

2. *Setting the Stage: Impact, Trends and Challenges of Tertiary Education*

2.1 Introduction

This Chapter provides the context for analysing tertiary education policy. First, it summarises evidence on the impact and relevance of tertiary education, in particular its effect on economic growth and the benefits it brings to both individuals and societies. Second, it describes the main trends within tertiary education, with particular emphasis on growth and diversification, and reviews the contextual factors affecting the development of tertiary systems. Finally, it identifies the challenges currently facing tertiary education systems and which are addressed in subsequent Chapters. Countries are in the process of making a transition from a focus on quantity to a greater emphasis on the quality, coherence, and equity of tertiary education giving considerable room for tertiary education policy to play a role.

2.2 The impact of tertiary education

This Section looks into the evidence of the social benefits of tertiary education and their aggregate effect on economic growth. Social benefits of tertiary education can be split into private benefits of tertiary education (which can be monetary⁵ or non-monetary) and external (non-private) benefits of tertiary education (also known as *education externalities*). Evidence on these is reviewed below. An attempt is made at focusing on the benefits generated more specifically by tertiary education but the literature often looks at the effects of education in more general terms.

2.2.1 *Private benefits of tertiary education*

Private monetary benefits of tertiary education

The empirical literature provides strong evidence that better-educated people are more likely to be in the labour force, and if economically active, less likely to be unemployed (see Blöndal *et al.*, 2002; Oliveira Martins *et al.*, 2007).⁶ There is also strong evidence

5. “Monetary benefits” are also often called “market benefits”.
6. As noted by Blöndal *et al.* (2002) and Oliveira Martins *et al.* (2007), while the gap in unemployment rates is large for those investing in upper-secondary education (relative to lower levels of education), it is smaller between tertiary-educated workers and those with completed upper secondary education. In 2001, the estimated probability of employment (conditional upon participating in the labour market) for an upper-secondary degree holder was around 92% for women and 95% for men in most OECD countries. With a tertiary degree, the conditional employment probability increases on average by around two percentage points (Oliveira Martins *et al.*, 2007). OECD (2007a) provides figures at country level for employment levels by level of education of individuals.

that better qualifications also attract wage *premia*. In some countries, these are very large, reflecting a greater wage spread in the labour market and possibly higher returns to particular skills (see Peracchi, 2006, for a review of the literature). Overall, empirical studies offer compelling evidence that undertaking tertiary education is a highly profitable investment from the individual's point of view. The measure typically used to assess the profitability of the investment in tertiary education is the internal rate of return to tertiary education (for extensive reviews of the literature see Psacharopoulos and Patrinos, 2004a and 2004b; Psacharopoulos, 1994). Precise estimates of the monetary benefits of tertiary education are presented below. These results draw mostly on recent OECD work which uses sophisticated techniques to estimate both wage *premia* and private internal rates of return (Boarini and Strauss, 2007; Oliveira Martins *et al.*, 2007; and Strauss and de la Maisonnette, 2007).⁷

There is significant evidence of the earnings advantage provided by tertiary education

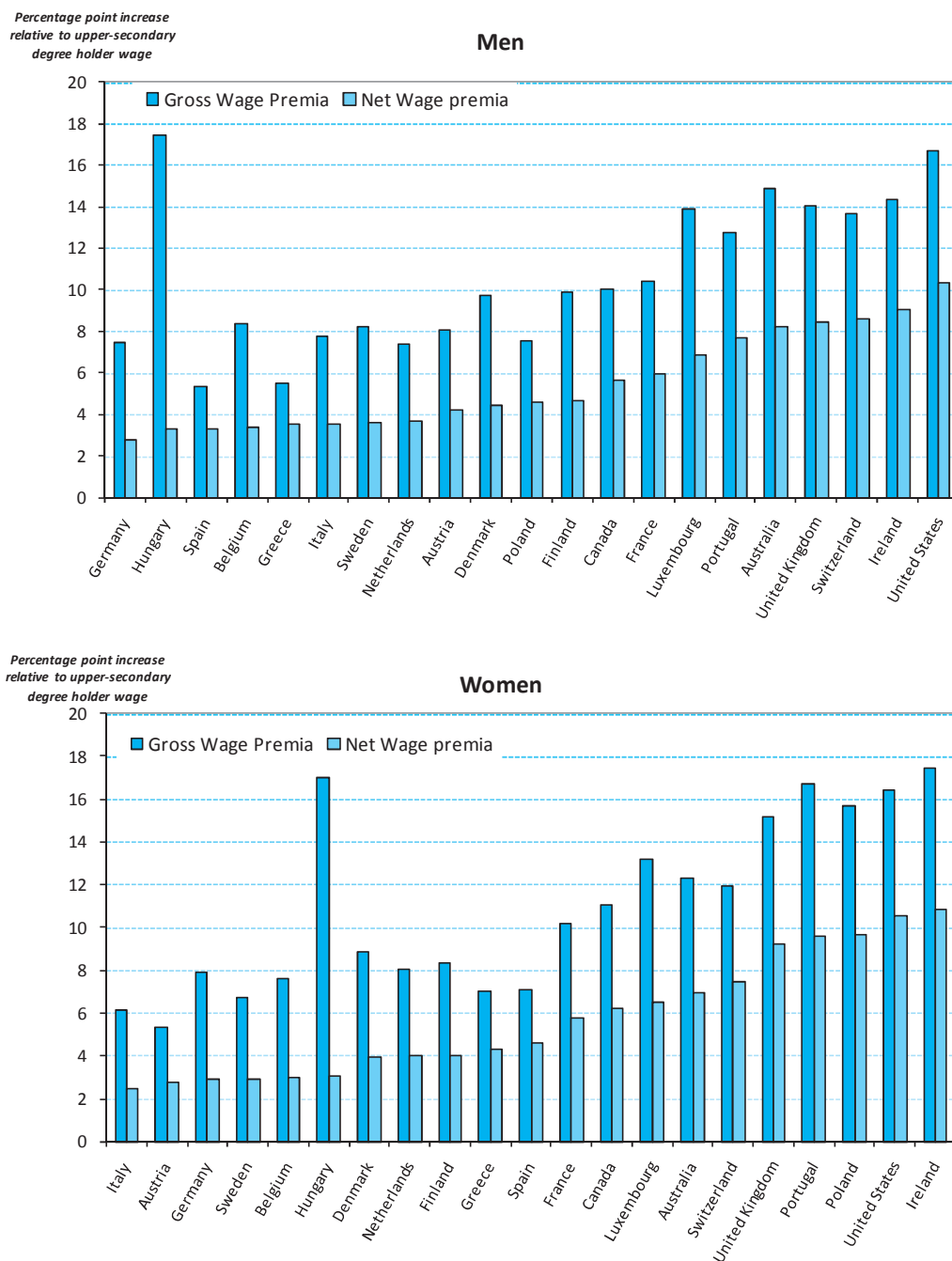
The simplest measure of the private benefits of tertiary education is the higher salaries graduates receive compared to non-graduates – it appears that there is not only an initial earnings advantage upon entry into the labour market but also a wage *premium* that increases with time spent in the labour market (Blöndal *et al.*, 2002). Controlling for a number of individual and context-specific characteristics (other than the level of education) that may affect individual wage earnings, it is possible to estimate the percentage increase in the gross hourly wage earned by an individual completing tertiary education relative to the wage earned by an otherwise similar individual holding only an upper secondary degree. The gross education *premia* estimated in this way reflect *inter alia* both the average quality of skills acquired by tertiary graduates and their scarcity relative to other types of skills. They are translated into net labour market *premia* by taking into account the duration of studies, the higher probability of employment after study completion and the influence of tax and benefit systems on net earnings. Figure 2.1 shows both gross and net labour market *premia* per year of tertiary education for a number of OECD countries in 2001, estimated using individual household panel data (Oliveira Martins *et al.*, 2007; and Strauss and de la Maisonnette, 2007).

The gross education wage *premia* per year of tertiary education ranged, in 2001, from slightly above 5% for men in Greece and Spain and women in Austria to above 16% for both men and women in Hungary and the United States and women in Ireland and Portugal, suggesting that tertiary education can provide indeed a substantial wage *premium* over secondary education. Net labour market *premia* change somewhat the country rankings. Net wage *premia* exceed 8% for both men and women in Ireland, the United Kingdom, and the United States, men in Australia and Switzerland and women in Poland and Portugal.

7. Compared to previous estimates, an important value-added of this work is the greater coverage in terms of both countries and period. Another innovative aspect is the use of micro-level datasets for the estimation of some of the components of the internal rates of return.

Figure 2.1. Gross and net wage premia of tertiary graduates

(Per year of tertiary education, 2001)



Countries are ranked in ascending order of the net wage premia.

Notes: Gross and net wage premia of tertiary graduates are adjusted for survival rates, experience premia, marginal tax rate for employed and unemployed, marginal gross out-of-work replacement rates, probability of unemployment and duration of studies. The year of reference is 1997 for Hungary and 2000 for Poland and Switzerland.

Source: Reproduced from Boarini and Strauss, 2007.

Peracchi (2006) provides time series on wage *premia* for the United States. The evidence shows that the tertiary wage *premium* for full-time full-year workers declined substantially during the 1970s, increased sharply during the 1980s, and continued to rise, albeit much more modestly, through most of the 1990s. The returns to experience also increased, especially among the less educated. He concludes that the consequence of these trends has been a substantial decline in the relative position of young workers with no tertiary education.

Greenaway and Haynes (2000) summarise a number of noteworthy findings concerning OECD countries. First, they point out that there is a remarkable persistence in the wage *premia* of tertiary graduates over time despite the substantial increase in their numbers in recent decades. They note that if we compare earnings profiles of graduates and non-graduates in the late 1950s and 1990s, the wage *premium* has altered comparatively little despite massive expansion. Second, they note that earnings differentials are more significant for men than women. Third, they observe that graduate earnings differ according to subject studies. For example, graduates in the sciences earn more on average than graduates in the arts.

Private internal rates of return provide compelling evidence of the profitability to invest in tertiary education

The private internal rate of return (*IRR*) to tertiary education is a standard measure of the profitability to undertake tertiary education. It can be defined as the discount rate that just equates the individual's future benefits with the costs of education to the individual. There is now a consolidated conceptual framework supporting the computation of *IRRs*, as well as considerable empirical evidence both across countries and over time (see Heckman *et al.*, 2006, for a review). From an economic point of view, the private monetary benefits of tertiary education essentially consist in a higher future stream of earnings after graduation.⁸

Figure 2.2 displays the private internal rates of return to tertiary education in 2001 for both females and males in 21 OECD countries computed in recent OECD work (Oliveira Martins *et al.*, 2007; and Boarini and Strauss, 2007). The computation of the *IRRs* took account of the following cost and benefit components:⁹

- The *direct costs* of tertiary education (*e.g.* tuition fees, cost of living);
- The *opportunity costs* associated with the several years of income of an upper secondary educated individual forgone during the tertiary studies;

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8. A general assumption underlying the computation of private *IRR* is that tertiary education benefits and costs are only pecuniary, although it is widely believed that education yields broader advantages to individuals (*e.g.* better health, see below).
 9. More specifically, the following policy variables or parameters enter the calculation of the private *IRR* (see Boarini and Strauss, 2007): average and marginal tax rates on labour earnings (including employees' contributions to social security); average and marginal unemployment benefit replacement rates; average and marginal tax rates on replacement income (unemployment and pensions); tuition fees, student grants and loans; the average duration of (completed) tertiary studies; benefit replacement rates of pension systems and their indexation to productivity growth (only public pension systems are considered, but this simplification is not overly restrictive if private pension systems are actuarially fair). As all these flows have to be properly discounted, the pension *premia* that occur in the distant future typically have a lower weight in the calculations than, say, immediate direct or opportunity costs.

