

# How to reform higher education in Europe

## SUMMARY

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*Although there are exceptions, most European universities and institutions of higher education find it difficult to compete with the best universities in the Anglo-Saxon world. Despite the Bologna Agreement and the ambitions of the Lisbon Agenda, European universities are in need of fundamental reforms. We look at structural reforms of higher education and propose more effective use of public subsidies, more efficient modes of financing institutions of higher education, more diversity, competition, and transparency, larger private contributions and more equity. In the process we discuss the nature and governance of an institution of higher education, selection, hierarchy in higher education, grade-inflation, fair competition, private and social returns to education, income-contingent loans, equity, and transparency. We sum up with seven recommendations for reform of higher education in Europe.*

— Bas Jacobs and Frederick van der Ploeg

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# Guide to reform of higher education: a European perspective

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## 1. INTRODUCTION

The dual objective of mass access and excellence requires a dynamic and competitive higher education sector. The proportion of adults with a higher education degree in OECD countries has in a quarter century almost doubled. The new growth economics indicates that knowledge and creativity are replacing land, mineral resources and physical capital in becoming the most important engines of economic growth. This suggests a golden age for universities. Still, as *The Economist* (2005) points out, academic institutions in Europe do not seem ready to pick up the challenges ahead, getting stuck instead in struggles with politicians about more funding. European higher education is stifled by excessive regulation from the state. The US, in contrast, is much better at letting a thousand flowers bloom.

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It is perhaps not a surprise that many of the best students, post-docs and professors in Europe move to a US top university as soon as they get the chance to go. Most academics argue that the United States offers a more exciting, dynamic and competitive environment for higher education than Europe. Indeed, continental Europe only has five universities in the Times Higher Education Supplement list of top 50 universities. Two of these are in Switzerland, two in France, one in Germany, and none in Italy, Spain, the Benelux or Scandinavia. Of the top universities 41 have an Anglo-Saxon system of higher education. This year's global university rankings published by the Shanghai Jiao Tong University, the most thorough of world rankings, showed only two European universities in the top twenty and they were both British (Cambridge and Oxford). Much of the policy debate in Europe is therefore about reforming the system of higher education towards a more Anglo-Saxon oriented system.

Still, the continental European system has merits over the US system. The average quality of higher education institutes (HEIs) is regarded to be better in Europe, accessibility of higher education for children from less privileged backgrounds is better, and there may be a stronger focus on long-run research. Indeed, the Education Commission of the United States warns in its recent 'Closing the College Participation Gap' that the United States does far worse than other developed countries. In 2000 the United States was tied in 13th place out of 32 industrialized countries in the percentage of the population that entered higher education. The United States suffers from a relatively high dropout rate at schools. OECD data indicate that the average of years of schooling for Americans is 12.7 years, which is less than in Norway, Denmark, Iceland, the Netherlands, Luxemburg, Germany, Switzerland, Australia and Canada. The United States only comes tenth in the percentage of young people that are awarded a high school diploma. Fewer Americans aged 25–34 obtain a high school diploma or higher education degree than the baby boomers. Although the United States has some of the best universities in the world, the US system does not appear as successful as other industrialized countries. Research output of Switzerland, the United Kingdom, Denmark, Spain, Sweden, Belgium, Canada and Australia scores better in terms of number of scientific publications per ten researchers and per dollar than the United States (e.g., NOWT, 2003). The challenge for those who wish to reform the European system of higher education is thus to get the diversity and quality for which part of the US system is justly praised without throwing out the benefits of the European system. Continental Europe may have more to learn from the UK, Canadian and Australian than the US system of higher education.

Policy discussions on higher education are often highly controversial. For example, in the United Kingdom Tony Blair almost stumbled over his plans for top-up fees in combination with income contingent loans (*The Economist*, 2003a, b). Controversies arise about the roles of the government and the private sector. They also arise about

whether higher education should be elitist or not and whether or not it can be left to the market. Many argue in favour of strong government intervention in higher education: to guarantee equality of opportunity, to secure universal access to higher education, to maintain a diverse higher education system, to avoid commercialization of research, and so on.

In this paper we sketch the contours of a policy agenda to reform higher education in Europe. We frame our analysis in modern welfare economics. We identify the reasons why higher education cannot be left to the market alone and why government intervention may be necessary to correct for these market failures. We do not touch upon the political economy of higher education reform. We acknowledge that political economic aspects are very important indeed. However, we firmly believe that it is precisely because elementary insights from public finance are lacking that politicians and policymakers are currently not capable of convincing the public of the benefits of certain reforms. Without a clear vision on the goals of higher education, and how these goals can be reached, education policy threatens to be *ad hoc* and mainly driven by special interests. We hope that our welfare economic approach contributes to a more rational debate on higher education reform with a stronger emphasis on the general interest.

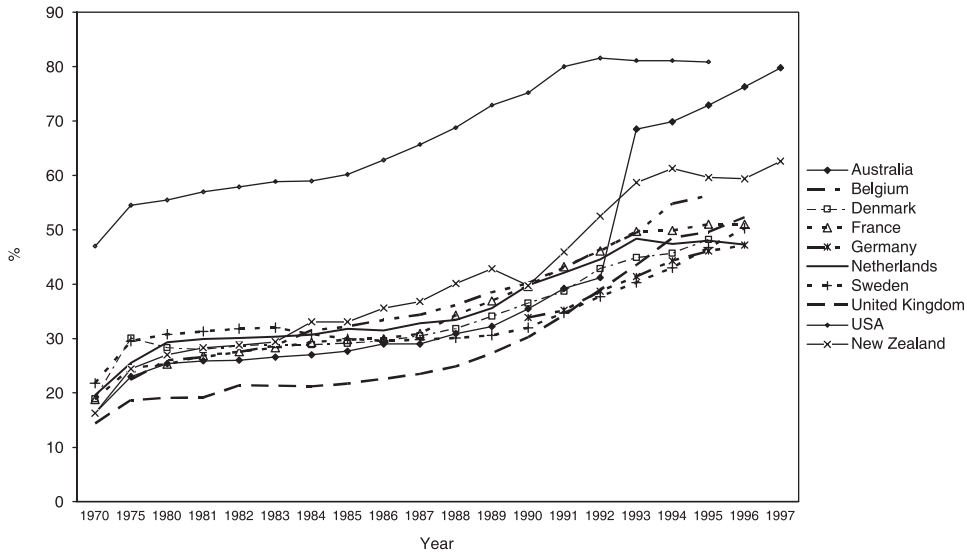
We analyse the consequences of external/merit good aspects of higher education, and how the government should organize its subsidies. We show that merit good aspects give a rationale for subsidies, but certainly not subsidies across the board for all studies. Related to this discussion is how subsidies should be allocated to maintain diversity in higher education. We also pay attention to monopolies and entry barriers in higher education. In some countries, scale in the higher education sectors has increased so much that one should worry about fair competition and undercutting of quality and quantity of higher educational services. We also stress the importance of information and transparency to improve the functioning of the market for higher education. Information asymmetries cause agency problems in funding schemes, governance structures of HEIs, selection of students, hiring of academic personnel, and the regulation of higher education sectors. Due to information problems, government intervention is not without problems either. Subsidies often create all kinds of unintended side effects: misallocation of resources, excessive enrolment of unmotivated students and perverse redistribution of incomes. Government funding schemes for HEIs may give rise to grade-inflation, monopolistic practices, and reduced incentives to manage universities efficiently. Capital and insurance market failures make it impossible for students from poor backgrounds to obtain funds and insure the risks of doing a study. These failures in financial markets lie at the root of accessibility problems and the government may intervene through loans. We ask whether equity arguments should matter in higher education. How do education policies interact with the redistributive income tax? Based on our assessment of market and government failures, we attempt to give some directions for policy reforms.

To set the stage, Section 2 summarizes quantitative and qualitative data on higher education systems in Europe and elsewhere, notably the United States and Australia. We point out how central planning imposes a straitjacket on higher education. We present some suggestive correlations of PISA (the OECD Programme for International Student Assessment) scores, private funding, student–staff ratios, and demand-side funding on educational performance as indicated by wage returns, dropouts, enrolment durations and educational attainment. Section 3 provides a qualitative assessment of the goals and ambitions of a university or college of higher education, and pays attention to funding and governance issues, selection, the bachelor master structure and incentives for research. Section 4 discusses optimal pricing, subsidy and tuition rules when HEIs benefit from having better-quality students. The government internalizes externalities. Section 5 derives optimal funding rules in case HEIs behave monopolistically. Section 6 explains why higher education in Europe should rely less on public subsidies and seek more funding from higher tuition fees. Section 7 discusses issues of equity and higher education and argues that equity should be organized through the tax system or basic education, not through higher education. Section 8 makes the case for income-contingent student loans instead of subsidies to warrant access. Section 9 argues that the structural reforms generically require much more transparency, otherwise the benefits of our proposals will be diminished. Section 10 concludes and offers seven policy recommendations for reform of higher education in Europe.

## 2. HIGHER EDUCATION IN EUROPE: CENTRAL PLANNING GALORE?

Much of European higher education suffers from the bureaucracies of central planning and too little autonomy. Too much time and energy goes into securing government subsidies for education and research rather than into academic entrepreneurship. To illustrate this gloomy picture, we present stylized facts on higher education in Europe. We also present quantitative and qualitative evidence on funding practices in higher education in Europe. Wherever possible we use the OECD Education Database covering 30 countries over the years 1985–2004 supplemented with general data from the OECD *Fact Books*. We note at the outset that many variables of interest are available for a few years only. Solid econometric analysis cannot be done due to the data limitations.<sup>1</sup> More in-depth analysis of country specific institutional details is confined to ten countries: Belgium (Flanders), Denmark, France, Germany, the Netherlands, New Zealand, Sweden, the United Kingdom and the United States. Sections 2.3–2.5 and 2.10 use the comparative institutional detail described in Eurydice (2000, 2001) and CHEPS (2001, 2002). The Appendix describes the empirical data used in our analysis.

<sup>1</sup> The lack of good data may be due to governments focusing mainly on inputs, and not being very interested in outputs, i.e. the performance of higher education. Input variables like student numbers, public resources spent, and attainment rates are reasonably well covered, but performance-related measures, such as dropout rates, returns to education, enrolment durations and student–staff ratios are unfortunately only available for one or two years.



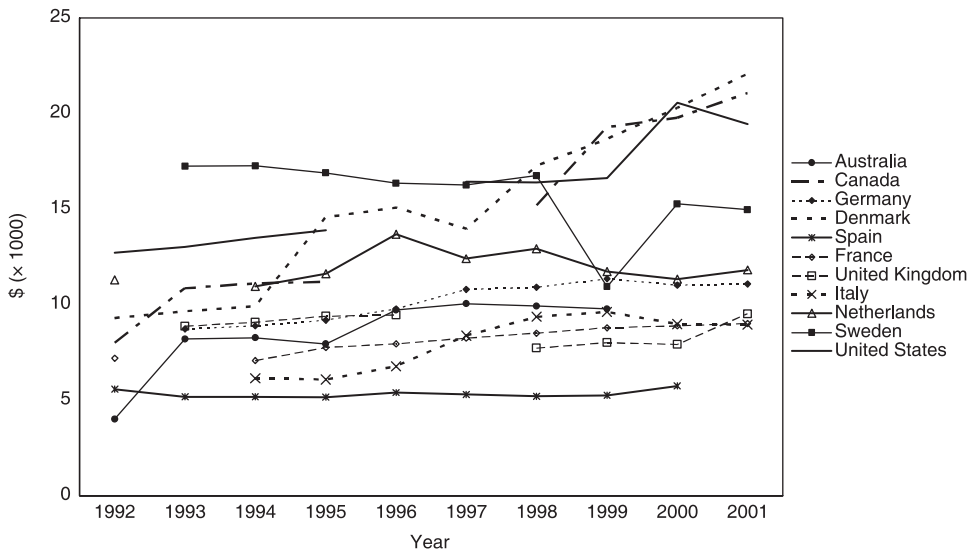
**Figure 1. Enrolment rates in higher education**

**2.1. Enrolment rates more than doubled during the last 30 years**

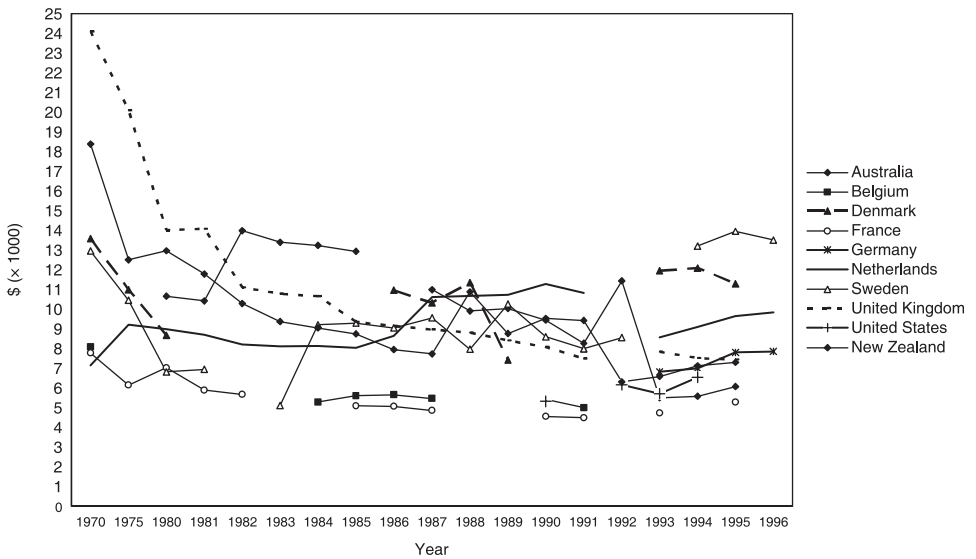
Figure 1 shows that enrolment in higher education has increased steadily during the last thirty years: from about 20% of the relevant birth cohort in the early 1970s to around half in most countries.

**2.2. Real spending per student in Continental Europe much less than in the United States and Scandinavia**

Student funding schemes often involve large education subsidies. In most countries, the government subsidizes tuition costs by 80–100% (OECD, 2006). In addition, students receive additional public support in the form of (means-tested) grants or interest-free loans. Many claim that the aggregate budget for higher education has not kept pace with the huge increase in enrolment rates, so the government contribution per student has dropped significantly. In the United Kingdom, Germany, the Netherlands and elsewhere some even speak of a funding crisis. However, Figure 2 indicates that in many countries real total education expenditures per student have remained quite constant over the last fifteen years according to OECD figures – witness Denmark, Sweden and the Netherlands. Figure 3 plots the data from UNESCO (2003) over the longer period 1970–97. This reveals that in the pre-1985 period many countries did respond to increasing enrolment rates by decreasing expenditures per student, as in Belgium and France. Most notable are the decreases in real education expenditures per student in the UK, Australia and New Zealand. Figure 4 shows that countries with high real expenditures per student

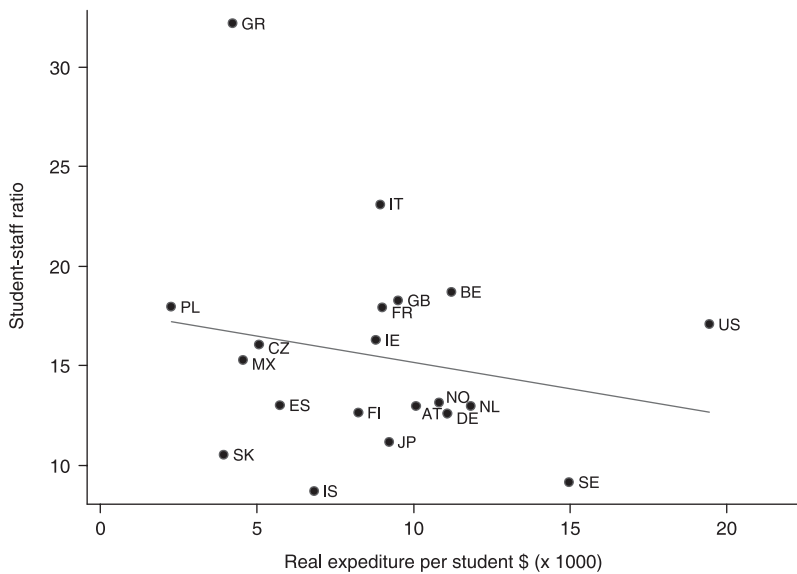


**Figure 2. Real resources per student (base year = 2000)**



**Figure 3. Real resources per student (base year = 1990)**

typically also have fewer students per member of staff. Still, there is considerable variation. Greece, Italy and the United States seem to have more extensive forms of teaching while Sweden, Japan and Spain have more intensive teaching. The reason may be that staff spend fewer hours in the front of the class or that they are more expensive. The most striking feature is that the United States and the



**Figure 4. Real resources per student and student-staff ratio**

Scandinavian countries are way ahead in spending per student compared to the rest of the OECD. The United Kingdom, Spain, Italy and France are at the low end of spending per student, whereas Germany and the Netherlands are somewhere in the middle.

