

**University Systems Ranking:
Citizens and Society in
the Age of the Knowledge**

By Peer Ederer, Philipp Schuller and Stephan Willms



Lisbon Council Policy Brief

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Left to right,
Schuller, Ederer and Willms

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'Excellence in research should never be allowed to become an excuse for underperformance in the educational tasks.'

Why do we have university systems?
What are these systems intended to do?
And what do we expect them to deliver – to society, to individuals and to the world at large?

First and foremost, our universities and tertiary education systems exist to educate and prepare people to be fully-functioning, well-developed members of our advanced, post-industrial society. Tertiary education systems exist not simply to give our citizens the rudimentary knowledge it takes to succeed as an adult (the secondary school system, where attendance is required in almost all societies of the world, even the poorest, exists for that.). Rather, our tertiary education systems are there to give ambitious students something at least as important: to help them enjoy, understand, preserve and perhaps even contribute to the all-important cultural legacy which makes our society great; and to give them the analytic capabilities and technical skills they will need to become the intellectual and social backbone of our advanced democracy – and ultimately to form an important, integral part of the economic machine which sustains that culture and democracy as well.

Reaching these lofty goals is important – both for individuals who pursue tertiary education and for the society which creates and maintains the system itself. For individuals, it means that the time spent in universities, colleges and professional academies can and should pay off. For society, it means that we must look at the tertiary education system not simply

as a mechanism for churning out a handful of elites and perpetuating social inequality (as is far too often the case under the current system); to the contrary, the system must be capable (and not simply at a rhetorical level) of empowering and equipping the largest possible number of individuals with the fullest set of tools she or he will need to become well-rounded participants in our social democracy and fully-functioning economic units in that society. It must also stand out – as many systems do today – as a centre of world-leading, independent research, capable of preserving, developing and perhaps even expanding our valuable cultural and scientific legacy for generations to come. But seeking excellence in research should never be allowed to become an excuse for underperformance in the educational tasks. Indeed, in the end both objectives require each other to be successful.

As the world moves towards a society where human capital is the largest and most basic determinant of a country's economic success, the strongest systems are those which not only do the best job of educating the broadest number of their own citizens for the economic and social challenges we will face, but that themselves become magnets for the world's talent.¹ To perform its broadest, and possibly most important, function in the modern knowledge-based economy, the education system should not only provide opportunity to the local country or community that sustains it; it should also attract the best and the brightest from around the globe and help those people

develop the knowledge and skills they will use to enrich the world both directly and indirectly in the years to come.

In order to look at the ability of European tertiary education systems to deliver on these important economic and social goals, we examined and ranked 17 OECD countries based on six separate criteria.² These include:

I. Inclusiveness: The ability of a country's tertiary education system to graduate large numbers of students relative to the size of its population. To measure this, we looked at the number of graduates a country produces as a percentage of the

population theoretically available for advanced study.

II. Access: The ability of a country's tertiary system to accept and help advance students with low levels of scholastic aptitude from secondary schools. To measure this, we compared countries based on the skill threshold of students entering universities derived from recent OECD data.

III. Effectiveness: The ability of a country's educational system to produce graduates with skills relevant for the country's labour market. Here, we compared the average wage premia a university graduate can expect, after

Table 1: University systems ranking
Accumulated relative ranking of sub-indicators

| Rank | Country | Score |
|------|-------------|-------|
| 1 | Australia | 30.6 |
| 2 | UK | 31.1 |
| 3 | Denmark | 39.1 |
| 4 | Finland | 40.8 |
| 5 | USA | 49.0 |
| 6 | Sweden | 49.2 |
| 7 | Ireland | 49.2 |
| 8 | Portugal | 54.3 |
| 9 | Italy | 60.9 |
| 10 | France | 62.2 |
| 11 | Poland | 64.4 |
| 12 | Hungary | 64.5 |
| 13 | Netherlands | 69.6 |
| 14 | Switzerland | 70.3 |
| 15 | Germany | 72.5 |
| 16 | Austria | 76.4 |
| 17 | Spain | 79.4 |

Table 2: Inclusiveness
Participation in tertiary education
Share of ISCED Va tertiary graduates of recent age cohort (2005)

| Rank | Country | Rate |
|------|-------------|------|
| 1 | Australia | 59% |
| 2 | Finland | 47% |
| 3 | Denmark | 46% |
| 4 | Poland | 45% |
| 5 | Netherlands | 42% |
| 6 | Italy | 41% |
| 7 | UK | 39% |
| 8 | Ireland | 38% |
| 9 | Sweden | 38% |
| 10 | Hungary | 36% |
| 11 | USA | 34% |
| 12 | Spain | 33% |
| 13 | Portugal | 32% |
| 14 | Switzerland | 27% |
| 15 | France* | 26% |
| 16 | Austria | 20% |
| 17 | Germany | 20% |

* 2004

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Table 1. Source: Human Capital Center, The Lisbon Council – Table 2. Source: OECD, Education at a Glance

2. The survey ranks 17 of the 30 OECD countries for which comparable data could be found for all sub-indicators in the project. The exceptions are USA and Australia, which are not part of the Bologna process. As a result, USA and Australia were both left out of the last sub-ranking on "ability to change" (and the overall ranking was adjusted so that the two countries' overall rankings would not be influenced by their absence in the last indicator). The 17 countries surveyed are Australia, Austria, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom and USA.

adjusting for labour-market characteristics which might affect wage premia independent of university education.

IV. Attractiveness: The ability of a country's system to attract a diverse range of foreign students. To measure this, we looked at the percentage of foreign students coming to each country from their 10 top source countries, hoping to show whether a tertiary system merely attracts foreign students from neighbouring countries or whether the country has a wider appeal among the international student community.

V. Age-Range: The ability of a country's tertiary system to function as a lifelong learning institution. Here, we looked at the share of 30-39 year olds enrolled in tertiary education institutions.

VI. Responsiveness: The system's ability to reform and change. Here, we measured the speed and effectiveness with which countries have adapted their education system to the criteria laid down in the Bologna Declaration, signed in 1999, which seeks to harmonise and improve cross-border recognition of degree courses and qualifications among its 29 signatories.³ Fifteen of the 17 countries surveyed in this study have formally accepted the criteria, though progress in implementing them has varied widely.⁴

The results were then compiled into an overall University Systems Ranking,

based on the average performance of each individual country in each of the six categories.⁵ The ranking itself is unique; it is designed not to tell us more about how individual universities are doing at churning out top-level graduates, but to make a global comparison of how entire national systems of tertiary education are coping with the economic and social challenges of a 21st century knowledge-based society.

Among the most important findings are:

I. Of the 17 countries surveyed, Australia, United Kingdom and Denmark have the best tertiary education systems, ranking Nos. 1, 2 and 3, respectively, according to the criteria laid out in this analysis. Taken together, their universities accept among the largest number of the local population for study, giving them high scores on Inclusiveness and Access. But their universities are also attractive to foreign students, which gives these countries an important leg up in the global war for talent. And all three countries are frontrunners in the effort to offer continuing education to adults after they have left the formal education system, with high numbers of people benefiting from access to lifelong learning. Finally, all three have opened up their education systems to a wide range of people without lowering their educational standards. To the contrary, there is much evidence that the diversity and inclusiveness of their educational system has helped them raise standards in important ways.