- Higher net wages driven by the gross tertiary education *premium*, discussed above;
- A higher probability of being employed throughout working life (or *employability premium*); and
- Eventually higher statutory pension benefits (or *pension premium*).

Figure 2.2. Estimates of the Internal Rates of Return to Tertiary Education, 2001



Countries are ranked in ascending order of the internal rates of return to tertiary education.

Note: The year of reference is 1997 for Hungary and 2000 for Poland and Switzerland.

Source: Reproduced from Boarini and Strauss, 2007.

Private internal rates of return vary from just over 4 to above 14% in 2001 for the 21 OECD countries covered by the analysis. The average return (across both countries and gender) is 8.5%, which is lower than previous OECD estimates but still substantially higher than current market interest rates adjusted for inflation. The range of returns for women is somewhat wider than for men (from over 4 to 14% vs. nearly 5 to 12%). Gender differences in the *IRR* are particularly large in Poland (almost five percentage points). By country, low average returns are found in Austria, Belgium, Germany, Greece, Hungary, Italy, the Netherlands, Spain and Sweden. In all these countries, low *IRRs* are driven by below average net labour market wage *premia*, despite low direct and/or opportunity costs. Moderate *IRRs* are found in Canada, Denmark, Finland, France, Poland and the United States, where labour market wage *premia* are around the OECD country average. Finally, tertiary education yields the highest returns to individuals in Australia, Ireland, Luxembourg, Portugal, Switzerland and the United Kingdom.

The study also shows that *IRRs* are relatively stable over time, with the OECD average slightly increasing between 1994 and 2001. The strongest upwards trends are observed for Denmark, Greece (women in particular), Ireland and Poland. By contrast, the *IRR* has decreased in Austria (women only) and the United Kingdom (Oliveira Martins *et al.*, 2007).

This is consistent with similar results by de la Fuente and Jimeno (2005) for 14 European countries using a comparable approach except that they use data from labour force rather than household surveys and a smaller set of control variables. The estimated private returns to a one-year increase in schooling, starting from currently observed average attainment levels, cluster between 7.5% and 10% in most member States of the European Union. Sweden is a clear outlier at the bottom of the distribution, possibly as a result of severe wage compression, while the highest returns are found in the United Kingdom and Ireland, followed by Portugal and Finland. The authors conclude that, in practically all European Union countries, the returns to schooling compare quite favourably with those of standard financial assets.

These studies provide estimates for an average *IRR* to tertiary education, with no account of the types of tertiary education undertaken or where and when it takes place. The literature identifies a number of bases on which it would be helpful to differentiate *IRRs* to tertiary education (Ehrenberg, 2004), depending on whether:

- The return depends on the length of the degree (2-year degree vs. 4-year degree);¹⁰
- The return depends upon the type of tertiary education institution (TEI) attended (*e.g.* university vs. non-university);
- Completion of a degree at the most selective institutions confers extra economic advantages to students; and
- The return depends on the field of study.¹¹

10. Based on 1995 earnings in Canada, Stark (2006) estimates private education returns for men at 9.9%, 4.1% and 1.3% for bachelor's, master's and doctoral levels respectively. The corresponding estimated returns for women are respectively 12.1%, 8.6% and 4.3%. Borland (2002), analysing the Australian case, finds that returns to tertiary education tend to decrease beyond the Bachelor's degree.

The non-monetary private benefits of tertiary education

The literature has identified a number of non-monetary private benefits of education

Individuals undertaking tertiary education also derive non-monetary benefits from it. The literature has identified a number of private non-monetary benefits of education, but few studies focus on the extent to which tertiary education contributes to these. Private non-monetary benefits of education, as identified in the literature, include the following (McMahon, 2004):¹²

- Better individual and family health;
- Cognitive development of children;
- Fertility, family size and poverty reduction (as a private benefit);
- Consumption efficiency;
- Higher return on financial assets (*i.e.* more educated individuals invest better their money);
- Reduced obsolescence of human capital via new leisure-time learning;
- Non-market job satisfactions (*e.g.* better working conditions);
- Greater amenities in urban life (*e.g.* live in areas where crime rate is low); and
- Pure consumption effects (*e.g.* enjoy student life while in tertiary institution over work).

But the empirical assessment of the non-monetary private benefits of education is still incipient

Private non-monetary benefits are not yet clearly identified or understood in the literature and it is difficult to quantify their importance. Their sound empirical assessment is still lacking (Barr, 2001).¹³ Some studies, however, provide some indications on potential private non-monetary benefits of tertiary education. For example, results from a longitudinal study in the Netherlands indicate that individuals with lower levels of education were almost three times more likely to engage in excessive alcohol consumption than individuals with a university degree, but with the causality of this relationship not robustly tested (OECD, 2006a). A study based on the 1990 Work, Family and Well-Being Study in the United States, finds that the association between education

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11. Stark (2006), based on 1995 earnings in Canada, finds that scientific fields tend to exhibit greater private returns than non-scientific fields at the bachelor's level, but there is a large dispersion (*e.g.* from 3.9% in Zoology and 4.4% in Fine Arts to 14.6% in Commerce and 23.3% in Actuarial science). By contrast, a master's degree is generally more rewarding in non-science fields. Analysing the case of Australia, Borland (2002) finds that business and administration and engineering diplomas yield much higher returns (close to 20%) than those of scientific, social and cultural fields (around 11%).
 12. Surveys of the empirical evidence can be found in Grossman (2006), Pascarella and Terenzini (2005) and Wolfe and Haveman (2001).
 13. OECD (2007b) synthesises what is known about the social outcomes of learning – such as the impact of education on health or on civic and social engagement. A focus on the wider benefits of higher education is provided in Bynner and Egerton (2001) and Bynner *et al.* (2003).

and depression strengthens with age, and that individuals with tertiary education are more successful at lowering the likelihood of depression because they have better physical health (Miech and Shanahan, 2000, reported in OECD, 2006a). A study by Currie and Moretti (2003) for the United States, using data covering the period 1970-1999, suggests that women with tertiary education are less likely to smoke during a pregnancy (reported in OECD, 2006a). A study in Finland provides some indications that individuals with tertiary education have improved nutrition habits *vis-à-vis* less educated individuals: the odds-ratio of being in accordance with dietary guidelines were 31% and 84% higher for those with secondary education and tertiary education, respectively, compared to those with basic education (OECD, 2006a). Schellhorn *et al.* (2000) show that, in Switzerland, older people with a higher educational degree undertake 18% fewer visits to a primary physician than older people with lower levels of education and make greater use of specialist physicians (by 45%) (reported in OECD, 2006a). It should be noted, however, that the causal effect of education is not fully addressed empirically in these studies.

It appears that non-monetary private benefits might be given little weight in the decision to enrol in tertiary education

It also appears that, although families and students do value better health, greater longevity, better child education, non-market job satisfactions, they might be unaware of the extent to which these benefits are connected to their further education – therefore it is possible that they are taken for granted by prospective students, reducing the incentive for additional private investment in human capital by individuals (McMahon, 2004). Consistent with this, when specific non-monetary returns including better education and health of future children, stimulation of lifelong learning later in life, and finding a spouse with university-developed values were tested in a sample of 1863 entering university students in the United States, McMahon (1984) found each of these (except the last) to be of very limited significance relative to expected money earnings.

2.2.2 External (non-private) benefits of tertiary education

External (non-private) benefits of education – or, *education externalities* – are social or public benefits from the education of an individual that benefit others in the society in both current and future generations and which are not appropriated by the individual receiving the education.¹⁴ They are over and above the private benefits that the individual decision maker takes into account in making his or her private decision to invest in education (McMahon, 2004).

A large literature identifies potential education externalities but empirical evidence on their importance is considerably more limited. Further, few studies focus on tertiary

14. In economics, an *externality* is a cost or a benefit resulting from an economic transaction that is borne or received by parties not directly involved in the transaction in a way that is not transmitted by market prices. Externalities can be either positive, when an external benefit is generated without payment (as occurs with inoculation against disease as the children who benefit indirectly do not have to pay the child who is immunised); or negative, when an external cost is imposed upon others with no compensation (as with a person smoking a cigar in a crowded room as non-smokers in the room do not receive compensation from the smoker for the use of the room's clean air). The participants do not bear all of the costs or reap all of the gains from the transaction. Effects on third parties which are reflected in prices are not externalities. For example, a brilliant surgeon who does much good for humanity creates no positive externality as long as the surgeon's salary reflects the value of his or her services (Rosen, 2005).

education as originating a given education externality. The following are among the education externalities most cited by the literature (McMahon, 2004):¹⁵

- Health effects of education as it reduces infant mortality, increases longevity, and improves public health;
- Fertility effects as female education lowers fertility rates;
- Democratisation and human rights, as education improves civic institutions;
- Political stability, aided by democratisation and education;
- Crime rate reduction and lower incarceration costs, with white-collar crime a negative externality;
- Poverty reduction and reduced inequality, via wider distribution of education;
- Environmental influences, all of which are indirect; and
- Education's contribution to R&D, and to diffusion of new technology.¹⁶

McMahon (2004) summarises the quantitative evidence on educational externalities. The existing evidence is limited but, as the author points out, the major shortcoming is that existing studies essentially capture only those externalities which can be monetarily quantified.¹⁷ He reports an estimate of market-measured (monetary) pure externalities returns (social monetary returns minus private monetary returns) of 14% in OECD countries, about 61% of total monetary social returns. Psacharopoulos and Patrinos (2004a) give an estimate of pure externalities returns to tertiary education in the United States of 12%. Further McMahon (2004) points out that, if the role of education on technological innovation is removed from static neoclassical models of growth, these externalities largely disappear. However, as emphasised by McMahon (2004), these studies largely ignore the impact of non-market education externalities and indirect and delayed effects on development goals.