### 2.3. Increased demand is met by larger public budgets, higher tuition rates or decreasing grants

In recent years, many governments (Australia, Belgium, France, the Netherlands and the United Kingdom) have increased tuition fees to keep sufficient resources flowing into higher education in the face of increasing enrolment. In the United States and New Zealand institutions are free to set fees, and tuition fees have increased substantially during the last few decades. Similarly, some countries have decreased the level of grants given to students and increased loan facilities. This occurred in Belgium, the United Kingdom and the Netherlands. In contrast, Germany, Sweden and Denmark have increased grants and loan facilities, whereas France only increased grants. New Zealand and Australia both substantially increased loan facilities. In Australia this is organized through the Higher Education Contribution Scheme (Barr, 1993; Chapman, 1997; CPB, 2001). Conditions governing awards of student grants have become tighter in some countries by linking grants/loans to academic progress (Denmark, Germany, the Netherlands, and Sweden). Interestingly, these are countries with relatively large subsidies on higher education.



**Table 1. Selection in higher education**

	Strong selection	Almost no selection
Belgium		H,U
Denmark		H,U
France		U
Germany		H,U
Netherlands		H,U
Sweden	H,U	
UK	H,U	
US	Various	Various

*Note:* H refers to colleges of higher vocational education and U to universities.

## 2.4. Admission criteria are soft without strong selection

Table 1 indicates a diverging pattern for admission criteria. Most European countries do not set admission standards, or only for specialized disciplines such as medicine, hotel management or music. If admission standards are set, they are primarily a consequence of lack of capacity and regulations forbidding institutions to charge higher fees if there is excess demand. This occurs in Belgium, Denmark, Germany, and the Netherlands. The United Kingdom, Sweden and the ‘grand écoles’ of France have strict entrance criteria. In the United States admission standards vary according to the type of university or college.

## 2.5. Input funding is more important than output funding

Funding of HEIs is typically organized around three pillars: lump-sum grants, ‘input funding’ dependent on the number of students enrolled and/or square metre floor surface, and ‘output funding’ based on the number of diplomas or grade points (and/or the research output) each HEI delivers. Traditionally, funding of HEIs was based on itemized budgets. Nowadays, most governments have abandoned these practices and rely more on (lump-sum) ‘block grants’. HEIs can spend these the way they wish as long as they comply with government regulations. Furthermore, many governments apply strict funding formulae to determine the size of the block grant. Both output and input criteria enter in these funding formulae. Governments have also introduced contract-based funding. Countries can be ranked by the extent of input or output funding of HEIs:

← Input				Output →
France	Belgium	Sweden		
N. Zealand	USA	Netherlands	Denmark	

Most countries organize funding on the basis of inputs such as the number of enrolled students (Australia, Belgium, France and New Zealand). Funding in Denmark has the largest emphasis on output. Danish HEIs only receive funding on the number of

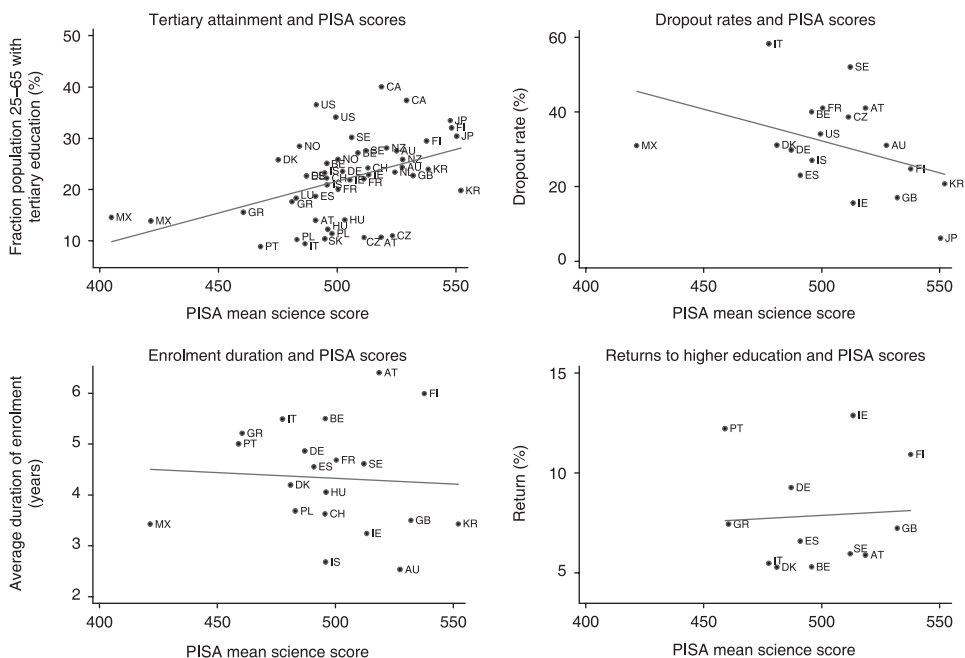
grade points that students receive (the so-called ‘taxi-meter model’). The Netherlands and Sweden take intermediate positions, where output funding seems to be more dominant. About half of funding in the Netherlands depends on the number of diplomas. A similar amount of resources depends on the number of grade points in Sweden. The United Kingdom and Germany are somewhat exceptional, because public funds are generally allocated on historical grounds independent of the number of students or output criteria. Nevertheless, government funding is the result of negotiations with HEIs and is based on budget forecasts. These budget forecasts generally reflect increases in enrolment, so the German and UK systems are characterized to some extent by input funding. Furthermore, in recent years, the UK government has put a growing emphasis on output and performance in teaching and research. In contrast, (public) funding schemes in Australia, Belgium, Denmark, the Netherlands, Sweden, and the USA are independent from basic research and related activities. This is not the case in Germany, France and New Zealand.

## **2.6. Funding may weaken incentives and cause grade inflation**

With input funding HEIs are fully responsible for cost savings that can be made. Also, with lump-sum grants institutions are encouraged to cut costs. On the other hand, input funding does not give strong incentives to supply quantity and quality of output. With output funding this can be restored but at the cost of weaker incentives to improve educational quality, because the quantity rather than the quality of output is rewarded due to the difficulties in measuring quality. With input funding HEIs have no incentive to sacrifice quality for quantity. There is a trade-off between, on the one hand, keeping incentives to reduce costs and avoid grade inflation, and, on the other hand, providing the socially desirable level and quality of output. If monopolistic practices are prevalent among HEIs, input funding schemes create welfare losses as institutions under-supply (quality of) education (also see Box 1). There is thus a trade-off between incentives to cut costs and monopoly rent extraction (cf., Laffont and Tirole, 1993; see Section 5).

## **2.7. Higher PISA scores and lower student–staff ratios correlated with higher performance in higher education**

Educational performance can be measured by attainment rates, dropout rates, average duration of enrolment for those who complete their studies, and the returns on each year of higher education. Apart from students working harder, the two main ways in which educational performance can be improved is by having better quality students and by having more staff per student. The quality of incoming students can be measured to some extent by the PISA scores of 15-year old pupils. The scatter diagrams presented in Figure 5 suggests that higher PISA science scores are indeed associated with a greater fraction of the population that attains tertiary education, fewer dropouts,



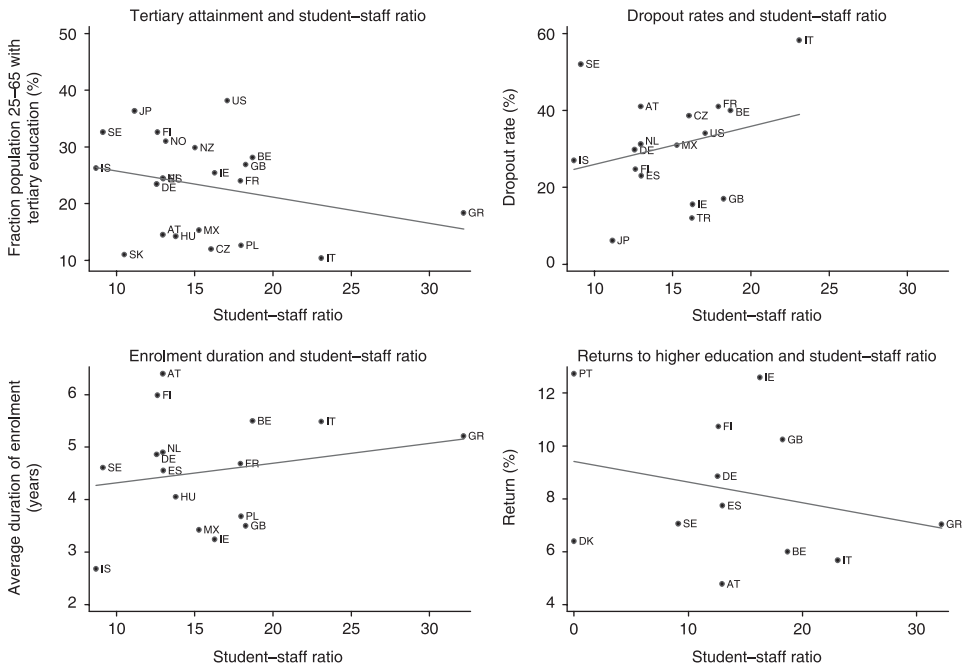
**Figure 5. Educational performance and PISA scores**

*Note:* In the case of educational attainment, PISA scores are lagged with 3 years to match the two years of PISA scores with the educational attainment data to have more observations. The graphs for dropouts and duration are not sensitive to this. The graph for enrolment duration is, however, and then the slope turns negative. This is caused by an outlier; Mexico's PISA score drops substantially between 2000 and 2003. Removing this outlier still yields a negative correlation between lagged PISA scores and duration.

shorter duration of enrolment to graduation and bigger returns. Scatter diagrams for PISA reading scores show a similar pattern. Figure 6 shows that more intensive teaching, indicated by lower student–staff ratios, is associated with higher tertiary attainment, lower dropout rates, shorter duration of enrolment to graduation and higher returns on education. These are only partial correlations, but the diagrams are suggestive.

## 2.8. Supply-side funding may improve education performance but may also induce grade-inflation

Another dimension of funding schemes is the extent to which subsidies on education are driven by demand or supply factors. Ignoring incidence of funding and taking a partial perspective, education subsidies boost demand for education if funds are directly given to students (e.g., through grants, scholarships or vouchers) or determined by the number of students. In that case, funding of education follows demand. Supply funding may be regarded as funding on outputs or through lump-sum grants to HEIs. Demand funding is important in countries with an emphasis on input funding. Furthermore, substantial resources are directly spent on students through grants and loans, which correspond to demand-driven funding.

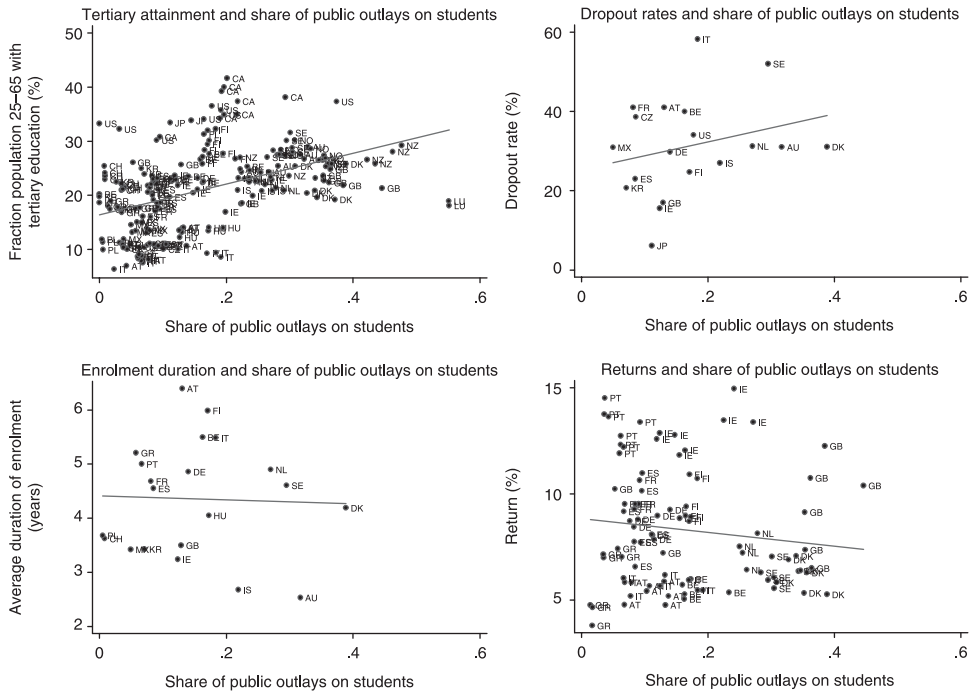


**Figure 6. Educational performance and student-staff ratios**

Figure 7 suggests that directing government funding of higher education to students rather than HEIs implies higher attainment rates, higher dropout rates and lower returns, and not much of an effect on enrolment durations for those who graduate. This can be explained by a larger enrolment of less motivated students. At the same time, the data are not inconsistent with the idea of grade inflation, that is, HEIs have incentives to keep students enrolled as long as possible if they are rewarded on enrolment and increase graduation rates if funding is based on diplomas.

**2.9. Demand seems moderately inelastic and supply fairly elastic**

If one takes a general equilibrium perspective, it is not clear who benefits from government subsidies to HEIs. From tax incidence analysis we know that the inelastic side of the market reaps the benefits, regardless of whether subsidies are allocated to the demand or supply side of the market. There is evidence that demand for HEIs is not very price-elastic (see Appendix). Doubling tuition fees reduces enrolment (inflow of students as a percentage of cohort of students) only by 5 to 10 percentage points. In fact, universities have absorbed the massive increases of enrolment in education without much trouble in many countries. This suggests quite elastic supply. One is tempted to conclude that the larger part of the incidence of education subsidies falls on the students despite the fact that in most countries universities receive the government contributions.



