Introduction formula funding	2000 Integration of HEIs ('mergers') 2001 introduction of student loan system	2005 introduction of Financial Board at institutions 2005 changes in admission and allocation of students 2005 increasing financial autonomy 2006 introduction of three year performance funding contracts

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
	Increasing institutional freedom in deciding on internal governance structures			
Ireland		1997 University Act: greater academic freedom, autonomy for universities and internal quality assurance; Abolition of tuition fees; Introduction competitive funding for research;	2003 National Qualifications Framework; 2003 establishment of Science Foundation Ireland and research councils, increase in research funding with greater emphasis on competitive funds	2006 Institutes of Technology Act: giving IoT more autonomy and becoming part of HE act (for greater coherence); 2006 Grant Allocation Model replacing historical funding system with more output and performance-based parameters;
Iceland		1997 University Law: opening up for private universities; Colleges were entitled to call themselves universities; More institutional autonomy (deciding on own internal structure, more external memberships); More systematic external quality assurance; 1998 introduction performance-based funding;		2006: public and private institutions get equal status; Adaptations in act as regards Bologna principles; 2008 new act stipulating that majority of senates are external stakeholders
Italy	1989 first start with granting more institutional autonomy.	1993-1995-1996: more institutional autonomy; Introduction of new national body to evaluate teaching and research; 1999: each university has to establish an internal evaluation body 1997: decentralization of authorities from state to institutions; 1995: shift from line item budgeting to lump sum allocation;		
Latvia	1991 Law on Education – private institutions were allowed and tuition fees introduced	1995 Law on HE	2001 introduction formula funding – 'contract-like' arrangements between state and HEI; Adaptations internal governance structures: strengthening leadership and management roles; Introduction of Higher Education Council – national strategic advisory body;	2006: universities become 'autonomous public entities'; 2006: ministerial approval of HEI research plans with separate funding for strategic research;
Liechtenstein	1992 first HEI (University of Applied Sciences)		2004 new HE act as the result of the Bologna process; Changes in state education support; Introduction new funding formula	2008 *Hochschule Liechenstein* given right to award doctoral degrees; 2009 new act proposed

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Lithuania	1991 Law on HE&R	1995 establishment of Lithuanian Centre for Quality Assessment in HE	2000 introduction of student registration fee; Less autonomy: study programmes must be in accordance with (strict) guidelines that are approved by government ('national curricula'); Introduction binary system – establishing non-university colleges; Change internal university governance: introduction university council (or board) with partly external membership; linking university funding to research performance;	2009 new act: change in legal status HEIs; Change internal governance structure with more powers of the university council/board; Expanding performance-based competitive funding; Abolition of the 2000 registration fee; Changing student support system; Introducing 'student basket'
Luxembourg			2003 establishment University of Luxembourg;	
Netherlands	Since 1985 several reforms to increase institutional autonomy and introduce quality assurance systems for teaching and research; mergers of *hogescholen* starting in 1983;	1997 change internal governance structure: strengthening executive leadership and introduction of supervisory board with external members; More emphasis on valorization (transfer and 'utilization' of knowledge); More conditional funding for research; 1996: introduction of student performance grant;	2002/03 introduction of Bologna principles; accreditation system along side existing evaluation systems for teaching and research; 2001 strengthening applied research function of Universities of Applied Sciences (e.g. through new staff category)	

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Norway			2001/04: implementation Quality reform with more output-based funding system, introduction of compulsory national quality assurance system and an independent QA agency (accreditation) and enhancing institutional autonomy as regards its own internal governance structure and programmes offered; 2005 common regulatory framework for both public and private HEIs; 2003 colleges that offer a minimum of four doctoral programmes can apply for university status; Introduction Bologna principles with new degree structures; A more performance-based student support system;	
Poland	1990 ministry issues national curricula; private HE possible, introduction tuition fees		2001 introduction mandatory internal quality assessment for teaching and establishment state accreditation commission; 2001 same conditions for private and public students as regards student support	2007 mandatory external quality assessment of research; 2005 shift from entrance exams to external maturity exams; Shift from ministry to State Accreditation Committee as regards curricula; 2005 student representation in governing bodies of public universities increased; 2010: establishing flagship universities foreseen; more transparent academic careers foreseen; charging tuition fees for full time public students foreseen; HEIs more freedom to develop their own curricula foreseen

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
Portugal	1988 Law on Autonomy – increased institutional autonomy, new governing boards with external participation, possibility of independent legal status for public institutions, establishment of consortia, recognition of research centres as part of university management		2003/05 performance-based formula funding; differentiation of tuition fees;	2006 regulations access for students over 23 years; 2007 introduction student loan scheme 2007 new legal regime for HEIs which changes internal governing structure and creation of new type of institutions (public foundations by private law); Changes internal governance: less collective decision-making, reduction size governance bodies, less student participation and more external involvement
Romania	Before 1990 completely centralized system; 1993 accreditation law; more democratized internal governance systems	1995/97/98 more financial and academic autonomy in universities; universities entitled to raise both public and private funds (e.g. tuition fees); Private universities can compete for public research funds; 1999 introduction new formula funding system 1998 ministerial strategic plans as basis for contracts between state and HEI		2005/07 quality assurance reforms – introduction periodical quality evaluation 2005 introduction Bologna principles Restructuring (reducing) the number of HE specializations; Introduction of doctoral school system;
Slovakia			2002 state HEIs are transformed to public institutions; Institutional autonomy increased; Faculties no longer legal entity; 2003 universities own their property; 2002 changing conditions for private institutions – growing number of privates; Less direct state steering – developing national strategic plan and HEIs develop their own strategic plans – to be discussed with ministry; 2002 introduction Board of trustees – strengthening link between institution and society; Introduction targeted funding and increase competitive funding;	