Few studies look at the specific externalities generated by tertiary education. A survey in the United States revealed that, with respect to the number of hours volunteered for community service, within each income group, 22% of those with some post-secondary education give their time to community service activities, which is nearly twice as often as the 12% of those with a secondary education (NCES, 1995). Another study (Hodgkinson and Weitzman, 1988) finds that, with respect to financial giving, university educated individuals, within each income group, give twice as often as individuals with secondary education. Bynner and Egerton (2001) using the National Child Development Study in the United Kingdom find a link between tertiary education and participation in community affairs, democratic processes, egalitarian attitudes, parenting and voluntary work. Dee (2004) finds that participation in higher education in the United States increases the probability of registering to vote by 22 percentage points and actually turning out to vote by 17 percentage points (as reported in OECD, 2007b). A survey of the adult population in

15. See McMahon (2004) for more detailed examples.

16. It should be noted that some of the educational externalities indicated (*e.g.* public health, democracy, political stability) are pure public goods (consumption by one individual generally does not diminish consumption by others) and therefore are also associated with a private benefit.

17. Jacobs and van der Ploeg (2006) also conclude that there is no suggestive evidence favouring externalities of human capital.

Ireland in 2002 showed that tertiary graduates, other things equal, were 7 times more likely to volunteer in the community than those with only secondary attainment (Healy, 2005). These results are similar to those found by Schuller *et al.* (2001) in the United Kingdom. They report that tertiary education graduates were three times more likely to be a current or active member of a voluntary organisation than those who did not complete secondary education (below “A-Levels”) and about twice as likely as upper secondary completers (reported in OECD, 2006a).

Some evidence suggests that more education is also associated with greater utilisation of preventative health care, which contributes to savings in health care systems. For cervical screening and mammography, evidence from Australia, Canada, the United Kingdom and the United States shows that women with tertiary education are more likely to uptake regular screenings. However, the specific causal effect of education on the demand for preventative health care has not yet been fully addressed empirically (OECD, 2006a).

2.2.3 Social rates of return

Social benefits of education amount to the sum of private benefits of education (both monetary and non-monetary) and external (non-private) benefits of education (both monetary and non-monetary). The social rates of return, defined as the discount rate that just equates the future social benefits with the social costs of education, take into account the entire range of social benefits of education. Unlike private rates of return, the social rates of return reflect the full investment costs. These are not just those to the individual and his or her family, including forgone earnings, but also those to the society in the form of institutional costs and grants. They also reflect all benefits, not just the monetary benefits to the individual but also, the monetary and non-monetary education externalities benefiting current and future generations that individuals take for granted (McMahon, 2004).

Estimated social rates of return to tertiary education documented in the literature are typically lower than private rates of return (see OECD, 2001a, for a review of studies measuring the social benefits of education). This is because as they tend to include only monetary benefits (and often do not account for education externalities), they end up reflecting the further account of the costs of provision borne by taxpayers in addition to the costs borne by the individual. In practice, given that there are many difficulties in calculating the full costs and benefits, published estimates often rest heavily on a relatively narrow range of measurable factors. Even so, as documented in Blöndal *et al.* (2002) and the successive editions of OECD’s *Education at a Glance* starting in 2002, social rates of return are typically above 5% in real terms for tertiary education.

McMahon (2004) explores the argument that standard estimates of social rates of return include only a portion of the total social effects of education. He argues that these estimates are limited to the monetary (private and external) returns and do not include the non-monetary private or the non-monetary external benefits of education. He further argues that choosing the narrower static interpretation of the neoclassical model (used to estimate externalities) where the specifications tend to focus on direct effects, externalities are often found to be negligible or even zero. Using a dynamic specification of the neoclassical model that allows accounting for indirect and long delayed effects of education externalities in the development process, he finds evidence for substantial externalities of education. His investigation suggests that the total value of education externalities as a percentage of social returns to education, within the OECD area, is

estimated to be between 37% and 61%. Based on this analysis, he provides preliminary estimates of the social rates of return that include non-monetary returns and externalities. His preliminary estimates for the social rates of return to tertiary education are 17.8% in the OECD area, 24.3% in Africa, 23.2% in Asia and 26.1% in Latin America, significantly higher than a benchmark return of, say, 10% available on average for private investment alternatives in bonds or physical capital (McMahon, 2004).

2.2.4 Impact of tertiary education on economic growth

The types of benefits described above have an aggregate impact on economic growth, an issue which is the subject of a vast empirical literature. These studies assess the impact of the stock and rate of change of human capital on the levels and rates of economic growth. A study by the OECD (2001a) summarises this literature. It stresses that the multitude of models and databases used to assess the impact of education on growth have produced mixed results, with some showing a strong effect and others indicating no effect at all. It is explained that while the so-called “new growth” models¹⁸ improved the ability to identify the impact of education on growth, the evidence they provide remains not as strong as expected.¹⁹ As recognised by many authors (*e.g.* Krueger and Lindahl, 1999; de la Fuente and Domenech, 2000; Bassanini and Scarpetta, 2001), this is partly linked to poor data quality and the inability to identify the complex interactions through which human capital plays a role in the growth process. There are many factors likely to influence the growth of industrialised economies. These include: national governance; overall economic and political stability; macroeconomic policies; financial, legal, and corporate institutions; regulatory policies; and policies for labour, science and technology, and education. In this complex mix, models are limited in the extent to which they account for the indirect effects of education (*e.g.* on national governance).

Other work by the OECD using a rich data set shows that “the improvement in human capital has been one of the key factors behind the growth process of the past decades in all OECD countries, but especially so in Germany (mainly in the 1980s), Italy, Greece, the Netherlands (mainly in the 1980s) and Spain where the increase in human capital accounted for more than half a percentage point acceleration in growth with respect to the previous decade” (OECD, 2000a). For OECD countries as a whole, the implication is that each extra year of full-time education (corresponding to a rise in human capital by about 10%), is associated with an increase in output *per capita* of about 6%.

The summary in OECD (2001a) also stresses that “new growth” models provide more solid evidence of the role of education and learning on growth through generating new technology and innovation. In particular, tertiary education is identified as important for the development of innovative research and the ability to acquire and adopt it. When, for instance, spending on research and development is included in growth models, the independent effect of schooling appears to be reduced (*e.g.* Nonneman and Vanhoudt, 1996, as reported in OECD, 2001a).

Some papers have focused on the growth-inducing role of tertiary or post-compulsory education. Evidence is scarce but Gemmill (1996), splitting the country samples by

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18. “New growth” models permit to differentiate “types” of education and take account of potential education externalities.
19. Krueger and Lindahl (1999), Lange and Topel (2006), Stevens and Weale (2004) and Temple (1999, 2001) provide reviews of the literature on the impact of education on growth.

income level, finds that, other things equal, tertiary education seems to be more important for economic growth in OECD countries, while primary and secondary education are more important for economic growth in developing countries. Similar results were obtained by Gemmell (1995) and Barro and Sala-i-Martin (1995), as reported in OECD (2001a). An important aspect is the impact of tertiary education by field of study. Investigating the impact of human capital on labour productivity growth for OECD countries during 1950-88, Gittleman and Wolff (1995) find that the number of scientists and engineers *per capita* has a significant positive impact on productivity. Greenaway and Haynes (2000), in interpreting the empirical literature, propose the following four key findings about the role of tertiary education on growth: *i*) countries with higher average years of education tend on average to grow faster; *ii*) OECD countries which expanded their higher education sector more rapidly from the 1960s experienced faster growth; *iii*) education is more important via its effects on productivity than directly as a factor input; and *iv*) there is some evidence that education positively affects physical investment in the economy which in turn further increases growth rates.

As reported in OECD (2001a), a generally favourable picture of the impact of human capital on growth has emerged from a review by Temple (2001) in which he concludes:

“Over the last ten years, growth researchers have bounced from identifying quite dramatic effects of education, to calling into question the existence of any effect at all. More recent research is placed somewhere between these two extremes, but perhaps leaning closer to the original findings that education has a major impact. In examining the studies that have not detected an effect, we have some convincing reasons (measurement error, outliers, and incorrect specification) to doubt such results. The balance of recent evidence points to productivity effects of education which are at least as large as those identified by labour economists.”

Wolf (2004) suggests that the empirical evidence on the impact of education on economic growth should be interpreted with care. She argues that often policy makers make decisions on educational investments on the basis of misinterpretations of the current empirical evidence of the impact of education on growth. First, the author points out that the current evidence of education on growth is not as strong as could be expected – she interprets this as indicating that the strong relationship between education and individual earnings might not fully reflect higher marginal productivity but rather be more related to signalling or credentialism. Second, she stresses that growth models used to empirically assess the impact of education use a very simple measure of education as the best proxy available: years of formal education completed. She argues that there is a risk that policy makers emphasise quantity of education over its quality, when the educational process and the mechanisms through which it impacts on growth and prosperity are considerably more complex than those implied by current empirical models. She suggests that tertiary education policies should put more emphasis on quality and particular attention should be given to the way resources are allocated and combined.²⁰

20. One drawback of most cross-country work is the inability to account for important differences in the nature and quality of schooling across countries, which could undermine the usefulness of international comparisons (Temple, 2001, as reported in OECD, 2001a). Hanushek and Kimko (2000) and Barro (2001), using data on international tests of cognitive ability in mathematics and science, estimate the quality of different groups in the adult labour force. They find that using measures based on the quality of education provides a more powerful explanation of economic growth in different countries than simply years of schooling (as reported in OECD, 2001a).

In her paper, Wolf (2004) conveys three main messages. First, there are cases where more education does seem clearly associated with higher productivity, but their nature differs between countries and across time. This could be the basis for favouring investments in certain sectors of tertiary education over others. Second, she indicates that a growing body of evidence points to the importance of quantitative/mathematical skills in developed economies, which might suggest specific investments in tertiary level training in these areas. Third, according to the author, “the economic performance of both a sizeable output of innovative research, and the symbiotic relationship between a country’s successful industries and its universities are well-attested.” She also reports evidence that the strength of countries in various different sectors (*e.g.* pharmaceuticals, software engineering) is closely related to the areas in which they possess centres of university excellence.