**Figure 7. Educational performance and share funding to students**

**2.10. Funding and tuition rates are fixed and centrally set**

Governments typically set the resources for students in various fields of study at a centralized level. Common practice is that governments use a number of tariffs in the funding formulae of HEIs for different disciplines. Table 2 shows the number of tariffs in various countries. In all countries we observe that more expensive disciplines such as medical or natural sciences receive larger government contributions than cheaper disciplines such as social sciences. Tuition and/or registration fees are,

**Table 2. Tariffs and tuition fees in higher education**

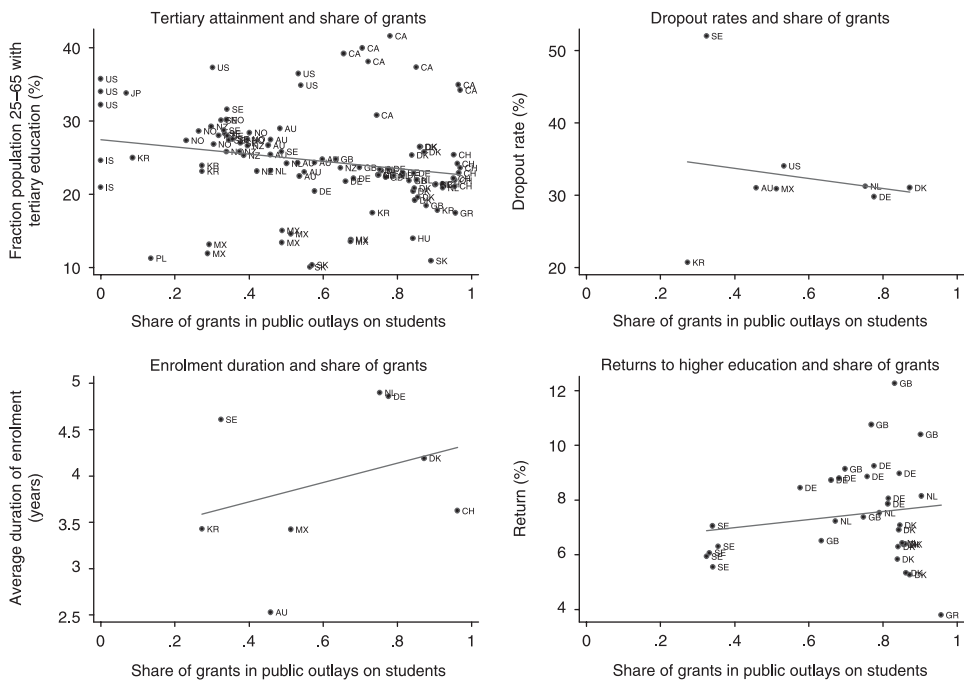
	No. of tariffs	Free tuition fees	No. of tuition fees
Australia	5	No	3
Belgium	3	Mixed	Various
Denmark	12	No	1 (free tuition)
France	31	No*	Various
Germany	n.a.	No*	1 (free tuition)
Netherlands	7	No	2
New Zealand	12	Yes	Various
Sweden	12	No	1 (free tuition)
UK	4	No	1
US Tennessee	3	Yes	Various

\* Applies only to public institutions.

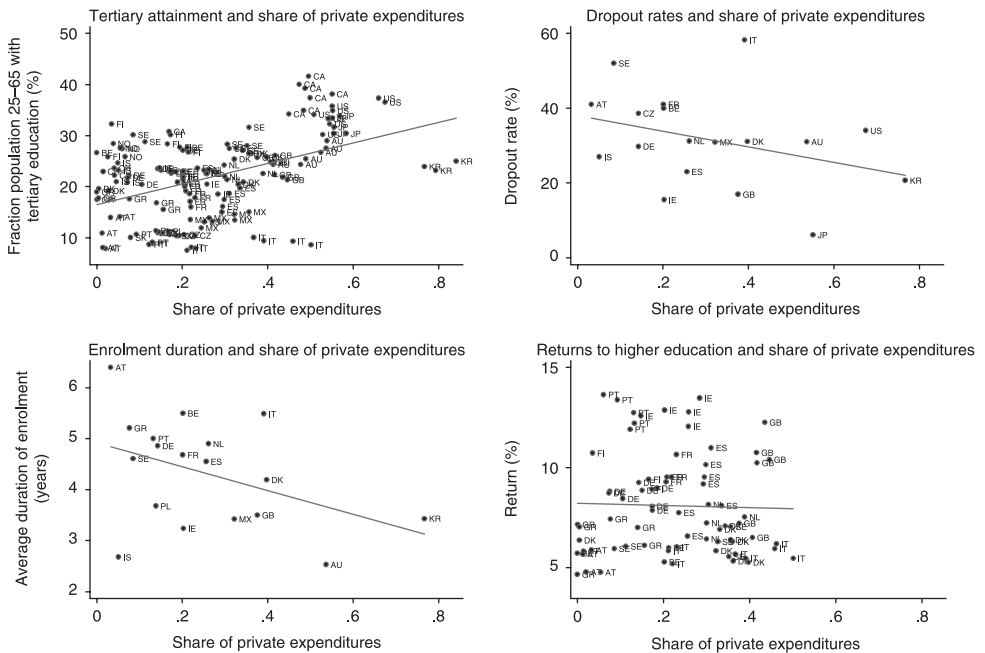
typically, also centrally planned in Europe and governments do not allow HEIs to differentiate tuition fees charged to students. This holds for all countries except the United States and New Zealand. Further, no tuition fees exist in Denmark, Germany and Sweden. Other countries have fixed but positive tuition fees that may differ between various fields of study (Australia, France, the Netherlands, and the UK). There is no relation between the costs of education and the prices charged to students in almost all countries (except in the United States and New Zealand). The consequence of government controls on both the prices charged to students and the government contributions to HEIs is that institutions can only adapt by changing the quantity and quality of their educational services. This may not be efficient. Moreover, if the market for higher education is imperfectly competitive, this could result in cross-subsidies from cheap to expensive studies.

**2.11. Higher tuition fees or private contributions are associated with better educational performance**

The scatter diagrams presented in Figure 8 only use observations for which the share of grants is less than 97%. The diagrams indicate that a lower proportion of student loans rather than student grants is associated with lower tertiary attainment rates, longer duration of enrolment for those who graduate, less dropout and bigger returns.



**Figure 8. Educational performance and share of grants in total public subsidies to students**



**Figure 9. Educational performance and share of private expenditures**

Figure 9 also suggests that a bigger share of private expenditures on higher education is associated with higher tertiary attainment rates, less dropout and shorter duration of enrolment for those who graduate, but there is no clear correlation with returns. The data are not inconsistent with the idea that if students borrow more and pay more of their study themselves that educational performance improves.

To illustrate, the present value of lifetime earnings varies from around €1.2 million for economics, medical, agriculture and technical university male graduates to 0.9 for behavioural and social graduates and €0.8 million for arts male graduates in the Netherlands (Jacobs, 2002). Graduates of higher professional schools have about €0.3 million less. Present value of lifetime earnings of female graduates is much less, but still many times more than the costs of higher education (€45,000). And the return on different types of studies is very different, even though tuition fees in Europe are typically the same for different studies. Hence, it is worthwhile to investigate the potential merits of higher and more differentiated tuition fees.

## 2.12. Efficiency of HEIs is difficult to assess

Very little work has been done on estimating stochastic frontiers to assess the technical and allocative efficiency of HEIs (e.g., Salerno, 2003). For example, estimation of stochastic frontiers has been used to estimate the relative cost efficiency of UK universities (Glass *et al.*, 1995; Izadi *et al.*, 2002) and non-parametric data envelopment analysis

to assess relative efficiency of Australian universities (Abbott and Coucouliagos, 2003). These studies only allow comparisons of *relative* efficiency levels between HEIs. The observation that in some countries institutions have a high overall score on relative efficiency may thus imply that they are all managed equally badly. It is difficult to correct for the quality of both inputs and outputs. In most of this analysis a *ceteris paribus* increase in the student–staff ratio is seen as an improvement in technical efficiency, but it may well imply a worsening of educational quality and ignore all kinds of intangible aspects of education. This renders this type of applied work less useful.

### 3. OBJECTIVES AND GOVERNANCE OF UNIVERSITIES

#### 3.1. University Ltd or Universitas Praesidium Libertatis?

The objective of a university is typically not profit maximization, although this is gradually changing in recent years. HEIs are mostly non-profit organizations that are driven by competition on relative performance, that is, how well they do compared to their peers measured by rankings and peer reviews. With the commercialization of higher education, partly due to internationalization, there is an ongoing debate whether universities should be profit organizations or not. A Universitas Praesidium Libertatis stresses academic freedom and excellence. This should be a charity or at least a non-profit organization, even better if it is financed by government grants. Universities could also be seen as a business that attempts to make profits. Many of the best universities are a mixture of both. An interesting example is the private university IU Bremen, which charges high fees and yet offers no commercial market-oriented studies such as accounting, law, business economics or engineering.

Information problems, the danger of price discrimination and potential crowding out of intrinsic motivation are the reasons why higher education is probably best operated as a non-profit enterprise (e.g., Winston, 1999). Students, state and sponsors lack the information necessary to judge exactly what they are buying because education is a one-off purchase. In some cases parents decide on behalf of their children. Information asymmetries give incentives to universities to exploit this by means of price-discrimination (e.g., Gary-Bobo and Trannoy, 2004). Some of the nature of academic interchange may even disappear if a price is attached to it. Intrinsic motivation of students and staff and trust are vital in any system of higher education and may be crowded out by incentives to stimulate extrinsic motivation (e.g., Francois, 2003). Non-profit organizations do not differ that much in terms of management and agency problems as every organization runs into incentive problems. Nevertheless, non-profit organizations are not without vices. They have a tendency for bureaucratic slack, which may be witnessed from the funds spent on prestige projects. Non-profit organizations also tend to underestimate the costs of its capital services such as buildings and campuses (e.g., Stiglitz, 1994, Chapter 5).



Whether universities should be public or private organizations is not clear *a priori*. In the absence of information problems (and therefore incentive issues) and with a full set of perfect (Pigouvian) taxes and subsidies, a government can perfectly implement any socially desirable outcome with private HEIs. At the same time, public HEIs would manage to do equally well. The fundamental problem with public universities is probably the lack of commitment of the government not to bail out HEIs if they get into financial trouble, which results in soft budget constraints. This gives incentives to make wrong decisions (Stiglitz, 1994, Chapter 10). On the other hand, owners of private universities may also run into problems as the quality and reputation of their institute is not easily measurable (as opposed to profits).

HEIs differ from normal enterprises in other respects as well. The quality of their output and the degree to which they are able to extract revenues from state and students depends to a large extent on the inputs of high-quality customers/students (Rothschild and White, 1995). Institutions can, if allowed, try to generate an excess demand for their services by selling below cost in order to control who they sell to. This way they can select the smartest students. This generates a positive feedback loop as it raises the quality and reputation of the institute and thus increases further demand from smart students. Having high-quality customers/students will also make it possible to attract much better employees/professors (Winston, 1999).

Another issue is the importance of private funding from sponsors, real estates or endowments. The most successful US and UK universities draw upon large revenues from endowments, sponsors and alumni to cross-subsidize tuition fees. This lays the foundation for a strongly hierarchical market for higher education with huge differences in price-cost ratios. Consequently, most US and UK HEIs compete with their peers for a niche in the hierarchy (Winston, 1999). Most European governments discourage private funding to avoid the emergence of elite universities that serve only the top end of the higher education market. Moreover, private HEIs seem to be crowded out from the market for higher education by the heavily subsidized public HEIs. The European market for higher education therefore has fewer niches and is not very hierarchical.

Cross-subsidies from private funding could be undesirable because they may obscure fair competition and grant the Harvards, MITs and other top-ranked universities a competitive advantage over universities without endowments. On the other hand, the accumulation of endowments may also be the result of being able to maintain a position at the high end of the university hierarchy, even if there is perfect entry and fair competition. Also, private universities may face unfair competition from subsidized public universities, so large endowments may level the playing field. However, public universities may serve different (cheaper) segments of the higher education market, so that unfair competition from public subsidies may not be such an issue. Hence, it is not clear-cut whether large endowments are a source of unfair competition. In any case, if cross-subsidies from sponsors and endowments are not possible, granting public subsidies to both public and private institutions also creates

a level playing field. This mixture of both public and private institutions is hardly observed in reality, but may well be the direction in which European HEIs should head in the future.

### **3.2. Interests of stakeholders and governance of HEIs**

Students, graduates, professors, taxpayers, sponsors and university managers are all stakeholders in higher education with different interests and objectives. Educational quality, teaching performance and career opportunities are what matters to students and graduates. Research quality, quality and motivation of students, the status of the institution, and tenure possibilities are crucial to professors and researchers. Numbers of students, the market share and the reputation of the institution are the issues at stake for university managers. The efficient allocation of scarce public resources is what matters to taxpayers. As such, the interests of all stakeholders in higher education are not necessarily aligned. In continental European universities, students and academic personnel have a say in the management of their universities. However, in some countries such as the UK and the Netherlands, universities are directly supervised by a non-executive board as in the United States. In that case, there is only weak internal democracy.

The economic literature provides little practical guidance on how the governance of HEIs should optimally be organized. Asymmetric information between various parties and contract incompleteness are probably key factors in explaining differences in university systems (e.g., Stiglitz, 1994). For example, democratization of universities appears less useful in competitive higher education sectors. Students vote with their feet and thereby discipline boards of governors. In monopolistic markets, students cannot vote with their feet, so it makes more sense to let them exert influence through university democracy. Government control and auditing is less relevant if universities do not get state subsidies as there is no potential conflict of interest between taxpayers and HEIs.

Different governance structures give rise to different conflicts of interests. In ‘democratic’ universities, students and incumbent professors may form a grand coalition to derail academic decisions. In the US system, internal criticism and critique may not be expressed by critical academics or students because university managers have large discretion in appointing professors and making academic decisions. Academic quality of research is only partially objective and there is always the danger that undemocratic boards of governors appoint their cronies. Teaching evaluations may be manipulated by teaching to the test or by giving students an easy pass, thereby undermining the long-run goals of universities and educational quality.

Future research should address the governance of HEIs. Here we suggest a simple rule of thumb: separate responsibilities and hold stakeholders accountable for their actions as much as possible. We are aware of the strong informational requirements that underlie this principle and deviations from this rule of thumb could be desirable

in the presence of asymmetric information and incomplete contractibility of stakeholders' actions.

### 3.3. Hierarchy and stratification in higher education

European politicians often express fears that a move towards an Anglo-Saxon style university system gives rise to a much more hierarchical higher education system which is stratified along incomes. US top ranked universities are not accessible by the poor without further assistance. Many students with insufficient academic quality from well-off backgrounds can also be found at the best universities. To understand how a hierarchy in higher education evolves, we learn from endogenous stratification models with local financing of education (e.g., Bénabou, 1992, 1996; Durlauf, 1994; Epple and Romano, 1998; Fernández and Rogerson, 1998). Not much literature exists in the specific context of higher education, except for Epple *et al.* (2004).

US public schools are generally financed locally from property taxes. Many parents move to better communities when they can afford it. Consequently, members of more wealthy communities can and do pay higher taxes and have better public schools. This yields a geographical stratification according to incomes, where the best schools are located in the wealthiest neighbourhoods and the worst public schools are found in ghettos. Stratification of neighbourhoods may entail persistent income inequality and reduce income mobility as parents of bright children get trapped in low-income neighbourhoods.

Similarly, universities can be seen as 'communities', where individuals gather to invest in their human capital. It is the gathering of the best students, professors and researchers at one location that determines the attractiveness of the university. Decentralized universities set tuition rates, just like communities set property taxes. In equilibrium, therefore, people go to the best universities they can afford. This generates a stratification and hierarchy according to incomes only if the willingness to pay to attend a better university is increasing in income. Without capital market imperfections, there will be stratification along academic capacities only. The best and most able students have the highest willingness to pay and therefore go to the best universities. With capital market imperfections, however, stratification along income emerges because poor students (or their parents) have a lower willingness to pay for a higher education if they are more liquidity constrained (e.g., Fernández, 1998). Stratification on incomes is not a just outcome, violates equality of opportunity, and reduces income mobility. We thus emphasize that it is of utmost importance that the poor obtain sufficient funds to finance their education by making income-contingent loans available. We want to encourage elitism in a purely academic sense.

Positive local externalities that raise the human capital only of those students attending a particular university magnify stratification. Universities internalize these externalities of attracting better students, researchers and professors by setting higher tuition rates and the outcome is in principle efficient (Rothschild and White, 1995).

Without capital market imperfections, local externalities will thus make the stratification along academic abilities more pronounced. However, with credit market imperfections, local externalities reinforce stratification along incomes. Moreover, it also introduces inefficient mismatches of students over universities. Rich but less able students enrol in the better universities and the poor but able do not.

Education is not only an investment but also a consumer good. More wealthy people have a larger willingness to pay for higher education, as with capital market imperfections. In this case, however, we do not see a violation of equality of opportunity. *A priori* it is not a problem if the wealthier people send their children to the more expensive universities even though the children have less academic potential. Rational universities will charge higher tuition rates to students who contribute less to the academic quality of the institution. Indeed, the 'poor but able' students may benefit from this because they may receive a discount on the tuition rates which are financed by the 'dumb and rich' students (see Section 4.2).