3. With the Bologna Declaration, 29 European countries vowed to create "a European higher education area by 2010" by harmonising degree requirements, raising standards and increasing cross-border recognition of qualifications and periods of study. Progress on the criteria – which are intended to make the European tertiary education system more integrated – is assessed in an important survey every two years. For more, see http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html.

4. USA and Australia are not signatories of the Bologna Declaration; see footnote 2.

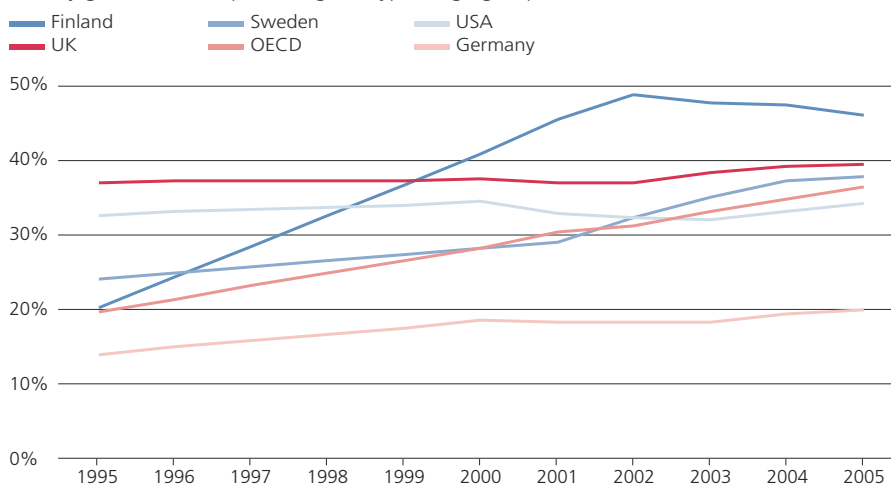
5. For more on how the University Systems Ranking was calculated, see the box on methodology and data sources, which begins on page 22.

II. By contrast, Germany, Austria and Spain all fare badly, weighing in at Nos. 15, 16 and 17, respectively. Austria and Germany suffer because of the restrictiveness of their educational system; they turn away the most number of students from higher education, and as a result offer higher education to a relatively low number of people. In addition, Germany also suffers from low wage premia for university graduates – a sign that the education system may not be turning out enough graduates with the right skills for the local labour market. Germany is, however, an attractive place for foreign students (weighing in at No. 3 in this sub-indicator), though this is offset by a relatively poor performance on providing access to lifelong learning (where Germany ranks last at No. 17).

III. In the overall index, Spain comes in dead last at No. 17. It ranks No. 12 on Inclusiveness (the measure of how many of its university-age students actually receive a university education). But it ranks lower on most other categories, and particularly on Effectiveness – the wage premia that a university education commands on the local labour market. In order to do better, Spain must do more to modernise its education system, bringing it more closely into line with European norms (faster progress on the Bologna criteria would be a good place to start). It must also work to address the balance between the subjects taught in university and the skills sought on the labour market (as measured by the relatively low wage premium which a university degree confers in Spain).

Figure 1: Graduation rates are rising

Tertiary graduates as a percentage of typical age group (1995-2006)



'A university system has a much broader mandate than producing hordes of Nobel laureates or cabals of tenure- and patent-bearing professors.'

- IV. Other countries – such as Poland – do well in some categories, but are brought down by relatively poor performance in other key areas. Poland is good at accepting lots of students, including students of relatively low skill levels upon entering university (as measured by Inclusiveness and Access, the first two sub-indicators in the study). But it does very badly at matching skills to the local labour market and at attracting foreign students (as measured by the Effectiveness and Attractiveness sub-indicators).
- V. In this ranking, Portugal performs surprisingly well. The country falls in the middle of the pack on overall score, but it comes out ahead of France and Germany on the all-important indicator of Inclusiveness and ahead of the United States on Access (which measures the number of relatively low skilled secondary students admitted to the tertiary system). It also does well in the wage premium for a university degree category. Even if this performance may be the result of exogenous factors – such as the country's rapid economic growth in the post-1985 period – it nonetheless illustrates an important corollary to this study; put simply, a healthy labour market (with low levels of unemployment and merit-based promotion) can itself be an excellent catalyst for educational performance, and forms an integral part of the overall system encouraging citizens to pursue

tertiary education and seek academic excellence. Overall, Portugal is a good example of how a growing domestic economy can encourage and improve educational performance. Longer term, Portugal must work to increase access to lifelong learning (as measured by the Age-Range sub-indicator) and raise the number of foreign students it attracts.

- VI. Broadly speaking, Anglo-Saxon and Scandinavian education systems dominate the top half of the ranking (Australia, Denmark, Finland, Ireland, Sweden, United Kingdom and USA); while a broadly-defined Romano-Germanic block makes up most of the lower half (Austria, France, Germany, Hungary, Italy, Netherlands, Poland, Spain and Switzerland). Without entering a debate on social and economic models, this implies that the Romano-Germanic countries we surveyed should do more to make their education systems more open, democratic and readily accessible to a broader range of people.

Policy Implications

To date, most rankings have looked only at the ability of systems to produce excellence.⁶ Our essential argument is that a university system has a much broader mandate than producing hordes of Nobel laureates or cabals of tenure- and patent-bearing professors.⁷ Indeed, we believe a system's broadest – and ultimately most important – mandate is to educate and prepare as many citizens as possible regardless of their age, social standing or previous academic record for

6. The Shanghai University ranking concentrates on the number of Nobel prize winners among both alumni and faculty, and the number of academic citations in prominent academic journals. The Times Higher Education Ranking gives 80% weight to peer review and citations, and 10% each to recruiters opinions and internationality of student body and faculty.

7. In terms of the highest number of Nobel prize winners per capita, Iceland, Sweden and Switzerland are Nos. 1, 2 and 3, respectively. USA follows at No. 11, behind Netherlands and Germany. See www.nationmaster.com for a list of Nobel laureates by country.

' University systems should be open and competitive; they should offer the widest chance to the broadest number of students.'

the very real social and economic challenges we face. Policy makers can and must learn that it is not enough to simply promote a handful of national champions in education, believing that individual pockets of excellence will somehow make up for overall mediocrity underneath. To the contrary, they must learn to look at their education systems as holistic entities where overall performance is determined by much more than just basic inputs, though inputs remain important, of course (see the box on input control vs output transparency on page 8 for more on this point). Instead, we must seek to redefine and better understand the function of an education system in modern society and construct new and more revealing ways of measuring success so we can devise more effective means of attaining it. That is the goal of this study.