2.3 Trends and contextual developments in tertiary education

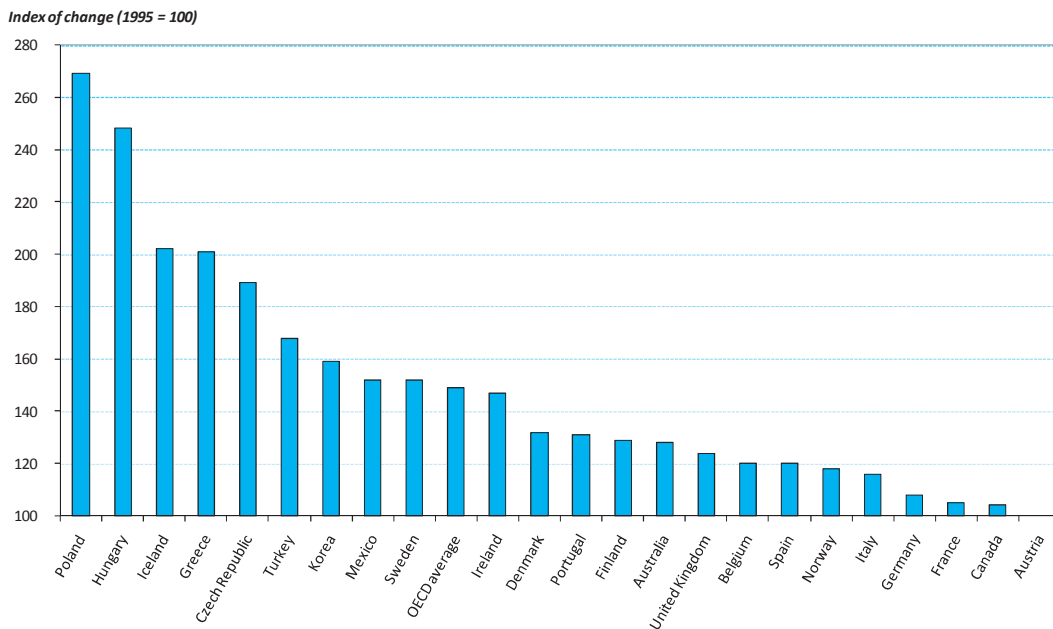
2.3.1 Trends in tertiary education

Expansion of tertiary education systems

The expansion of tertiary education has been remarkable in recent decades. Globally, in 2004, 132 million students enrolled in tertiary education, up from 68 million in 1991 (UNESCO, 2006). Average annual growth in tertiary enrolment over the period 1991-2004 stood at 5.1% worldwide. Over this period, growth was: *i*) particularly marked in East Asia and the Pacific (8.1%), Sub-Saharan Africa (7.2%), and South and West Asia (6.8%); *ii*) around average in Latin America and the Caribbean (5.1%) and Central and Eastern Europe (5.0%); and *iii*) below average in North America and Western Europe (1.9%). The ratio of the number of tertiary students to the tertiary school-age population²¹ increased between 1991 and 2004 from 52 to 70% in North America and Western Europe, 33 to 54% in Central and Eastern Europe, 17 to 28% in Latin America and the Caribbean, and 7 to 23% in East Asia and the Pacific (UNESCO, 2006, Table 1, p. 23).²²

In the last decade, the number of students in tertiary education has increased in practically all OECD countries. Figure 2.3 shows the expansion between 1995 and 2004. In this period, the number of students enrolled in tertiary education more than doubled in the Greece, Hungary, Iceland and Poland and rose between 50 and 100% in the Czech Republic, Korea, Mexico, Sweden and Turkey. Austria was the only OECD country where the absolute number of tertiary students did not increase in this period (remained constant).

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21. Defined as the five-year cohort after the theoretical/typical age of secondary education completion (variable across countries).
 22. World Bank (2002) provides an overview of trends and developments in developing and transition countries.

Figure 2.3. Change in the number of students in tertiary education between 1995 and 2004

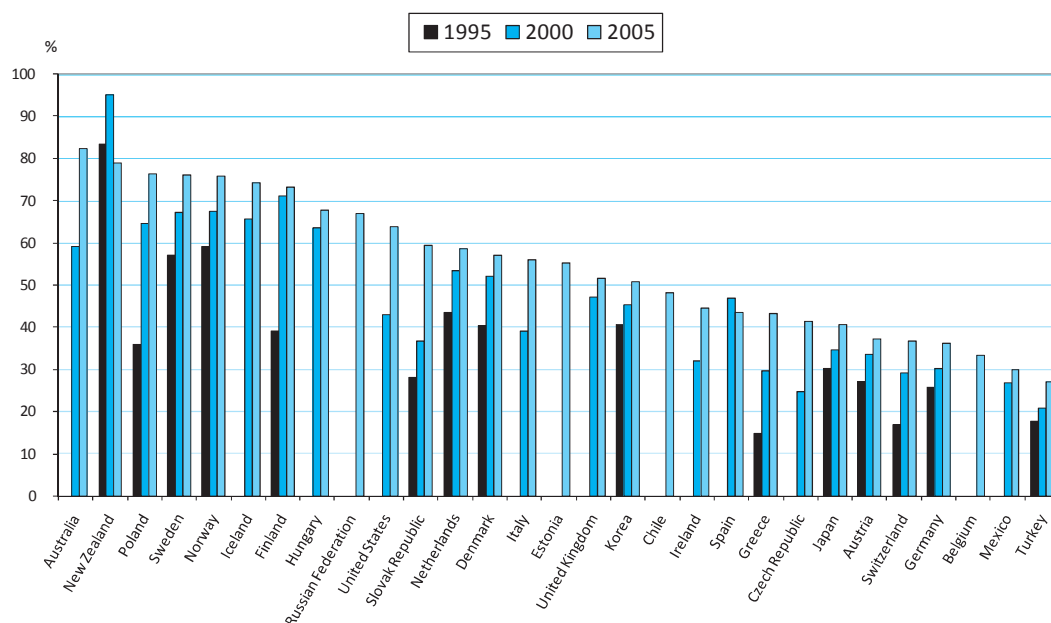
Countries are ranked in descending order of the change in the number of students in tertiary education between 1995 and 2004.

Note: Data for Belgium exclude the German-speaking Community of Belgium. For Canada, the year of reference is 2002.

Source: OECD, 2006b.

Participation rates in tertiary education of over 50% for a single age cohort are becoming the benchmark for OECD countries. Figure 2.4 shows the net entry rates in tertiary-type A programmes for 1995, 2000 and 2005. Net entry rates represent the proportion of people in a single age-cohort who enter a given level of tertiary education at some point in their lives. In 2005, over 70% of a single age cohort could expect to enter a tertiary-type A programme in Australia, Finland, Iceland, New Zealand, Norway, Poland and Sweden. In the same year, other countries such as Chile, Denmark, Estonia, Japan, Korea, the Russian Federation and the United Kingdom combined net entry rates in tertiary-type A programmes above 40% with net entry rates in tertiary-type B programmes above 20%. In 2005, net entry rates in tertiary-type B programmes stood above 30% in Belgium, Chile, Estonia, Japan, Korea, New Zealand and the Russian Federation (OECD, 2007a). Net entry rates increased in the period 1995 to 2005 in all countries for which data are available with the exception of New Zealand.

Gibbons (1998) suggests that forces behind the expansion of tertiary education include the democratisation of politics and society after World War II; the expansion of the public sector and the subsequent increased demand for white collar workers; a growing industrial economy that needed highly skilled and educated workers; the widespread view that educated manpower is essential for economic development; and finally “the attractiveness of education itself as a major element of the new welfare states, sustaining and legitimating democratic societies”.

Figure 2.4. Net entry rates in tertiary-type A programmes, 1995-2005

Countries are ranked in descending order of the net entry rates in tertiary-type A programmes in 2005.

The **net entry rate** of a specific age is obtained by dividing the number of first-time (new) entrants of that age to a specific type of tertiary education by the total population in the corresponding age group (multiplied by 100). The overall net entry rate for each tertiary level is calculated by summing the rates for each single year of age at that level. The *net entry rate* represents the proportion of people in a synthetic age-cohort who enter a given level of tertiary education at some point in their lives. In the case where no data on new entrants by age are available, **gross entry rates** are calculated. Gross entry rates are the ratio of all entrants, regardless of their age, to the size of the population at the *typical age of entry*. Gross entry rates are more easily influenced by differences in the size of population by single year of age. Mismatches between the coverage of the population data and the student data mean that the participation rates for those countries that are net exporters of students may be underestimated and those that are net importers may be overestimated.

Notes: Entry rates include advanced research programmes for 1995 and 2000. Data for Belgium exclude the German-speaking Community of Belgium. Entry rates for Chile, Italy, Japan, Korea and the Russian Federation are calculated as gross entry rates.

Source: OECD, 2007a.

Schofer and Meyer (2005) explore the worldwide expansion of tertiary education in the 20th century using pooled panel regressions. Their study identifies factors that were associated with growth in enrolment numbers. They find that tertiary systems expanded faster in countries with expanded secondary education systems and in those “with strong links to the international system or the ‘world polity’”. In addition, “economic development tends to have a positive effect on enrollments, but the effect is not significant in the early part of the century or in models with improved measures that control for secondary enrolments”. Conversely, enrolment increased at a slower pace in ethnically and linguistically diverse countries, suggesting the competition between different status groups leads to under-representation of particular groups. The expansion was slower in countries with centralised educational systems, where governments had greater capacity to limit growth. Starting around the 1960s, the rate of increase in enrolments became considerably higher in all types of countries distinguished in the analysis. The authors suggest that this worldwide trend is linked to “global institutional

changes linked to the rise of a new model of society: increasing democratisation and human rights, scientisation, and the advent of development planning”.

Diversification of provision

Expansion of tertiary education was accompanied by a diversification of provision. New institution types emerged, educational offerings within institutions multiplied, private provision expanded, and new modes of delivery were introduced.

Development of non-university sectors and diversification of educational offerings

The growth of non-university sectors is among the most significant structural changes which occurred in tertiary education systems in recent times. Many countries established new sectors of institutions that are alternatives to traditional universities. Examples include the *Instituts Universitaires de Technologie* (IUTs) in France (created in the mid 1960s), the Technical and Further Education Colleges (TAFE) in Australia (early 1970s), the German *Fachhochschulen* (early 1970s), the Polytechnic Institutes in Portugal (late 1970s), the regional colleges (*Distriktshøgskoler*) in Norway (early 1970s), the *Hogskolen* (HBO) in the Netherlands (late 1980s), the Polytechnic sector (AMK) in Finland (early 1990s), the *Universidades Tecnológicas* (early 1990s), the *Universidades Politécnicas* (early 2000s) and the *Universidades Interculturales* (mid 2000s) in Mexico, and the Swiss Universities of Applied Sciences (late 1990s), among many others. While these institutions are enormously varied, their common objective is to be strongly employer-oriented and closely integrated with the labour market needs of each locality and region (Grubb, 2003; OECD, 2005a) (see also Chapter 3).

A number of factors led to the expansion of more vocationally-oriented sectors. With the expansion of systems, governments wanted to create clear and distinctive alternatives to universities, to meet the increasingly diverse needs of the labour market (Kyvik, 2004). Doubts arose concerning the capacity of traditional universities to handle the rapid growth, as well as their ability to respond to the demands of individuals and a gradually more knowledge-based economy. The emergence of new types of institution was also part of regional development strategies with enhanced social and geographical access to tertiary education. These institutions were seen as more innovative in responding to the needs of local communities (Kyvik, 2004) and as more accommodating of the growing diversity of individual qualifications, motivations, expectations and career plans of students (Goedegebuure *et al.*, 1994). Educating a larger proportion of students in short programmes also allowed governments to reduce the costs involved with the provision of tertiary education (Kyvik, 2004).