A final remark on competition is in order here. Under perfect competition and perfect capital markets, each student with a certain academic level can find a corresponding university that perfectly matches his or her ability (Fernández, 1998). This stratified equilibrium internalizes all externalities at the university (Rothschild and White, 1995). Imperfect competition, however, hampers the effective internalization of local externalities as students with different abilities are mixed and educational programmes cannot be perfectly tailored to internalize the local external effects and efficiency losses occur. Consequently, more effective competition, that is, more suppliers, results in more variety, a steeper hierarchical distribution of universities, and fewer welfare losses in internalizing local externalities of higher education (cf. Epple and Romano, 1998).

### **3.4. The Bologna Agreement: more variety, flexibility, transparency and harmonization?**

With the signing of the recent Bologna Agreement member states of the European Union agreed to reform the structure of their university courses towards the Anglo-Saxon system of three- or four-year bachelor degrees and one- or two-year master degrees. This has some potential advantages.

First, it encourages many students in continental Europe to complete their studies more quickly. The Anglo-Saxon system of higher education features almost no drop-outs. Much waste can be avoided if students complete their studies on time and the nominal study length is reduced by one and a half to two years.

Second, the Bologna reforms will reduce the risk of choosing the wrong course of study and encourage students to take more demanding courses of study due to the benefits of flexibility and variety that the bachelor-master system can in principle offer. Many prospective students hesitate in choosing mathematics or other science subjects for fear of failing and/or getting locked into a discipline in which they may

not excel. By the same token, the Bologna reforms allow students to wait in the presence of uncertainty with regard to their capacities, interests and job market circumstances.

Third, the Bologna reforms stimulate product variety. In the complex society in which we live there is a growing demand for people who can combine different disciplines and points of view. Much technological and economic progress in contemporary society occurs in the twilight zone between different disciplines. Think of chemists with a masters degree in law, who may find a career in due diligence regarding firms and environmental pollution. Moreover, the Bologna reforms induce a better allocation of students to courses in vocational higher education and universities. University students who discover that they have more of a professional interest can switch to a professional masters course at a college of professional higher education, and some of the more academically minded vocational bachelors may switch to university. The Bologna Agreement stimulates HEIs to provide more diversity, for example in intensive or extensive education, to find a niche, and distinguish themselves from competitors. Although there is a growing amount of variety on offer in European higher education, it is still a lot less than in the United States. The mismatch between demand and supply of higher education is probably much larger in Europe than in the United States and more variety is needed.

Fourth, the Bologna reforms increase the number of (shorter) degree programmes and can strengthen competitive pressures between HEIs. Also, the Bologna reforms make the European system more compatible with Anglo-Saxon systems of higher education found in the United Kingdom, United States, Canada, Australia, New Zealand, India, Pakistan and much of Asia and Latin America. This enhanced transparency encourages European HEIs to compete on a global scale.

The potential advantages of the introduction of bachelor and masters programmes only materialize if competition between HEIs is stimulated and cartels are not tolerated. In addition, a revolutionary change in mindset is necessary so that secondary school pupils and students become discriminating and critical consumers of higher education. Currently, most of them go to their local university or college near to the home of their parents even if this is evidently a bad match with their talents or their demand for education. Transparency of the system is thus crucial, as school pupils and students should base their decisions on better premises, and more transparency fosters competition. Michelin guides for the quality of teaching and research can play an important role (see Section 9).

### **3.5. Striving for quality: selection, peer review and external examiners**

In much of continental Europe universities seem hesitant to strive for academic excellence. Although the average quality of European universities may be higher than their US counterparts, the United States seems to top the bills in terms of rankings in, for example, the 2005 Times Higher Education ranking of the world's top 200

universities. The ranking considers peer review, international faculty, international students, faculty/student and citations/faculty scores. Forty-one of the top fifty universities are from countries with an Anglo-Saxon system of education. If we also count the Indian Institute of Technology, then there are 42. Continental Europe (excluding Switzerland) only has three universities in the top fifty. The picture for continental Europe seems gloomy. The key question is whether the move towards an Anglo-System of higher education leads to more top universities in Europe.

European universities seem more comfortable providing a decent education for all with not much selection based on national exams and/or interviews or exams set by the universities themselves. Of course, abstaining from selection may be a legitimate policy choice, but it hurts efficiency and excellence. One big consequence is that there will be less competition on academic excellence among secondary schools, especially if there is no national exam or the national exam only sets a minimum standard. On top of that, selection of students will in principle enhance the efficiency of matching students with institutions. Rationing of places is inefficient as arbitrary rules determine enrolment. Moreover, selection on ability seems fairer and more efficient than selection through the market mechanism, that is, on prices and thereby on parental income, if borrowing constraints are binding (Fernández, 1998; Fernández and Galí, 1999). The United States has considerable experience in aptitude rather than ability tests. These test aptitude, innate intelligence and suitability for higher education rather than ability or knowledge, which can be crammed by the fortunate ones with extra training.<sup>2</sup> The central government should not determine the timing of selection (at entry or not). It is unavoidable that selective programmes make mistakes and turn away good students. In an open and decentralized system this should not matter too much, because rejected students get another chance at another programme and competition will weed out programmes that are too lax in their selection.

In much of Europe the market for lecturers and professors is closed to outsiders. In Italy we still hear of scholars with Harvard or MIT PhDs and excellent publication records beaten to the job by local heroes with the right connections with local professors. It is not that different in France, Greece and Spain. Even in the national competition for chairs in those countries, it is difficult for outsiders, let alone foreigners, to succeed (see Perotti, 2002). Germany is stifled by the hierarchy of its universities, where until recently outsiders and foreigners did not get a real chance to establish themselves. The UK, Scandinavia and the Netherlands have more open recruitment, so benefit from a more competitive environment. Apart from cultural and institutional hurdles for appointing talent, most countries suffer from administrative civil servant salary scales. It is thus impossible to reward and attract young talent, while older academics are encouraged to stay on even if their productivity has

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<sup>2</sup> Unfortunately, there are signals that during the last few years the aptitude tests have become more like ability tests. This undermines the huge success of the US higher education system and threatens to move the United States away from a meritocracy towards a system where family ties and background matter.

declined substantially. Many post docs and young professors leave Europe for the United States as soon as they get an opportunity.

All these insider-outsider problems drive up real costs of higher education, reduce educational output, dwarf the effectiveness of public resources spent on higher education and waste academic potential. Insider-outsider problems are exacerbated if there is less competition in the market for higher education; monopoly rents are larger and this results in more rent-seeking activities of insiders.

To mitigate insider-outsider problems, peer review is crucial for giving the right incentives for high-quality research, to ban cronyism and to reduce rent-seeking activities of university managers. Peer review is, however, weak in Europe. Member states are beginning with external five-yearly evaluations of teaching and research programmes, as in the UK. In some parts of Europe where peer review of research has really taken off, it sometimes overshoots at the expense of educational quality. Apart from the UK, there is almost no use of external examiners to audit marks given to courses. Without external examining there is a danger of grade inflation, especially if funding of institutions depends on the number of awarded degrees and higher education teachers can mark their own exams.

#### 4. TOWARDS OPTIMAL SUBSIDIES AND PRICING OF HIGHER EDUCATION

Suppose that there are no equity concerns and no monopoly power of HEIs. What is the market outcome? To answer this question we develop a simple general equilibrium model of the market for higher education with students demanding various varieties of education, universities supplying the various varieties of education, and firms hiring graduates for production activities. An important feature is that attracting good students boosts academic reputation and thus attracts more students and sponsor income, which generates more revenues and/or lowers costs.

##### 4.1. Students

First, students borrow money to finance their education and costs of living. Second, they work and pay back their loans. Students are credit constrained if loans are insufficient to cover the costs of education and living. Students differ in ability and initial wealth holdings. Student  $i$  has ability  $\theta_{in}$  in degree  $n$  and initial wealth  $\omega_i$ .<sup>3</sup> The cumulative distribution of students is  $F(i)$ . Students can enrol in  $N$  types of higher education. Educational investment in study  $n$  is denoted by  $e_{in}$ . One may view  $e_{in}$  as the number of years student  $i$  is enrolled in discipline  $n$  or, alternatively, as the intensity of educational effort if enrolment durations are fixed. Total production of human capital  $h_i$  of student  $i$  depends on investment in all disciplines:

<sup>3</sup> We could interpret  $\theta_{in}$  as student performance and study incentive issues, but we abstract from that here.

$$h_i = \sum_{n=1}^N \theta_n \phi(e_n), \quad \phi'(\cdot) > 0, \quad \phi''(\cdot) < 0, \quad \forall i, n \tag{1}$$

Students with higher ability in a particular programme thus generate more human capital if they direct their effort in that direction. For example, student  $i$  has a comparative advantage over student  $j$  in  $\beta$ -studies rather than  $\alpha$ -studies if  $\theta_{i\beta}/\theta_{i\alpha} > \theta_{j\beta}/\theta_{j\alpha}$  holds. In the extreme case where student  $i$  has only one talent, one has  $\theta_m > 0$  and  $\theta_n = 0, \forall m \neq n$ . Students invest in the disciplines that suit their relative abilities best. Alternatively, one may view investment in a specific course (e.g., political science) as a combination of investments in various types of human capital (e.g., maths and statistics, sociology, history, law and economics).

Student  $i$  pays tuition fees of  $p_n$  per year if they are enrolled in course  $n$ . Tuition fees may be conditioned on particular student types if they have value added to the university. This makes sense if students are consumers of education and (co-)producers of education. This occurs if good peers raise the quality of education (e.g., Winston, 1999). There is indeed some quasi-experimental evidence that good students improve and bottom-ranking students worsen the exam performance of middle-ranking students (Winston and Zimmerman, 2003). With peer effects, we will show that universities reward students for their contribution to the educational process by giving them a discount on their tuition.

Tuition fees are subsidized at the rate  $s_m$ . This subsidy may be differentiated according to the ability of the student and the field of study. We ignore opportunity costs of education in terms of forgone income, even though they constitute about three-quarters of total costs, because they do not affect our main results. The cost of living for students,  $c$ , is exogenous. Students may borrow  $d_i$  to finance their cost of living and educational expenditures. We introduce a maximum borrowing limit  $d^* \geq 0$  to capture imperfect capital markets. If  $d^* = 0$ , borrowing is impossible and costs of education/living must be financed from initial income/endowments  $\omega_i$ . The student budget constraint is given by:

$$d_i = \sum_{n=1}^N (1 - t_i)(1 - s_n)p_n e_n + c - \omega_i \leq d^*, \quad \forall i, \tag{2}$$

where total borrowing equals total outlays on tuition (net of subsidy) plus cost of living minus initial wealth. We assume total education expenditures are tax deductible and denote the income tax rate faced by student  $i$  by  $t_i$ .

Students work after graduation and repay their debts. The wage rate per unit of human capital for graduate  $i$  with education  $n$  is fixed and denoted by  $w_n$ . Graduates with different education face different prices per unit of human capital. General equilibrium effects on wages could be allowed for, but this would not affect our results. Every student pays the same interest rate  $r$  on the debt arising from student loans. Interest is not tax deductible, since this would distort saving.<sup>4</sup> After-tax graduate



<sup>4</sup> If students are short-sighted and suffer from debt aversion, hyperbolic discounting may justify an interest subsidy.



income  $y_i$  equals after-tax labour earnings minus repayment of and interest on student loans:

$$y_i = (1 - t_i) \left( \sum_{n=1}^N w_n \theta_n \phi(e_n) \right) - (1 + r)d_i, \quad \forall i. \quad (3)$$

Graduate utility equals graduate net income plus immaterial benefits of education:

$$U_i \equiv y_i + \sum_{n=1}^N \alpha_n \theta_n \phi(e_n), \quad \forall i, \quad (4)$$

so students obtain utility from studies that give them fun or status ( $\alpha_n > 0$ ) or disutility from studies they detest but may give them a high return in money ( $\alpha_n < 0$ ). The immaterial returns may reflect the symbolic value of a certain job (e.g., medics or teachers). Immaterial benefits or costs are effectively untaxed.

Each student maximizes graduate utility by choosing investment in its various degree programmes subject to loans not exceeding the credit limit. Necessary and sufficient conditions for maximizing graduate utility are:

$$((1 - t_i)w_n + \alpha_n)\theta_n \phi'(e_n) = (1 + \mu_i + r)(1 - t_i)(1 - s_n)p_n, \quad \forall i, n, \quad (5)$$

where  $\mu_i$  is the shadow value of one extra resource unit of credit limit to student  $i$ . If capital markets are perfect or student  $i$  can borrow sufficiently from the government, we have  $d_i < d^*$  and  $\mu_i = 0$ . If capital markets are imperfect and student  $i$  is credit constrained, we have  $d_i = d^*$  and  $\mu_i > 0$ . From the first-order conditions we derive the demand of individual  $i$  for degree programme  $n$ :

$$e_n = \Phi \left( \frac{(1 + \mu_i + r)(1 - s_n)p_n}{(w_n + \alpha_n/(1 - t_i))\theta_n} \right) \leq \Phi \left( \frac{(1 + r)(1 - s_n)p_n}{(w_n + \alpha_n/(1 - t_i))\theta_n} \right), \quad \Phi' \equiv 1/\phi'' < 0, \quad \forall i, n. \quad (6)$$

Hence, individual  $i$  invests more in higher education in discipline  $n$  if interest costs  $r$  are low, the individual is not credit constrained ( $\mu_i = 0$ ), subsidies for that discipline  $s_n$  are high, tuition fees for that discipline  $p_n$  are low, graduate wages in that discipline  $w_n$  are high, and academic ability in that discipline  $\theta_n$  is large. Students also invest more in studies that give them high immaterial value and the more so if a large part of immaterial returns escape the income tax, that is, when  $t_i$  is high. They will then study even if the wage is relatively low. In the absence of other distortions, there will be over-investment in education with immaterial returns. Conversely, students are discouraged to take courses that give little esteem and a lot of sweat. A higher tax rate depresses after-tax graduate income and thus discourages investment in higher education. A higher interest rate on student loans discourages study. For now we assume that the government makes sufficient borrowing possible, so that students are not credit constrained in financing their education and costs of living.

## 4.2. Institutions of higher education

With constant returns to scale, absence of monopolistic behaviour, and no agency or contracting issues, the outcome of a profit-maximizing university corresponds to that of a non-profit university. Each course  $n$  thus sets tuition fees to maximize profits:

$$\Pi_n \equiv \int_I p_m e_m dF(i) - C_n(e_n, h_n), \quad e_n \equiv \int_I e_m dF(i), \quad h_n \equiv \int_I \theta_m \phi(e_m) dF(i), \quad (7)$$

subject to the demand of each student for its courses. The cost function of degree programme  $n$  increases with total student demand  $e_n$  (i.e.,  $\partial C_n / \partial e_n > 0$ ), but decreases with total human capital produced by the programme  $h_n$  (i.e.,  $\partial C_n / \partial h_n < 0$ ). If students are more able, more human capital is produced. Positive peer group and reputation effects then occur, the quality of education improves and consequently courses are easier and cheaper to teach (cf. Rothschild and White, 1995). Alternatively, with better students and a better reputation for academic excellence it is easier to attract funding from sponsors and the state and thus (as a short cut) costs are less. The optimal tuition fees are determined by the following mark-up formulae:

$$p_m = \frac{1}{1 - (1/\varepsilon_m)} \left( \frac{\partial C_n}{\partial e_n} + \theta_m \phi'(e_m) \frac{\partial C_n}{\partial h_n} \right), \quad \varepsilon_m \equiv - \frac{\phi'(\cdot)}{\phi''(\cdot) e_m} \geq 0. \quad (8)$$

Without peer group or reputation effects degree programmes set tuition fees equal to a mark-up on marginal cost  $\partial C_n / \partial e_n$ . The mark-up is particularly high for courses with a low price elasticity of demand  $\varepsilon_m$ . This may be so for pure mathematics or anthropology. Such courses may have high marginal cost anyway, so are extra likely to be expensive in the absence of cross subsidies or special government support. If peer group and reputation effects matter, tuition fees are higher for the less able or less motivated students with low  $\theta_m$  and lower for the smart students with high  $\theta_m$ . This explains why universities like to award scholarships to bright students. To close this setup of monopolistic competition among HEIs, we either have restricted entry and exit ( $\mathcal{N}$  fixed) or free entry and exit ( $\mathcal{N}$  adjusts until profits are driven to zero).