Our evidence shows that the best-performing tertiary systems all do the following:

- a. The overall system should be geared primarily towards education. Conducting world-class research is an important aspect which allows some universities to turn out first-class students, but for the system as a whole, the educational mission is paramount. University systems that focus exclusively on developing world-class research should not ignore their larger pedagogical mission, if they want to perform their full social and economic role in a modern, knowledge-based society.
- b. University systems should be open and competitive; they should offer the widest chance to the broadest number of students; they should not become engines for perpetuating social and economic inequality. Importantly, fees and fee-based systems – such as the ones in UK or Netherlands – do not seem to bring inherently less democratic results than systems based on free access

Excellence

The ability of any system to produce excellence – and to secure a place among the world's best – is an indication of strength. But it cannot be the only indicator of any system's ability to produce overall excellence. To employ an analogy in this Olympic year, a country's performance in the medal count does not indicate the fitness or health of its entire population. At the Olympics in Beijing, Japan ranked No. 57 by total medals per citizen, while the Japanese population regularly tops the league tables in longevity and health. First-ranked Olympic nations Bahamas and Jamaica in turn are not renowned world leaders in health or fitness. Only Iceland proves the rule by exception: the European longevity leader comes third in the European medal count with one silver. Likewise, counting the number of Nobel prize winners may say something about a country's ability to produce excellent research, but it says little about the overall education of its population.

to education. To the contrary, the “top-up” fees often serve as important sources of funding for the universities themselves, and help students and institutions alike focus on the ultimate

utility of the education they will receive. They also help to send information about the demand for and supply of certain skills to the education sector. Either way, the mode of financing,

From Input Control to Output Transparency

Traditionally, European education systems have been largely controlled and evaluated by insisting on the quality of the inputs which go into making up the system. First and foremost, this means teachers. Most educational systems guarantee excellence by making sure that the teachers they employ are themselves excellent. This means insisting on high or very high degree qualifications when it comes to teaching and extensive use of peer review when it comes to research.

However, in recent years this paradigm has begun changing. A rash of projects – ranging from the Bologna process to the OECD Programme for International Student Assessment (PISA) – have inspired educators to find new ways of benchmarking themselves – ways in which educational establishments can and will be judged more on the quality of the outcomes they produce than the inputs they deploy. The Bologna process, for one, has encouraged different groups to compare the output performance of tertiary and secondary education systems in different countries, often with numeric benchmarks. Examples include the Bologna Stock Taking Report by the Bologna Follow Up Group, Bologna with Student Eyes by the ESIB (European Students Union) and the extensive Eurydice database maintained by the European Commission. The PISA study – undertaken by the OECD for secondary schooling – has been hugely influential as well, leading to acceptance of cross-country comparison for learning outcomes. Soon, the PISA approach will be broadened and extended to measure competencies among adults with the Programme for International Assessment of Adult Competencies (PIACC). Meanwhile, the European Association for Quality Assurance in Higher Education (ENQA) is creating and implementing analytics for ensuring quality management. Various private/public ranking initiatives such as the CHE consortium, the CHEPS consortium or the popular global rankings by The Times Higher Education Ranking or the Shanghai Jiao Tong University Ranking are attempting to compare and evaluate the performance of universities.

Also, increasingly, funding for departments at universities is starting to depend on their performance in objectively quantifiable areas. In the Netherlands, for instance, university department budgets are allocated according to both numbers of students as well as points awarded for publications. Since the implementation of this system, there has been a flurry of academic publications from Dutch universities.

'Labour markets send important signals about whether students are picking up the skills that society needs.'

or the mix of private and public funding, is less important for achieving educational excellence than having effective mechanisms in place where all students can receive an education in line with their talent and eagerness regardless of their economic and social background.

- c. Labour markets can and should play a more important role in evaluating the relevance of the education students are receiving. Labour markets send important signals about whether students are picking up the skills that society needs. The best systems are those that produce graduates who succeed in labour markets. While labour markets are complex systems influenced by a host of factors (including wage levels, the nature of existing employment legislation, the health of the local economy, and more), education systems that produce large numbers of graduates who go on to face unemployment, under-employment or difficulty in entering the labour market should ask themselves more directly if they are adequately fulfilling the role that society and citizens expect of them.
- d. The mandate of a good tertiary education system goes beyond the local community. Indeed, its remit is and should be to attract ambitious talent from around the world – and to help those talented people develop the knowledge and skills they will need to contribute to society throughout their lifetime. This is an important development role, whose relevance

will only increase as economic success moves inexorably to countries that attract, develop and mobilise the best human capital.⁸

- e. Put simply, the best university systems are the ones that offer the most chances to the largest number of people.

I. Inclusiveness: Participation Rates in Tertiary Education

A tertiary education system consists of several different types of institutions offering a wide array of degrees. Among these are universities, colleges, professional academies and similar institutions. From the perspective of labour-market qualifications, what counts is that the students have achieved a degree of higher learning that enables them to perform advanced skills in their professional environment – regardless of where they have acquired those skills and regardless of how much original research the university has undertaken parallel to teaching.

The number of students who receive tertiary education is rising throughout the world – an indication that, in Gordon Brown's famous phrase, globalisation is leading us "in a race to the top" rather than a race to the bottom (see figure 1 on page 5 for a look at the 10-year trend.). As late as the mid-1990's, only 20% of the relevant age group in OECD countries received a tertiary degree. Today, nearly one third of eligible students in OECD countries do so. Ten years ago, most of the OECD-based students receiving tertiary education were based in Anglo-Saxon countries. Since then, Scandinavian and

'Ten years ago, most OECD-based students receiving tertiary education were based in Anglo-Saxon countries. Since then, Scandinavian and Central European countries have expanded their systems dramatically, offering tertiary education to millions of their young people.'

Central European countries have expanded their systems dramatically, offering tertiary education to millions of their young people. By contrast, the traditionally strong UK and USA have mostly stagnated.

To compare the number of people in a given country who receive higher education, we chose to look at the percentage of university-age cohorts in each country who graduate with a university-level degree (for the results, see table 2 on page 3). We used the UNESCO ISCED 97 Va classification to define what is (or is not) a university-level degree.⁹ According to this criteria, a “university degree” is any degree awarded after at least three years of cumulative, full-time, theory-based study taught by faculty with advanced research degrees and qualifying the holder to work towards an advanced research degree.

The results are revealing. Australia does particularly well, weighing in at No. 1 in this category (it manages to provide almost 60% of its young age cohorts with a university degree). But countries like Netherlands, Poland, Italy, Denmark and Finland also do well, coming in at Nos. 2, 3, 4, 5 and 6 in the category, ahead of the UK, which would have been leader in this category 10 years ago. This shows the danger to successful systems of sitting on their laurels while other countries are advancing quickly.

At the other end of the spectrum, France, Austria and Germany score particularly poorly, coming in at Nos. 15, 16 and 17.

These countries each have graduation rates that are less than a third of Australia's. Given this poor performance, it is no surprise that France, Austria and Germany all have acute skills shortage in their labour markets – a condition that is bound to become worse, unless their education systems radically restructure their focus and priorities.

II. Access: The Ability to Accept Low Levels of Scholastic Aptitude from Secondary Schools

The tertiary education system does not start from scratch. It takes in students from among the graduates of the corresponding secondary schooling system. All tertiary systems and their institutions have thresholds of academic performance below which they will not award degrees. They like their students to achieve a high average and high peak performance. It is natural for them to seek to do this with the least effort, so many tertiary education institutions are interested in accepting only students above a certain level of scholastic aptitude. The brighter and better prepared the students that come in, the easier it is to teach them more and reach higher performance standards.

While this is understandable from an individual institution's point of view, from a system perspective, the motivation should be the opposite. It would be preferable for the system to accept students with as little pre-qualification or as low a scholastic aptitude as possible and to provide them with as much educational lift as possible. The lower

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the entry-level scholastic aptitude, the more demanding is the task to educate the students to high standards. From a society point of view, a tertiary education system is therefore more valuable if it can accept and educate students with a lower scholastic aptitude without compromising quality.