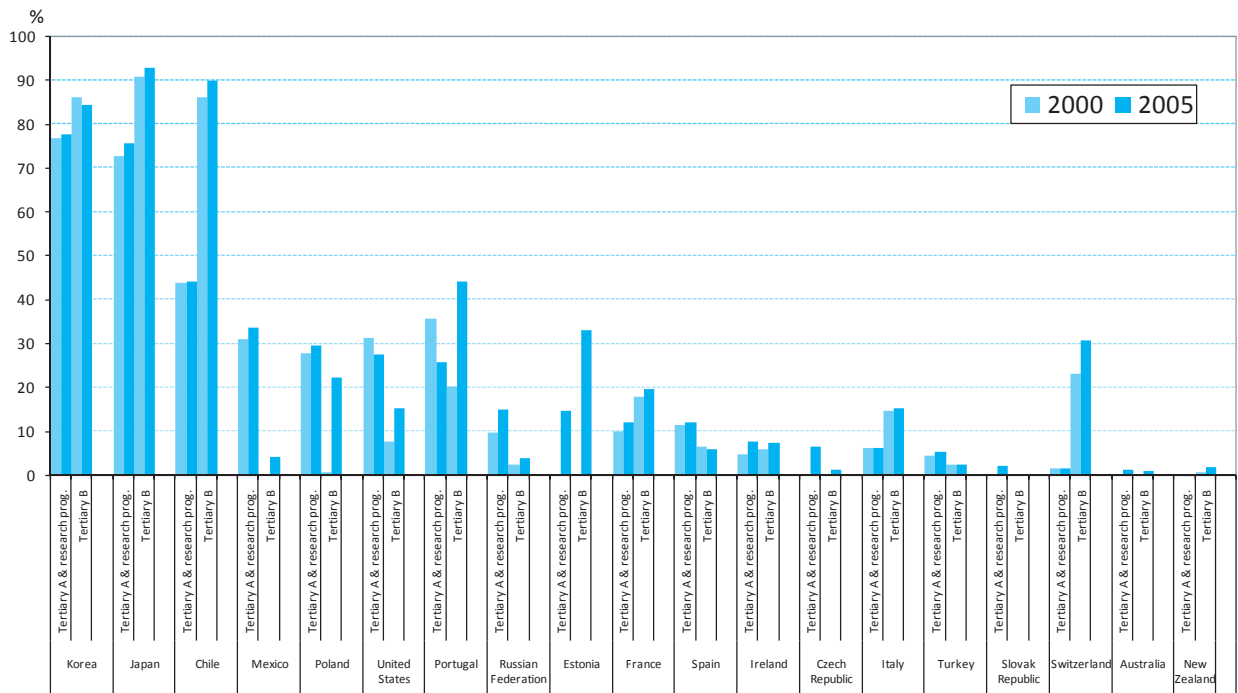
A related trend is the growing diversity of educational offerings within single institutions, regardless of their type. For instance, traditional universities are increasingly expanding their educational offerings to include short-cycle courses and more vocationally-oriented degrees. This trend reflects that, in some countries, distinctions between institutional types have become blurred. In some of these, university systems have become formally “unitary”. For instance, binary university systems were abolished in Australia and the United Kingdom in the late 1980s and early 1990s respectively.²³

23. In both Australia and the United Kingdom unitary university systems coexist with vocationally-oriented systems (Technical and Further Education (TAFE) institutes in Australia and Further Education Colleges in the United Kingdom).

Sizable private provision in some countries

A response to the growing demand for tertiary education in countries with limited public resources has been the expansion of private provision of tertiary education.²⁴ Figure 2.5 illustrates marked differences across countries in the proportion of tertiary students enrolled in independent private institutions (for both tertiary-type A and tertiary-type B programmes). Over 70% of students in both types of programmes in Korea and Japan and students in tertiary-type B programmes in Chile are enrolled in independent private institutions. Other countries with well-established independent private tertiary sectors include Estonia, Mexico, Poland, Portugal, the Russian Federation, Switzerland (in tertiary-type B education) and the United States. By contrast, countries with minor independent private tertiary sectors include Australia, Denmark, Greece, New Zealand and the Slovak Republic. In other countries, a good proportion of students are enrolled in government-dependent private tertiary institutions. These include Austria, Belgium, the Czech Republic (in tertiary-type B education), Estonia, Finland, Germany (in tertiary-type B education), Hungary, Iceland, New Zealand (in tertiary-type B education), Norway, Sweden, Switzerland and the United Kingdom (where all institutions have this legal status) (OECD, 2007a). Between 2000 and 2005, in most countries there was a slight expansion of the independent private sector. In this period, sharp expansions occurred in tertiary-type B education in Poland, Portugal, Switzerland and the United States. By contrast the importance of the private sector decreased in tertiary-type A education in Portugal and the United States.

24. In this report, tertiary education institutions are classified as either “public” or “private” according to whether a public agency or a private entity has the ultimate power to make decisions concerning the tertiary education institution’s affairs (*e.g.* activities, appointment of managers, decision to open or close the institution). The extent to which an institution receives its funding from public or private sources does not determine the classification status of the institution between public and private, and some institution may be classified as private even though they are mainly funded by central/regional government authorities. A “government-dependent private institution” is a private institution that either receives 50% or more of its core funding from government agencies or one whose teaching personnel are paid by a government agency - either directly or through government. An “independent private institution” is a private institution that receives less than 50% of its core from government agencies and whose teaching personnel are not paid by a government agency (OECD, 2004a).

Figure 2.5. Proportion of tertiary education students enrolled in independent private institutions

Countries are ranked in descending order of the proportion of tertiary education students enrolled in independent private institutions in Tertiary-type A or advanced research programmes in 2005.

Note: An independent private institution is a private institution that receives less than 50 per cent of its core funding from government agencies and whose teaching personnel are not paid by a government agency. Years of reference for the Russian Federation are 2001 and 2004. '2000' data for Chile refer to 1999.

Source: OECD, 2002; and OECD, 2007a.

New modes of study and delivery

Modes of delivery have also considerably diversified. The development of more flexible ways of provision such as distance learning and e-learning has improved access to a wider range of student populations and contributed to meet increasingly diverse demand (OECD, 2005b). These are also seen as more cost-effective alternatives to traditional modes of tertiary education in light of growing constraints on public budgets and the increasing demand for tertiary education (Salmi, 2000). New technologies have also brought about changes in approaches to teaching, especially at under-graduate level, with standardised courses often delivered online, and different use of classroom time with more small seminars and interactive discussions, and more time spent with students on their individual projects.

The demands of students are also changing. Learners increasingly seek courses that allow them to update their knowledge throughout their working lives. In addition, as learners seek to acquire particular knowledge or skills to satisfy labour market needs, more and more prefer to pick and choose courses from the most suitable providers, rather than studying a traditional clearly defined programme at one institution. As a result, TEIs have started to extend their lifelong learning offerings and, accordingly, the organisation

of learning is increasingly adapting to include: the assessment of prior learning; a wider range of programmes; part-time learning; module-based curricula and credit systems; competence-oriented, student-centered organisation of studies; and the provision of non-degree studies and continuing education (Schuetze and Slowey, 2002).

More heterogeneous student bodies

The rise of female participation has been the most noteworthy trend affecting the composition of student bodies in tertiary education. Figure 2.6 depicts the difference in tertiary education attainment between females and males for different age groups, as of 2005. It shows that, in every country for which data are available, tertiary education attainment of females progressed enormously relative to that of males over the past three decades, as illustrated by the changes in attainment between the cohorts aged 25-34 and 55-64 in 2005. The progress of female participation is also visible in terms of net entry rates to tertiary education. In 2005, 61% of females could expect to enter tertiary-type A education at some point in their lives on average in the OECD area compared to 48% for males (OECD, 2007a). In 1998, these proportions (net entry rates) were 43% for females and 37% for males (OECD, 2000b). In some countries differences in net entry rates can be sizeable. In 2005, while 96% of females in Iceland could expect to enter tertiary-type A education at some point in their lives, only 53% of males could expect so. Other countries in which this difference has become significant include Denmark (69% net entry rate for females against 45% for males), Estonia (68% against 43%), Finland (84% against 63%), Hungary (78% against 57%), New Zealand (93% against 64%), Norway (89% against 63%) and Sweden (89% against 64%) (OECD, 2007a).

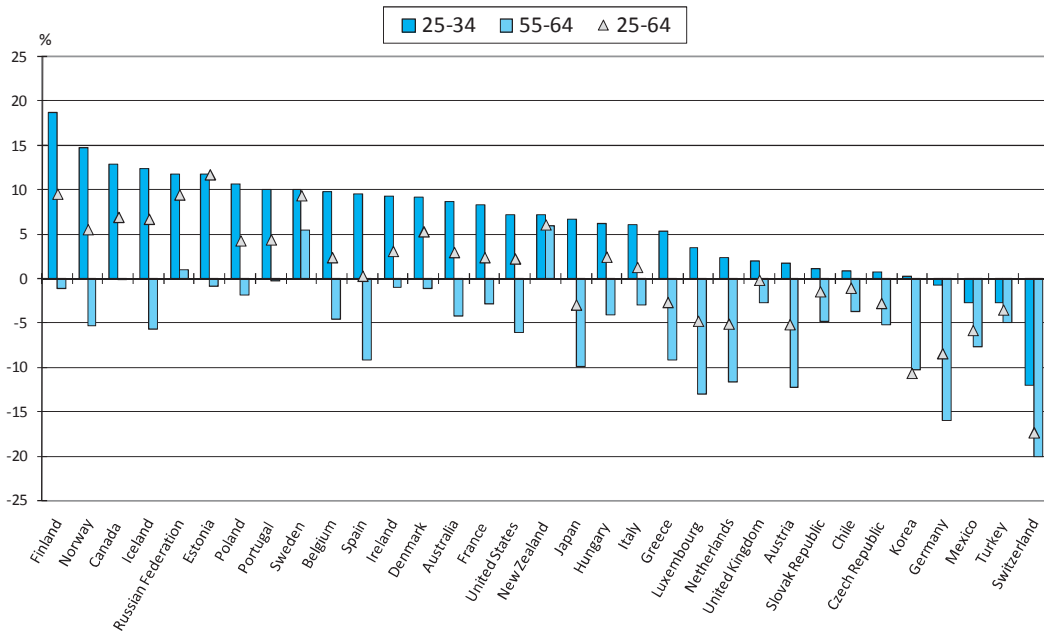
A second prominent development is the growing participation of more mature students leading to a rise in the average age of student bodies. Among the 20 OECD countries for which data are available in 1998 and 2005, the median age²⁵ of new entrants into tertiary-type A education increased in half of them (most notably in Australia from 19.5 to 20.9; Belgium from 18.7 to 19.5; and Iceland from 22.3 to 23.1); remained constant in four of them; and decreased slightly in six of them (Hungary, Mexico, Netherlands, New Zealand, Norway and Spain). In 2005, the median age of new entrants into tertiary-type A education was highest in Iceland (23.1), Denmark (22.7) and Sweden (22.5) and lowest in Greece (18.6), Ireland (19.0) and Spain (19.0).