We take up the issue of monopolistic price setting in Section 5. Here we assume that HEIs operate under perfect competition. In that case, the optimal tuition fees are  $p_m = \partial C_n / \partial e_n + \theta_m \phi'(e_m) \partial C_n / \partial h_n$  and it is not difficult to show that they correctly internalize all peer group and reputation effects. In fact, a government that simply maximizes social welfare, i.e., graduate utility minus tuition subsidies:

$$\int_I \left( U_i - \left[ \sum_{i=1}^{\mathcal{N}} (1+r) s_{im} p_m e_m \right] \right) dF(i), \quad (9)$$

and has access to non-distortionary taxes, sets the optimal subsidies to zero and the market outcome is efficient (cf. Rothschild and White, 1995). Furthermore, price discrimination is absent. If we also assume that peer group and reputation effects are absent, tuition fees equal marginal costs. If marginal costs are exogenous, tuition

fees will be also, that is  $p_{in} = \partial C_n / \partial e_n > 0$  is constant and fixed by technological considerations.

### 4.3. Objectives of higher education policy

In general the government maximizes a social welfare function, defined over the sum of individual utilities and ‘educational welfare’  $\Gamma$ . We are not concerned with equity here, since education policies and redistribution of incomes can be separated (Bovenberg and Jacobs, 2005). Individual utility functions are linear in income and a utilitarian sum of individual utilities does not imply a social preference for redistribution. Hence, we only consider efficient education policies.

The government has a preference for studies that are of interest to society and yet do not survive in the market as private (marginal) benefits are too low. One could think of, say, anthropology, Sanskrit or pure mathematics. The government may also have a preference for education if this contributes to citizenship, democratic participation and the transmission of (cultural) knowledge and values. The government may also want to reduce the popularity of those studies that are associated with excessive status seeking and signalling. Educational welfare is a weighted sum of educational investments by students in those merit studies:

$$\Gamma \equiv \int_I \sum_{n=1}^N \xi_n e_{in} dF(i), \quad (10)$$

where  $\xi_{in}$  is the marginal contribution to educational welfare of individual  $i$  investing in education of type  $n$ .<sup>5</sup> This specification is sufficiently general to capture many interpretations, since  $\xi_{in}$  lumps *all* external effects together that individual  $i$  may generate through investing in education  $n$ . If education type  $n$  is a merit study, the marginal social contribution to the educational surplus may be positive ( $\xi_{in} > 0$ ). However, if education type  $n$  is law, rent seeking may increase waste of productive resources (Murphy *et al.*, 1991) and induce negative externalities ( $\xi_{in} < 0$ ). Signalling may also lower the social value of education below the private value of education as students signal their ability by taking up more education ( $\xi_{in} < 0$ ). Firms may use these educational signals to attract high-ability workers and pay higher wages accordingly (Arrow, 1973; Spence, 1973; Stiglitz, 1975).

Apart from merit good studies and adverse externalities due to rent seeking and signalling, there are two other types of externalities. One occurs if human capital formation in certain disciplines contributes to aggregate labour productivity (e.g., Lucas, 1988; Romer, 1990). Examples include R&D-related disciplines like science and engineering (Murphy *et al.*, 1991). Another one occurs if human capital is a status good. The more one gets of it relative to the human capital of others, the higher is one’s status (e.g., Lommerud, 1989; Layard, 1980).

<sup>5</sup> We could take a concave sum of individual investments in human capital, but this does not add much.

The marginal contribution to the educational surplus  $\xi_{in}$  may also depend on the ability of individual  $i$ . If especially the brighter students generate educational surplus, that is, students with a large  $\theta_{in}$ , the marginal contribution  $\xi_{in}$  is larger than the marginal contribution  $\xi_{jn}$  of a less able student  $j$  with  $\theta_{jn} < \theta_{in}$ .

The government may want to exert distributional preferences for ‘equality’ in educational outcomes by putting a larger weight  $\xi_{in}$  on individuals with a relatively low level of education  $e_{in}$ . Alternatively, the government may give a larger weight to the education of poor students or other disadvantaged students who have lower initial wealth  $\omega_i$ . This is a non-welfarist, a paternalistic motive, because poor students invest optimally in higher education in the absence of capital market imperfections.

**4.4. Optimal subsidies with selection and free tuition fees**

If the government perfectly observes individual abilities in the various degree programmes (i.e.,  $\theta_{in}$ ), it can tailor education subsidies to exactly internalize the external effects that each individual in each course generates. As a benchmark, the Pigouvian subsidies are derived under full information. Universities can select, in the sense that they can discriminate the fees they charge to students, according to ability and type of education programme. However, the government or universities do in fact have imperfect information on individual abilities (Gary-Bobo and Trannoy, 2004).

The government finances the outlays on education subsidies  $(1 + r)s_{in}p_{in}$  from general tax revenues. The interest factor appears, since the government gives subsidies to students and the social surplus is generated after graduation. Effectively, the government issues government debt to finance the subsidies and repays debt including interest. The resource cost of raising one unit of public revenue is denoted by  $\eta$ . It exceeds unity if the government has to levy distortionary taxes. We assume that marginal cost is constant for each programme of study and independent of characteristics of students ( $p_{in} = \partial C_n / \partial e_n$  is constant). The government then maximizes social welfare:

$$\max_{\{s_{in}\}} \int U_i + \sum_{n=1}^N (\xi_{in} e_{in} - \eta(1 + r)p_{in}s_{in}e_{in}) dF(i) \tag{11}$$

subject to the demand for the different types of study programmes by all students and the pricing schedule of these programmes. This yields the first-order conditions for the optimal second-best education subsidies:

$$\frac{s_{in}}{1 - s_{in}} = \frac{1}{\epsilon_{in} + \sigma_{in}} \left[ \left( \frac{\epsilon_{in} \xi_{in} / \eta}{((1 + r)(1 - t_i)(1 - s_{in})p_{in})} \right) - \frac{\sigma_{in}}{\eta} - \left( 1 - \frac{1}{\eta} \right) \right], \quad \forall i, n \tag{12}$$

where  $\sigma_{in} = e_{in} \theta_{in} \phi''(\cdot) (\partial C_n / \partial h_n) / p_{in}$  denotes the elasticity of the tuition fee set by universities for their degree programme  $n$  to student  $i$  with respect to this student’s

demand for this degree programme. We call  $\sigma_m$  the elasticity of fees with respect to the peer or reputation effect, which is larger for smarter students. If the government has access to non-distortionary means of taxation, the cost of public funds is unity ( $t_i = 0$  and  $\eta = 1$ ) and the optimal subsidies in the absence of peer effects ( $\sigma_m = 0$ ) are:

$$s_m = \frac{\xi_m}{(1+r)p_m}, \forall i, n. \quad (13)$$

Clearly, the optimal education subsidies exactly internalize the merit study externalities of education. If the social marginal value of education  $\xi_m$  is  $x\%$  above the private return, the government subsidizes the private costs with  $x\%$  as well to line up the private incentives with the social incentives to invest in education. The reduction of costs due to peer and reputation effects and the scholarships or discounts offered to bright students by universities lowers optimal subsidies. The government taxes enrolment of smart students more if they raise quality and/or lower cost higher education.

In general, lump-sum taxes are unavailable ( $t_i > 0$ ) so that the cost of public funds exceeds unity (i.e.,  $\eta > 1$ ). The optimal second-best subsidies given by expression (12) then consist of three terms. The first term is a Pigouvian term for the merit good value of higher education, which is expressed in private welfare by dividing through the shadow value of public resources. The optimal education subsidies thus increase with the size of the marginal merit value of education  $\xi_m$ . Hence, if society values education of individual  $i$  in field  $n$  more, education subsidies should be higher. Education subsidies decrease *ceteris paribus* with ability  $\theta_m$  of student  $i$  in course  $n$ . This may seem counter-intuitive at first blush, but it is not. Suppose that the social returns to education of type  $n$  are equal for high- and low-ability individuals, i.e.,  $\xi_m = \xi_n \equiv \xi_n$ . Then, a higher ability results in a higher private return to education, cf. the first-order condition for optimal learning (5). Hence, the percentage-wise shortfall in the private return from the social return is lower for high-ability students. Consequently, lower subsidies (as a percentage of private costs) are needed to internalize the externality. Nevertheless, the value of the education subsidy  $(1+r)(1-t_i)s_m p_m e_m$  is larger for high-ability than low-ability individuals since high-ability individuals learn and earn more. For the Pigouvian case this value equals  $\xi_m e_m$ . Optimal subsidies (as a fraction of total costs) decrease with more expensive types of education as these education types have large returns. The absolute subsidy increases by definition if education becomes more expensive.

Education subsidies are also larger if individuals have a lower private return to education relative to the social return to education, that is if  $(1-t_i)\omega_m\theta_m\phi'(e_m)$  is low relative to  $\xi_m$ . The intuition is that a bigger gap between private and social returns implies larger education subsidies. We have tacitly assumed that education only generates positive external effects,  $\xi_m > 0$ . However, if education causes social damage

(rent seeking, signalling), education should optimally be taxed to correct for excessive investments in disciplines which may not be socially desirable.

The second term in expression (12) for the optimal second-best subsidies to higher education corresponds to the peer or reputation effect which is again expressed in private welfare units by dividing by the costs of public funds. This term is less if the elasticity of prices with respect to peer and reputation effects ( $\sigma_m$ ) is small. A tax on education is directed at smart students. It explains why governments pay fewer subsidies to smarter students in situations where universities find it profitable to offer scholarships or discounts to brighter students.

The third term in expression (12) corresponds to the Ramsey motive of taxation, which insists that higher education be taxed if public funds are scarce. The Ramsey motive drives the second-best optimal subsidy below the optimal Pigouvian subsidy. The reduction is larger if it is more costly to raise tax revenues and if the net elasticity of educational effort  $\epsilon_m + \sigma_m$  with respect to the relevant subsidy is low (and thus much tax revenue is needed to induce individuals to invest more in education). In fact, if a type of education has no social merit and public funds are scarce, the government taxes rather than subsidizes it even if there are no peer or reputation effects ( $s_m < 0$  if  $\eta > 1$  and  $\xi_m = \sigma_m = 0$ ).

Both the first-best and second-best expressions for the optimal education subsidies make clear that uniform tuition fees are *never* optimal if social returns differ between disciplines and students. Subsidies should therefore be optimally targeted to fields of study that have the largest social returns. Furthermore, subsidies should be targeted towards the students that appear to generate most social value. Clearly, it is optimal to condition education subsidies, if possible, on students' characteristics. Hence, selection is desirable. Subsidies that 'lean along with the market', that is, subsidies on studies with a relatively large private rate of return compared to the social rate of return, violate optimal rules for education subsidies. Subsidies should be directed towards studies with a large social value, not a large private value. Optimal policies are furthermore *independent* from social economic characteristics such as initial wealth if student loans are used to deal properly with capital market imperfections (see Section 8). A final remark is that the mere fact that for some disciplines the marginal benefits are mainly non-monetary ( $\alpha_m > 0$ ) is not a valid reason for government subsidies. That induces over-investment in those disciplines. Students take account of immaterial benefits themselves.

With imperfect capital markets, the optimal subsidies for higher education are higher. For example, with a unit marginal cost of public funds ( $t_i = 0$ ,  $\eta = 1$ ) and no immaterial and peer or reputation effects ( $\alpha_{is} = \sigma_m = 0$ ), one has:

$$s_m = \left( \frac{\xi_m}{(1+r)(1-s_m)p_m} \right) \left( \frac{1+r}{1+r+\mu_i} \right) + \left( \frac{\mu_i}{1+r+\mu_i} \right), \quad \forall i, n. \tag{14}$$

Effectively, the subsidy alleviates the credit constraint and thus students borrow less.

#### 4.5. Optimal subsidies without selection: uniform pricing

In much of Europe politicians and HEIs hesitate to select students at entry level. A major drawback is that this hampers competition between secondary schools, but selection is often viewed as unfair for children of less privileged backgrounds. Suppose, therefore, that the government does not want or is unable to select students. It then gives subsidies that are independent of student's abilities  $\theta_m$  and potentially also independent of the field of study  $n$ . Subsidies are thus denoted by  $s_n$ . If there are no immaterial benefits ( $\alpha_m = 0$ ) and reputation or peer effects ( $\sigma_m = 0$ ), the optimal education subsidy on education type  $n$  equals:

$$\frac{s_n}{1 - s_n} = \left( \frac{\int_I \xi_m dF(i)/\eta}{\int_I (1 - t_i) \omega_m \theta_m \phi'(e_m) dF(i)} \right) - \left( \frac{1 - 1/\eta}{\varepsilon} \right), \quad (15)$$

where we assume (for simplicity) that the elasticity of educational effort in course  $n$  with respect to the subsidy for course  $n$  is constant at  $\varepsilon$ . Hence, the optimal subsidy is now defined in terms of average levels of education.

For a given marginal cost of public funds, aggregate welfare is lower than when the government sets individualized subsidies. The reason is that with non-individualized subsidy schemes, more subsidies will be misallocated and the more so in the latter case, because subsidies are based on average externalities only. Of course, marginal social value of externalities over all students within, or averaged over all studies, are lower than the social marginal value of externalities generated by the merit studies only.

In the real world uniform pricing schemes, or pricing schemes with limited variation, are indeed commonly observed. This is even true if one takes into account the supply side tariffs. Any pricing scheme which charges uniform prices to students in various disciplines (or a limited set of prices less than the number of studies) can be replaced by a differentiated pricing-cum-subsidy scheme which results in higher educational output and fewer welfare losses. Uniform pricing generally thus results in under-utilization of academic potential.

### 5. FIGHTING MONOPOLISTIC PRACTICES AND GRADE INFLATION

In response to scarcer public budgets governments have cut average costs by increasing scale of higher education institutions at the expense of creating larger public monopolies or even cartels. Such monopolists and cartels do not necessarily act in the national interest. Box 1 tells the worrisome tale of the Netherlands, where enormous increases in scale and monopolistic practices have gone hand in hand with huge increases in overhead and capital expenditures, leading to a substantial decline in resources for teaching.

**Box 1. Dutch mergers and acquisitions – a sorry tale**

Before the introduction of Bachelor and Master degrees, the Dutch higher education system was binary with higher professional schools and universities. During the past twenty years the Netherlands has witnessed a dramatic increase in scale in the higher education sector. In 1980 there were 353 higher professional schools with on average 370 students. In 2000 there were only 56 HEIs with an average of 4,460 students. Hence, scale increased more than ten-fold. Scale in the university sector did not change dramatically. There were 13 universities with on average 10 275 students in 1980. In 2000 the average number of students per university (still 13 in total) increased to 13.500. Scale at universities increased about 30%. At the same time, total expenditures on HEIs declined in real terms: 16% for higher professional schools and 32% for universities in the period 1980–2000. These are the total contributions to HEIs including tuition fees. The total expenditures on students remained rather stable from 1985 due to the introduction of the basic grant.

In the face of declining contributions per student, total expenditures on overhead costs (administration, governance and maintenance) increased dramatically during the same twenty-year period. For higher professional schools the increase in overhead costs during 1980–2000 is an extraordinary 83%, while for universities the increase was 31%. The current share of overhead in total costs in the Netherlands is 33% for higher professional schools and 38% for universities. This development meant that real expenditures on the primary process (teaching, research) fell quite strongly. There was a real decline in expenditure per student of 31% for higher professional schools and 40% during these twenty years.