The scholastic aptitude distribution among secondary school students is known on an internationally comparable basis among 15 year olds thanks to the PISA scoring tests performed by OECD.¹⁰ The calculation for this second sub-indicator, Access, rests on the assumption that it is the smartest group of students who graduate with a tertiary degree. By counting down the percentiles of the share of tertiary degree graduates from among the PISA distribution, it is possible to derive how good a student must be in a given country in order to be able to graduate from that country's tertiary education system. The lower the threshold, the less good the student needs to be when entering the tertiary system, and thus the better for the country.

By this criteria, Germany comes in dead last in our ranking (for the results, see table 3 on page 13). This is not surprising, as the German tertiary education system traditionally has been geared towards achieving the opposite of letting the lower-educated enter tertiary education. German professors typically see their duty to be kicking out as many students as they can early on, in order to allow only the best to move on to a degree.

Germany continues to place its educational focus on providing master-level degrees which are far more demanding than bachelor degrees. But the approach has been nothing short of catastrophic. A strategy based on over-educating some while leaving others to go horribly under-educated has led to ever growing pockets of social exclusion in some quarters and a chronic shortage of talent available to the German economy as a whole.¹¹ The fact that bachelor-level students in Germany achieve nearly the same salaries in the labour market as master-level students – as will be discussed in the next section of this paper – is further evidence that the German education system has massively overinvested in providing some students with advanced degrees and chronically underinvested in the more basic, advanced education which society today demands.

Other systems handle this trade off differently – and better (see figure 2 on page 13 for a comparison). In Sweden, for example, the scholastic aptitude of an average secondary student (as measured by PISA achievement scores) is almost sufficient to later graduate from university as well, indicating that a broad range of students have access to a university education in this country (a development which has, in no small measure, contributed to the country's remarkable competitiveness standing today). By contrast, in Germany, Czech Republic and Turkey, the difference between an average secondary student and a university graduate is around 100 PISA points, indicating that only the brightest students

have access to a tertiary degree education in those countries (100 PISA points are the equivalent of one standard deviation from the mean of the student body.).

Among the countries in our ranking, Poland comes in at No. 1 in this category. It allows students with the lowest degree of scholastic aptitude to enter university. In other words, Polish professors are thus asked to teach the least prepared students in Europe. This is good for the system's overall ability to offer educational opportunity to the broadest number of people, but alas the Polish system does a poor job of taking advantage of its relative strength in this area, as we shall see in the next section. Put simply, Poland ranks last in Effectiveness, the measure of a university systems ability to produce graduates with skills relevant to the labour market. It means that, while Poland scores high on providing educational opportunity to its citizens, it must do better at using that advantage by making sure students are being taught skills and topics that will be useful to them – and to society at large.

Some countries do better at making sure their success in one area translates to performance in others. Portugal and the United States are cases in point. Both countries accept students with relatively low scholastic aptitude, and then teach those same students effectively enough that they go on to achieve the best salaries in the labour market.

III. Effectiveness: The Value of a Tertiary Degree to the Labour Market

Tertiary learning can impart many skills: academic research techniques, theoretical knowledge, advanced thinking skills, applied know-how for a given profession, etc. Not all of these skills can be objectively measured and compared, and for some of these skills a financial yardstick would be inappropriate. However, from a broad, system-based point of view, the most attractive yardstick is the extent to which these tertiary degree holders can pay back the financial investment that society has made in them by adding to the overall public's general welfare. Assuming a meritocratic pay system and a level playing field for all economic actors (which is a big assumption), we argue that the more economic welfare a degree holder can generate, the higher will be the salary he can achieve. Thus, the wage premium that tertiary degree holders can achieve above their compatriots who only hold a secondary degree is an important indicator both of the extent to which that degree-granting system is able to produce graduates with the skills their local economy needs but also of the strength of the overall education system at sending the right signals to future degree holders.¹²

To be sure, this approach suffers from the drawback that labour markets are in fact often not efficient allocators or rewarders of skills – but are fraught with cultural and regulatory influences which blur the skill-income relationship. The less labour force mobility and individual

Figure 2: Selectivity in the tertiary education system differs widely

Difference between the PISA score of an average student and the aptitude level required for graduation from a university (2003)

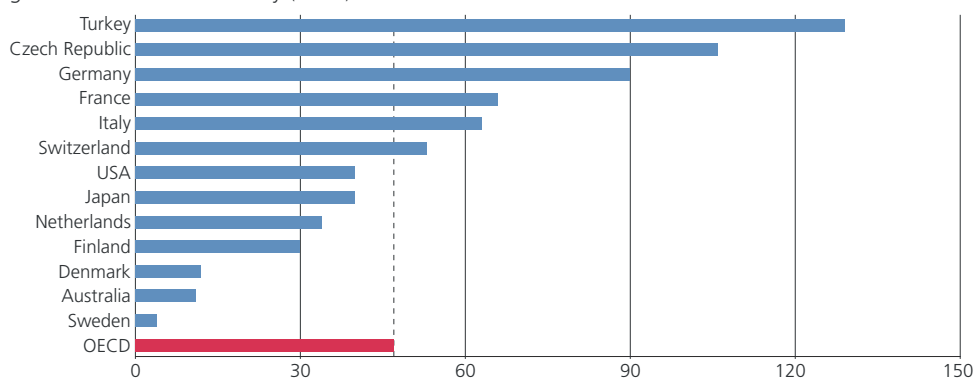


Table 3: Access

Threshold of skill aptitude required for tertiary graduation

Minimum PISA math scores of tertiary ISCED Va graduates (2003)

| Rank | Country | PISA Score |
|------|-------------|------------|
| 1 | Poland | 500 |
| 2 | Portugal | 503 |
| 3 | USA | 523 |
| 4 | Denmark | 526 |
| 5 | Italy | 529 |
| 6 | Ireland | 532 |
| 7 | Spain | 535 |
| 8 | Australia | 535 |
| 9 | Sweden | 539 |
| 10 | UK | 542 |
| 11 | Hungary | 542 |
| 12 | Finland | 548 |
| 13 | Netherlands | 572 |
| 14 | France | 577 |
| 15 | Switzerland | 580 |
| 16 | Austria | 590 |
| 17 | Germany | 593 |

Table 4: Effectiveness

Value of tertiary education to the labour market

Gross wage premium for men with tertiary education adjusted for local level of collective bargaining coverage

| Rank | Country | Premium |
|------|-------------|---------|
| 1 | USA | 76.8% |
| 2 | Portugal | 68.8% |
| 3 | France | 64.6% |
| 4 | Ireland | 61.4% |
| 5 | Austria | 61.0% |
| 6 | Finland | 58.4% |
| 7 | UK | 54.8% |
| 8 | Italy | 54.0% |
| 9 | Hungary | 50.7% |
| 10 | Denmark | 50.7% |
| 11 | Germany | 46.1% |
| 12 | Australia | 45.2% |
| 13 | Netherlands | 44.7% |
| 14 | Switzerland | 38.3% |
| 15 | Sweden | 35.4% |
| 16 | Spain | 30.0% |
| 17 | Poland | 28.1% |

'The less labour force mobility and individual merit compensation is possible in the labour market as a whole, the less it is possible to reward individual skill advantages.'

merit compensation is possible in the labour market as a whole, the less it is possible to reward individual skill advantages. Thus, countries with traditionally large degrees of labour-market rigidities will see smaller salary premiums for their higher skilled labour force. Furthermore, short-term business cycle effects in particular sectors can also skew the picture. Finally, it may make a difference whether tertiary degrees tend to be privately financed or publicly financed. In countries where students enter the labour market with personal debts resulting from the payment of tuition, they will be more insistent on choosing lucrative employment, thus pushing up the wage premia observed in those countries.