In addition, in most countries, tertiary student bodies are increasingly heterogeneous in terms of socio-economic background, ethnicity and previous education. Today, TEIs include an increasing number of non-traditional students, “those who had not entered directly from secondary school, were not from the dominant social groups in terms of gender, socio-economic status or ethnic background, or were not studying in a full-time, classroom based mode” (Schuetze and Slowey, 2002). This diversification reflects the increasing social demand for tertiary education and the subsequent wider participation.

However, the expansion of tertiary education has not resulted in wider access for all groups of non-traditional students. While in many developed countries, women now form the majority of tertiary students, other groups such as “older people without traditional entry qualifications for higher education, people from working class background, those living in remote or rural areas, those from ethnic minority or immigrant groups” remain under-represented in tertiary education (Schuetze and Slowey, 2002) (see also Chapter 6).

25. 50% of new entrants are below the median age.

Figure 2.6. Difference between the percentage of females and the percentage of males who have attained at least tertiary education, by age group, 2005



Countries are ranked in descending order of the difference between the percentage of females and the percentage of males, in the age group 25-34, who have attained at least tertiary education.

Note: Years of reference are 2004 for Chile and 2003 for the Russian Federation.

Source: OECD, 2007a.

New funding arrangements

A number of trends are also discernible in funding arrangements for tertiary education. First, there has been a diversification of funding sources. The relative proportion of expenditure on TEIs by private sources – *i.e.* households and other private entities – increased from 1995 to 2004 in 16 of the 20 countries for which data are available (the four exceptions are the Czech Republic, Ireland, Japan and Spain). Countries in which the increase has been more significant include Australia (from 35 to 53%), Chile (75 to 85%), Italy (17 to 31%), Mexico (23 to 31%), Portugal (4 to 14%), the Slovak Republic (5 to 19%), and the United Kingdom (20 to 30%) (OECD, 2007a). This reflects, in part, an overall trend of greater contributions of students and their families to the costs of tertiary education. Cost-sharing is under debate in many OECD countries and some countries have recently introduced or raised tuition fees to increase the financial resources available to institutions. Private resources have also been mobilised through the commercialisation of research and other private uses of institutional facilities and staff (see also Chapter 4).

Second, the allocation of public funding for tertiary education is increasingly characterised by greater targeting of resources, performance-based funding, and competitive procedures. In some countries, institutions are now receiving a sizeable share of public funds through developmental programmes attached to specific policy objectives such as the introduction of innovative curricula, the improvement of management

practices, or the enhancement of the collaboration with surrounding communities. Programme-based targeted funding is organised through competitions or the individual assessment of proposals. The basis for allocating core funding to institutions is also becoming more output-oriented. In a number of countries, formulas to allocate public funds to institutions are now related to indicators such as graduation rates. Research funding is also increasingly allocated to specific projects through competitive processes rather than block grants. There are also a number of countries, such as New Zealand and the United Kingdom which link the allocation of research funds to assessments of research quality. This takes place in settings where there are increasingly separate resource streams for research and general institutional expenditures (see also Chapters 4 and 7).

Third, a number of countries are expanding their student support systems. Between 1998 and 2005, the expansion of the proportion of total public expenditure on tertiary education allocated to financial aid to students (grants and loans) was more remarkable in Australia (from 28 to 33%), Austria (10 to 18%), Chile (24 to 35%), Germany (11 to 18%), Korea (3 to 18%), Norway (29 to 41%) and Turkey (2 to 19%). Another trend in some countries is the importance loans have gained relative to grants in overall financial aid packages. Repayable type of aid gained in importance in countries such as Australia, Chile, New Zealand, Turkey, and the United Kingdom (OECD, 2007a; OECD, 2001b) (see also Chapter 4).

Increasing focus on accountability and performance

The development of formal quality assurance systems is one of the most significant trends that have affected tertiary education systems during the past few decades (El-Khawas, 1998). Starting in the early 1980s quality became a key topic in tertiary education policy. According to El-Khawas (1998), there were a number of broad trends behind the development of quality assurance systems, including the massification of tertiary education, the growing diversity of educational offerings and the expansion of private provision. While traditional, often informal quality assurance procedures may have suited tertiary systems with a small number of institutions and students, expanded and diversified systems require formal procedures (El-Khawas, 1998). It is argued that confidence in tertiary education can no longer be based on a combination of quality embedded in elitism and tight governmental regulation of the educational process (Brennan and Shah, 2000) (see also Chapter 5).

Van Vught and Westerheijden (1994) suggest that the expansion of tertiary education raised questions about the amount and direction of public expenditure for tertiary education. The societal benefits of tertiary education legitimised its growing cost, but assuring its quality became essential in this respect. Growing pressure on governments to limit public spending was another related factor: “Budget-cuts and retrenchment operations automatically lead to questions about the relative quality of processes and products in higher education” (van Vught and Westerheijden, 1994).

In addition to fiscal constraints, increased market pressures have also fostered the growing focus on accountability in tertiary education. In the United States, for instance, students and parents have expressed resistance to tuition hikes and called for more accountability for the quality and cost-effectiveness of TEIs. Tertiary education has thus become more consumer-driven (Gumport *et al.*, 1997).

New forms of institutional governance

Over the past few decades important changes have occurred in the leadership of TEIs, including the emergence of new perspectives on academic leadership and new ways of organising the decision-making structure. Academic leaders are increasingly seen as managers, coalition-builders or entrepreneurs (Askling and Stensaker, 2002). TEIs are increasingly accountable for their use of public funds and are required to demonstrate “value for money”. They are under pressure to improve the quality of their teaching and research, while the availability of resources is limited by growing funding constraints.

Developments in the area of institutional governance include the establishment of governing bodies composed of internal and external stakeholders and operating at a more strategic level; the authorisation for TEIs to be established as legal persons (foundations, not-for-profit corporations); and the widening of institutional autonomy permitting innovations in areas such as contracting for services, labour relations, and public auditing (see also Chapter 3).

Global networking, mobility and collaboration

Tertiary education is becoming more internationalised and increasingly involves intensive networking among institutions, scholars, students and with other actors such as industry. International collaborative research has been strengthened by the dense networking between institutions and cross-border funding of research activities.

International mobility of students and academics has been happening for a very long time, however over the past few decades such mobility has expanded and numerous cross-border educational providers emerged. In particular, “the last decade has witnessed explosive growth in international trade in education services, particularly at the tertiary level and in specialised training fields” (Sauve, 2002). According to van der Wende (2003), national tertiary education systems are not always able to meet the growing and diversifying demand of students. This creates opportunities for foreign education providers and leads to the emergence of a global market for tertiary education. “This trend is sometimes described as trans-national education, borderless education, or (in the case of online delivery) as global e-learning and is linked to a growing commercial interest in higher education” (van der Wende, 2003). There is a variety of cross-border tertiary education ventures, ranging from “twinning programmes” that link an institution in one country with a partner institution in another, to the establishment of branch campuses abroad (Altbach, 2004) (see also Chapter 10).

Altbach (2004) argues that there is also a trend towards the internationalisation of the curriculum, although to a different extent in different disciplines. Ideas from major academic centres tend to be dominant in fields such as business and management studies, information technology and biotechnology. On the contrary, history, language studies and many fields in the humanities are more nationally based. It is argued that the worldwide use of instructional materials originating from large academic systems, particularly France, the United Kingdom and the United States contributes to the internationalisation of the curriculum. Common textbooks and course materials are increasingly used in tertiary education systems all over the world. This trend is enhanced by the influence of multinational publishers, the Internet and databases (Altbach, 2004).

2.3.2 Contextual developments

Globalisation

Globalisation, interpreted as the growth of economic activity across national and regional political boundaries, finds expression in the increased movement of tangible and intangible goods and services, including ownership rights, via trade and investment, and often of people, via migration (Oman, 1996). It leads to increasing global connectivity, integration and interdependence in the economic, social, technological, cultural, and political domains. Some analysts stress convergence of patterns of production and consumption and a resulting homogenisation of culture across boundaries (see Chapter 10).

A possible reflection of this phenomenon in tertiary education is the observation that the direction of reforms carried out throughout the past few decades was similar worldwide, regardless of political-economic systems, higher education traditions, technological development and cultural views (Johnstone, 1998). There appears to be a global trend towards extensive participation, focus on lifelong learning, decreasing reliance on public funding and growing preference for market-oriented systems (Kwiek, 2001; OECD, 2008a).

A development with a large potential impact on tertiary education systems is the inclusion of trade in education services in the new services negotiations of the General Agreement on Trade in Services (GATS). These negotiations began in 2000 under the auspices of the World Trade Organisation (WTO). The GATS aims at promoting the liberalisation of international trade in services, including trade in education services (Geloso-Grosso, 2007). Some argue that the GATS can help facilitate the entry of private and foreign tertiary education providers into countries where national capacity is insufficient. However, as explained by Geloso-Grosso (2007), liberalisation “is no easy task and requires sound regulation and effective institutions to address market failures and ensure public policy objectives. This is particularly the case in the areas of quality of service and recognition of qualifications, equity and potential downsides stemming from students going overseas.” He defends that “If appropriately designed, bound liberalisation under the GATS can contribute to the advancement of national objectives by improving investor’s confidence when countries decide to allow private sector participation in higher education. While many of the policies needed to manage liberalisation of tertiary education services are not shaped by the GATS, the Agreement can affect the regulatory conduct of governments in some areas of tertiary education.”

The perspective of certain types of education falling within the scope of trade regulations and agreements has been source of an intense debate on the nature of education, particularly in those OECD countries where education is provided as a public service on a not-for-profit basis (OECD, 2004b). There is a concern in relation to the potential effects of the GATS on governments’ ability to maintain their right both to publicly subsidise education and to put in place related regulation (Geloso-Grosso, 2007). GATS critics are also concerned that increased trade might exacerbate the negative consequences of market-driven, for-profit education such as the increased number of “diploma mills”, “canned degrees” and “accreditation mills” (Knight, 2003).

Regional integration processes

Regional integration processes are also affecting tertiary education systems of many countries, albeit to a different extent. While Europe seems to be the most advanced regarding the convergence of tertiary education, there have been initiatives for regional collaboration in other regions, as well (de Prado Yepes, 2006).