In the absence of incentive effects, an increase in scale would have led to a decrease in resources spent on overhead and a corresponding increase in resources spent on the primary process (teaching and/or research). In other words, real costs per student should have fallen relative to overhead costs. We observe exactly the opposite. Without competition in the market for higher education, scale increases seem to induce monopolistic practices and produce adverse incentive effects on university management as universities are not disciplined by market forces. In the Netherlands, HEIs form a strong cartel through the union of higher professional schools (HBO-Raad) and the union of cooperating universities (VSNU). We believe that the massive increases in scale that we have witnessed in the Netherlands are the major explanation for the dramatic increase in overhead costs and the corresponding fall in real resources per student available for teaching and research.

*Source:* Onderwijsraad (2004).



Whereas externalities are the main reason for differences in social and private marginal benefits of higher education, monopolistic behaviour by HEIs causes differences in social and private marginal costs of education. Monopolistic price setting drives up tuition fees and lowers the quantity and quality of supply of higher education below the social optimum, especially because the estimated price elasticity of demand is low. The government may restore social efficiency by subsidizing HEIs on their outputs or costs so as to give incentives to increase quality and quantity of output. With perfect competition in higher education, no funding is needed on the supply side as this would distort incentives and result in overprovision of education. As a corollary, supply side funding can diminish if competition increases, because there will be less undercutting of educational output.

No funding scheme is without problems. The government faces various information problems in determining the correct costs of operation as they are malleable by the efforts of university managers. These managers may misrepresent true costs to the government and favour prestige objects that have little to do with the core tasks of teaching and research. HEIs are often encouraged to engage in a race to attract as many students as possible to get more state funds that are often based on student numbers. Some governments base funding criteria also on outputs. Since quality of output is not easy to measure, such funding schemes typically exacerbate grade inflation. Both output funding and input funding have unintended side effects (e.g., Laffont and Tirole, 1993).

Output funding restores incentives to supply socially desirable levels of output, but has the unintended disadvantage that it induces grade inflation, unless it is accompanied by an effective system of external examining. At the same time, output funding does not give strong incentives to university bureaucrats to minimize costs. Indeed, the government may inadvertently reward institutions that operate inefficiently through output funding. On the other hand, input funding does not induce grade inflation but leaves monopolistic practices in tact. Furthermore, university bureaucrats have stronger incentives to be more efficient. Governments and HEIs thus have to strike a difficult trade-off between, on the one hand, avoiding grade inflation and inefficiently run universities, and, on the other hand, curbing monopolistic practices.

Although incentive issues affect the design of optimal funding schemes, they typically do not affect the formulae for optimal tuition fees. Optimal fees/subsidies satisfy the Ramsey rules, which state that the Lerner index for the pricing of higher educational services varies inversely with the elasticity of demand (cf. Laffont and Tirole, 1993). This result rests on the assumption that the marginal costs of cost-reducing efforts by university managers are independent of the marginal costs of providing a particular education. Incentive problems do, however, affect the optimal funding schemes and more high-powered schemes should be implemented if efforts of university managers are more responsive to financial incentives. Indeed, if there is a lot of uncertainty involved and efforts of university managers correlate only little with cost reduction, high-powered incentives become less attractive.

In addition, most government financing schemes suffer from ‘ratchet effects’ as a consequence of budgeting and accounting procedures. It is in general not in the interest of university management to seriously pursue cost-effective and efficient management, because the government cream skims the cost savings or penalizes efficiently operated HEIs with lower future government contributions. Indeed, such budgeting procedures typically exacerbate the problems of giving university bureaucrats incentives and therefore dwarf the gains of incentives for cost-reducing efforts. We think that this is especially the case for long-term investments in buildings and equipment.

Many governments in Europe obstruct competition in the market for higher education by granting subsidies only to accredited public institutions, excluding newcomers and foreign institutions, and allowing incumbents to use cross-subsidies to kill competing private initiatives. The Russell group of medical institutes in the UK (like the Ivy League of US top universities) have been accused of collusion. In some countries internal checks and balances have been destroyed as well through the abolition of university democracy. Very often, neither governments, nor students, nor personnel, nor boards of governors, nor potential entrants, can effectively discipline monopolistic HEIs.

A level playing field must therefore be created in the market for higher education. Both private and public institutions should be able to compete on the same terms. Barriers to entry should be lowered by abolishing historical funding schemes and barring cross-subsidies that hinder fair competition. This opens up national markets to the international environment, especially if students are able to get student loans for study abroad and even more so if they can spend (part of) their subsidies abroad. Competition authorities should break cartels and penalize abuse of market power. If students can vote with their feet, this will discipline HEIs. Government subsidies can then be allocated directly to students by means of vouchers, grants, or scholarships. Students can spend their subsidies on the institution and courses of their preference. By relying less on highly distortive output funding schemes, grade inflation is avoided and cost-efficient university management is rewarded.

## **6. WHY HIGHER EDUCATION SHOULD RELY LESS ON PUBLIC FUNDING**

We acknowledge that higher education in many parts of Europe is starved of funds. However, we argue that there are no convincing arguments favouring extra state funding for higher education. The efficiency of the system of higher education needs to be increased and more private funding has to be found.

### **6.1. Social return to higher education does not exceed private return**

Each additional year of education, typically, raises wage incomes by 5–10% (e.g., Card, 1999; Ashenfelter *et al.*, 1999; Harmon *et al.*, 2003). These so-called Mincer

returns apply to all levels of education, but generally are larger for higher education. If the social exceeds the private return, education causes positive external effects to society and the government should support education. If the social equal the private returns, the private sector's incentives to invest in education are exactly lined up with the optimal social incentives to invest in education.

Endogenous growth theories (e.g., Romer, 1990; Lucas, 1988) emphasize that human capital can be accumulated without decreasing returns setting in. Education is thus an important engine of technological improvements generating economy-wide benefits above the private benefits. Still, one cannot increase the level of education without limits as human beings are mortal and take their human capital with them into their graves. Hence, decreasing returns eventually set in. Initial empirical evidence found positive effects of human capital on growth (e.g., Benhabib and Spiegel, 1994; Barro and Sala-i-Martin, 1995), but these results are not robust due to the poor quality of the data, various econometric problems and specification issues (Krueger and Lindahl, 2001). Although endogenous growth driven by human capital is empirically implausible, there may be externalities of education so that people under-invest in education compared with what is socially desirable.

Many have estimated the effect of a one-year increase in the average level of education on income per capita (for overviews see Temple, 2001; Sianesi and van Reenen, 2002). If these macro-Mincer returns exceed micro returns, there are positive externalities of education that go undetected in micro estimates. However, the point estimates for the macro-Mincer returns are roughly the same as for the micro-Mincer returns (e.g., Heckman and Klenow, 1998; Acemoglu and Angrist, 1999; Cohen and Soto, 2001; Krueger and Lindahl, 2001; Ciccone and Peri, 2002). Estimating macroeconomic Cobb-Douglas production functions where outputs are explained by human as well as physical capital (cf., Mankiw *et al.*, 1992), one obtains macro-Mincer returns of about 5–6% for each year of education. This is at the lower end of the estimated micro-Mincer returns (e.g., Bassani and Scarpetta, 2001; Cohen and Soto, 2001; De la Fuente and Doménech, 2002). There seems to be no evidence that human capital (growth) increases total factor productivity (growth) (Wolff, 2000). In fact, the largest increases in the levels of education have been in sectors that display no or very slow productivity growth such as services sectors or government (Griliches, 1996).

In second-generation endogenous growth theories, human capital plays a crucial role in the R&D process (Romer, 1990). Although there is robust evidence for the importance of R&D for total factor-productivity growth (Nadiri, 1993), no robust effects of the complementarity of education and R&D can be found (e.g., Nonneman and Vanhoudt, 1996). Klenow (1998) also strongly supports R&D-based models of productivity growth over human-capital based models. Further, a well-educated labour force may help to catch up with more advanced countries and absorb and diffuse technologies more easily. However, the role of catching up and technology adoption is probably only of minor importance as most OECD countries are currently at the technological frontier (Sapir *et al.*, 2003; Aghion and Griffith, 2005), and no

robust evidence for human capital as a catching-up or assimilation device can be found (Sianesi and van Reenen, 2002).

In sum, the empirical evidence does not suggest persuasive externalities of human capital as the macro returns to education are (at most) equal to the micro returns. These findings suggest signalling is of minor importance, because macro estimates indicate that education is productive. Perhaps, potential positive external effects of education cancel the negative external effects of signalling at the macroeconomic level. A final caveat is that, if there are indeed positive externalities of education, the finding that social returns approximately equal private returns, may suggest that the government currently chooses the optimal level of education subsidies so as to internalize the externalities at the macroeconomic level (Heckman and Klenow, 1998).

In popular policy debates there is much confusion. A popular argument is that the private (Mincer) returns to (higher) education are higher than the safe real return on government bonds, approximately 3%, and thus the government should expand investment on education and reap a higher rate of return than reducing public debt. The same misguided reasoning would suggest that the government should massively invest in the stock market and pay off the government debt with the higher returns on equity.

The argument confuses private and social returns to higher education. The government should intervene in higher education, because the social exceeds the private return to education. Investment in higher education should be compared with investments with similar risk, liquidity and other properties, not with government bonds. The returns on education are much higher, since human capital is illiquid (slavery is forbidden) and risky as labour incomes fluctuate due to business cycles, sectoral shifts, technological developments, international trade, etc. (Palacios-Huerta, 2004). and the Mincer return is only comparable to a return on a financial investment under very strict conditions, which are not met in practice (Heckman *et al.*, 2003). The acquisition of human capital requires direct material (tuition) and immaterial (effort, psychic) costs. The Mincer approach assumes that these costs are negligible and that the only costs of education are forgone earnings. Further, it assumes that individuals are infinitely lived. Both direct costs and finite time horizons drive up the required returns for an investment in education. There are thus good reasons why private (and social) returns are high and there is no free lunch if governments invest in education rather than pay off debt.

We conclude from our discussion of private and social returns to education that, at current levels of subsidies on higher education, there are no convincing arguments to extend the overall level of public subsidies to higher education.

## 6.2. Private returns are rising due to a growing skill premium

Private returns to education have risen as wage inequality between skilled and unskilled workers has increased in industrialized countries, especially in the United

States and the United Kingdom and less dramatically in continental Europe (Davis, 1992). If skilled graduates earn much more than low-skilled workers, it is profitable to invest more in higher education.

The first and most dominant explanation for the rise in the skill premium is skill-biased technological change (Katz and Autor, 1999). This boosts relative demand for skilled workers and thus the skill premium, especially after the ICT revolution (Autor *et al.*, 1998). Some endogenous growth theories suggest that skilled workers spur R&D activities, which leads to new technologies that are more complementary to skilled workers. Consequently, stimulating skill formation does not only increase the relative supply of skilled workers, but also the relative demand for skilled workers. If this effect is strong enough, the skill premium may even increase in the long run (Acemoglu, 1998, 2002; Nahuis and Smulders, 2002).<sup>6</sup>

Increasing international trade offers the second explanation for the rise in relative demand for skilled workers in highly developed countries. Countries with an abundance of skilled workers specialize in skill-intensive production, whereas low-wage countries specialize in labour-intensive production. Relative wages then depend on global relative supplies and demands for skilled workers (Topel, 1999; Katz and Autor, 1999). However, this explanation of increasing wage inequality is disputed due to the limited volume of international trade (Wood, 1994; Borjas and Ramey, 1995; Krugman, 1995).

Supply side and institutional factors play a role as well. Some suggest that the relative supply of skilled workers has, in fact, decreased in the United States due to ageing of the population, lower fertility rates and the inflow of low-skilled migrants (Katz and Murphy, 1992; Borjas *et al.*, 1997). Changes in labour market institutions may also have contributed to increases in the skill premium. Lower minimum wages and erosion of union power have increased US wage inequality (DiNardo *et al.*, 1996; Lee, 1999). However, in Europe skill-biased labour demand shifts do not result much in larger wage inequality, but in higher unemployment rates among the low skilled, especially if their incomes are protected by minimum wages, strong unions, labour market regulations, and so on (see also Krugman, 1995; David, 1998).<sup>7</sup>

Katz and Autor (1999) conclude that only a third of overall wage inequality in the United States can be attributed to gender, education and experience. The bulk of wage inequality remains unexplained and cannot be attributed to observed differences in skills, experience, sector of employment, etc. Skill-biased technological change is therefore the major candidate to explain residual wage inequality. Empirical estimates suggest that the skill premium continues to grow in the future at about

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<sup>6</sup> Some recent studies suggest that higher educated workers are more complementary to capital than unskilled workers. This implies that relative demand for skilled workers increases with the capital intensity of the economy, analogously to skill-biased technical change (Krusell *et al.*, 2000). The question is whether capital-skill complementarity is empirically relevant, because it is difficult to disentangle from skill-biased technological change.

<sup>7</sup> Institutional changes may have been triggered by changed labour market conditions, so standard labour supply and demand analysis can explain differences in wage inequality between developed countries (Oosterbeek *et al.*, 2004).

3% per year for the United States if relative supply of skilled workers remains fixed (Katz and Murphy, 1992; Heckman *et al.*, 1998). For Sweden it is only about 1% (Edin and Holmlund, 1995) and for the Netherlands roughly 2% per year (Jacobs, 2004). In most of Europe, the growth in relative supply of skilled workers levels off, so the returns to education will grow substantially in the future. With rising private returns to higher education, governments in Europe should get out of the way and facilitate these investments rather than obstruct them. The right way to do so is through income-contingent loans to pay for higher tuition costs. Section 8 discusses these in more detail.

### 6.3. Baumol's cost disease also suggests more private funding

Higher education is, like the performing arts, intrinsically labour intensive and enjoys little technological progress. It thus suffers from Baumol's cost disease (Baumol, 1967). Teaching and research need to be done by highly qualified people and cannot be replaced by technology. Since productivity growth in higher education lags behind other sectors of the economy, the cost and price of higher education rise over time unless wages in higher education consistently lag behind wages in the rest of the economy. To ensure demand and provision of higher education goods do not fall, some in Europe argue in favour of a growing government subsidy. This is unconvincing for two reasons.

First, skill-biased technical change boosts the returns to higher education. Graduates can thus rationally use the higher returns to pay for the higher cost of education, since the opportunity costs of education do not increase as much as tuition fees. Second, higher education is a luxury good. Demand for higher education therefore flourishes as technical progress makes people wealthier. The budget share of higher education rises over time, as people give relatively more priority to education as they grow richer. On both accounts Baumol's cost disease actually creates jobs and output in higher education. Hence, despite rising relative prices, people become sufficiently rich due to technological advances to be able to afford higher education.

In any case, Baumol's cost disease leads to a number of offsetting trends. The rise in the relative price of labour-intensive educational activities causes a shift towards less labour-intensive forms of teaching and research. In addition, rising prices of higher education induce a shift from small-scale to large-scale teaching programmes. The possibilities for a good academic operating on a world market have grown enormously with the advent of globalization and the internet. This has led to very high incomes for a few academic superstars (Rosen, 1981). Baumol's cost disease also triggers the reform of higher education for the elite into education for the masses which may have resulted in dumbing-down at the expense of diversity and research. A strong case remains for subsidizing pure research and unprofitable, less popular, academically worthy studies.

#### 6.4. Other trends and developments

Internationalization will increase competitive pressures. This does not require larger subsidies but may make it desirable to shift from funding suppliers of higher education to demand funding (grants, vouchers, scholarships). Another inexorable trend is individualization and increased heterogeneity. Societies are rapidly changing and the demand for higher education becomes more diverse. An educational system which is a straitjacket to individuals increases the welfare costs of uniform prices. Consequently, the government should respond by allowing for more degrees of freedom in price setting of HEIs. Again, this should not lead to more subsidies.

Many governments face increasing scarcity of public funds due to the ageing of the population. Also, criteria on deficits and debt for EMU member states impose ceilings on government expenditures. Further, increased mobility of tax bases (also due to internationalization) raises the costs of public funds. As arrangements in welfare states become more costly (Baumol's disease and individualization), the marginal benefits of public goods decrease and thus willingness to pay taxes for these public goods diminishes. These trends do not offer much hope for extra public funding either.

