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Efficiency and equity in European education and training systems

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Efficiency and equity in European education and training systems

This staff working paper complements the Communication on “*Efficiency and Equity in European Education and Training Systems*”. Sections 1 and 2 present the theoretical and empirical evidence upon which the policy messages of the Communication are based. This is supported by a separate paper produced by the European Expert Network in Economics of Education (EENEE)¹ which gives an account of some relevant research. The results of projects under the fourth and fifth EU Framework Programmes for Research and Technological Development have also been drawn upon.² Section 3 is a quantitative analysis of the state of play across Europe using efficiency and equity indicators.

¹ Ref.

² For a summary of these projects see S. Power (2006)

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SECTION 1 - INTRODUCTION

1.1 – POLICY CONTEXT

In March 2000, the conclusions of the Lisbon European Council stressed that learning is a key component both for the development of the European economy *and* as a cohesive force behind the European social model³. In doing so, it confirmed the need to study the shifting processes and practices of learning, and to relate these to wider aspects of contemporary social and economic change in Europe and beyond.

The 2001 Stockholm European Council⁴ agreed on a work programme for Europe in the field of education and training organised around quality, efficiency, access and openness of education and training systems. This work programme, “Education and Training 2010”, includes a specific objective investigating “Making the best use of resources”⁵. Building on the Lisbon Council’s call for increased and improved investment in human resources, this objective refers to both public and private investment. It also aims to ensure more equitable educational systems in terms of access, treatment and outcomes and effective distribution of available resources.

By stressing that lifelong learning is central to the achievement of the Lisbon objectives, the 2005 Spring European Council⁶ confirmed that investing more and better in human capital is at the heart of the Lisbon strategy. Education and training policies should aim to improve the knowledge, skills and competences of society as a whole and of individuals, especially the most disadvantaged. They should *increase efficiency* by raising the average skill level in the population and *reduce inequality* by improving the life opportunities of those most in need and narrowing the gap between the best and worst qualified individuals. However, progress against the benchmarks adopted under the Education and Training 2010 Programme has been slow, especially in those areas related most closely to social inclusion.⁷ Unless significant improvements can be made in reducing the numbers of early school leavers, raising upper secondary completion rates and the acquisition of key competences, an increasing number of citizens will face the risk of social exclusion, marginalisation and disengagement at great cost to themselves, to the economy and to society. According to recent research, in 2004, 75 million EU citizens were low-skilled (32% of the workforce) but by 2010 just 15% of new jobs will be for those with only basic schooling⁸.

This is the message of the 2006 joint progress report⁹ of the Council and the Commission on the implementation of the “Education & Training 2010 work programme”. Following from this, the 2006 Spring European Council concluded that: *Education and training are critical factors to develop the EU’s long-term potential for competitiveness as well as for social*

³ This was reaffirmed by the Stockholm European Council of 23 and 24 March 2001, while the Spring 2005 European Council underlined that “human capital is Europe’s most important asset”.

⁴ Ref. <http://register.consilium.eu.int/pdf/en/01/st05/05980en1.pdf>

⁵ Ref. http://europa.eu.int/comm/education/policies/2010/objectives_en.html#making

⁶ Ref. http://europa.eu.int/growthandjobs/key/index_en.htm

⁷ Commission staff working document SEC(2006) 639, “Progress towards the Lisbon objectives in education and training 2006”

⁸ http://ec.europa.eu/education/policies/2010/studies/cedefop_en.pdf

⁹ http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2006/c_079/c_07920060401en00010019.pdf

cohesion.... Reforms must...be stepped up to ensure high quality education systems which are both efficient and equitable.¹⁰

1.2 – ECONOMIC EFFICIENCY AND SOCIAL EQUITY IN EDUCATION AND TRAINING SYSTEMS

A simple definition of **efficiency** states that “Efficiency involves the relationship between inputs and outputs in a production process. The underlying notion is that production is efficient if given inputs produce the maximum output.”¹¹ Therefore, educational efficiency is a measure of how resources/inputs allocated to the educational system (funds, expertise, human resources, time, etc.) are converted into outputs for individuals (e.g. educational achievements, employability, earnings) as well as for the economy and society. Internal efficiency relates to outcomes inside the education and training system (i.e. educational achievement) while external efficiency relates to outcomes in the economy (e.g. productivity, employment, growth) or society (e.g. social cohesion, democratic participation).

The Communication and Staff Working Paper focus on efficiency. It is common to distinguish between efficiency and effectiveness by using the typology proposed by Lockheed and Hanushek (1994)¹².

Internal/External - Efficiency/Effectiveness		
	Non-monetary outputs (e.g. learning achievement)	Monetary outputs (e.g. earnings, ...)
Non-monetary inputs (e.g. school organization)	Internal effectiveness (Technical efficiency)	External effectiveness
Monetary inputs (e.g. teacher wages...)	Internal efficiency	External efficiency

The distinction between efficiency and effectiveness is taken to depend on the form of the inputs: efficiency refers to monetary inputs whereas effectiveness refers to non-monetary inputs. As shown in the table, the definition of efficiency typically also encompasses the relationship between non-monetary inputs and non-monetary outputs in the form of *technical* efficiency. A number of the policies in the Communication also fulfil this criterion. Therefore, the concept of efficiency used in this Communication, and referred to in the Conclusions of

¹⁰

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=DOC/06/1&format=HTML&aged=0&language=EN&guiLanguage=en>

¹¹ Hanushek, E.A. (2001), “Economics of education,” *International Encyclopedia of the Social & Behavioral Sciences*, Elsevier Science.

¹² "Concepts of Educational Efficiency and Effectiveness", in T. Husén and T. Neville Postlethwaite (ed.), *International Encyclopedia of Education*, 2nd Edition, Volume 3 (Oxford: Pergamon, 1994), pp. 1779-1784.

the 2006 European Spring Council, broadly covers what is normally understood by both efficiency and effectiveness, with less emphasis on external effectiveness.

While the terms *equity* and *equality* are often used as synonymous or interchangeably in discussions on education, some distinction between the two concepts is useful. In this Communication and paper, **equality and inequality** are understood broadly in terms of equal or unequal opportunity and life chances that have a direct bearing on what people can be and what they can do. That is, they have a direct impact on human capabilities. Individuals start their lives with unequal opportunities. The opportunities that shape the distribution of income, education, health and wider life chances in any society are not randomly distributed. They reflect complex hierarchies of advantage and disadvantage and deep-rooted patterns of inequality that are transmitted across generations. They also reflect public policy choices. Inequality has different dimensions and interlocking inequalities in income, health and education not only disadvantage the poor, they also violate basic precepts of social justice (UNDP, 2005:51).

Distinct as they are, the concepts of *equality* and *equity* are intimately linked. The question of how to achieve **equity** continues because inequalities in the economy and society persist. However, there is a lack of theoretical clarity over the concepts of equity and equality and both words carry significant connotations.¹³ The intention of this Communication and paper is to provide policy-makers with a basis for finding a workable mix of institutional arrangements to support the search for excellence, efficiency and equity in education and training systems. Equity is considered as the goal towards which education and training policy aims and the role for policy-makers is to decide what is equitable and just in any given context. *Equity measures* are taken to be practical steps introduced to redress the effects of broader social and economic inequalities and in the context of learning, to allow individuals to take full advantage of quality education and training irrespective of background and depending on their needs. Ensuring that systems are equitable implies that the outcomes of education and training should be independent of socio-economic background and other factors that may lead to educational disadvantage. A commitment to equity suggests that differences in outcomes should not be attributable to differences in wealth, income, ethnic origin, gender, power or possessions (OECD, 2006:8). As such, access should be open to all and treatment should be differentiated according to individuals' specific learning needs. Equity, as opposed to equality, thus offers a fairer, more adaptable and realistic policy approach¹⁴.

It is useful to distinguish between equity in *access* (the same opportunities for all to access to quality education), in *treatment* (quality educational provision suited to individuals' needs once in the system) and in *outcomes* (the knowledge, competences, skills learnt and qualifications achieved within an educational system). In places, this paper and Communication also consider equity of *participation* in education and training, which means a combination of access to education and treatment of an individual once inside the system. To focus solely on equity in access without taking into account a number of variables including the socio-economic background of the learners, the type of institution or its location

¹³ For some discussion on concepts of equity, inequity, equality and inequality see Hutmacher, et al (2001:10), Valli et al (1997) and Gillborn (1999).

¹⁴ See European Study on "Equity in European educational systems" by EGREES

could lead to the compounding of existing social and educational inequalities (independent from the potential of the individual learner).¹⁵

For many years, discussions on economic and social policies noted the apparent **trade-off between efficiency and equity** (See the *Journal of Political Economy*, 1972 for a review). In Okun's terms, "the conflict between equality and efficiency is inescapable" (Okun, 1975:120). He and others stressed the "leaky bucket" character of redistributive programmes, that is, the efficiency losses associated with administrative costs and the programmes negative effects on attitudes, particularly in relation to individuals' motivation to work, save and invest. In the field of education policy, efficiency and equity have also been considered as contradictory or mutually exclusive. This school of thought argues that efficient systems are inevitably inequitable, while equitable systems are inefficient because they dampen average performance by constraining the highest achievers. However, a wider and longer term perspective has been taken more recently leading to a consensus that efficiency and equity objectives can, in fact, be **mutually reinforcing** because of the positive effect of investing in social policies on wider economic, social and financial outcomes (Arrow et al., 2000; Hutmacher et al, 2001; Fouarge 2003).

The discourses that surround the call for modernised efficient and innovative education systems tend to speak of education as if it were a universal and evenly distributed benefit which simply requires updating. However, the evidence in the statistical annex to this paper¹⁶ demonstrates that all European education systems, to a greater or lesser extent, are marked by widespread educational inequities that reflect, reproduce and compound socio-economic inequalities (Schütz et al, 2005; Power, 2006). Inequities can be found at every facet and level of education systems – in opportunities, access, treatment and outcomes (Niçaise, 2000). Defining where educational inequities exist, and their implications for the lives of individuals and social groups, is challenging and has been the focus of extensive debate and research in recent years. In the last thirty years, there has been increased awareness of how socio-economic position, gender, race, ethnicity, disability and of other forms of social and economic disadvantage relate to educational inequities.

In relation to socio-economic inequalities, education has a pivotal but paradoxical role. It can both contribute to their perpetuation but it is also seen as a vehicle (and sometimes the *only* vehicle) by which they can be ameliorated. Research shows that, despite the general presumption that education systems offer opportunities to reduce social inequalities and exclusion, the opposite is often true¹⁷. In this context, equity and efficiency concerns cannot be viewed in isolation and they can indeed be mutually reinforcing. For example, PISA and TIMSS studies show that in countries, such as Finland, where pupils have high average performance, the variations in achievement of pupils from different socio-economic backgrounds is only small.

European research on national, European and global education policies demonstrates that there is an urgent need for a **better balance between the economic and socio-cultural objectives of learning** in Europe (Kuhn & Sultana, 2006; Kuhn, Tomassini & Simons, 2006; Strieszka, 2006; Collins, 2003; Charles, Conway & Dawley, 2003). A pragmatic policy

¹⁵ Demeuse, M. and A. Baye (2005), « Pourquoi parler d'équité ? », in M. Demeuse et al. (ed.), *Vers une école juste et efficace*, (De Boeck Université, 2005), pp. 149-170.