In Europe, the Bologna Process is an intergovernmental initiative which aims to create a European Higher Education Area by 2010. The Bologna Declaration, with 46 signatory countries by mid 2007, started a series of reforms in individual countries needed to make higher education in Europe more compatible and comparable, more competitive and more attractive for Europeans and for students and academics worldwide.²⁶ The ten action lines of the Bologna Process are: *i*) Adoption of a system of easily readable and comparable degrees; *ii*) Adoption of a system essentially based on two cycles (with doctoral level qualifications now considered as the third cycle in the Bologna Process); *iii*) Establishment of a system of credits; *iv*) Promotion of mobility; *v*) Promotion of European co-operation in quality assurance; *vi*) Promotion of the European dimension in higher education; *vii*) Focus on lifelong learning; *viii*) Inclusion of higher education institutions and students; *ix*) Promotion of the attractiveness of the European Higher Education Area; and *x*) Doctoral studies and the synergy between the European Higher Education Area and the European Research Area. European countries are also reinforcing co-operation in vocational education and training through the parallel Copenhagen Process, signed in 2002 by 31 European countries. The work is currently focusing on areas surrounding quality assurance and the transparency and recognition of qualifications (through the *European Qualifications Framework for Lifelong Learning*, EQF). The Bologna Declaration has led to an increased focus in policy debates on the employability of graduates. In many countries, the process encouraged policy initiatives aimed at improving links between higher education and the labour market (Huisman and van der Wende, 2004).

In South America, a major development in the regionalisation of tertiary education was the approval in 1992 of a plan for the MERCOSUR Education Area. Key challenges have included making education systems compatible, facilitating the recognition of studies and the homologation of degrees. While progress in the recognition of primary and secondary education was simpler to achieve, the recognition of tertiary education studies has proved more challenging (Fernandez Lamarra, 2003). An important step was the establishment of the MERCOSUR Experimental Mechanism for Career Accreditation (MEXA) for the recognition of under-graduate tertiary degrees granted by those institutions whose curricula are accredited on the basis of agreed standards. Accredited degrees would be recognised in member countries making possible for professionals to move within the region. For North America, de Prado Yepes (2006) argues that the regionalisation of tertiary education is rather limited to initiatives promoting university collaboration on a voluntary basis as is the case of the Consortium for North American Higher Education Collaboration.

Regionalisation of tertiary education and the cross-border recognition of degrees is also becoming an important issue in Asia. Developments in this area started with the creation of the *Association of Southeast Asian Institutions of Higher Learning* in 1956. The Association seeks to foster the cultivation of a sense of regional identity and interdependence and liaison with other regional and international organisations concerned

26. It should be noted that the Bologna Process is a European rather than a European Union endeavour.

with research and teaching. In the context of the ASEAN (Association of Southeast Asian Nations), after two decades of irregular discussions and small pilot projects, the *ASEAN University Network* was launched in 1995 with the aim of promoting student and staff exchange, information networking and research collaboration (de Prado Yepes, 2006). Other developments in the region include the establishment in 1993 of the *University Mobility in Asia and the Pacific* (UMAP) – an association of governmental and non-governmental representatives of the tertiary education sector in the region – and steps towards the creation of a UMAP Credit Transfer Scheme (Mongkhonvanit and Emery, 2003) (see Chapter 10).

Contribution to knowledge-based societies

A country's ability to generate and exploit knowledge is an increasingly crucial factor determining its economic development. While natural resources and cheaper labour used to form the basis of comparative advantages, innovations and the use of knowledge are becoming more important. Economic growth is increasingly based on knowledge accumulation. Knowledge-based intangibles such as training, research and development, or marketing account for about one-third of the investment of firms. Economies of scope, "derived from the ability to design and offer different products and services with the same technology" (Salmi, 2000), are an increasingly important driving force for expansion. This is particularly true in the case of high-technology industries such as electronics, where economies of scope outweigh the importance of economies of scale (Salmi, 2000).

Increasingly knowledge-based economies and the need to improve a country's international competitiveness put tertiary education systems under increasing pressure to contribute to economic growth. This is well illustrated in the European Union by the key contribution expected from tertiary education systems to the Lisbon Strategy which established that by 2010 the European Union was to become "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" (Lisbon European Council, 2000). As stated in a communication from the European Commission (European Commission, 2005), TEIs are essential in strengthening the "three poles of the knowledge triangle": education, research and innovation.

The production of knowledge has also changed in a number of ways, which brings challenges to tertiary education. Gibbons (1998) argues that there have been fundamental adjustments regarding the notion of science and the ways science is produced, disseminated and absorbed into society. The development of a "distributed knowledge production system" with the transition from Mode 1 towards Mode 2 knowledge production is one of the key changes (see Table 2.1):

"The main change, as far as universities are concerned, is that knowledge production and dissemination – research and teaching – are no longer self-contained, quasi monopolistic activities, carried out in relative institutional isolation. Today universities are only one amongst many actors involved in the production of knowledge, and this is bound to govern, to some extent, the future relationships that universities will seek to establish" (Gibbons, 1998).

Table 2.1. Key characteristics of Mode 1 and Mode 2 knowledge production

Mode 1 characteristics	Mode 2 characteristics
Emphasis on the individual	Emphasis on teams
Academic control and authority over research direction	Research direction shaped by interaction between researchers and users
Discipline-based	Problem- and issue-based Transdisciplinarity
Local organisational knowledge base	Organisational diversity, networks, connectivity draws together knowledge from diverse sources
Quality judged by peer review	Broadly-based quality control incorporating academic peer review and judgements of users (<i>e.g.</i> economic and social impact)

Source: Coaldrake and Stedman (1999) based on Gibbons (1998).

Gibbons argues that universities have been adept at producing knowledge. However, they will need to become competent at reconfiguring knowledge that was produced elsewhere. The ability to re-use knowledge in some other combination, reconfigure it with other forms of knowledge in order to solve a problem or to meet a need is becoming crucial. TEIs will need to make adjustments to satisfy these new needs. A major resulting challenge for universities is “to take the lead in the training of knowledge workers – individuals who are skilled and creative at making use of knowledge that may have been produced anywhere in a global distributed knowledge production system” (Gibbons, 1998).

Information and communication technologies

The information and communication revolution has drastically improved capacity to store, transmit, access and use information. The cost of transmitting information has significantly fallen, leading to the quasi abolition of physical distance. Information access and communication among people, institutions and countries are no longer hindered by logistical barriers (Salmi, 2000). The development of information technology has the potential to transform tertiary education by changing the communication, storage and retrieval of knowledge (Castells, 2000). Academics and students increasingly rely on the Internet to undertake research, as well as to disseminate their own work (Altbach, 2004). The Internet has had a democratising effect on scientific communication and access to information by improving access for academics at institutions that lack good libraries. International networks are also facilitated by lower costs of communication and transportation (OECD, 2008b).

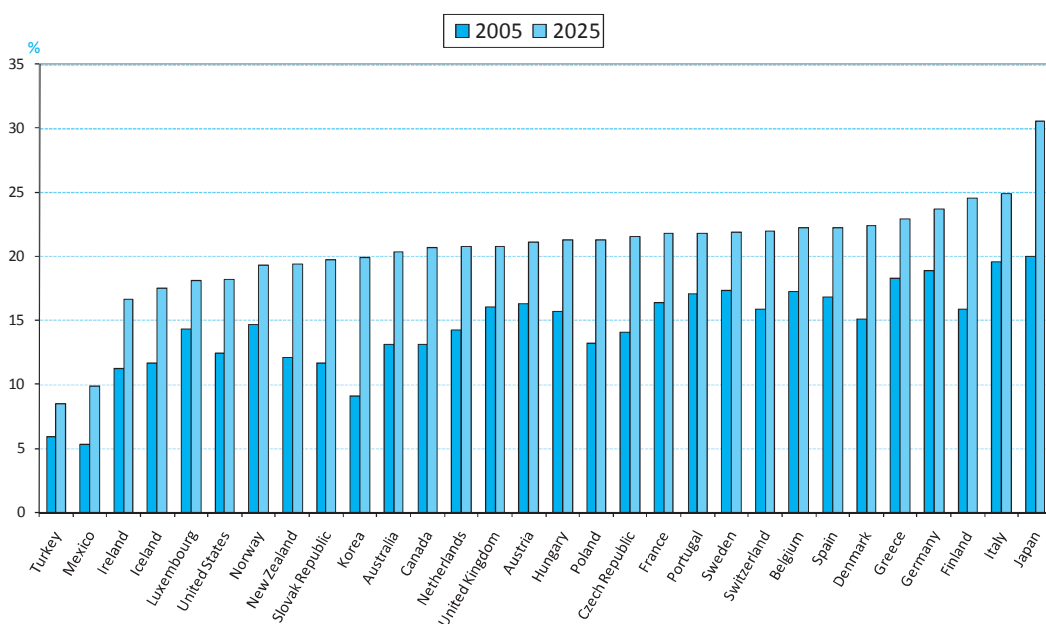
Rapid progress in information and communication technologies (ICTs) has also fostered the development of new ways of learning, such as distance learning and independent study (Schuetze and Slowey, 2002). ICTs had an impact on tertiary education already before the development of digital media and the Internet. For instance, the development of print, audio-visual and broadcast media largely facilitated the expansion of distance education (Thorpe, 2005). E-mail and video conferencing not only allow students in distance education programmes to have frequent contact with their

tutors, but also offer new opportunities for campus-based programmes (Thorpe, 2005). The role of libraries is being transformed as well, they are no longer used just to store books and journals, but also to provide access to databases, Web sites and a variety of IT-based products (Hawkins and Battin, 1998 in Altbach, 2004).

Demographic developments

Population ageing affects all OECD countries, as illustrated by Figure 2.7. The ratio of the population aged 65 and over to the total population is predicted to exceed 20% by 2025 in 20 of the 30 OECD countries, with expected aged populations more manifest in Finland, Germany, Greece, Italy and Japan. This will create a number of challenges for countries. An increasing strain on public finances is likely with projected increases in public expenditure on pensions and health care. The other aspect of population ageing is the slowdown in the growth of the population aged 20 to 64 where participation in the labour market is concentrated. This is likely to lead to a sharp drop in labour force growth and, thus, to slower economic growth, especially in *per capita* terms and also to a reduction of tax revenues (OECD, 2006c).

Figure 2.7. Ratio of the population aged 65 and over to the total population



Countries are ranked in ascending order of the ratio of the population aged 65 and over to the total population expected in 2025.