#### 7. WHY EQUITY SHOULD NOT MATTER IN HIGHER EDUCATION

If anything, education is associated with the pursuit of a more equal society. Still, a grand coalition of politicians from the left to the right of the political spectrum blocks necessary structural reforms by repeatedly raising equity or accessibility issues for the wrong reasons. This section attempts to illustrate the flaws in this populist discourse.

The case for providing large-scale subsidies for higher education on equity grounds is dubious, since subsidies for higher education are fundamentally regressive. The vast majority of students in higher education belong to the richest half of the population. To finance education subsidies from general tax revenues therefore implies perpetuation of inequality over the generations and a reduction of income mobility, because these subsidies redistribute resources away from the poorer individuals in each birth cohort towards the richer ones. Moreover, education subsidies are regressive from a life-cycle perspective. The average taxpayer has a lower lifetime income than the average recipient of education subsidies.

Many politicians argue that access to education is a basic right and should thus be supplied free of charge. Of course, education should be accessible to all with sufficient academic capabilities. But this neither implies that higher education should be free, nor that all should pay the same price. Access to food or healthcare is also a basic human right, but this does not mean that food and health are supplied free or of uniform quality.

Some argue that higher education subsidies lower wage premiums of graduates. By giving incentives to over-invest in higher education, workers without an academic

degree become scarcer and consequently wages of graduates fall relative to those of other workers. This argument does not stand the test of theoretical and empirical scrutiny. Jacobs (2005) shows theoretically that education policies should not be used to generate excess investment to compress wage differentials. The Diamond and Mirrlees (1971) production efficiency theorem implies that distortions in factor prices should be avoided even if the government wants to redistribute incomes. In fact, if education generates untaxed rents, redistribution requires a tax on education. The poor are worse off with higher education subsidies, since the income tax is more efficient in redistributing incomes and avoids over-investment in education. In calibrated models, Dur and Teulings (2004) and Heckman *et al.* (1998) show that the regressive incidence of education subsidies roughly cancels the compression of the wage distribution, so that no net reduction in inequality results.

Another misguided argument is that regressive higher education subsidies are a good idea as graduates pay more taxes later on in life. However, the increase in tax revenues does not recoup higher education subsidies because most governments over-subsidize education from a fiscal perspective (De la Fuente and Jimeno, 2005). This argument also violates horizontal equity norms in tax laws, which require that people in identical positions should be treated equally. The point is that higher education subsidies discriminate against high-income earners who did not study and did not receive large subsidies, but they still pay higher net taxes compared to those who did study.

Higher education subsidies should be used to offset the tax distortions of redistributive taxes on human capital investments. Education subsidies should be used for efficiency, not equity reasons. Progressive taxes reduce human capital investment, work effort and labour force participation. This erosion of the tax base harms the redistributive powers of government. Optimal second-best policy ensures neutrality of the income tax on educational investments and leaves the tax base intact by making the costs of higher education tax deductible or subsidizing higher education at the rate of the marginal income tax (Bovenberg and Jacobs, 2005). The poor benefit from regressive higher education subsidies, because they allow the government to tax income more progressively. Hence, higher education subsidies can be defended only in conjunction with more progressive income taxes. Crucial is that education generates ability rents. If there are no such rents, neutrality of the tax system implies that the impact of progressive taxes cancels the regressive impact of education subsidies. These findings do not imply that interest on study loans should be tax deductible because it would boost the discounted value of future returns on higher education and induce over-investment. Tax-deductible interest distorts saving behaviour and encourages tax arbitrage, because students can borrow to save at a market return in order to cash in on the implicit subsidy.

Another argument is that higher education policies 'limit the domain of inequality' (Tobin, 1970). If the government makes the distribution of educational outcomes less unequal, income dispersion is reduced as education is strongly correlated with



income. This argument appears in various forms. Some politicians vehemently reject 'elitist' higher education systems where the brightest students receive the best and most expensive education, but this seems a plea for high implicit or explicit taxes on investment in higher education. This would obstruct profitable investment in human capital and the best students would migrate abroad. Both would shrink the tax base. Consequently, the lowest incomes are worse off than with direct redistribution through the income tax with a larger tax base when the brightest educate themselves. Limiting the domain of inequality violates principles of equal opportunity. By forcing the most talented people to reduce their educational investment, these people are not able to fully develop their potential. This is neither efficient nor equitable, and morally repugnant.

It is often claimed that it is equitable to charge the same (low) uniform tuition rates to both poor and rich students. However, by the same line of reasoning, it is highly inefficient to effectively tax educational investments at a 100% rate above the fixed tuition fee. Again, income redistribution should be carried out through the tax system and not through the education system.

Increasing enrolment in higher education of children from lower socio-economic backgrounds requires intervention in basic and secondary education and not generic subsidies for higher education. The social returns of primary and secondary education are more obvious and quantitatively more important. For example, if students drop out before completing secondary education, they impose large costs on society due to larger dependency on welfare benefits, tax avoidance by working in the black circuit and higher crime rates (e.g., Lochner, 2004). Subsidies are thus justified for lower and secondary education. Parental incomes do play a role for enrolment in higher education. This vindicates the necessity of income-contingent loans, not subsidies. Parental incomes seem to be of little quantitative importance compared to the social environment, family, culture and academic ability (Shea, 2000; Carneiro and Heckman, 2002; Plug and Vijverberg, 2004; Cameron and Taber, 2004).

## **8. FROM STUDENT GRANTS TOWARDS INCOME-CONTINGENT LOANS**

Many HEIs in Europe (apart from Scandinavia) are starved of funds. They can improve their teaching and research by asking higher tuition fees. However, capital markets may fail to deliver the loans to finance increased tuition and costs of living. Human capital is not good collateral as it cannot be traded (slavery is forbidden). Furthermore, banks cannot easily assess the risks of default and face difficulties monitoring efforts by students and graduates to perform well. Resulting adverse selection and moral hazard effects result in high interest rates, credit rationing or even a collapse of the credit market for student loans (Stiglitz and Weiss, 1981). In addition, students are risk averse and hesitate to take up large loans (Eaton and Rosen, 1980). Indeed, the risks associated with human capital investment cannot be insured for similar reasons as credit markets fail, that is, incomplete contracts and information

problems (Rothschild and Stiglitz, 1976). Imperfect capital and insurance markets generally cause under-investment in higher education. These financial market failures typically hurt students from poorer socio-economic backgrounds. Many students depend on their parents or are forced to take little jobs to pay for tuition fees and their costs of living if sufficient loan facilities are not available. Hence, there is a case to help such students.

### **8.1. Income-contingent loans**

Students need credit, not grants. To tackle student poverty, students should be able to borrow their fees and cost of living. Income-contingent student loans (ICL) seem an efficient way to overcome problems of capital market imperfections with risk-averse students (Nerlove, 1972, 1975; Barr, 1993; Chapman, 1997; Oosterbeek, 1998; Jacobs, 2002). ICL schemes allow students to finance their education, but only require them to pay back principal and interest if their income after graduation is sufficiently high. They offer students a combination of loans and social insurance which directly tackles the capital market imperfection and partially resolves the insurance market imperfections. Further, if income risks are shared among graduates by pooling the risks at the macro level, the government needs fewer subsidies to eliminate risk aversion.

Banks and insurance companies are unable to write contracts based on future incomes, but the government can enforce such contracts through the monopoly of the tax authorities. In addition, the government has more information than private banks or insurance companies and is thus better able to avoid problems of adverse selection and moral hazard. Through selection and tracking of student performance and denying funds to non-performing students, one can eliminate the 'rotten apples' from the ICL scheme. Collecting repayments through the income tax system avoids costly verification procedures to determine earned incomes. The government can also collaborate with other governments and other tax authorities in the European Union in order to track down graduates who try to escape repaying their loans by working abroad.

### **8.2. Graduate taxes**

An alternative policy is to provide students with funds through a graduate tax (GT). Under a GT every graduate receives an amount of resources financed through the issue of government debt. Graduates retain a (potentially differentiated) fraction of their income and pay a fraction of their lifetime income to the government: the graduate tax. The government pools GT revenues so as to repay the government debt including interest. From the individual perspective, repayments under a GT may (far) exceed initial funds (including interest). Therefore, contributions by graduates with high incomes under a GT system are relatively larger than under an ICL

scheme and there is more insurance and redistribution. The link between the amount of equity received and the total repayments is severed at the level of the individual. However, the government may set different GT rates *ex ante* for different levels of funding so that the connection between funds and repayments does not need to be completely dwarfed. A GT can be viewed as equity finance rather than debt finance of higher education (cf. Friedman, 1962).

### 8.3. Income-contingent loans better than graduate taxes

There is only a gradual difference between a GT and the ICL scheme. Under a GT the high-earning graduates remain in the system whereas under an ICL scheme these graduates leave the system at a certain point after which they do not contribute any more to risk sharing. The duration of participation in an ICL scheme increases with a larger imposed degree of risk sharing. Both ICL schemes and a GT have disadvantages associated with insuring income risks. In the absence of incentive effects, a GT is preferred as it provides more insurance than ICL schemes (García-Peñalosa and Walde, 2002). However, both ICL schemes and a GT distort labour supply and delay career choices as repayments are contingent on incomes. Further, students may not put enough effort into studying hard; they may study longer or enrol in fun studies. An ICL scheme provides better incentives than a GT, because it features less insurance.

Moral hazard problems in labour supply *after* graduation will not have large effects on the terms and conditions of the ICL scheme or GT, since repayment tariffs are rather small (Jacobs, 2002). For example, with a private contribution of half the costs of higher education, the tariff needs to be approximately 3–4% of earned income, depending on the degree of risk sharing after graduation (more risk-sharing allows for lower tariffs as high income earners contribute more). On the other hand, the government may lose substantial tax revenues if labour supply is distorted because a slight change in the tax base produces large revenue effects if average tax rates are large (around 40%). With reasonable estimates for labour supply elasticities, this tax leak is approximately 20% of the initial increase in revenues due to lower public subsidies.

Moral hazard problems can be mitigated by selection and penalties for those who make insufficient progress with their studies. The payback tariff should be differentiated by study length and size of loan. In particular, a bigger loan warrants a higher tariff. This prevents cross-subsidies from cheap to expensive courses and avoids income redistribution from smart (high-return, low-risk) to less bright (low-return, high-risk) students. To prevent cross-subsidies from profitable to loss-making studies, tariffs per course and per discipline must be differentiated (see Section 4).

Insurance of risks of non-repayment may also give rise to adverse selection. Rich and smart students may not be willing to participate in an ICL scheme or GT to avoid risk sharing. This problem can be circumvented if the government pays the cost

of default out of general funds rather than through risk sharing. In that case, default risks are shifted rather than shared. This comes at a cost, because (*ex post*) education subsidies still enter the system. An advantage is that these subsidies are not regressive, since only students with very low lifetime incomes would benefit. Alternatively, the government may make participation in an ICL scheme or GT obligatory.

We prefer an ICL scheme to a GT, because it features less insurance, allows for more flexibility in repayment conditions, and can be better tailored to avoid moral hazard. This holds especially if repayment parameters are not much differentiated according to the level of funds received, the type of study or student performance. In that case, the GT causes a potentially large moral hazard problem as the link between funds received and repayments is substantially weakened.

#### **8.4. Contingent loans avoid dead-weight costs of education subsidies**

Education subsidies restore access by reducing the need to borrow, but do not tackle problems of failing capital and insurance markets. Education subsidies therefore have important disadvantages over ICL schemes. First, subsidies involve large transfers to students who do not need financial assistance as they come from well-off backgrounds. More importantly, most students are not credit constrained over the life-cycle and can easily fund the costs of their education from their lifetime income. Also, subsidies are not effective in reducing income risks. Consequently, most of the subsidies will be directed to students with relatively safe earnings prospects such as medics, lawyers or business economists. Furthermore, large subsidies on higher education provoke excessive enrolment of less talented and lazy students, who feature large risks of dropping out and too low returns on their education. Therefore, student grants or subsidized tuition suffer from massive misallocation of resources and, consequently, much more subsidies are needed to achieve the same degree of accessibility. Because education subsidies have to be financed from general tax revenues, the welfare costs of distortionary taxation are substantial. ICL schemes generate virtually no dead weight losses of subsidies, require much lower levels of taxation, have less perverse redistribution effects, and weed out the frivolous students.

#### **8.5. Income-contingent loans also superior to means-tested subsidies**

Popular arguments for means-tested student grants or subsidized tuition fees are based on the notion that the poor suffer particularly from credit market imperfections and the inability to insure human capital risks. These arguments are not convincing, because ICL schemes appear to be a more efficient and appropriate instrument to tackle these market imperfections directly and subsidies are unnecessary. This is also the case for subsidies based on parental incomes, because poor students can also apply for income-contingent loans and do not need to rely on their parents, nor need to be afraid that they suffer huge repayment burdens. An important disadvantage of

means testing is that it discourages parental savings (Feldstein, 1995). Means-tested subsidies cannot be defended on equity grounds, since graduates from poor backgrounds also look forward to high lifetime incomes.

### **8.6. International dimension of student loans**

With the ongoing internationalization of higher education, any form of ICL scheme, GT or indeed student grant system, has to face up to the prospect that some of the most able graduates will migrate. Some may even not pay back their student loans. Hence, recouping student loans may become more difficult. In that case, governments have an incentive to give bigger higher education subsidies for degrees focusing on country-specific skills such as law and lower subsidies for internationally applicable disciplines such as medicine, engineering and economics (Poutvaara, 2005). Governments may also want to apply exit taxes for graduates leaving the country or try to recoup repayments through source-based, rather than residence-based, levies to mitigate the problem.

International mobility of successful academics is high. However, student mobility is rather low, but increasing. To foster competition and internationalization, one could make student loans and grants available for study at any accredited HEI at home or abroad. This would encourage HEIs at home to reform and become more attractive to students. Governments could also stimulate a 'race to the top' by giving larger subsidies to attract the best students and professors from other countries.

## **9. WHY TRANSPARENCY IS A MUST**

Information problems are the key reason why the market for higher education fails. Students have inadequate insight in their own abilities, future returns on their studies and the quality of the various degree programmes. Universities and higher professional schools are likely to abuse their informational advantages to (price-) discriminate, select and cream-skim the best students. Financial markets for student loans and human capital insurance fail due to information problems between financial institutions and students. Accessibility therefore becomes an issue. The government faces problems in measuring the output and quality of HEIs, which results in distortionary funding schemes and budgeting procedures. Governments face important information problems when allocating subsidies, because student abilities and performance are hard to observe. Separation of responsibilities in the governance of HEIs is only possible if sufficient information is available to hold all stakeholders accountable. Incentives in salary scales and tenure decisions for academics are sub-optimal, since the performance of academics is imperfectly measured by teaching and research evaluations.

These information problems derive, on the one hand, from the impossibility of correctly verifying both the quality and quantities of educational and research outputs. On the

other hand, inputs in higher education are difficult to verify as well. That is, it is difficult to determine the abilities and work efforts of students, teachers, researchers, and university managers. In order to avoid inefficiencies, more transparency is of utmost importance, because otherwise the potential merits of introducing more flexibility and variety through competition will not materialize and may have unintended side-effects.

First, to improve the efficiency of matches between students and universities, there is an urgent need that students be well informed on the average returns on their education, the risks associated with such investments (employment probabilities, etc.), the repayment obligations of student loans in normal circumstances and in cases of low incomes, and so on. Government, secondary school teachers and HEIs should therefore invest in informing school children where they can best study in terms of quality of teaching, research reputation, extracurricular assets, expected returns, etc.

Second, to foster real competition, achievements of HEIs should be published and made available through Michelin guides of higher education. These should, for example, contain average grade marks, average number of times that exams are retaken, average enrolment durations, scientific accomplishments of university personnel, teaching evaluations, student evaluations, average salaries of graduates, average employment rates, average job-seeking durations, and so on.

Third, a consistent and non-discriminatory system of screening student qualities and capacities, based on academic aptitudes, should be introduced to avoid waiting lists for the best applicants and misallocation of students over universities and higher professional schools. The inability to observe the quality of applicants at HEIs causes problems similar to the ones we know from the 'efficiency wage' literature. Universities may give excessive discounts on tuition fees to recruit, retain and motivate the best students, while at the same time rationing the number of places available. A testing and screening scheme also avoids excessive screening and signalling activities that are wasteful from an aggregate perspective.