¹⁶ See the statistical section: Part 2 on equity indicators

¹⁷ For example, Power (2006); Machin (2006), Niçaise (2000)

response to this need should build on a clear understanding of the limits of and opportunities provided by education and training systems, leading to an assessment of the support that education needs in order to achieve efficiency and equity goals.

Efficiency and equity concerns, of course, go well beyond the field of education. While there is a broad acceptance that education and training are fundamental for developing a more cohesive society, for reducing social inequalities and for combating social exclusion, links between education and other areas of social policy are crucial to achieving efficiency and equity aims. While education is often seen as a route out of social disadvantage, research shows that education policy initiatives alone have only limited success in removing inequalities and barriers to inclusion. If inequalities and disadvantage have multiple causes (which is nearly always the case), tackling them requires strategies that bring together multiple agencies and policies such as migration, employment, welfare, housing, justice and health (for example, L. Feinstein and R. Sabates (2005) on the positive effects of combining crime reduction programmes and educational initiatives). Combined social and educational strategies that tackle poverty, inequalities and related aspects of disadvantage at their roots are likely to be much more successful than purely educational interventions in influencing overall patterns of educational and social inequality and inequity.

Two possible ways to understand the link between inequity and inefficiency in education and training are, firstly, to look at the benefits of education for all citizens and, secondly, to consider the huge monetary and social costs of inequity.

1.3 – THE BENEFITS OF EDUCATION AND TRAINING

1.3.1 - Contribution to economic outcomes

Human resources are important for growth, as individual knowledge and skills raise productivity and increase a society's ability to develop and adapt to new technologies (Romer, 1990; Lucas, 1988; McDonald, 1994; Hanushek and Kimko, 2000; Coulombe et al. 2004). Evidence for shows that, in the EU, the short-term impact of one year of additional education would be an increase in aggregate productivity of 5-6%, with another 3-5% in the long-run as a result of the impact of higher education on technological progress (De la Fuente and Ciccone, 2002; De la Fuente, 2003).

The positive effects of the quantity and quality of education and training on growth and employment are exemplified by the high private and social rates of return of investing in human resources¹⁸. The rates of return for an individual and society from one additional year of education are around 6-10% (De la Fuente, 2003)¹⁹. Education makes a strong positive contribution to employment prospects; the EU-25 unemployment rate ranges from 12.6% for people with less than upper-secondary education to 5% for people with tertiary education²⁰.

¹⁸ Internal rate of return to investment in education is the discount rate that equates the stream of benefits to the stream of costs. Private ROR refers to costs and benefits realised by the individual. Social ROR includes the public costs and benefits in terms of growth rates (externalities are not included) of education.

¹⁹ See the statistical section: Part 1 – Efficiency indicators

²⁰ See the statistical section: Part 1 – Efficiency indicators

1.3.2 - Contribution to financial sustainability

Moreover, by investing in public and private educational services, governments can contribute to productivity and encourage job-creating investment. New jobs support economic growth, bring in additional tax revenues, and thereby contribute to more sustainable welfare policies. Investing in social services has an upfront cost; indeed, spending more on education and training can make it harder to contain budget and social deficits, particularly in an economic downturn. In fact, though, not investing in education and training has a hidden cost in terms of lower potential economic gains and hence further endangers financial sustainability. Investing in education and training generates medium and long-term private, fiscal and social returns that outweigh the initial costs and give a higher rate of return than investments in physical capital and most financial assets²¹.

1.3.3 - Contribution to social outcomes

Participation in education and training brings a number of benefits to individuals and to society. It has been shown to improve democratic participation, tolerance and respect of diversity, social integration, cohesion and inclusion, community-building, to bring better individual and public health, reduced crime, a cleaner environment, and a better quality of life (Yamada et al., 1991; Hodgkinson and Weitzman, 1988; Behrman and Stacey, 1997; McMahon, 2002 and 2004; Schuller et al, 2004; Feinstein, 2002; Green et al, 2003; Green et al, 2006; Preston & Green, 2003). Investing in education and training in order to raise efficiency and quality brings social benefits which in turn feed economic growth. This is because those with a higher level of education and training are much less likely to be unemployed, to be involved in crime or in other socially undesirable activity. They also typically have better housing, better health and are more committed to democratic participation (Grossman, 2000 and 2006; see also <http://www.learningbenefits.net/>).

Education enhances self esteem, which in turn motivates people to learn and achieve more. Furthermore, quality education provides individuals with problem-solving skills and the ability to adapt to and manage change allowing them to cope more effectively with life changes, including the most destabilising such as redundancy or divorce. The skills acquired through learning help people to understand what further skills they need and how to use the skills of others. The better educated are more likely to join voluntary associations, show greater interest in politics and take part in political activities. Evidence also suggests that a higher level of education tends to result in greater tolerance, trust in others and in institutions and more “civic cooperation” (Emler & Frazer, 1999; Putnam, 2000). Indeed, there is research showing a strong relationship between the level of education attained and racial, religious and interethnic tolerance (Hagendoorn & Nekuee, 1999; Green et. al, 2006; McGlynn et.al, 2004).

Moreover, investing in lifelong learning to improve access and equity through the distribution of educational outcomes can make an important contribution to social cohesion, for example by reducing income inequality. Well-designed education and training systems can enhance social mobility, for instance, according to Blanden et al. (2005), education determines 35% to 40% of intergenerational income mobility in the UK. Researchers have recently shown that the most effective education systems, for example in the Nordic countries, have contributed to weakening the link between parents’ economic resources and the adult earnings of their

²¹ See Education at a Glance (2005) from OECD for recent calculations of private, fiscal and social rates of return.

children, especially amongst the lowest earners. This has been achieved by reinforcing educational standards for all citizens through highly redistributive and targeted policies towards the most disadvantaged (Raaum et al., 2003; 2006; Bratsberg et al., 2006).

1.4 – COSTS OF EDUCATIONAL INEQUITY

Inequality and inherited disadvantage in opportunity violate fundamental human rights and basic precepts of social justice. Beyond the moral responsibility of education to help break the circle of disadvantage and vulnerability, there are also strong instrumental reasons for a concern with inequality: deep disparities based on factors such as wealth, region, gender, ethnicity stunt economic growth, are detrimental for democracy and work against social cohesion (UNDP, 2005:51). Inequalities have an extremely high societal and financial cost (Wilkinson, 1996, 2005).

More specifically, research shows that educational inequity has devastating effects on the lives of individuals and communities, especially on the lives of the already socially and economically disadvantaged (see, for example, the REGULEDUC and EGSIE research projects²² or Bynner & Parsons, 1997). Early school leavers, the poor, the homeless and those in a precarious social situation, the low-skilled, older workers, the unemployed, people re-entering the labour market, migrants, refugees and people from ethnic minorities are among the most vulnerable and severely affected by educational inequities.

In financial terms, by ignoring equity concerns, society loses out on the benefits of education (foregone costs) and incurs direct costs for the state. Direct costs are measurable in terms of income tax losses, health-care, crime and delinquency and public assistance costs. The most socio-economically disadvantaged are the most likely to have the lowest levels of education and they are, therefore, at increased risk of unemployment and social exclusion. Inequity in education thus also entails costs in terms of higher state insurance/health payments and welfare benefits. For an accurate picture of the costs of inequity, the gross costs of, for example, welfare benefits should be offset against the costs to society of keeping these young people in education. These costs may be considerable, but we should also not ignore the less tangible benefits that can accrue from a longer education discussed in the previous section.

Researchers have calculated the impact in quantitative terms (direct and indirect costs) of inequities in the United States, but the state of empirical knowledge in this respect in Europe is still limited. While some figures on the direct costs of inequity do exist, the enormous financial and social costs of inequity in education are usually understood indirectly through the large body of research that points to the economic and wider **benefits**, rather than costs, of learning both for the individual and for society.

²² REGULEDUC: *Changes in Regulation Modes and Social Production of Inequalities in Education Systems: a European Comparison*, research project supported by DG-Research of the European Commission under FP5, <http://www.pjb.co.uk/npl/bp63.htm> EGSIE: Education Governance and Social Integration and Exclusion, research project supported by DG-Research of the European Commission under FP4, see <http://www.pjb.co.uk/npl/bp35.htm>

1.4.1 Estimated cost of inequity in Europe

Evidence from the UK

In 2001 the Centre for the Wider Benefits of Learning²³ produced two research reports on the positive social effects of learning on crime²⁴ and on health (depression and obesity)²⁵, the latter based on information from the latest UK national cohorts.

The first report on crime estimates that if 1% of the population who only had GCSEs²⁶ gained an A Level²⁷ or equivalent qualification, and that those who went on to study A levels were replaced by individuals studying GCSEs who previously had no qualifications, the benefit to the UK economy would be between £80 million and £500 million per annum. Assuming a straightforward linear extrapolation, a 5 point increase would bring between £400 million and £2,500 million extra.

The second report on health and obesity concludes that if educational interventions reduced depression amongst women and enabled 10% of depressed women who do not have qualifications to progress to a level 1 qualification, economic benefits of between £6 million and £34 million per year would result. If educational interventions raised 50% of women with mental health problems and no qualifications to Level 1 academic qualifications, the benefit would be between £300 million and £1,900 million per year.

Costs of inequity in terms of productivity losses

Individual productivity is very difficult to measure, but one means to estimate the productivity loss attached to early school leaving is to estimate the extra earnings that drop outs would have earned had they stayed in education (Brunello and Comi, 2004). A viable quantified estimate of the cost of dropping out of school suggests that if all dropouts completed upper-secondary education total productivity would increase by 1.4%²⁸. This calculation assumes that earnings per hour are on average equal to productivity, and that the 77 out of 100 young Europeans who completed upper secondary education in 2005 have productivity – or earnings per hour – equal to 100. By comparison, estimates suggest that the average productivity of each dropout is 6% less (i.e. 94) than for those who complete upper-secondary education. Therefore, the 23 out of 100 Europeans who do not complete upper-secondary education cost the European economy productivity losses of about 1.4 percentage points each year.

1.4.2 Estimated cost of inequity in the USA

In the USA, researchers have gone further in quantifying the costs of inequity. For example, in a symposium, “The social costs of inadequate education” that took place at Columbia

²³ <http://www.learningbenefits.net/>

²⁴ <http://www.learningbenefits.net/Publications/ResReps/ResRep5.pdf>

²⁵ <http://www.learningbenefits.net/Publications/ResReps/ResRep6.pdf>

²⁶ General Certificates of Secondary Education (GCSEs) are national single-subject examinations taken at the end of compulsory education, usually at the age of 16.

²⁷ General Certificate of Education Advanced-level examinations (GCE ‘A-levels’) are post-compulsory education, single-subject examinations, which may be studied in any combination. Courses normally last two years and most students take the examinations at age 18.

²⁸ Detail of the calculation: $77*1 + 23*0.94 = 98.62$

University on October 24th–25th 2005, researchers estimated the different costs incurred by those who drop out of high school.²⁹

The United States foregoes \$192 billion (1.6% of GDP) in combined income and tax revenue losses with each cohort of 18-year-olds who do not complete high school. Increasing the duration of education for that cohort by one year would recoup nearly half those losses. Moreover, for all 23,000,000 U.S. high school dropouts aged 18-67, annual losses exceed \$50 billion in federal and state income taxes.