Interestingly, even with today's level of labour-market mobility (which has theoretically improved as the European Union has grown to 27 members), these effects have not been neutralized by skill migration. If the achievable skill premium is lower in Germany than in the UK, then higher skilled labour would theoretically migrate from Germany to the UK until the market balances. However, in practice, labour mobility between countries is not yet large enough to achieve this market allocation effect.

Collective bargaining coverage strongly varies even within OECD countries with the USA having only about 14% of the workforce covered by collective bargaining, while 95% of Austrian workers are covered.¹³ For the countries in our sample,

the average level of collective bargaining coverage is 68% and the average wage premium is 51% for a tertiary degree. Using statistical methods, we adjusted the actually observed wage premia per country for each country's level of collective bargaining coverage – stripping away a level of labour-market rigidity and looking more closely at that part of the wage premium which is due to a job's economical value to the industry in which it is held. The extent to which the actual wage premium is higher or lower than this statistical average describes the ability of the university system to produce skills that are prized and rewarded by the labour market.

The USA and Portugal perform particularly well in this regard (see table 4 on page 13). Both countries have economies where holders of higher degrees can command a comfortable wage premium – a fact which is itself an important incentive to encourage people to get a higher degree. It is noteworthy as well that both countries also score well in the Access sub-indicator, which looks at their systems' ability to provide education to the broadest range of students. This is a sign that – in this area at least – both systems are performing well at a key function – namely, the ability to offer educational opportunity to the broadest array of students (regardless of their qualifications or background) and later to reward those students with good jobs that command higher wages than work with a lower qualifications threshold would give.

Table 5: Attractiveness
Ability to attract foreign students

| Overall attractiveness rank | Country | Subranking 4a | Share of foreign students (2005) | Subranking 4b | Students from top ten source countries (2002/2003) |
|-----------------------------|-------------|-----------------------|----------------------------------|------------------------|--|
| 1 | UK | Australia | 17.3% | Denmark | 38.3% |
| 2 | France | UK | 13.9% | Sweden | 44.9% |
| 3 | Germany | Switzerland | 13.2% | France | 47.9% |
| 4 | Australia | Austria | 11.0% | Germany | 49.0% |
| 5 | Switzerland | France | 10.8% | UK | 55.5% |
| 6 | Denmark | Germany ¹ | 10.7% | USA ² | 57.3% |
| 7 | Sweden | Ireland | 6.9% | Finland | 58.5% |
| 8 | USA | Netherlands | 4.7% | Switzerland | 61.6% |
| 9 | Finland | Sweden | 4.4% | Italy | 61.7% |
| 10 | Ireland | Denmark | 4.4% | Spain | 63.8% |
| 11 | Netherlands | Portugal ¹ | 3.9% | Netherlands | 70.0% |
| 12 | Italy | Finland | 3.6% | Ireland | 72.7% |
| 13 | Austria | USA | 3.4% | Poland | 74.1% |
| 14 | Spain | Hungary | 2.7% | Australia ³ | 75.4% |
| 15 | Portugal | Italy ¹ | 1.9% | Portugal | 82.7% |
| 16 | Poland | Spain | 1.0% | Hungary | 84.6% |
| 17 | Hungary | Poland ¹ | 0.4% | Austria | 97.1% |

Notes: (1) 2003; (2) OpenDoors 2003; (3) Australian Higher Education Statistics 2003

Figure 3: English speaking countries are favorite study destinations
Foreign tertiary students by country of enrollment, 2005

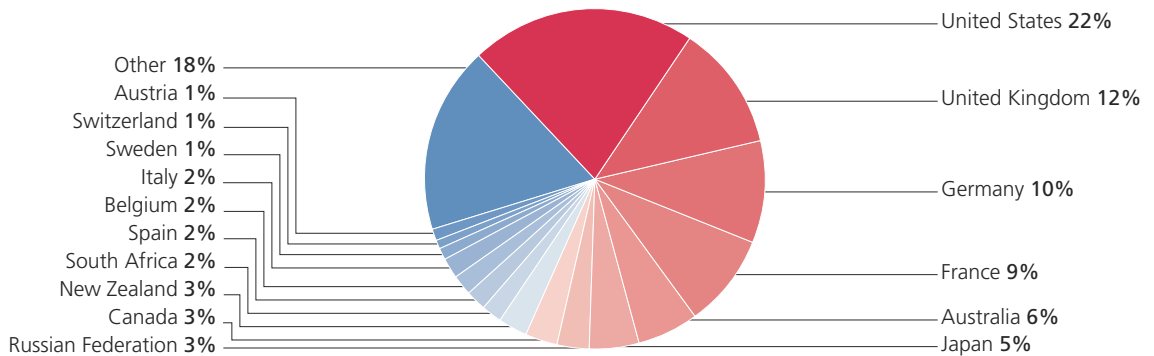


Table 6: Age-Range
Tertiary education as lifelong learning institution
Share of 30-39 year olds among relevant age cohort enrolled in tertiary education

| Rank | Country | Share |
|------|-------------|-------|
| 1 | UK | 15.8% |
| 2 | Australia | 14.0% |
| 3 | Sweden | 13.3% |
| 4 | Finland | 13.1% |
| 5 | Denmark | 7.8% |
| 6 | Hungary | 5.8% |
| 7 | USA | 5.2% |
| 8 | Poland | 4.6% |
| 9 | Ireland | 4.0% |
| 10 | Portugal | 3.8% |
| 11 | Spain | 3.6% |
| 12 | Switzerland | 3.6% |
| 13 | Austria | 3.3% |
| 14 | Italy | 3.2% |
| 15 | Netherlands | 2.7% |
| 16 | France | 2.6% |
| 17 | Germany | 2.5% |

France and Austria also do relatively well in the Effectiveness category, coming in at Nos. 3 and 5, respectively. Due to strongly selective admission to study (as evidenced by their low showing in the Access category), it is sometimes difficult to enroll in institutes of higher learning in those countries. However, for those who are admitted and go on to graduate, they find their education is well valued in the local labour market. On the other hand, Germany, Netherlands and Switzerland perform badly on both counts; despite heavy screening of applicants, graduates in those countries often find their skills are not well rewarded in the local labour market.

IV. Attractiveness: The Ability to Attract Foreign Students

In the future fight for global talent and in expectation of future patterns of migration – where many individuals will pursue careers in multiple successive locations rather than a final and permanent relocation – it is critical for countries to be attractive to global talent if they want to be successful. Global migration rates are highest among 20 to 25 year olds. One key factor for luring such global talent is to provide tertiary education as an attractive entry point for migrants. Attractiveness is determined among other things by financing options, language issues, degree compatibility, visa regulations, work permits, etc. – all of which are part of the tertiary education system.