Fourth, ensuring fair competition and effective use of public subsidies requires that the government can effectively monitor costs, quality of educational output and knows how public subsidies are allocated. Therefore, HEIs not only have to be more transparent for prospective students, but also for the government and therefore society in general by means of clear auditing and budgetary rules.

Fifth, to avoid deadweight losses of subsidies, eligibility and terms of income-contingent loans, grants and scholarships should be conditioned on measures of student performance, such as grade marks and enrolment duration, and be differentiated according to study type.

## **10. SEVEN RECOMMENDATIONS FOR REFORM OF HIGHER EDUCATION**

European higher education seems to be hijacked by inert politicians with visionless and mistaken egalitarian policies, which impose a straitjacket for students and

institutions. Central planning and control deny possibilities to reform in response to changing societies in which there is an urgent need for more investment in human capital. Students are not challenged, become lazy and drop out in large numbers. Current policies grant monopoly positions and render strongholds of power to the insiders: a tyranny of vested interests of the university bureaucrats and malfunctioning university personnel. All this reduces the intellectual development of future generations, erodes the quality of European universities and higher professional education, and ultimately threatens the future wealth and civilization of European nations. To break this vicious circle, we propose a seven-tier agenda for the reform of higher education.

1. *Expand private funding by higher tuition fees and income-contingent loans.* At current levels of public spending on higher education there are no convincing arguments for further increases in public funding. Governments should facilitate rather than obstruct such private investment by allowing young individuals to borrow against their future earnings by means of income-contingent loans. The supply of higher education can expand in response to larger demand without burdening the public finances. To avoid moral hazard and adverse selection, governments should in principle try to eliminate the 'rotten apples' through selection, tracking and monitoring students' efforts and progress. Governments may wish to finance risks of default in student loans from general tax revenues to avoid adverse selection.
2. *Distinguish studies that are public goods from those that are private goods.* Giving subsidies on higher education across the board wastes government resources. The government should subsidize those studies whose social benefits exceed private benefits. Such studies may be science, art history and archaeology. Government subsidies for studies with negligible or negative external benefits should be stopped. Studies with large 'status' or 'signalling' value generate negative externalities as these activities are socially wasteful. Uniform tuition rates and government contributions to HEIs are very inefficient because too many students will enrol in fields which have no social value over and above the private value, and vice versa. Politicians and policymakers should clearly define their objectives, i.e., determine which studies should receive public support, and subsequently, allocate scarce government budgets to these disciplines only. This will free up scarce resources that can be used to realize the real goals of government intervention: a diverse and intellectually challenging higher education system that secures the continuity of academia in its broadest sense.
3. *Differentiate tuition fees and offer a greater diversity of higher education.* Different studies have different costs. Higher quality and more intensive teaching have a price tag. Students have different academic abilities. Furthermore, universities are willing to give the best students discounts on their tuition fees because they raise the quality and reputation of the institution. It makes no sense from an economic perspective to charge uniform (possibly zero) tuition fees. Differentiation of

tuition fees allows the market for higher education to respond to changing preferences of students, changing conditions on the labour market and changing circumstances in the market for higher education. Universities should be able to give discounts on tuition rates to reward the high-ability students for their contribution to the higher quality of the institution. Fixed tuition fees do not function as signals of scarcity, reduce variety, results in one-size fits all education with a low average quality.

4. *Selection, tracking and incentives.* Public resources should be wisely allocated. Good public policy requires the design of subsidies to avoid waste of resources. Therefore, selection of students based on academic aptitude upon admission helps to avoid enrolment of too many non-qualified students and reduces dropout rates. Entitlements to subsidies should also be made contingent on student performance. Non-performing students should lose their eligibility for public subsidies (grants/low tuition), but should be allowed to continue their education at full cost at the same time. Higher student efforts and lower failure risks free up resources that can be allocated to raise the government contributions to students that do perform well. By allowing HEIs to select, retain and motivate the best students, they can also compete more successfully for the best teachers and professors. Good staff are attracted by good salaries for which private funding through higher tuition fees is needed, but also by being able to teach excellent students. All this will raise educational quality and gives taxpayers more value for money.
5. *Foster competition, shift funding to students, and diminish government control.* In response to scarcer public budgets some governments have (perhaps inadvertently) stimulated the creation of large public monopolies and cartels in higher education by increasing scale to cut average costs. Monopolists and cartels in higher education reduce the quality (grade inflation) and quantity, ignore the demands of students and employers, increase overhead costs and encourage university bureaucrats to abuse scarce public resources on prestige projects. A fair level playing field must be created for higher education in Europe. At the same time internationalization and competition with the best institutions abroad for the smartest and brightest students and staff should be encouraged. Both private and public institutions should compete on the same terms by allocating government subsidies directly to the students, through vouchers, grants or scholarships. Students can spend these subsidies on the institution of their preference. Students should be able to use their income-contingent loans for study at universities abroad in order to encourage reform of universities at home. Barriers to entry in the market for higher education should be lowered by abolishing historical funding and potential cross-subsidies that may hinder fair competition. Competition authorities should break cartels and penalize abuse of market power. Academic selection of universities has the added advantage that it fosters competition among secondary schools.
6. *Abolish equity issues from higher education.* Although equity arguments feature prominently in discussions of higher education, they are not convincing. Subsidies on



higher education are after all regressive. If the government wants to redistribute incomes, a legitimate objective, it should do this through the tax system or through basic education. The decision of individuals to enrol in higher education is determined earlier on in life, at the start of secondary school, and much less when people reach the age of going to higher education. Education policies should be separated from equity issues and only be geared towards the pursuit of economic efficiency defined in a broad sense, which includes the immaterial rewards of education. Let all flowers flourish should be the motto.

7. *Increase information and transparency.* Universities and higher professional schools should be obliged to yearly publish performance criteria with respect to students' dropout rates, average enrolment durations, average exam marks, student evaluations, scientific publications, evaluations of scientific visitation committees and so on. If students vote with their feet, HEIs will be disciplined. Governments should develop uniform ability and aptitude tests to make fair selection of students possible, while avoiding excessive screening and selection and cream-skimming activities of HEIs. Funding of HEIs should be as simple and transparent as possible. Europe would benefit from some form of tenure-track appointment system with regular assessment of both teaching and research performance of every staff member. The assessments should have implications for salary, tenure and promotion in order to provide the right career incentives. One should also avoid insider-outsider issues in labour markets for teachers and researchers.

The two corner stones of our policy recommendations are: increase private funding so as to raise the quality of education, and allow for more differentiation and variety. However, our policy recommendations cannot be viewed in isolation of each other. Our policies come as a package deal and we want to warn policy makers that cherry picking from our list of recommendations may have disastrous and unintended consequences. Therefore, we end with three important warnings.

- (i) *Do not raise and differentiate tuition fees or select students without an income-contingent loan scheme.* Without income-contingent loans to warrant accessibility, allowing HEIs to set their own pricing and selection policies will result in cream-skimming of the best and, more importantly, the wealthiest students. and there will be too many smart and poor students in low-quality universities. Enrolment in higher education will then be determined by parental wealth and this causes strong violations of equality of opportunity. Indeed, this would be a step back in time where the best education is only affordable by the affluent.
- (ii) *Do not pursue laissez faire without ensuring competition in higher education.* Government control in higher education is a necessary evil in the absence of fair competition and entry barriers in markets for higher education. Laissez-faire policies in monopolistic education sectors harm competition if the market structure is not fundamentally affected, and exacerbate the social costs of monopoly by allowing HEIs to lower standards, reduce educational outputs, and increase costs of

overhead. All this results in larger waste of taxpayers' money and lower educational performance.

- (iii) *Unresolved information problems produce unintended side effects.* If fair access based on ability and aptitude is not safeguarded, the governance of HEIs is not dealt with properly, academic appointments can be manipulated by university management, research and teaching evaluations can be crammed by teaching and research personnel, budgeting rules are not transparent, allocations of subsidies are not based on objective criteria and students are ill-informed about their decisions, more laissez-faire policies and more selection and differentiation do not produce beneficial outcomes. Instead, they result in more rent-seeking activities among scientific and teaching personnel, larger degrees of financial freedom for megalomaniac university bureaucrats, grade inflation, and lower student performance.

To sum up, Europe would benefit from reform in the direction of the Anglo-Saxon system of higher education with much more choice, differentiation and competition, but should not throw away the baby with the bathwater. Europe should strive to give the best possible access to the smartest students from less privileged backgrounds and charge less bright, well-off students substantially higher tuition fees. At the same time, Europe should be careful not to only invest in top academic universities, but maintain and cherish the high average quality of higher education institutions in Europe.

## Panel discussion

Esther Duflo expressed concern that insufficient attention had been paid to differences in the political and economic environment that would make US-style policy reforms difficult to implement in Europe. Much of the funding for the best US universities comes not from tuition fees but from foundations, private firms, alumni and other sources. In Europe many universities have a governance structure that entrenches the rights of current students at the expense of future students and other parties, and this makes them difficult to reform. In the face of such entrenched conservatism and inefficiency, the rational response of governments has been to keep funding per student low, and the rational response of the private sector has been to avoid becoming involved at all. She was not optimistic that this was likely to change soon.

She also wondered how much it mattered. It might be that the United States was closer to the technological frontier and should therefore invest more in higher education, while the concern for a broad-based and more inclusive system might be more suited to Europe's follower position.

Finally, she pointed out that the incentive effects of such schemes as income-contingent loans were highly sensitive to details. She felt the authors underplayed the difficulties of monitoring students sufficiently to avoid adverse moral hazard effects of the loans on the incentives of students to graduate and use their qualifications in economically rewarding ways.

### **Civil involvement in reforms**

Several panel members brought up the point that it was not what reforms to make, but how to make them. As a starting point to implementing reforms, Christian Gollier suggested that pressure to reform must come from the citizens. He suggested that this was possibly missing in Europe, because of two types of information shortages – citizens and students are unaware that the education they receive is of low quality, and because they undervalue the returns to education. On the more practical side of implementing reforms, several panel members echoed Esther Duflo's emphasis on the governance of universities. Harald Hau cited INSEAD as a successful European example that has succeeded in the absence of public funding and a history of private funding. Hau suggested that fundamental reform was necessary, and that a bureaucratic reform involving micro-management at the margin was not sufficient. He stressed that the key was to involve the civil sector in education, and to cut links with the political sector. Barry Eichengreen said that the University of California at Berkeley was a European-style university in California and it was kept efficient by competition. The authors replied to these comments saying that governance structure of universities is so far a relatively unexplored topic and one for future research, but also that the paper is based in welfare economics and aims to look at the ideal reform first, and to put across some straightforward ideas.

While the consensus seemed to be that greater private sector involvement is needed to fund higher education in Europe, Ernst Ludwig von Thadden said that points should be taken in a general equilibrium context, considering the interaction of donations with the incidence and levels of taxes. Neil Gandal's take on the issue was to privatize the (key) universities, which may then have positive spillover benefits to nearby public universities. Rob Chote from the IFS pointed out that if more private funding were to be implemented, the marketing of ICLs, for example, would be very important as, while students are not adverse to debt when it comes to credit cards, the perception of debt with regard to spending on education is rather more negative.

### **Wages and incentives**

Ernst Ludwig von Thadden made the point that wage differentials are as high as 5:1 in the USA, whereas they are much flatter in Sweden for example, and that this has an effect on the motivation of professors and the quality of education.

## Allocation of educational benefits

A number of redistributive points also came up in discussion.

Ernst Ludwig von Thadden believed that the redistributive effects of reform, in particular in relation to the ICLs, should be looked at more closely. Lars Bovenburg thought the ILCs may have disincentive effects that had not been considered, and that equity-efficiency trade-offs had been treated too optimistically. The authors replied to these comments saying that they had looked into the issue of moral hazard in the ICLs and found that it was low and less significant than any moral hazard effects that might come about from a 40% income tax.

Lars Jonung felt that the gender issue was important, and suggested that the high welfare in Nordic states could be attributed to the high education of women who pass their human capital onto their children.

The opinion of Charles Wyplosz was that an ideal mixture was a few top schools and rather more, weaker schools. Europe needs to concentrate on creating just a few first-class schools and as this may be politically difficult for national governments, the Commission should do this. Gilles Duranton suggested that the dual roles, and associated trade-offs of universities between research (performed by a few universities) and education (performed by all universities) should be given more consideration in the paper. Differentiation of universities, as pointed out by Eichengreen, requires students to be willing to move within their country, and within Europe to the most suitable universities.

## DATA APPENDIX

From OECD Education Data Base we obtain the number of graduates, numbers of entrants and total enrolment in A-type (long) and B-type (short) tertiary education, student-staff ratios, educational attainment by various cohort-ages, numbers of foreign students enrolled, total/public/private expenditures on higher education, total public, capital and other expenditures on HEIs, total public grant and loan expenditures to students, total public and private expenditures on HEIs, total capital and personnel expenditures on HEIs ([www1.oecd.org/scripts/cde/members/EDU\\_UOEAuthenticate.asp](http://www1.oecd.org/scripts/cde/members/EDU_UOEAuthenticate.asp)). We take data on enrolment durations and survival rates from OECD Education at a Glance 2003 and 2004 ([www.oecd.org/document/11/0,2340,en\\_2825\\_495609\\_33712011\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/11/0,2340,en_2825_495609_33712011_1_1_1_1,00.html)). We use data on consumer price indices, US dollar purchasing power parities, gross domestic product, population sizes, and PISA scores from the OECD Fact Book 2005 (<http://iris.sourceoecd.org/vl=15396015/cl=12/nw=1/rpsv/factbook/>). Expenditure data are deflated in real terms using the consumer price index (2000 = 1) and converted into US dollars using US dollar purchasing power parities. The OECD Labor Force Data Base, 2005 gave data on the age composition of population ([www1.oecd.org/scripts/cde/members/lfsdataauthenticate.asp](http://www1.oecd.org/scripts/cde/members/lfsdataauthenticate.asp)). We obtain wages by schooling level from the European

**Table A1. Enrolment responses to changes in tuition costs and quasi-elasticities**

Study	Country	Data <sup>a</sup>	Controls	Selection	Sign <sup>2b</sup>	Elasticity
Kane (1994)	US	CS+TS	Yes	No	Yes	0.06
Kane (1995)	US	CS+TS	Yes	No	Yes	0.03
Leslie and Brinkman (1987)	var.	M	–	No	–	0.21–0.27
Hilmer (1998)	US	M	Yes	No	Yes	0.36
Dynarski (1999)	US	CS	Yes	Yes	Yes	0.35 (0.3 <sup>c</sup> )
Heckman <i>et al.</i> (1998)	US	SM,P	Yes	Yes	Yes	0.07 <sup>d</sup>
Card and Lemieux (2000)	US	CS+TS	Yes	No	Yes	0.01–0.04
Cameron and Heckman (2001)	US	P	Yes	Yes	Yes	0.02–0.05

*Notes:* ‘Control’ indicates whether estimations are done when controlling for background characteristics, IQ, and other individual characteristics.

<sup>a</sup> CS = cross section; TS = time series; P = panel; M = meta analysis; SM = structural model.

<sup>b</sup> Indicates significance at 5% level of estimated coefficient for tuition.

<sup>c</sup> Price change relative to all costs of college including tuition, room and board. In parentheses we show elasticity evaluated at average tuition rates used by Cameron and Heckman (2001).

<sup>d</sup> Price changes taken relative to an approximated weighted mean of 2 and 4 years tuition costs for blacks, Hispanics and whites in Cameron and Heckman (2001) (\$1250).

Community Household Panel collected by the European Union. We compute ‘quasi’ Mincer returns by taking the log of the ratio of the average wage of a tertiary educated worker and the average wage of a secondary educated worker and dividing this by the average enrolment duration of higher education. We do not control for experience or other standard controls. Comparing with the Mincer returns in Harmon *et al.* (2003, Table 2), and Denny *et al.* (2004, Table 2) suggests our short-cut is not that bad.

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