Inequity in education contributes to poorer health for excluded individuals, with high school dropouts in the US having a life expectancy that is 9.2 years shorter than high school graduates. High school dropouts also have higher rates of cardiovascular illnesses, diabetes and other ailments, and require an average of \$35,000 in annual health-care costs, compared with \$15,000 for college graduates. Indeed, health-related losses for the estimated 600,000 high school dropouts in the US in 2004 totalled at least \$58 billion, or nearly \$100,000 per student. In addition, the net present value of improving the educational achievement of all these dropouts by one grade would have been a \$41.8 billion reduction in health-related costs.

As discussed in section 2.2 below, investments in pre-primary programmes can reduce later costs including those attendant on crime, drug use and teenage parenting. In terms of reducing such costs, investments in pre-primary in the US could bring benefits as high as \$7 for each dollar invested. Early interventions to reduce inequity combined with continuing efforts to combat exclusion at secondary level can help reduce the costs of crime: increasing the high school completion rate by just one percent for all men aged 20-60 would save the US up to \$1.4 billion per year. Moreover, a one year increase in the average years of schooling for dropouts in the US would reduce murder and assault by almost 30 percent, motor vehicle theft by 20 percent, arson by 13 percent, and burglary and larceny by about 6 percent.

The costs of inequity in education have also been estimated in terms of the public assistance costs and welfare benefits associated with exclusion. The US could save between \$7.9 billion and \$10.8 billion annually in spending on TANF (Temporary Assistance for Needy Families), Food Stamps and housing assistance by improving the educational attainment of those who currently do not complete high school. If one third of all Americans without a high school education went on to get more than a high school education, the savings would range from \$3.8 billion to \$6.7 billion for TANF, \$3.7 billion for Food Stamps and \$0.4 billion for housing assistance.

By combining these costs from the US (including income tax losses, increased demand for health-care and public assistance, and higher rates of crime and delinquency), we obtain a global estimate for the average gross cost over the life time of one 18-year-old who does not complete high school of approximately \$ 450,000 (or 350,000 euros).

²⁹ <http://www.tc.columbia.edu/centers/EquitySymposium/symposium/resource.asp>

SECTION 2 – ECONOMIC AND SOCIAL ANALYSIS

Drawing on results from recently-completed European and international research in the economic and social sciences (largely presented in the EENEE paper), the following sections will argue that while increasing the supply of skills can have beneficial effects in terms of efficiency (by raising the average performance), the most useful equity policies are those that: diminish the correlation between a pupil's socio-economic background and his/her outcomes; and, close the skills gap between the top and the bottom of the income distribution (Bloom, 1979) by raising the skill levels of the most disadvantaged.

2.1 – EFFICIENCY AND EQUITY IN A LIFELONG LEARNING PERSPECTIVE

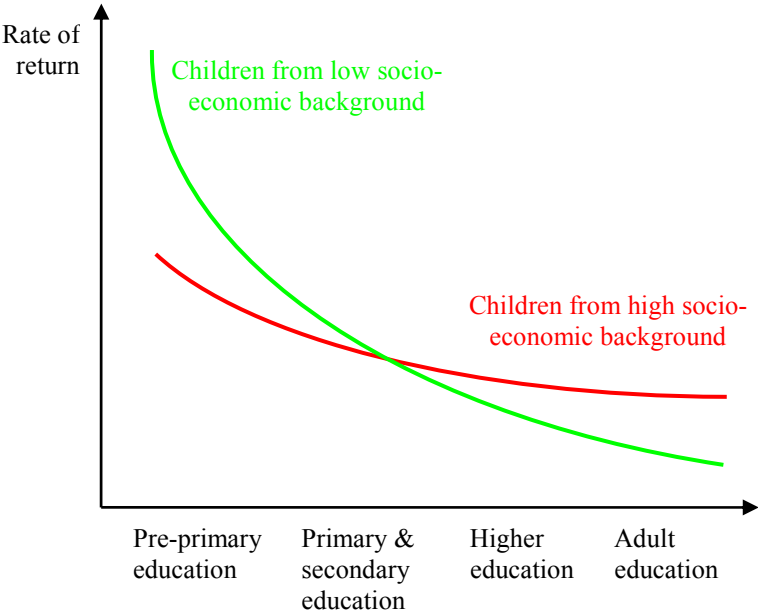
This sub-section presents an overall assessment of efficiency and equity in European education and training systems within a lifelong learning perspective. It shows that efficiency and equity can be complementary particularly when investment and reform is concentrated at the earliest stages of life. Evidence suggests that the link between efficiency and equity is less strong when interventions take place later in the lifecycle and policy-makers face more difficult choices as the costs of policies to improve equity are much higher. Of course, those individuals who have been let down in the past by compulsory education systems may need educational interventions at a later age, but policies should concentrate on eliminating the need for remedial action as much as possible.

2.1.1 - The life-cycle of education and training

Learning is a life cycle process. An investment at one stage of education raises not only the skills and competences attained at that stage but builds the foundation for the acquisition of further skills and competences at the next level. This multiplier effect means that education is a dynamic synergistic process in which early learning begets later learning (Heckman, 1999 and Carneiro and Heckman, 2003). Interventions at an early stage are, therefore, crucial especially because deficiencies in learning that may have developed are difficult and more costly to rectify at later stages. In early childhood, returns to educational investments are highest because of their effects on facilitating later learning. In addition, returns to early interventions are particularly high for children from disadvantaged backgrounds.

By contrast, returns to educational interventions in late adolescence and adulthood are lower, often because they do not build on a solid base of earlier learning (and since people may be beyond sensitive or critical periods to acquire certain skills). In economic terms, older people have a shorter time during which to reap the beneficial effects of newly acquired learning and skills. Also, lifelong learning activities may also lend themselves less easily to certification. This is where the validation of informal and non-formal learning, particularly through qualifications frameworks, is important. Recent studies have shown that qualifications frameworks can facilitate the transfer of qualifications and remove dead ends in qualifications and career routes (OECD 2005). Adult learning can be beneficial in many ways for the individual and for society, but efforts to remedy failings earlier in education and training systems are particularly costly.

Figure 1: Returns to investment at different levels of education



Source: EENEE’s adaptation of Cunha et al. (2006).

Equity and efficiency are clearly reinforcing when investments are made in early childhood education. However, this complementarity decreases when investments in education are made later in the lifecycle. The most efficient policy at an early stage is to invest in the most disadvantaged children. Such investments yield particularly large returns because of their additional indirect effect of increasing the productivity of later learning. It has to be stressed that this perspective requires a particularly long time horizon because the positive returns to early childhood investments may not be fully visible until 20 or 30 years later.

2.1.2 – Rates of return from investments in education and training

Research reviewed by Psacharopoulos (2006, 2005, 1994 and with Patrinos, 2004) shows that the returns to education are higher the lower a country’s level of development (usually measured by per capita income). The main reason is the relative scarcity of human capital in less developed countries. As with any form of investment, returns to investing in education are subject to diminishing returns and decrease as human capital becomes more abundant.

Education and training are two complementary forms of human capital investment. Education usually takes place before individuals enter the labour market, while training takes place concurrently with or after some labour market experience. Education tends to be general-purpose and can be used in a variety of different activities, while training often provides skills and competences useful for specific tasks. While decisions about education are made by an individual and his/her family, training investments are usually under the control of both the individual and his/her employer (except where training is undertaken voluntarily during leisure time). Initial VET often has lower rates of return than general education. This is due to a number of factors, not least the relatively high cost of VET and the lower status it is accorded in many countries. In addition, the rapid development of new technologies makes the requirements of specific training hard to predict and specific vocational skills can go out of date quickly. Although the returns to vocational education are usually lower than for

general education, they are still substantial (Bassanini et al., 2005; Carneiro and Almeida, 2006) and investment in VET is justified for both economic and social reasons. These include the close link between high graduation rates in upper secondary vocational streams and lower rates of early school leavers in many countries (Tessaring and Wannan, 2004).

Interestingly, and contrary to the law of diminishing returns, private returns by level of education follow a U-shaped pattern, that is, they decrease between primary and secondary education, but they increase at the tertiary level. This is mainly due to the distortion introduced by the public subsidisation of tertiary education. Moreover, in recent years the private returns to tertiary education have increased in many countries as a result of the demand for more educated workers to complement advances in technology (Psacharopoulos, 2006). However, the social rates of return follow a declining curve³⁰ meaning that there is a discrepancy between private and social rates of return at the tertiary level of education. Some research, usually based on private rates of return, considers that the most technologically advanced countries (nearest to the ‘technology frontier’) should invest primarily in higher education, whereas the least advanced should focus on primary and secondary education (Mingat and Tan, 1996; Acemoglu et al., 2002; Vandebussche et al. 2004). However, recent research (e.g. Cunha et al., 2005) based on social rates of return shows that the returns to investment, whatever the level of development in the country, are highest from interventions at an early age.

Unfortunately, there are few cross-country calculations of rates of return broken down by the socio-economic status of the individual. Aggregate rates of return to education for individuals from different socio-economic backgrounds do not show, on average, any major variations between the richest and the poorest although they do when we look at the different levels of education (see Figure 1 above). Research shows that in the USA and France the returns to education among those whose father belongs to a higher socio-economic group are only about 1 percentage point higher relative to lower socio-economic groups (Psacharopoulos, 2006). Higher returns to schooling may be expected to encourage further schooling and so they may reduce inequity in the future. However, the high economic and social potential of investing in education and training measured by rates of return is largely unknown because of a lack of information. This explains why the returns to education and training, even when broken down by level of education, are rarely taken into account by individuals or governments when they make spending and investment decisions.³¹

2.2 –PRE-PRIMARY EDUCATION

On these grounds, public investment should be prioritised towards education at the earliest age. Indeed, the earlier the level of education assisted by public funding, the higher the efficiency and equity benefits (Heckman and Masterov, 2005; Cunha et al. 2005). Research has demonstrated the positive effects of high quality pre-primary provision on children’s intellectual and social behavioural development. Substantial long-lasting effects on economic

³⁰ The social returns to education calculated by the OECD are based on monetary earnings and do not take into account non-market and external effects of education. In addition, the rates of return are static, i.e. based on a cross-section picture of what people earn at different ages by level of education.

³¹ Costs of education matter for education decisions. They include tuition costs, foregone earnings and non-pecuniary costs. The influence of financial costs in the calculations of individuals and families also depends on credit market problems. In the presence of credit market imperfections, individuals cannot borrow in order to smooth their consumption, and the perceived costs of education will be much higher.

and social outcomes have been shown in particular for children from disadvantaged backgrounds (e.g. Duncan et al, 1998; Tietze et al, 2001; Sylva et al, 2004; see also European Agency for Development in Special Needs Education Report, “Early Childhood Intervention: Analysis of Situations in Europe” (2005)). There is a strong correlation between a child’s intellectual skills and their family background characteristics on entry to pre-primary. While quality pre-primary provision does not eliminate this, large-scale longitudinal studies have found that it reduces significantly the relationship between socio-economic background and intellectual development by the time of entry into primary school (see the EPPE in the UK and the NICHD in the US). Thus, early childhood education programmes that are particularly targeted at disadvantaged children seem to have strong potential for raising equity.