However, measuring only the share of foreign students of the total tertiary

enrolment is not a sufficient indicator, as it fails to take into account whether the students are predominantly from geographically, culturally or linguistically proximate countries – and likely to return after completion of their education – or whether the host country attracts students from around the globe. By examining the percentage of foreign students that come from the top 10 source countries, it is possible to show whether a tertiary system merely attracts students from particular countries or whether there is a wider appeal. Thus the lower the combined share of a country's 10 most prominent source countries, the more diverse and attractive is a country's tertiary education system. Therefore, for this sub-indicator we combined two scores – one of the respective share of foreign students and one of the share of students from the top 10 source countries – to achieve our ranking.

Interestingly, countries where English – the world's lingua Franca – is spoken claim the top ranks, but there are important exceptions (see figure 3 on page 15). France and Germany also do well – even though teaching there is mostly in their local language (a sign that English is not a *sine qua non* for foreign-student education). These two countries continue to be attractive to students from all over the world, who represent a significant portion of the student body. At the other end of the spectrum are Portugal, Spain, Poland and Hungary, which do a poor job of attracting foreign students.

‘The higher the ability and the willingness of a tertiary system to change, the faster it can react to the ever changing future needs of both its students and the labour market.’

V. Age-Range: The Ability to be a Lifelong Learning Institution

In order for labour market participants to stay competitive and valuable to the economy, they need to uphold or enhance their skill level as time proceeds. Lifelong learning is an objective within the framework of the Bologna process, including particularly the accreditation of prior learning.

The fifth sub-indicator measures the ability of a tertiary education system to offer lifelong learning. It does this by measuring the percentage of people in the age cohorts 30-39 who participate in higher education through public or private institutions. The more a tertiary education system can support and promote lifelong learning and the higher the ratio of lifelong learners of that age cohort, the better for the country.

UK, Australia and Sweden do best, coming in at Nos. 1, 2 and 3. All three have encouraged financial autonomy among their universities, and even among the departments within them. This, in turn, seems to encourage those universities to seek out more students and offer more

fee-based courses to people regardless of their age or previous qualifications. By contrast, France and Germany do the poorest in this category. Both severely restrict the ability of their universities to offer additional fee-based courses; neither has yet found a successful mechanism for funding university-based, lifelong learning or encouraging universities to open up to more than the traditional university-aged cohort.

To be sure, UK and Sweden conduct a fair amount of vocational and professional education through academic tertiary institutions, whereas in France, Germany and Netherlands these training programmes tend to be undertaken in-house or by specialized, non-academic service providers. Both approaches have merit; assessing the relative strengths and weaknesses of these two systems is outside the scope of this study.

VI. Responsiveness: The Ability to Change

In a highly globalised and competitive economic environment where labour-market dynamics evolve everyday, tertiary education systems must change and adapt as well.¹⁴ The Bologna process, launched

Only Good in Singapore

At Ludwig-Maximilians-University in Munich, one of the few officially designated elite universities in Germany, Jonas is reading business mathematics – a course of study that promises a bright future in business. On his own initiative, Jonas also studied one year at the internationally renowned National University of Singapore in order to sharpen his skills in international commerce and gain exposure to the market dynamics of Asia. Upon his return, his university in Munich did not accept transfer credits from this stay at NUS towards Jonas’ German degree.

Table 7: Responsiveness – Ability to Change

Progress in implementing Bologna targets measured in scorecard grades (one is the best score; five is the worst)

| Rank | Country | Average Grade |
|------|-------------|---------------|
| 1 | Ireland | 1.06 |
| 2 | Denmark | 1.19 |
| 3 | UK | 1.35 |
| 4 | Finland | 1.43 |
| 5 | Hungary | 1.65 |
| 6 | Portugal | 1.65 |
| 7 | Sweden | 1.71 |
| 8 | Austria | 1.82 |
| 9 | Netherlands | 1.85 |
| 10 | Germany | 1.89 |
| 11 | Poland | 1.93 |
| 12 | Switzerland | 1.99 |
| 13 | Italy | 2.02 |
| 14 | France | 2.04 |
| 15 | Spain | 2.64 |
| | USA | n/a |
| | Australia | n/a |

in 1999 by the European Council, called for higher education systems to be dynamic and responsive to the needs not only of students but also of changing labour-market conditions. But this will hardly have been the end of all the necessary changes. New challenges will surely come along. Therefore, as the last sub-indicator, we chose to measure each system's ability to change as a contributor to a country's overall quality of its tertiary education system.

This sub-indicator measures progress based on a grading system established by EU member states as part of the Bologna stocktaking process.¹⁵ A Bologna score of “green” translates to a “one” for purposes of this study; a Bologna score of “red” equals “five” in our rating. The system measures progress that countries have made towards harmonising higher education systems in light of their legal commitments in the Bologna process. The examined data was compiled in the Bologna Stocktaking 2007 report. Among the 12 individual criteria of progress, we double-weighted whether countries have already implemented a two-cycle degree system (bachelor and master

cycles), as this is the central and most difficult aspect of the Bologna process.

The higher the ability and the willingness of a tertiary system to change, the faster it can react to the ever changing future needs of both its students and the labour market and thereby more efficiently ensure also in future its importance to the labour market.

In 1999, all EU countries agreed to restructure their tertiary systems by the year 2010. This common date was chosen with the explicit target that from the graduation year 2010 onwards there would be a maximum degree of educational compatibility among European countries, where students and professors could freely transfer their credentials between systems. Tellingly, Germany, Poland, Switzerland, Italy, France and Spain come out at the bottom of this ranking, scoring Nos. 10, 11, 12, 13, 14 and 15, respectively. In most of those countries, the signing of the Bologna Declaration went largely unnoticed by the universities – or their students. In order to award degrees by 2010, universities would have needed to offer the new courses of study from 2006. However, in Germany in 2006, there was barely the capacity installed to accredit

'The education system is there to serve as a catalyst for meritocracy and social advancement. It should provide the maximum amount of opportunity to people of all ages.'

these new degree programs, let alone offer them. The system was so self-absorbed that it failed to recognise even its legal obligations!

In general, the Bologna stocktaking report points out that most countries have come a long way to be achieving the implementation of the Declaration. However, plenty of evidence on the ground suggests that quite often these are semantic changes rather than changes of substance. For instance, some universities seem to be enrolling students for combined Bachelor/Master programmes and discouraging the transfer of credits from one university to the next (see the box on page 17 for more). What's more, countries that are blessed with university systems that are more open to change and better understand what is required of them – such as Ireland, Denmark, Finland, Hungary and Portugal, which all score relatively well on this indicator – can hope to achieve more and better skill generation from their universities not only today, but also in the future.¹⁶

Conclusions and Analysis

A tertiary education system is an integral part of our modern economic and social infrastructure. At its most basic level, it serves to arm a cadre of people with the knowledge they will need to function at the top of modern society, and to begin training those people in the critical analytical and decision-making processes they will use in a creative, knowledge-based economy. It is also a very complex, multilayered system – one that both affects

and is itself affected by the world in which it operates. That has been the central argument of this paper – namely, a tertiary education system is much more than simply the inputs we throw at it, and that, while the size of inputs and the amount of resources we devote to education are no doubt important, if we only ever measure inputs as a guide to success, we risk overlooking the very real failures which a poorly-functioning system could be bequeathing us.