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
	More output-driven formula funding; HEIs can decide on tuition fees for special groups of students;			
Slovenia	1993 universities became legal entities, private HEIs allowed;	1997 establishment National HE Quality Assessment Commission; 1999 financial autonomy and ownership of property; Democratization of internal university governance;	2004 introduction of lump sum funding; Introduction quality assurance system; 2004 composition of the administrative board changed;	2008 Senate of Evaluation responsible for QA – replacing 1997 national evaluation body;
Spain (Catalonia)	1983: autonomous status universities within regulatory framework; authority shift from federal to regional level; professors 'belong' to university and not to national body;		New Universities Act Catalonia (2001) with subsequent reform in 2007; Some lay persons in university social council; election of rector by direct vote; increase staff representation; Accreditation by new national agency for quality assessment and accreditation; Catalonian Universities Act 2003: system structuring, increase university funding, framework for contract teaching staff;	2007: more institutional freedom for curriculum design; More freedom to open new posts and select academics; More freedom to decide on internal organization;
	Gradual introduction of quality assurance system and reorganization competences regional quality agency; introduction formula funding with more emphasis on outputs; targeted national funding for teaching quality and student mobility; growing importance of competitive research grants			
Sweden	1993 HE act; early adopter of reforms (early 1990s) concerning devolving authorities from the state, management by objectives, quality assurance, accountability and performance-based funding;	1995 national system of quality assurance and creation National Agency for HE; 1997 more detailed result specifications funding, all HEIs granted funding for research; 1998 rector no longer chair of University Board, chair and most board members appointed by state (changed in 2007); 1999 new rules for HR based on merit and research production; 1999/00 HEIs may apply for changed status – colleges becoming universities;	2000/01 establishment of four research funding bodies; Increasing focus on strategic management;	2006 implementation Bologna principles – new study structures; 2009 new system public funding gradually introducing research performance-based funding; 2011 foreseen changing legal status universities to autonomous organization with special public law status – staff no longer governmental employees, more entrepreneurialism, more institutional strategic profiling, multi annual contracts between state and institutions;
Switzerland		Establishment of Universities of Applied Sciences; Reform federal Act: strengthening joint governance structures and cooperation between Confederation and cantons;		Preparation new HE Act – common framework for whole higher education system

Country	Prior to 1995	1995-1999	2000-2004	Post 2004
	General increase autonomy HEIs; gradual reform funding system from historically-based to more balanced system			
Turkey	1981 integration all HEIs; 1982 introduction private institutions		2003/07 public funds allocated through performance-based system in accordance with annual plans of universities;	2005 yearly internal assessment of academic and administrative activities and external assessment every five years; 2005 establishment of Commission for Academic Assessment and Quality improvement in HE; 2005 intention to increase student participation in HE governance – introduction of national and institutional student councils;
United Kingdom	Early adopter of 'NPM reforms'; introduction of influential Research Assessment Exercises; 1992 abolition of the binary system; Quality Assurance systems; Funding councils	1997 introduction tuition fees (flat rate);		2006 introduction variable tuition fees

Appendix 2: National experts

Country	National expert	Institution
Austria	Hans Pechar	University of Klagenfurt
Belgium	Kurt de Wit	Katholieke Universiteit Leuven
Bulgaria	Pepka Boyadjieva	Institute of Sociology, Bulgarian Academy of Sciences
Croatia	Danijela Dolenec	Institute for Social Research
Cyprus	Petros Pashiardis	Open University of Cyprus
Czech Republic	Ales Vlk	Independent consultant
Denmark	Hanne Foss-Hansen	University of Copenhagen
Estonia	Hanna Kanep	Estonian Rectors' Conference
Finland	Timo Aarrevaara	University of Tampere
France	Christine Musselin	Centre de Sociologie des Organisations (Sciences Po and CNRS)
Germany	Barbara Kehm	INCHER–Kassel
Greece	Rania Filippakou	Institute of Education, University of London
Hungary	Jozsef Temesi	Corvinus University of Budapest
Iceland	Jón Torfi Jonasson	University of Iceland
Ireland	Lewis Purser	Irish Universities Association
Italy	Emanuela Reale	Cnr CERIS
Latvia	Indrikis Muiznieks	University of Latvia
Liechtenstein	Benedetto Lepori	University of Lugano
Lithuania	Rimantas Zelvys	Vilnius Pedagogical University
Luxembourg	Fritz Ohler	Technopolis
Malta	Carmel Borg	University of Malta
Netherlands	Ben Jongbloed	CHEPS, University of Twente
Norway	Bjorn Stensaker	NIFU STEP
Poland	Wojciech Duczmal	The Academy of Management and Administration in Opole
Portugal	Pedro Teixeira	University of Porto
Romania	Luminita Nicolescu	Academy of Economic Studies
Slovakia	Gustav Murin	Comenius University
Slovenia	Aleksandra Kovac	CHEPS, University of Twente
Spain	Pepe Mora	Institute of Education, University of London
Sweden	Anki Dällnes	SISTER
Switzerland	Benedetto Lepori	University of Lugano
Turkey	Fatma Mizikaci	Eastern Mediterranean University
United Kingdom	Paul Temple	Institute of Education, University of London