However, some evidence (see Magnuson et al., 2004) suggests that the positive effects of early investments decay over the education life cycle unless they are topped up by interventions later. However, this research also shows that there are more lasting cognitive gains for disadvantaged children and for those who get low instruction in early school years. A combination of investments at different stages is likely to be most effective, though a lack of investment at a very early stage is likely to create high costs for investments further down the line (Nechyba, et al. 2000). This consideration reemphasises the importance of policies directed at pre-primary education.

Although further research is required into the factors that contribute to high-quality pre-primary programmes (cf. Currie 2001), more educationally intensive programmes seem to produce better outcomes. Evidence suggests that the duration of attendance in pre-primary institutions is important with an earlier start being related to better intellectual development. It is not just the availability of provision that matters, though. Research would suggest that policy makers should focus more on quality and content rather than structure. For instance, child-care policies often focus on the welfare benefits of provision, but it would appear that their educational benefits deserve more attention. The child’s family setting and the relationship between parents and pre-primary institutions is crucial, especially for the disadvantaged (EPPE project) whose parents, for a number of reasons, are less likely to be involved in their children’s education (Desforges and Abouchar, 2003). Involving parents through home visits has also proved effective (cf. Cunha et al. 2006). Strategies should, therefore, be developed which bring educators and parents closer together earlier in children’s lives, both in terms of the range of activities and the resources made available.

In its publication, *Starting Strong: Early Childhood Education and Care* (2001), the OECD stress the importance of focusing on quality improvement and assurance in pre-primary education as well as appropriate training and working conditions for staff. This thematic review emphasises that defining, ensuring, and monitoring quality should be a participatory and democratic process that engages staff, parents, and children alike. Pedagogical frameworks focusing on children’s development in cognitive and behavioural skills across the age group can support quality practice. The quality of pre-primary education depends on adequate staff training and good working conditions across the sector. It appears that initial and in-service training should be broadened to take into account the growing educational and social responsibilities of the profession. There is a critical need to develop strategies to recruit and retain a qualified and diverse, mixed-gender workforce and to ensure that a career in pre-primary education is satisfying, respected and financially viable.

2.3 – PRIMARY AND SECONDARY EDUCATION

Evidence from a number of countries suggests that young people who fail to complete upper-secondary education tend to come from less affluent backgrounds, ethnic minorities or are recent migrants to a country³². Given that young people from poorer backgrounds are most likely to drop out from upper-secondary education, improvements in upper-secondary completion rates will improve equitable outcomes.

Young people leaving school early face a greater risk of exclusion from the labour market as well as higher job insecurity and less well remunerated employment³³. Even more importantly, they face frustration in respect of social expectations, a growing incidence of homelessness, poverty, marginalisation and social exclusion. Primary and secondary education (as well as adult and community learning) can play a vital role in promoting social and political participation. European research projects, such as ETGACE³⁴, INTERACT³⁵ and EUYOUNG³⁶, show that this community engagement can be enhanced by active citizenship education, which also helps to combat exclusion in all its forms, as well as to promote dialogue and understanding within Europe and beyond. This is especially relevant in a context of increasing migration into and within a culturally differentiated EU. Indeed, European research projects, such as CHICAM, ETHNOGENERATION and WORKALÓ, find that education (formal, informal or non-formal) of children, adults and community leaders can be a vital component of broader strategies for social integration, community-building, social cohesion and, especially important, intercultural understanding, tolerance and respect of difference and diversity.

Research shows that, in all systems, a poor early education experience has serious consequences at later stages in life and that policy makers need to ensure that there are systems to reduce early failure and/or provide alternative routes to skill acquisition. This involves identifying those individuals likely to drop out and providing them with incentives and support to remain in education. A number of European research projects (such as CATEWE³⁷) suggest that, given the diversity in education, training and labour market systems across Europe, the same policy interventions are unlikely to be equally effective in different contexts (Hannan et. al, 2001).

Nevertheless, a substantial body of research over recent years shows that the efficiency of the school system can be substantially increased by institutional reforms that focus the incentives for all actors in the system on increasing the performance of students. Local actions are important, but an overall message from research is that structural inequities cannot be tackled by school improvement strategies in individual institutions alone. Rather, system-wide attention must be given to improving efficiency and equity. Organisational changes entail upfront costs, but in the long-run, structural reforms do not necessarily incur increased spending, unlike the provision of, for example, extra teachers or resources. If implemented in the right way, they can, therefore, be considered relatively efficient in maximising outputs from given inputs. Public funding should be allocated to improving the quality of education, rather than simply expanding the length of compulsory schooling. School attendance is a

³² See the statistical section: Part 2 on equity indicators
³³ <http://ec.europa.eu/education/doc/reports/doc/earlyleave.pdf>
³⁴ <http://www.pjb.co.uk/npl/bp44.htm>
³⁵ <http://www.pjb.co.uk/npl/bp66.htm>
³⁶ <http://ec.europa.eu/research/press/2006/pr2003en.cfm>
³⁷ <http://www.pjb.co.uk/npl/bp16.htm>

necessary condition for learning to take place, but perhaps more important is the teaching and learning that take place in the classroom.

2.3.1 - Tracking by ability

One policy with a substantial impact on the equity of opportunity in a school system is the timing of the “tracking” of students into different kinds of schools based on their ability. Early tracking is taken to mean the segregation of children into separate schools based on ability before the age of 13. Whilst this does not necessarily involve a division into academic/general and vocational tracks, in practice this tends to be the case. This definition does not include “streaming”, which involves tailoring the curriculum to different groups of children based on ability within one school. The bulk of research suggests that early selection into different tracks is wasteful and inequitable. Early tracking, at ages ten to twelve is common in several European school systems but has an especially negative effect on children from families with low socio-economic status (for evidence, see Hanushek and Wößmann 2006; Schütz et al. 2005; Ammermüller 2005; Bauer and Riphahn 2006; Dustmann 2004). Therefore, postponing tracking to a later stage in the educational process can act as a policy to increase equity of opportunity at the school level.

Studies have investigated whether early tracking has an effect on the relationship between school performance and parental background. There are methodological difficulties with this approach, not least because any efficiency gains in tracking are likely to accumulate over time and might be more visible if standardised tests were taken at the end of upper secondary education rather than at the start. Moreover, it is difficult to evaluate the efficiency of early tracking by examining the impact of school design on standardised cognitive tests because these tests measure reading, mathematics and science, but exclude more practical and technical skills, which are developed to a greater extent by the relatively long vocational schools of early tracking systems. More convincing evidence would require that we examine a broader range of skills, such as those measured in the US by the ASVAB tests, which include both cognitive and practical skills.

Hanushek and Woessman (2005), and Schütz et al. (2005), look at tracking at the age at which the first selection into tracks takes place, and compare individual performance using standardised test scores taken either at age 15 (using the OECD PISA dataset) or at age 13 (using the Boston College TIMMS dataset). The earlier the age when children are put into tracks in a particular country, the longer the time spent in a selected system. Thus, in this analysis, Germany and Austria which track from age 10 and Hungary and the Czech Republic which track from age 11 have a system of early tracking. Schütz et al. (2005) interact this measure of school design with the number of books in the household and find that the effect of a disadvantaged family background (fewer books) on standardised test scores at age 13 is significantly higher in countries with an early tracking system (see also Ariga et al.). It is worth noting, however, that Waldinger’s (2006) evidence is more equivocal on the effects of early tracking on the link between family background and standardised test scores. He believes that this results from the complexities introduced by other forms of differentiation that operate alongside tracking, such as streaming, school choice or residential location.

Advocates of early tracking usually argue that it increases efficiency in school systems, not least because schools can focus their teaching on pupils of similar abilities. They refer to the relative importance of peer effects: when students are allocated to different tracks, they interact with different peers. If allocation is by ability, the more talented students interact with talented peers, and the less talented students interact with peers of similar ability. The

argument is that if the gain from tracking by the more able is higher than the loss by the less able and if monetary transfers can be envisaged to compensate the losers, then tracking, in a purely economic sense, increases efficiency (Hoxby, 2001).

However, numerous empirical contributions – including Zimmer and Toma, 2000; Hoxby, 2001; Zimmermann, 2003; Hanushek et al. 2001 – have investigated this issue with results that are more equivocal on the efficiency gains of tracking. In a recent investigation, Hanushek and Woessmann, 2005, find that early tracking reduces average performance in standardised reading tests, but increases it in standardised science tests. They also find that early tracking increases inequity in achievement and so conclude that early tracking increases inequity, without any obvious effect on efficiency.

Having said this, there is an argument for the efficiency gains of later tracking. Data suggests that the opening up of higher education to all students without sufficient screening mechanisms (either at entry or upper secondary level) is expensive and leads to wastage. The implications of this are that differentiation is most effective at the upper secondary levels. Differentiation of students into particular academic tracks creates wastage if undertaken too early (e.g. at early secondary level) or too late (e.g. at university level). The most appropriate time to differentiate is at upper secondary level.

2.3.2 - Autonomy with accountability

Many Member States have given autonomy to institutions in decision-making in an effort to improve efficiency in education and training systems. Some countries have also implemented accountability systems in the form of analysis or publication of central exit examination results and/or internal qualitative and quantitative evaluation systems, such as independent inspections and self-evaluation. Research suggests that giving autonomy without putting in place an external accountability system is detrimental to student performance. However, if accountability systems provide the right incentives for actors to act in a manner which promotes better pupil performance, research suggests that attainment can be increased (cf. Di Gropello, 2004; Wößmann 2005b). Accountability systems must also be designed in such a way that equity of access, treatment and outcomes for students is measured and promoted.

2.3.2.1 Autonomy

In giving greater autonomy to individual schools in decision-making, Member States have argued that local actors, especially principals, are able to employ their knowledge of local circumstances and conditions to the best effect (for a review of the literature see West, 1992). In some centralised systems of decision making, excessive bureaucratisation has been shown to hinder the use of this knowledge, led to duplication and dispersion of efforts and funding and reduced flexibility in the system to respond to specific local needs (Filmer and Eskeland, 2002; Robin and Sprietsma, 2003). There is also an increasing consensus that overly centralised systems can hinder creativity, enterprise and innovation, though research indicates that decentralisation has sometimes been matched by increasing centralised control and monitoring through standardised curricula and assessments.

Decentralisation to different levels of the system (whether school, district or region) implies different trade-offs (Gunnarsson et al., 2004). Governance from the centre has possible limitations in that access to information can be reduced and policies are potentially less receptive to specific local conditions. On the other hand, decisions at lower levels have often been less transparent and more sensitive to local partial interest groups and the most proactive

social groups. Financing from regional budgets can limit choice and competition as a result of the limits imposed on cross-regional enrolment. In some cases, local funding has increased interregional inequity and inequitable access to education.

The effectiveness of autonomy is only as good as the quality of decisions made at a local level; poor decisions at a local level can offset any efficiency gains of decentralisation. Any decentralisation should be matched by training for central administrators and local actors in financial and management matters.