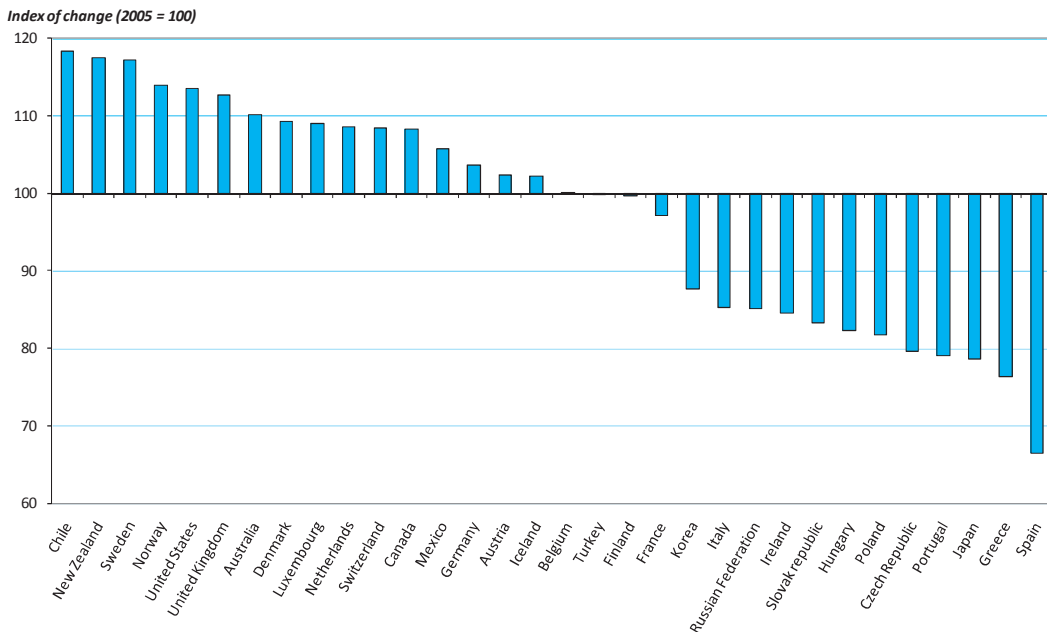
Source: OECD, 2007c.

Policies to meet the economic challenges of ageing societies include encouraging older workers to remain in the labour force, increasing immigration and implementing policies leading to productivity growth (OECD, 2006c). Achieving the latter, through the strengthening of human capital formation, R&D and innovation, will require important contributions from the tertiary education sector. Population ageing also increases the need

for opportunities for lifelong learning. Work-force ageing means that a larger share of the working population will need to refresh their skills and knowledge during their career. Countries will increasingly rely on mid- and late-career workers in order to meet evolving skill needs. TEIs will also have to cope with the ageing of their workforce (see Chapter 8).

The size of the population of typical tertiary school age also affects tertiary education systems. Figure 2.8 provides the expected demographic changes within the population aged 20-29 over the period 2005-2015. There is great variation of the projections across countries. In about half of the countries, the size of the 20-29 age group is expected to expand, the trend being more pronounced in Australia, Chile, New Zealand, Norway, Sweden, United Kingdom and the United States (where projected growth exceeds 10%). By contrast, the 20-29 age group is expected to shrink in about the other half of the countries, with a marked drop exceeding 20% in the Czech Republic, Greece, Japan, Portugal and Spain.²⁷

Figure 2.8. Expected demographic changes within the population aged 20-29 between 2005 and 2015



Countries are ranked in descending order of the expected demographic changes within the population aged 20-29 between 2005 and 2015.

Source: OECD, 2006b.

27. The impact of demographic changes on the tertiary education sector is analysed in OECD (2008c).

2.4 Challenges in tertiary education

Over the past few decades tertiary education systems have experienced significant transformations. Globalisation and the development of knowledge-based economies have put new demands and pressures upon TEIs. Tertiary education is increasingly expected to satisfy the needs of the economy and society, meet requirements for accountability and build closer links with a variety of stakeholders. During the past 20-30 years, the tertiary education landscape has changed a great deal, with increasingly diverse student populations and the emergence of new types of institutions and modes of study. Growing constraints on public funding, together with the expansion of tertiary education and the emergence of new demands, have encouraged the development of new patterns of financing and management.

Country Background Reports indicate that changes in the context in which tertiary education takes place, new external pressures and expectations on TEIs have created numerous challenges. Some examples of challenges and opportunities for tertiary education systems mentioned in Country Background Reports are as follows.

Steering tertiary education

Articulating clearly the nation's expectations of the tertiary education system. A key challenge for government is to provide a clear articulation of the nation's expectations of institutions of tertiary education. The objective is to devise a common vision for the system and agree on the medium and long term strategy for tertiary education.

Aligning priorities of individual institutions with the nation's economic and social goals. Institutions of tertiary education, as recipients of public funds, are experiencing new pressures to adjust rapidly, efficiently and fairly to the changing demands of society and the labour market. This reflects the greater recognition of the contribution of tertiary education to economic growth, regional development and innovation. The challenge is to reconcile the broader priorities as perceived by society and the priorities of individual institutions.

Creating coherent systems of tertiary education. As a result of rapid expansion, some tertiary systems evolved in somewhat fragmented and uncoordinated ways with limited attention to the creation of a coherent *system* of inter-related institutions. The challenge for governments is to create coherent systems in which individual institutions are given opportunities to define a clear profile and mission and students are able to easily move across institutions and programmes. The aim is to create and maintain a system of diverse, sustainable, and high-quality institutions responsive to external demands and accountable for the outcomes they produce.

Finding the proper balance between governmental steering and institutional autonomy. In devising mechanisms to enable TEIs to operate effectively in a new environment, governments face the challenge of finding the appropriate balance between their steering and institutional autonomy. The challenge is to introduce a new relationship between governments and TEIs so that institutions are accountable for their performance, but given sufficient autonomy in the direction of their own affairs to be dynamic and creative.

Developing institutional governance arrangements to respond to external expectations. Countries are recognising the importance for institutional governance arrangements to further evolve to reflect the increasingly diverse interests that institutions serve.

Funding tertiary education

Ensuring the long-term financial sustainability of tertiary education. A major challenge for countries is to secure sufficient funding levels to enable TEIs to meet the growing expectations of society and respond to the growing demand by students, in a context of tight education budgets. TEIs have been under pressure to diversify their revenues and reduce their dependence on public funding. This raises broad issues such as the appropriate balance between public and private contributions and ways to ensure that access is not hindered by new funding arrangements.

Devising a funding strategy consistent with the goals of the tertiary education system. Countries are seeking to design funding approaches consistent with the policy goals sought for their tertiary education systems. This includes the introduction of elements of funding more directed towards performance and results.

Using public funds efficiently. Some countries are concerned with inefficiencies in their systems, including high student drop-out rates, excessive time for completion, programme duplication, programme under-enrolment, and insufficient use of cross-institution collaboration.

Quality of tertiary education

Developing quality assurance mechanisms for accountability and improvement. The growth of tertiary education, the diversity of educational offerings, and the expansion of private provision has led to increasing attention to the development of quality assurance systems. These are now seen as essential to hold institutions accountable and as a vehicle for improvement and innovation.

Generating a culture of quality and transparency. There is growing awareness and acceptance that learners need to be protected from the risks of misinformation and low-quality provision and that quality improvement is to be part of the daily activities of the actors in the system. Countries are seeking to ensure that key stakeholders – including students, families, policy-makers, and employers – gain better information about the quality and cost of tertiary education.

Adapting quality assurance to diversity of offerings. Countries are devising differentiated systems of quality assurance to account for the diversity of missions and profiles of TEIs. The emergence of new delivery modes, such as e-learning, also requires new approaches to quality assurance.

Equity in tertiary education

Ensuring equality of opportunities. In a number of systems the expansion of tertiary education has occurred with little thought for equity issues. The question of equity of access, which relates more to the question of differences in participation rates among groups of students – by gender, ethnicity, and socio-economic status of students and their families –, is now receiving more policy attention.

Devising cost-sharing arrangements which do not harm equity of access. Limitations in public budgets have led to the expansion of cost-sharing in most countries. A key policy concern is to devise cost-sharing arrangements which do not harm participation by the most disadvantaged groups, in particular through the development of student financial aid systems.

Improving the participation of the least represented groups. Countries are faced with low levels of participation in tertiary education of groups such as immigrants, ethnic minorities, students with a socio-economic disadvantage, living in remote areas or with a disability, which more often than not reflect fewer educational opportunities at lower levels of education.

The role of tertiary education in research and innovation

Fostering research excellence and its relevance. TEIs make a major contribution to research and innovation by creating new knowledge through scientific and technological research and by training skilled workers through their educational mission. A major challenge in the governance and funding of research is to make research more relevant to society and the economy.

Building links with other research organisations, the private sector and industry. Institutions of tertiary education are not the only players in the knowledge production process. Independent research institutes and private companies are key players in national research systems with which tertiary education needs to build links. New collaborative settings, often in a “context of application”, are requiring new forms of engagement of researchers in tertiary education.

Improving the ability of tertiary education to disseminate the knowledge it creates. An increasingly important challenge faced by countries is to improve the ability of TEIs to transfer knowledge and technology so the full social and economic benefits are realised.

The academic career

Ensuring an adequate supply of academics. Ensuring an adequate supply of academics is a major challenge in some countries. In some disciplines – typically computer sciences, engineering, law, business and economic studies – the private sector offers much higher salaries and/or better career prospects, which makes the recruitment of good academics particularly challenging. Some countries are also faced with the ageing of their academic workforce.

Increasing flexibility in the management of human resources. In some countries there are debates about the need for more institutional autonomy in the management of human resources. In some cases, the debate also focuses on moving away from the civil servant status of academics and tenured positions as a way to improve the flexibility in the recruitment of academics, including the setting of more competitive salaries.

Helping academics to cope with the new demands. Growing demands on academics – *e.g.* new tasks in the fields of internationalisation; compliance requirements and information requests; interdisciplinarity; administrative duties; industrial research; new pedagogies, including e-learning and various domains of new income generation – raise the challenge of finding new ways of organising academic work and renewing support from institutions' leadership.

Links with the labour market

Including labour market perspectives and actors in tertiary education policy. Countries are increasingly engaging labour market representatives in tertiary education policy development and bringing together institutions and representatives of employers and labour unions. The aim is to ensure that educational offerings are informed by the needs of the labour market.

Ensuring the responsiveness of institutions to graduate labour market outcomes. As part of the challenge of meeting labour market needs, institutions are more and more encouraged to follow the labour market outcomes of their graduates, seek the views of employers of their graduates and improve their programmes accordingly.

Providing study opportunities for flexible, work-oriented study. The transition to knowledge-based economies not only results in a demand for a highly skilled labour force, but also in new training needs. TEIs are increasingly challenged to include lifelong education among their offerings.

Internationalisation of tertiary education

Designing a comprehensive internationalisation strategy in accordance with country's needs. Countries participate in the internationalisation of tertiary education with distinct objectives – *e.g.* attract skilled workers, generate revenue, foster exchange and co-operation, use cost-effective alternatives to domestic provision. The challenge is then to design a comprehensive internationalisation strategy consistent with the established objectives. This generally entails the strengthening of policy coherence across education, immigration and international aid authorities.

Ensuring quality across borders. The internationalisation of tertiary education and the expansion of cross-border provision with great diversity of providers and delivery methods bring important challenges in protecting students against misinformation, low-quality provision and qualifications of questionable validity.

Enhancing the international comparability of tertiary education. Countries recognise the need to make qualifications more understandable and transparent internationally to increase their international validity and portability. International co-operation between national quality assurance and accreditation agencies seeking to increase mutual understanding of tertiary education systems is already visible.

Each of the following Chapters explores in more detail the challenges summarised above for each of the identified areas.

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