We advocate the opposite approach – namely, we argue for an approach based on measuring outputs, where we look at the quality and number of graduates which the system produces, and the relevance of the education they receive to the very real social and economic challenges we face. We also believe the entire incentive structure in which the tertiary education system sits must be considered part of the system itself. And, if we truly want to ensure that our education system is world class – which is itself a universally recognised requirement of success in a modern, knowledge-based economy – we must find better, more revealing ways of measuring and understanding exactly how our systems are performing. What exactly are our goals and expectations for the tertiary education system? And how can we best affect and influence those systems for the most social good?

One very important goal is inclusiveness. Put simply, the education system is there to serve as a catalyst for meritocracy and social advancement. With that in mind,

it should provide the maximum amount of opportunity to people of all ages (including through lifelong learning). And it can and should be open and available to the broadest number of people. It cannot be allowed to degenerate into a cultural finishing school, in which opportunity is available only to the rich and privileged. It must become a genuine engine of social change, opening its doors to the widest number of people and helping anyone who cares to be educated to be the best that they can be.

The system must also do a better job of understanding – and responding to – the signals which the outside world is giving it. University systems that produce high numbers of unemployed, over-educated graduates are perhaps not fulfilling an important part of their economic and social duties: namely, to train high calibre knowledge workers who will drive our economy and society forward and to offer a solid financial return to those people willing to continue their education into their adult years. To be sure, the education system alone is not responsible for persistently high unemployment in many OECD countries – or the equally disturbing, modern phenomenon of “skills mis-matching,” in which high unemployment exists alongside of good jobs which companies tell us they cannot fill due to a shortage of suitable graduates. But the tertiary education system can and should do more to pay attention to important signals such as these, to adjust their curricula in a timely way, to offer sound advice to potential graduates

who fill its programmes and to work to be modern engines of excellence in every conceivable way.

The tertiary education system consists of several elements:

- Universities
- Professional schools
- Academies
- Professors and lecturers
- Administration of the system and its institutions
- Systems for awarding degrees and certification, including accreditation
- Access systems and pathways to the tertiary institutions of learning
- Financing systems, both public and private, including labour market conditions

The interaction of all these elements with each other are deeply complex, and moreover are much influenced by local culture and institutional legacy: the way students obtain finance, how they secure access to learning, how degrees are accredited, etc. That is why our evaluation prefers to look at countries’ systems from an output perspective: how many students is the system able to train? How low is the threshold of entry to the system? How much actual learning seems to take place? How successful are students later in their jobs? How much foreign talent is being channelled to domestic labour markets? How much lifelong learning has become a reality? And is the system adapting and changing to new challenges?

‘ Among the factors that count for economic growth – raw materials, financial capital, people and knowledge – Europe’s best bet by far remains on letting knowledge and human capital drive its wealth creation.’

From the point of view of society, the system which produces the largest highly-qualified, gainfully-employed, academically-trained workforce – and offers the opportunity to join that highly-trained workforce to the broadest number of people – is the most successful.

Lisbon – and Beyond

In the year 2000, European heads of state and government met in Lisbon, Portugal, and vowed to make Europe “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.” The question now is what comes next and how best to get there.¹⁷

Since 2000, the world has obviously changed in some foreseen and many unforeseen ways. The productivity advantages that used to be propelling North America towards ever-increasing competitiveness seem to have evaporated. Meanwhile many resource-rich economies are profiting enormously from a global shortage of available energy and its related impact on commodity markets of every type (proving that it is not only knowledge which can lead to riches). Moreover, the incessant rise in power of many economically successful, authoritarian regimes, notably in Asia, calls in question the previous Western consensus that innovative creativity, competitive spirit and economic progress must go hand in hand with civil liberties.

Yet, regardless of whether a course other than reliance on competition and knowledge exists towards economic success, it is hard to see what else could be a better strategy for Europe. Europe remains poor of natural resources and thus ultimately the only way to escape from the stranglehold of the commodities squeeze is to diversify forward into dematerialized, knowledge-driven economies. Europeans are also unlikely to want to give up their civil liberties, rendering mute any discussion on whether more authoritarian governance would be of advantage. Neither does Europe yet have the clout on the financial markets to be the dominating reserve currency and thus make the rest of the world pay for its financial blunders by a currency devaluation. And finally, Europe’s demography is and will be stagnant, so no economic stimulus can be expected from a population rising in numbers.

Thus, among the factors that count for economic growth – raw materials, financial capital, people and knowledge – Europe’s best bet by far remains on letting knowledge and human capital drive its wealth creation. And for that, we need a tertiary education system that lives up to the very real tasks that society holds out for it.

Table 8: Summary of ranking and sub-indicators

| Overall Rank | Country | Overall Points | 1. Participation in Tertiary Education | 2. Acceptance Threshold | 3. Wage Premium | 4.a. Share of Foreign Students | 4.b. Top 10 Source Countries | 5. Lifelong Learning | 6. Ability to Change |
|--------------|-------------|-----------------------|--|-------------------------|-----------------|--------------------------------|------------------------------|----------------------|----------------------|
| | | 6 = best; 102 = worst | in % | in PISA score | in % | in % | in % | in % | Grade |
| 1 | Australia | 30.6 | 59 | 535 | 45.2 | 17.3 | 75.4 | 14.0 | n/a |
| 2 | UK | 31.1 | 39 | 542 | 54.8 | 13.9 | 55.5 | 15.8 | 1.35 |
| 3 | Denmark | 39.1 | 46 | 526 | 50.7 | 4.4 | 38.3 | 7.8 | 1.19 |
| 4 | Finland | 40.8 | 47 | 548 | 58.4 | 3.6 | 58.5 | 13.1 | 1.43 |
| 5 | USA | 49.0 | 34 | 523 | 76.8 | 3.4 | 57.3 | 5.2 | n/a |
| 6 | Sweden | 49.2 | 38 | 539 | 35.4 | 4.4 | 44.9 | 13.3 | 1.71 |
| 7 | Ireland | 49.2 | 38 | 532 | 61.4 | 6.9 | 72.7 | 4.0 | 1.06 |
| 8 | Portugal | 54.3 | 32 | 503 | 68.8 | 3.9 | 82.7 | 3.8 | 1.65 |
| 9 | Italy | 60.9 | 41 | 529 | 54.0 | 1.9 | 61.7 | 3.2 | 2.02 |
| 10 | France | 62.2 | 26 | 577 | 64.6 | 10.8 | 47.9 | 2.6 | 2.04 |
| 11 | Poland | 64.4 | 45 | 500 | 28.1 | 0.4 | 74.1 | 4.6 | 1.93 |
| 12 | Hungary | 64.5 | 36 | 542 | 50.7 | 2.7 | 84.6 | 5.8 | 1.65 |
| 13 | Netherlands | 69.6 | 42 | 572 | 44.7 | 4.7 | 70.0 | 2.7 | 1.85 |
| 14 | Switzerland | 70.3 | 27 | 580 | 38.3 | 13.2 | 61.6 | 3.6 | 1.99 |
| 15 | Germany | 72.5 | 20 | 593 | 46.1 | 10.7 | 49.0 | 2.5 | 1.89 |
| 16 | Austria | 76.4 | 20 | 590 | 61.0 | 11.0 | 97.1 | 3.3 | 1.82 |
| 17 | Spain | 79.4 | 33 | 535 | 30.0 | 1.0 | 63.8 | 3.6 | 2.64 |

A Note on Methodology and Data Sources

Composite indicators like the one developed in this policy brief have a central weakness: they are based on value judgments regarding the relative weight assigned to each of the sub-indicators in the composite. In an ideal world, the sub-indicators are and should be linked to each other through an overarching logic which can also provide some guidance as to the relative weights they should be assigned. Given existing data and methodological limits, we have built the first edition of the University Systems Ranking along those lines to the extent that we can. The first three indicators – which are by the far the most important three of the study, Inclusiveness, Access and Effectiveness – work somewhat to the exclusion of each other, i.e., it is relatively easy to provide low access to education to many students at shoddy standards, or some other combination, but to be good in all three indicators at the same time is a real challenge. Therefore, we chose to give these indicators equal weights, believing their collective interaction represents a fair evaluation of the trade offs and challenges which a university system has to master.