2.3.2.2 Accountability

International evidence suggests that institutional features that introduce accountability by externally testing and making public the quality of what students and schools deliver create incentives that improve educational performance (cf. Bishop 1997, 2006; Bishop and Wößmann 2004; Betts 1998; Jürges et al. 2005; Wößmann 2002, 2003b, 2005b). Figlio and Lucas (2004) report US evidence showing that higher standards in marking work (i.e. a student has to gain a higher score or produce better work to gain a certain grade) can have a positive effect on student achievement. US research also suggests that students' learning can be improved through explicit school-focused accountability systems (Hanushek and Raymond 2004; Jacob 2005). In areas where granting greater autonomy has been successful in raising efficiency, local decision-makers have been held accountable for the impact of their hiring, retention and other management decisions on student performance (Ballou, 1996). The introduction of an assessment system can give better information on the outcomes and costs of teaching and help policy-makers respond to the demands of creating more efficient and equitable education systems. It can also be used as a tool for schools' self-evaluation, another method of accountability, providing schools with the means of identifying areas for improvement and directions for change.

In several countries, schools and students are evaluated using standardised tests. Test scores showing absolute levels of achievement have proved useful for assessing the performance of groups of students and schools at a given point in time. Increasingly, value-added analysis is considered more effective in showing the achievement gains of one student over time (Meyer, 1997, Kane and Staiger, 2002; Ladd, 2002). The purpose of value added analysis is to separate the influence of confounding variables, such as a student's socio-economic background and his/her previous school attainment, from individual performance. Standardised test scores are a noisy measure of true performance and researchers suggest that value added measurements allow policy makers to hold teachers better to account for students' learning gains irrespective of an individual's previous level of learning (Cawley et al., 1999).

The design of systems for measuring school performance is important if equity objectives are to be promoted. Straightforward measurements of the level of students' absolute performance can lead to strategic responses on the part of teachers and schools: the stigmatisation of low achievers; the possibility of schools creaming off the most able pupils; increasing placements of low-performing students in special-education programs which are outside the accountability system; or by pre-emptively retaining students (Jacob, 2005). Even judging schools on the basis of value added measures of school performance may still give schools an incentive to select the pupils which are easiest to teach, not least because absolute levels of performance are what attract pupils to schools and provide access to higher education. Indeed, if an average value added measure of performance is used, there can be a disincentive for teachers to concentrate on students at either end of the performance spectrum (on the UK see

Burgess et al., 2005). There is even some evidence that high-stakes testing can introduce incentives for outright cheating by teachers (Jacob and Levitt, 2003).

It is also worth noting the more qualitative problems associated with standardised testing systems (Taylor and Nguyen, 2006). Excessive testing and examination can be stressful for teachers and students and can use valuable time which may be used more effectively for other forms of teaching and learning. Standardised testing which attempts to measure the whole range of skills could introduce incentives to focus teaching on testable skills, neglecting other important qualities which cannot be tested easily. Comprehensive testing is also less reliable in countries with diversified vocational schools.

However, recent research suggests that systems of accountability can be designed to mitigate inequitable responses (Betts and Costrell, 2001; Hanushek, 2004; Taylor and Nguyen, 2006; West and Peterson, 2006). OECD thematic reviews suggest that countries with the lowest levels of inequity have accountability systems which combine a number of different elements that are both quantitative (external examinations) and qualitative (external inspection, self-evaluation). Such accountability systems collect information on equity, measure schools' progress against equity objectives and offer support or challenge should an institution fail to meet equity goals. Testing systems are more subtle when value-added approaches are used because these test the learning gains (rather than the absolute levels) of each individual student (cf. Kane and Staiger 2002; Ladd and Walsh 2002). Perhaps the most sensitive system of standardised examination is one that takes into account an individual student's background and context comparing their level of achievement with groups of students with similar characteristics (e.g. similar socio-economic background, ethnicity, gender, and weight at birth). Having said this, a lack of accurate information means that, at present, it is unclear whether the use of contextualised data provides a corrective for the inequity that can result from the way schools react to accountability mechanisms.

2.3.3 Teacher quality and mobility

Given the importance of quality teaching, one of the key equity challenges facing European school systems is to respond to the difficulties encountered in teacher recruitment and supply. The attractiveness of the teaching profession must be assured in order to attract the best candidates. Teachers' function in guiding and counselling pupils puts them in the position of role models so it is important that the ethnic and cultural background of the teaching force reflects the ethnic and cultural mix of society. More specifically, research shows that, across countries with different systems of teacher recruitment, schools in the most challenging circumstances have difficulty in attracting and retaining the most experienced and motivated teachers. In the UK, where teachers are able to apply directly to posts in individual institutions, schools with more challenged pupils (in terms of their ability, social and economic background and special needs) are more likely to lose teachers to other schools (Smithers and Robinson, 2005). In France, where a more centralised system of teacher assignment operates, 58% of new teachers in 2000 began teaching in the eight least popular school regions (OECD 2005, *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*). Research in the US finds that teacher shortfalls are higher in urban schools and those with high numbers of low income students (Murphy et al, 2003), while in secondary schools with high levels of poverty the proportion of teachers without a degree is highest (Ingersoll, 2003; c.f. also Lankford et al, 2002).

In an effort to increase equity, countries have targeted recruitment on specific problems of teacher supply. For example, as a means to encourage teachers into challenging schools, some

countries have introduced performance related pay and monetary incentives for those teaching in the most deprived areas, with some positive results (OECD, 2005). Interestingly though, other evidence suggests that rather than monetary incentives, improvements in the qualitative aspects of school life would encourage teachers to enter or remain in challenging schools (Bush, 2005). These include smaller class sizes, more non-contact time, more classroom support, better management and support in relation to behaviour, a clear message that the teacher is valued and time for respite from the job linked to continuing professional development. The preparation of teachers to cope with the equity challenges of teaching is crucial. In the Netherlands, for example, partnerships between teacher education establishments and individual schools have been introduced to give students lengthy practical experience in schools facing specific challenges (e.g. rural or inner-city), with on-site support from trainers and mentors.

2.4 – HIGHER EDUCATION

Increased participation in tertiary education in Europe has not enhanced equity. It has improved the *absolute* prospects of those from less advantaged backgrounds, but it has not improved their *relative* prospects. The average annual increase in the participation rates of young people from low socio-economic groups has in most cases failed to keep up with the increase in the total participation rates. The participation of young people in tertiary education has a strong correlation with the educational attainment of their parents and the socio-economic background of their families. In many countries, those whose parents have completed some tertiary education are twice as likely to participate in tertiary education as those whose parents lack upper-secondary level qualifications. This correlation between the educational attainment of successive generations within families acts to limit inter-generational income mobility (Solon (1992), Björklund and Jantti (1997), Couch and Dunn (1997), and Checchi *et al.* (1999)).

Attainment in compulsory education is the key to tertiary participation because, in most countries, tertiary education requires prior qualifications. Existing compulsory education systems have not generally succeeded in breaking the link between performance and children's family background. This reemphasises the importance of interventions at early stages when children's cognitive and non-cognitive abilities are being developed so as to improve their chances of being ready to take advantage of post-compulsory education (cf. Machin 2006).

2.4.1 – “Free” higher education systems

So-called “free” higher education systems imply direct public subsidies to higher education institutions so that the costs of HE are borne by the state, not the user. Such systems are regressive because they benefit mostly middle and higher income families³⁸ and reduce the progressive nature of the overall tax-transfer system (Garcia-Panalosa and Walde, 2000; Winston, 1999). The economic debate around the desirability and level of private contributions to higher education is partly concerned with the question of whether the individual benefits from higher education outweigh the benefits that graduates produce for wider society, especially because it has proved challenging to measure these benefits.

³⁸ Lower levels of access to tertiary education by young people from disadvantaged backgrounds can also be explained by the presence of family credit constraints, different rates of time preference amongst people from different family backgrounds and to differing attitudes to debt.

One such consideration is the extent to which a tax system can recoup the costs of public subsidies given to education through the tax revenues gained from the higher earnings of graduates. Sturn and Wohlfahrt (2000) argue that in highly progressive tax systems earnings are "condensed" over the life cycle thereby shifting tax burdens towards more-educated members of the population. Therefore, it is possible that fully publicly-funded higher education systems in countries where a very progressive tax system exists can have smaller redistributive impacts than might otherwise appear to be the case (see Barbaro (2003) on Germany for an example of this argument).

There are a number of problems with general subsidies to university education that are stressed by Acemoglu (2003). The most important is that such subsidies are costly and inefficient because they fund not only marginal agents (that is, students who would not have attended college in the absence of such subsidies), but also intra-marginal agents (that is, students who would have attended college anyway). The subsidies are also inequitable because the intra-marginal students are often from middle and upper income families. Even in the presence of subsidies, the majority of students are from middle and upper-income backgrounds and, therefore, general state funding acts as a form of government rebate to these social groups. Free higher education encourages individuals already at the top of the income distribution to pursue higher education (Dur, 2004). Without efforts to improve the achievement of the disadvantaged in compulsory education to enable them to attain the level of learning required to enter higher education, general subsidies simply widen the skill and income gap between the highest and lowest groups (Yaqub Vawda, 2003).

This partly explains why moving away from a 'free' HE system towards the introduction of tuition fees has so far proved publicly unpopular (e.g. the UK and SK). Quantifiable evidence on public attitudes to HE systems which entail private contributions is understandably scarce. Generally, though, the case for fees and loans has not been made in such a way that the public perceives the equity benefits of such a system; it tends to be regarded as a government imposition rather than an equity measure.

Part of the public money spent on general subsidies could be used instead to fund specific subsidies in the form of scholarships targeted at specific groups experiencing difficulty in gaining access to higher education. This more direct approach to promote access and equity is also more efficient than approaches that scatter resources indiscriminately across the whole student population (Rubinstein, 2004 and 2003). In theory such an approach will be more cost-effective because fewer intra-marginal households will be subsidised. By means-testing applicants, those from disadvantaged backgrounds who most need financial support may be in a position to afford higher education (Merkel and Heaton, 1997).

2.4.2 – Tuition fees with accompanying financial measures

There is substantial evidence that the private internal rate of return from higher education is relatively large. Graduates have higher incomes, lower unemployment rates and take less time to find employment than those who have not attended HE (Chapman, 1997; Biffi and Isaac, 2002). According to some recent estimates, the average private rate of return for 10 OECD countries is close to 9 per cent (OECD, Education at a Glance, 2005) and higher than the social rates of return (7.5%)³⁹. Since these returns are private, it makes sense in economic

³⁹ Note that these social rates of return are estimated using a narrow definition that excludes any positive externalities. To the extent that there are significant positive externalities related to human capital

terms that part of the cost of higher education should be borne by college graduates in the form of tuition fees. As long as graduates have relatively higher private returns (e.g. higher earnings, job security or personal development) than those who do not attend university, they should contribute to the costs by paying fees to complement government expenditure (Canton and de Jong, 2005; Rivard and Raymond, 2004). To ensure equity, those people who are below a certain income threshold and cannot afford to pay fees should not have to and should be supported by means-tested grants and scholarships.

Tuition fees introduce a market mechanism into higher education. As consumers of education, students (demand side) are able to apply more pressure on the education providers (supply side) to improve the quality and efficiency of the programmes and ensure that they are responsive to students' needs (Gary-Bobo and Trannoy, 2004 and 2005; Hoxby, 2004; Psacharopoulos, 2005; Lowry, 2004). This increases the accountability of HE institutions. Paying for their higher education gives students an incentive to take the decision to enter higher education more seriously, which is likely to lead to an increase in attendance at classes and a reduction in the number of repeated years (in systems where this is possible) (Carmichael, 1999). Some have advocated incentives in the form of a "credits" system (a fixed amount of credits to be spread over a maximum number of years) in order to reduce excessive study durations.

Introducing tuition fees without accompanying financial support for the disadvantaged would aggravate the current inequity in access to higher education. A combination of higher tuition fees and a graduate tax, income-contingent loans or performance grants is more equitable and efficient than direct state subsidies to higher education because the latter brings reverse redistribution from the poor to the rich (Barr, 1993; Vandenberghe and Debande, 2004).

Potential students face uncertainties about whether their investment in higher education will be worthwhile in terms of increasing their future employment prospects and income. Students may not be able to raise the necessary finance from banks or parental sources to fund their education. Moreover, evidence shows that the most disadvantaged are also the most risk and debt averse and, without a family culture of learning, they often prefer to begin earning straight away rather than enter higher education (Davis and Lea, 1995). In order to enhance equity, policies can reduce the risk that students take on, either by guaranteeing commercial bank loans or by offering income-contingent loans or grants. Student loans have been found to provide incentives to students to choose subjects leading to employment, and to study harder, which enhances efficiency (Barr, 2004).

Income-contingent loans enable students to pay for university education up front and then pay back the loan only if their income after completing university exceeds a certain threshold. In order to be most equitable and efficient, loans should be made available to all students and cover living costs in addition to tuition fees. Income-contingent loans are an investment in future returns and are more efficient than grants because they have to be repaid and so incentivise more thoughtful enrolment decisions. In systems without loans, students have to rely heavily on their families' income to pay for accommodation, transport and food which has clear consequences for equitable access and participation (Barr 2004, Dur et al. 2004 and Greenaway and Haynes 2004). One key feature of income-contingent loans in terms of equity

investment by the average student these estimates will thus be biased downwards. See statistical section: Chapter A – *The returns to education: education and earnings*

is that, while high-earning graduates pay back the loan plus interest, low-earning graduates do not fully pay back their education costs and are subsidised by taxpayers.

The introduction of income-contingent loans in Australia has encouraged a considerable expansion of students without negatively affecting the participation of poor students in HE. Levels of participation have increased in every quartile of the income distribution. Lower participation in more expensive programmes seems to be connected to cultural and social behaviour (different value systems) rather than to economic and financial constraints (Chapman, 1997). Some countries (notably the US) which have tuition fees for higher education are classed as having the least affordable (or most expensive) higher education systems. Significantly, though, those countries which have well-developed financial support schemes to accompany fee systems display more equitable access to HE than many of the countries with “free” HE systems (Educational Policy Institute “Global higher education rankings” (2005)). Unfortunately, individual European countries that have systems of tuition fees backed up with loans and grants are too recent to have been properly evaluated.

A graduate tax might be considered as an alternative to the introduction of income-contingent loans. In a graduate tax scheme, graduates pay for the cost of their education after completing education, but, significantly, high-earners pay more tax in order to subsidise low-earners, who pay less than the full cost of their education. The advantage of the graduate tax is that it does not use general tax revenue to fund the system. Recent theoretical research has shown that an income-contingent loan scheme and a graduate tax have the same efficiency implications, but that the former has less desirable distributional effects because it implies some reverse redistribution (Cigno and Luporini, 2003; Garcia-Penalosa et al., 2000). However, a graduate tax scheme based on later earnings is likely to be more difficult to introduce politically and practically (e.g. how to deal with mobility across tax borders after graduation).

Financial support for the disadvantaged alone would not be enough to improve access and participation in higher education for the disadvantaged. Better knowledge of the demand and supply side of higher education for all potential students and stakeholders (students, universities, employers and government) should improve the efficiency of higher education systems. More information about the advantages of attending higher education is essential, notably for people who do not attempt to enter higher education because they are unaware or unconvinced of the opportunities it affords (Lee and Miller, 2005; Studley, 2003; Botello and Costa Pinto, 2001). Such students are often from the most disadvantaged families who do not have a culture of attending tertiary education. Mentoring of schoolchildren by current university students, preferably from similar backgrounds, visits by pupils to universities and by academics to schools or extra teaching/tutoring are all ways of improving information at an earlier stage and can reduce drop-outs (Smith and Naylor, 2001; Barr, 2004; Arulampalam, 2004).

A system of higher education where beneficiaries contribute tuition fees financed through income-contingent loans is judged to be both efficient and equitable (cf. Greenaway and Haynes 2003; Jacobs and van der Ploeg, 2005). The experience of countries that have combined an increase in tuition fees and an increase in student loan facilities suggests that there are no significant adverse effects on equity of access and participation. It is unclear how efficient a system of government financed loans is in terms of the use of government expenditure (administration costs etc.) compared to the more traditional direct subsidies, and more research should be carried out in this field.

2.5 – VOCATIONAL EDUCATION AND TRAINING

Research into and evidence on vocational education and training (VET) is more limited than for the other levels of education and training. It is especially sparse on the efficiency and equity of different VET approaches and further research should be carried out in this area. With this caveat in mind, the following section draws on existing studies and evidence to consider approaches that, to some degree, have been shown to be equitable and efficient.

2.5.1 - Initial vocational education and training

European research, such as the YOYO project,⁴⁰ shows that young people at the bottom of the qualifications ladder encounter substantial difficulties in entering the labour market and are the most vulnerable to economic swings. They face a higher risk of unemployment and tend to end up in low-skilled or temporary jobs, with a future of state-funded training programmes interspersed with insecure low paid employment and lengthy periods of unemployment. They are often channelled into training schemes that do not always match the needs of the labour market and neglect individual aspirations and strengths. This results in de-motivation and disengagement⁴¹.

Evidence on the impact and benefits of VET at upper secondary level is still limited, but it shows that a system of vocational education and training which is well regarded by employers and relevant to the labour market can produce substantial earnings returns (Lauer and Steiner 2000; cf. Bishop 1994). Initial VET caters for learners with a broad range of abilities depending on a country's traditions and labour market characteristics. Employers must be able to understand the relevance of VET qualifications to the labour market and the performance of their companies if clear pathways are to be established through VET to employment (Machin and Vignoles, 2005) and if it is to be considered an attractive learning route. This is already the case in some countries and/or sectors where employers are involved in the design and delivery of qualifications and training programmes.

In terms of school to work transitions, the effectiveness of VET systems varies very much depending on the specific institutional and labour market conditions of the country. Across Europe recent school-leavers experience difficulties finding employment. In countries with a dual system of initial training (e.g. DE, AT), the unemployment rate is low immediately after entering the labour market, and it remains more or less constant over time (though this is also true for e.g. DK, IE, NL, PT, SI, UK)⁴². Significantly, research suggests that policies which involve the active participation of young people in transition and the recognition of informal learning can have a major impact on enhancing motivation for active re-engagement in transitions to work. Indeed, evidence shows that the active participation of young people in their learning (e.g. through project work, workplace learning, programmes where learners are involved in the decision making at course and/or VET school level) should be a key principle of policies concerned with young people's transitions to work and that young people should be put at the centre of policies concerning their lives and be given negotiating power (Niçaise, 2000; López Blasco, et. al., 2003, Walther et al, 2006).

⁴⁰ <http://www.pjb.co.uk/npl/bp51.htm>

⁴¹ See Maastricht study: http://ec.europa.eu/education/policies/2010/studies/maastricht_en.pdf

⁴² See Maastricht study: http://ec.europa.eu/education/policies/2010/studies/maastricht_en.pdf

2.5.2 - Continuing vocational training and adult education

Policies encouraging adult training and learning opportunities for workers at the lower tail of the skill and earnings distribution are one of the most effective ways of reducing the gap between the top and the bottom of the skills distribution. Workers without a qualification from compulsory education or who have no post-compulsory education can benefit from acquiring skills for a specific occupation or industry. With such skills, their productivity and earning capacity can be substantially increased and their prospects of finding employment improved (Acemoglu, 2003). Some studies find a positive correlation between initial and continuing education and training and higher wages throughout working life (Brunello & Comi, 2004; Tessaring, 2004). Given that training appears to have a strong impact on employment security, especially for older and low-educated workers, the avoidance of lost earnings due to unemployment spells can be regarded as being a positive effect of training on earnings.

Despite this, the statistical section of this paper shows that participation rates in adult training across all countries, including those in Scandinavia, are highest for the most educated, thereby reinforcing existing educational inequities.⁴³ Moreover, under existing institutional arrangements, the labour market offers scant, if any, financial incentives for adults to pursue long-lasting studies. This is an important reason why adults rarely participate in long formal education programmes⁴⁴. Adult participation in formal education would be stimulated if programmes could be designed in a way that reduces the opportunity cost for older workers to participate, for example through greater use of intensive or modular courses, or if benefits could be increased, such as through formal certification or longer working lives (Blöndal et al. 2002).

2.5.3 - Continuing vocational training provided by enterprises

It is generally the case that training by private companies concentrates on the most highly educated and those in the most skill-intensive occupations (Arulampalam et al. (2004a) and Bassanini et al. (2005)).⁴⁵ This is because the principal incentive for firms to invest in training is to increase profits (Becker, 1993) and training is likely to be expanded as long as the rate of return is higher than investment in alternative assets. As a result, training is disproportionately concentrated on the better educated because they are easier to train and produce better rates of return (Acemoglu, 2003 and Acemoglu and Pischke, 1998). As Oosterbeek (1998) argues using Dutch evidence, it may be the case that this pattern reflects differing net benefits for workers of different education levels, rather than firms favouring workers differently according to their skill levels. However, training is less common for older workers because employers often associate this with lower rates of return than the training of people with longer working lives ahead of them (Blöndal et al. 2002). In addition, Bassanini et al. (2005) show that employees with higher socio-economic status are more likely to obtain workplace training than those with lower socio-economic status. This implies that employer provided training in Europe discriminates not only according to the level of skills of the employees but also to their socio-economic background (whereas this does not seem to be the case in the USA according to Carneiro and Heckman, 2003).

⁴³ See the statistical section : Part 2 – Equity indicators.

⁴⁴ Other explanations include family responsibilities, difficulties in adapting to a university environment after a long period out of study and difficulties in recognising non-formal qualifications.

⁴⁵ This is not the case in dual training systems.

The size of a company also tends to determine the level of investment in training. Small and medium enterprises employ around two thirds of all workers outside the agricultural sector in the EU, but invest far less in the training of their employees than larger firms (Tessaring and Wannan, 2004). SMEs face particular challenges, for example, a lack of resources to develop in-house training strategies, less input and influence over course contents to tailor them to their needs, and difficulty in covering for employees whilst they are on training (on SMEs see the European research projects, SMEs-TRAINING⁴⁶, WORKTOW⁴⁷ and NEWSKILLS⁴⁸).