However, the next three indicators – covering Attractiveness, Age-range and Responsiveness – proved more problematic. In the end, we chose to give equal weight to all three as well, though this decision is more arbitrary, as there is no inherent trade off between a system’s ability to attract foreign students, to offer educational opportunities to post-graduates or to adopt the Bologna process reforms.

Our goal was not to present a definitive statement on the quality of the education students are receiving or individual institutions are giving – statements of that type will need better, more broadly defined data sets than are available today. But we did want to raise awareness of the sometimes very real gap between the goals we set for our tertiary education system and the system’s ability to deliver. We wanted to launch a broader debate on how we might learn to track and follow – perhaps with a new set of indicators capable of giving us more focused, more relevant information – the ability of our educational systems to meet the social and economic

challenges we hold out for them. Excellence at the top, while a worthy goal in and of itself, does not always translate into overall excellence – and effectiveness – of the system itself. We believe Europe needs better, more targeted, more refined ways of measuring educational outcomes – and providing policy makers with the tools and levers they can use to improve performance.

In that light, we encourage countries to pay attention not just to their overall score, but to their score in each of the six individual indicators, each of which was chosen to help countries benchmark an important task of the educational system (for a summary see table 8 on page 22). A brief discussion of the methodological and data considerations behind each indicator follows.

Inclusiveness

For the first two sub-indicators, we used the ISCED Va definition of tertiary education, because this type of education is broadly comparable across the country sample (degree awarded after at least three years of cumulative, full-time, theory-based study taught by faculty with advanced research degrees). Contents and standards for ISCED Vb degrees diverge sharply across countries. Using ISCED Vb as the criteria would have incurred even more comparability issues than are present already.

Access

The logic behind this indicator is in some ways counter intuitive, but we believe an acceptance of that counter intuition will be important for helping our system make progress in the key areas of Access and Inclusiveness. Put simply, we chose to measure the level of educational attainment of incoming classes, awarding a higher grade to systems that take in students with lower scholastic averages. We believe that, from a system perspective, the more under-educated, socially excluded students the system can nonetheless find a way of educating, the better the system. Of course, the outcome quality of an individual educational institution is likely to be much higher, the higher the intake quality is, and is therefore a key indicator for that institution's performance. But from a system point of view, society should know how much educational lift a layer of education can provide to its population – and the lower it can start, the better for society.

Effectiveness

In this indicator, we use the wage premium that the labour market is willing to pay for a tertiary education compared to a mere secondary schooling degree as an indication of the quality of the education students receive. Obviously, numerous methodological problems are inherent in this approach. To begin with, many tertiary systems will outright reject the notion that labour market utility is or should be the goal of the education they are providing. Most universities seek to breed the next generation of top scientists; they argue that it would be unfair to measure recently-graduated scientists on such short-term, economics-oriented measures – and even if one intends to do so, then capturing only their achieved salary would be discounting all the externality effects that science has for a society.

Even when accepting the appropriateness of measuring labour-market returns for education, numerous methodological issues arise. Strauss and de la Maisonneuve (2007) have conducted the most in-depth empirical investigation of tertiary education returns available. Their calculations adjust for instance for gender, marital status, type of job tenure, the type of work contract, working in the public versus the private sector, for the size of the production unit in which individuals are employed and over- or under-qualification for the job, besides a large range of data purification measures.

Drawing on other work by Barth and Lucifora (2006), we have taken Strauss and de la Maisonneuve's calculated education returns and let them undergo another adjustment: namely for different labour-market composition and tolerance towards individual performance reward, which was not captured by Strauss and de la Maisonneuve's original study. The work by Barth

and Lucifora tested for many different variables of labour-market performance and concluded that systematically only the spread of collective bargaining coverage of the work force has an effect on individual performance reward – which we then corrected for in our data. While it is anecdotally possible that from country to country temporary factors may also influence education premia (for instance economic boom times), systematically speaking we have adjusted the data for all those impacts that are empirically proven not to be related to education.

Attractiveness

We have opted to subdivide this sub-indicator to draw on two different data sets: the share of foreign students and the diversity of source countries of foreign students. Both measures have their advantages and drawbacks. What we would really like to know is how many students have changed country residency in order to study abroad – and where these are going. Such data are being collected only recently by some countries, but not yet consistently in all places. In a few years we will have a better picture due to better empirical data.

Age-Range

Countries that have an established tradition of advanced professional programmes such as MBA degrees will have a natural advantage in this indicator. Lifelong learning may be happening in other countries in other institutions or as part of the daily job performance. This indicator can therefore not judge the degree to which lifelong learning takes place, nor is it the intention. The intention here is to mark out the contribution of the tertiary education system in providing lifelong learning – the more prominent its role is regardless of the reasons, the more valuable the system is to society.

Responsiveness

A center piece to the Bologna reforms were the implementation of the Bachelor/Master two cycle degrees. As some countries (such as the UK) were closer to that system than others, they may have had less of a road to travel, and might therefore have had an easier time to respond to the new challenges. This is certainly a potential bias in this indicator. On the other hand, the Bologna process asked for several more reforms such as quality control accreditation, student representation, etc. in which other countries may have been more advanced already.

Overall score

Each sub-indicator has an equal weight contributing to the overall rank. The best possible score is six (indicating a ranking of No. 1 in all six categories), and the worst possible score is 102 (indicating a ranking of No. 17 in all six categories). However, in compiling the rankings, we adjusted the scores to account for relative performance, allowing us to more accurately reflect how countries are doing relative to each other instead of just relying on a first-past-the-post horserace to determine the winners. For example, in the first sub-indicator, Inclusiveness, the top three contenders, Australia, Finland and Denmark, scored Nos. 1, 2 and 3, respectively, based on the number of people graduating with a degree as a percentage of the total population (the relative percentages were 59%, 47% and 46%, respectively). However, in terms of performance, the relative distance between Australia and Finland (at 12 percentage points) is larger than the distance between Finland and Denmark (at one percentage point). Therefore, for purposes of calculating the final ranking, we adjusted both countries' relative score in the individual sub-rankings to take account of their distance from one another. In this case, Finland received a score of 5.9 (instead of 2) after adjusting for its relative spot in the Inclusiveness sub-ranking and Denmark a score of 6.6 (instead of 3). The goal was to take into account not just the winners and losers but the actual distance between the countries in each category, thereby making the index more fair and more capable of telling us about the actual performance of countries relative to each other.

Your comments, criticisms and suggestions for future refinement are welcome.
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