Although it has proved difficult to isolate the impact of company training on productivity, empirical studies provide some direct evidence that training has succeeded in raising productivity in the enterprises and sectors involved. Country studies that find significant impacts of training on companies' productivity include Holzer *et al.* (1993), De Koning (1994), Alba-Ramirez (1994), and Barrett and O'Connell (1998). Dearden *et al.* (2000) suggest that a 5 percentage point increase in training incidence could lead to an increase in the level of labour productivity of 4 per cent. The limited evidence available also suggests that training does indeed increase productivity and profitability of the companies and sectors involved. However, the fact that firm-provided workplace training tends to be confined to the high-skilled suggests that this kind of training does not advance equity causes.

2.5.3.1 - Subsidies and tax incentives

Member States have attempted to improve adult training programmes by offering subsidies or tax credits to firms providing training to their employees. As long as there is underinvestment in training, subsidies to training firms or tax credits for on-the-job training are beneficial. Such subsidies can also increase the human capital of workers at the bottom tail of the skills distribution in society and serve to reduce inequity. However, subsidies are relatively ineffective where the monitoring of work-based training is difficult. For example, if the amount or quality of training the firm provides is not verifiable, then regardless of the subsidies received, the quality of training may not be improved and subsidies are simply a windfall gain to the firm. Moreover, subsidies can have large deadweight and substitution effects (Acemoglu, 2001).

Favourable tax treatment of company training expenses has provided considerable support for such activities. Some countries have, or have had in the past, tax levies that require employers either to spend on training beyond a certain threshold level, or pay a training levy. This serves to enhance access to training for the low-skilled and to upgrade technical and vocational training for those who are not admitted to academic education (Arulampalam *et al.*, 2003; Bassanini *et al.*, 2005). However, government subsidies for company training have traditionally been targeted at sectors or firms that are under pressure to reduce activity.

2.5.4 - Public training programmes

In Europe many people leave compulsory education without a sufficient level of skills or competences for employment. To ensure equity of opportunity, targeted public interventions in particular within active labour market programmes are needed to ensure that the disadvantaged (e.g. low-skilled, vulnerable, unemployed young people) can access training and enhance their employment prospects.

⁴⁶ <http://www.pjb.co.uk/npl/bp26.htm>

⁴⁷ <http://www.pjb.co.uk/npl/bp21.htm>

⁴⁸ <http://www.pjb.co.uk/npl/bp13.htm>

Publicly provided training programmes often target the unemployed, which is welcome from an equity perspective. However, government training programmes often lack relevance, fail to exploit the complementarity between training and industry and their curricula lag behind the needs of businesses and trainees. Evaluation studies of public training programmes in European countries, including France, Germany, Ireland, Norway, Poland, the Slovak Republic, Sweden and the United Kingdom tend to report very low returns from adult training programmes. This is often because the costs of the programmes are significantly higher than the benefits in terms of increased earnings or employment prospects (Martin and Grubb 2001 and Kluve and Schmidt 2002).

Many adult training programmes suffer from high dropout rates and large deadweight costs. From their comparison of different programmes, Heckman and Lochner (2000) find that "you get what you pay for" and that the effect of treatment may vary substantially among subgroups. Crucially they also find that these types of programme have wider social benefits beyond learning and employment, such as a reduction in crime. The huge costs associated with social exclusion and inequity mean that investing in upskilling poorly educated adults can be positive from both an efficiency and an equity perspective.

The US experience with subsidies and government-run training programmes is rather mixed, suggesting that only expensive government programmes are successful (see Lalonde (1995)). There is strong evidence from the United States (mostly, though not exclusively, based on randomised experiments) that more intensive programmes can improve the education and skills of adults and thereby have a positive effect on earnings. Apart from a few notable exceptions, these programmes have had no impact on high-school dropouts.

European evidence shows that such programmes can have employment impacts (both for adults and youth), but tend to show no positive impact for earnings (where this has been considered). General concerns in this literature are the reliability of the evaluation methodology; the short-term nature of many interventions and evaluations; wider effects that are not often considered by evaluators, such as crime and indirect or net effects (e.g. consideration of whether employment programmes displace workers who would otherwise be employed, aggregate employment effects at the macro-level) (See Machin, 2006 for a review).

2.5.5 –Partnerships

One effective method for increasing the relevance of all training programmes, especially those provided publicly, is through establishing closer links with business and employers. Practical partnerships involving the key stakeholders and local actors in training, such as government agencies, employers, employees, the voluntary sector and unions, are increasingly pursued in some countries as a method for bringing diverse actors together.

2.5.5.1 – Benefits of partnerships

Theoretical insights into sectoral approaches in lifelong learning are developed in Finegold's (1991) article about the preconditions for a high-skill equilibrium (HSE). He presents the poaching issue as a classic "prisoner's dilemma" or "free rider" problem based on game theory. "Prisoner's dilemma" or "free-riding" occurs when a firm does not benefit directly from the individual apprentices it trains, but does benefit from the overall supply of trainees who have been trained at the expense of other firms in their industry. This is a basic case for the "prisoner's dilemma" where all employers have an interest in financing general training,

but where any one employer may prefer free-loading in order to reap the benefits of hiring a newly trained employee without having paid for it.

Finegold therefore argues that in the absence of cooperation between employers, no employer will invest in training so that they avoid losing their trained worker to another enterprise. Where cooperation between employers exists to ensure that all employers engage in training, the outcome (benefits) for each of both employers will be higher than in case of non-cooperation. According to Finegold, one institutional mechanism that can overcome the lack of co-operation is employers' associations, organised on a sectoral or geographical basis. In practice, the extent to which these employers' associations can discourage free riders will depend upon variables such as their representativeness, the legal framework, the services they can provide and the sanctions that can be imposed.

Culpepper (2003) examines in greater detail how employers' organisations in the field of lifelong learning exert influence. Based on interviews with employers and on theoretical arguments about the phenomenon of 'group polarisation', he argues that employers' organisations have a "dialogic" capacity, i.e. that they have the ability to persuade firms which are hesitating to invest in training, by promoting discussion among smaller subgroups, whose members are more likely to lean towards cooperation.

2.5.5.2 – Contribution of stakeholders

The involvement of unions as key stakeholders in the provision of training can help improve outcomes for employees. There is some evidence that unionised employees receive more training (Booth et al. 1999) because union involvement helps: a) to raise relative wages and therefore reduce the incentive to resign; b) to disseminate information, monitor the application of contracts and reduce the scope for opportunistic behaviour (e.g. cosmetic training, training of poor quality); c) to systematically promote workplaces conducive to learning (releasing the learning potential of employees through a combination of formal, non-formal and informal learning).

In industrial contexts where small and medium sized firms are predominant and internal labour markets are shallow, employer organisations and chambers of commerce can provide the institutional framework for a high training balance (e.g. Germany, Netherlands). Collective agreements could also help to set the quantitative conditions of the contract (e.g. requiring fixed salary and fixed duration). On the one hand, we may have the unions pushing for higher trainee salaries and "lower trainee exploitation". On the other hand, the firms may push for more flexibility in the training structure, splitting between on-the-job and off-the-job traineeships, the latter being covered by industry training funding schemes (Ryan, 2003).

The OECD Employment Outlook from 2003 provides evidence of increased social dialogue in many countries. The study points out that social bargaining in continuing vocational education and training is most intensive in countries characterised by joint governance of continuing training funds. This is because such funds are usually developed through bipartite agreements where operational targets are often negotiated at sectoral or inter-professional level.

One study from 2003 (OECD, 2003, *Beyond Rhetoric: Adult Learning Policies and Practices*) and OECD Employment Outlook 2003 (OECD, 2003) highlights a number of reasons for involving employee representatives and the social partners in a more structured way at various levels of negotiation and dialogue on training and skill:

- Public expenditure has to be funded mainly through taxes on profits or wages and employers and employees alike may resist such policies. Participation by the social partners in public policy may help alleviate such resistance.
- Employers and employees are more likely than governments to have in-depth information on current skill needs, thereby enabling more accurate forecasting of skill needs and the development of curricula and qualifications with more relevance to the labour market.
- At a company level, employee involvement and employee councils may help increase the efficiency of further training by balancing employer information on the costs and benefits of training. They can also provide employers with an insight into further and future training requirements of employees.
- The use of payback clauses in collective agreements and individual contracts - whereby a worker leaving the firm within a specified period after the training has to agree to (partially) reimburse the training costs - could help alleviate credit constraints faced by employees as well as the possibility of 'poaching' by other employers.
- In several OECD countries, social partners run national or sectoral training funds into which firms pay a certain percentage of their payroll and from which they have their own training expenses reimbursed. Collective funds for employee training can be one of the instruments that can promote continuous learning, especially in firms that are less likely to invest in developing human resources.

2.5.5.3 – Impact of partnerships on disadvantaged learners

Partnerships at a local level can be effective in addressing the needs of the disadvantaged because they can be calibrated to deal with specific groups and particular individual needs (OECD (1998), *Human Capital Investment: An international comparison*). Furthermore, the most vulnerable adults are often reluctant to engage in training because of their distrust of formal schemes or representatives of authority. Indeed, European research projects suggest that an important determinant in the participation and learning of the most vulnerable young people is the trust built up between “teachers” and the learner (Power, 2006). Partnership approaches and small-scale schemes can be successful at establishing such constructive relationships because they are often regarded as outside 'official' forms of intervention (Power 2006). Partnerships can also provide alternative provision for young people at risk of dropping out of compulsory education or support the most disadvantaged in their transitions to work. The flexibility of partnerships makes them well-placed to concentrate individuals and their specific needs, though this can be costly and requires sustainable funding over the medium term.

A concrete example of a successful partnership initiative is provided by the European Union community programme EQUAL. The aim of EQUAL is to promote new means of combating all forms of discrimination and inequalities in connection with the labour market through geographical or sector-based partnerships. According to a recent evaluation⁴⁹, the implementation of the partnership principle has stimulated the involvement of local or community organisations with a good knowledge of target groups. The result is that groups

⁴⁹ Bernard Brunhes Consultants, *EU-wide evaluation of the Community Initiative Equal 2000-2006*, Evaluation report commissioned by the European Commission, 2006.

who would normally be excluded from training or employment opportunities have benefited from EQUAL actions.

Moreover, there have also been direct results in terms of ‘empowerment’ of groups which are being discriminated against, marginalised or simply forgotten by policies and institutions. This could be expected in a programme focused on the reduction of discrimination, but the partnership and empowerment principles behind the projects were seen by the evaluators as the direct impetus for this to happen. New ways of working have also been experimented with, often leading to increased efficiency through the mobilisation of complementary expertise and better co-ordination. The mobilisation of grass-roots NGOs has facilitated outreach activities and access to the target groups.

2.5.6 - Public-private training initiatives at a sectoral level

Greater use of work-based training both in public and private training schemes helps to improve the productivity gains of workers and employment prospects of the unemployed. Therefore, encouraging the private sector, which has better knowledge of market and industry needs, to feed into the design of training schemes and curricula is beneficial, while the government can help through certification and quality monitoring (cf. Acemoglu 2001; Heckman 2000; Kluve and Schmidt 2002).

Most government regulation of private training, for example in the German apprenticeship system, is used to monitor the quality of training programmes and to certify skills. One effect of regulation is that it makes it easier for firms and workers to contract in to training, allowing them to eliminate the externality that arises when training is decided non-cooperatively (see e.g. Acemoglu and Pischke (1998)). Regulation also allows workers to contribute to the amount of training they receive and so it is most useful when workers have the ability to pay for training. Such policies are very effective in dealing with skill shortages for specific industries or occupations.

However, different industrial sectors have different needs and training capacities. For example the sector may be more or less flexible (and hence require greater adaptability in the workforce and training), focus on mass production, or conversely need to react quickly to specific demands. Sectoral initiatives can play an important role by increasing the accuracy of information on the skill needs of the economy and thereby improving the relevance of training to the labour market. Sectoral schemes can also stimulate the development of recognised and quality qualifications in sectors where there is little tradition of education and training.

Education and training initiatives across the various sectors can ensure that certain core skills are included in the programmes developed for different sectors. Frameworks, standards, and certifications facilitate cross-sectoral integration and mobility as sectors converge and new occupational profiles develop. At the same time, training schemes that focus on the needs of regional economies, providing learners with skills relevant to the local labour market have been shown to be successful (Meager (1997); Nicaise (1999); OECD (2000)).

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SECTION 3 - STATISTICAL DESCRIPTION

This section considers efficiency and equity performance of education and training systems in Europe by using selected indicators to identify relative strengths and weaknesses in European education systems. It deals with all levels of education while focusing on formal and, when applicable, on non-formal learning. Efficiency indicators aim to measure the performance and quality of education and training systems. Equity indicators aim to measure the participation by various different groups in education and training and the dispersion in results across the student population. Unfortunately, few indicators exist to reflect both the efficiency and equity of education and training systems.

Indicators, whether quantitative or qualitative, cannot fully reflect the complexity of education and training systems as regards their efficiency and equity. However, they help to identify variations in performance levels - between countries and within years - and can form the basis for the examination of the underlying reasons for these variations. Statistical comparison also helps to identify countries which perform particularly well and whose good practice and expertise can be analysed and eventually shared with others. Exchange of experiences and good practice are key elements in the Open Method of Coordination and the follow-up to the Lisbon Strategy. This paper shows that in the area of efficiency and equity Member States can learn from the performance of other European countries and of countries across the world.

The main sources used in the working paper are the UOE data (joint UNESCO, OECD and Eurostat data collection), the EU Labour Force Survey and PISA (OECD). Whenever possible, data — covers 25 EU countries, EFTA/EEA countries, candidate and acceding countries, Japan and the US. These data are recognised as valid and largely comparable across countries. In a number of key areas for measuring efficiency and equity of education systems indicators are currently missing and new indicators are in the process of being or will be developed. This situation was analysed in the Council Conclusions of 24 May 2005 on new indicators in education and training⁵⁰. Therefore, due to a lack of appropriate data, the choice of variables sometimes does not exactly reflect what is understood by efficiency and equity but are still informative for considering these two key concepts.

The section is divided into two subsections, each containing three sub-parts. The first subsection gives an overview of efficiency in education and training while the second focuses on equity issues. The efficiency issues are examined in terms of rates of return; input measures such as expenditures; and output measures such as test scores or employment rates. Equity indicators are broken down by: participation rates; participation rates in terms of working status and level of education; and dispersion in outcomes.

3.1 - EFFICIENCY INDICATORS

Since efficiency involves the relationship between inputs and outputs, the indicators on efficiency are divided into three parts: the first part presents rates of return; and the two following parts present components in terms of input and output measures often used in the calculation of rates of returns.

⁵⁰ http://europa.eu.int/comm/education/policies/2010/doc/indicators_en.pdf

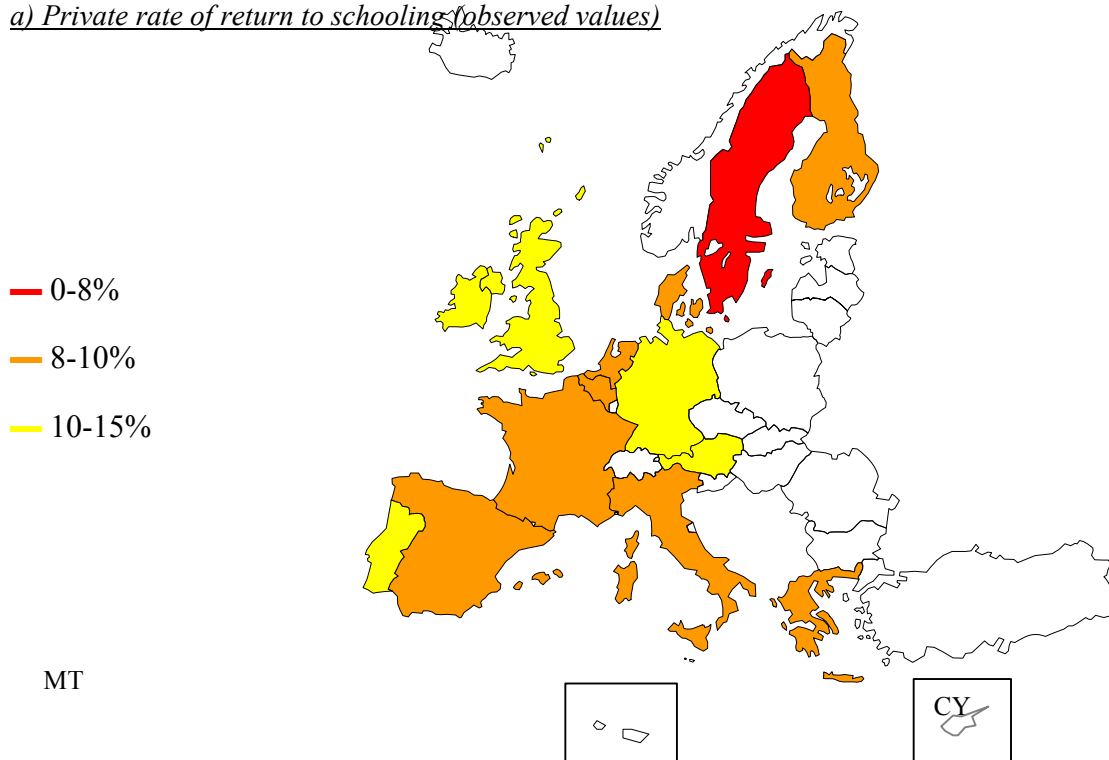
3.1.1 - Rates of return (ROR) to investment in education

Internal rate of return to investment in education is the discount rate that equates the stream of benefits from the investment to the stream of costs. Private ROR refers to costs and benefits for the individual (i.e. types of private benefits, - such as probability of employment and earning returns, related to the direct and indirect costs of schooling). Social ROR includes the public costs and benefits in terms of growth rates of education. Externalities such as non-market and external effects of education (e.g. increased tolerance, social cohesion, democratic participation...) are not included in this calculation.

3.1.1.1 - Private rates of return to investment in education

OECD provides information on private rates of return, taking into account costs and benefits). For example, the costs involved in attending higher education might be tuition fees, and earnings foregone by attending college rather than working and adjusted for tax and the risk of unemployment. Contributions towards the costs, such as grants and loans, would be subtracted from this total. The benefits of attending HE might be the gains in after tax earnings adjusted for the higher probability of employment minus the repayment of any public support, such as an income-contingent loan.

a) Private rate of return to schooling (observed values)



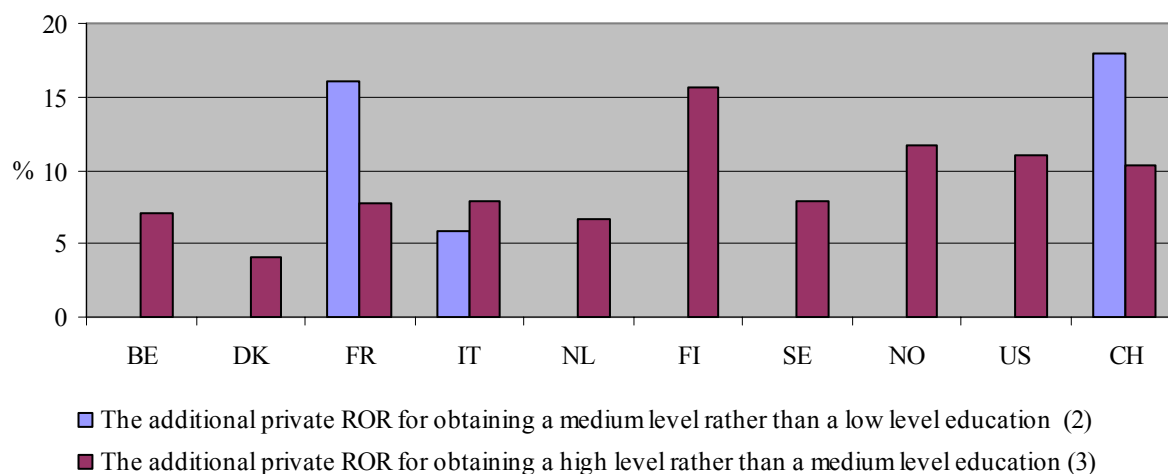
EU 14	UK	PT	AT	DE	IE	EL	FI	FR	ES	DK	IT	BE	NL	SE
9.75	13.9	12.3	10.5	10.5	10.4	9.8	9.6	9.6	9.4	8.9	8.6	8.6	8.0	6.0

EU 14: 9.75 %

Source: European Commission, Final report for DG Employment and Social Affairs, *Human capital in a global and knowledge-based economy*, 2003, de la Fuente, p. 28

In 14 European countries, the private rate of return to schooling ranges between 8 and 10% for every country except Sweden where the rate is 3.75 percentage points lower, possibly as a result of narrowing the wage gap between the lowest and highest paid employees. This will occur when lower paid employees receive a larger wage increase than the highest paid employees. The private rate of return exceeds 12% in the UK and Portugal and is over 10% in Austria, Germany and Ireland. National policies strongly impact on this private rate of return from education and training. It can be increased by direct subsidies to education or reduced by higher personal taxes and social contributions. Other key factors should be taken into consideration to explain national differences, such as the duration of studies, age at which students graduate or the graduation rate.

b) Comparison of the private rate of return for individuals achieving different levels of education



Source: OECD. See Annex 3 for notes (www.oecd.org/edu/eag2005)

ROR calculated when the individual immediately acquires the next higher level of education

Un-weighted average between male and female populations

(2) Private internal rates of return (ROR) for an individual who obtains an upper secondary or post-secondary non-tertiary education (ISCED 3/4)⁵¹ as opposed to an individual who obtains only a lower upper secondary level of education (ISCED 0/1/2) (2002)

(3) Private internal rates of return (ROR) for an individual who obtains a university-level degree (ISCED 5/6) as opposed to an individual who obtains only an upper secondary and post-secondary non-tertiary level of education (ISCED 3/4) (2002)

Private rates of return are estimated by comparing levels of participation in different levels of an education and training systems. In the OECD’s publication of *Education at a Glance* (2005), rates are calculated for 9 European countries and the United States. At the tertiary level the private internal rates of return are between 4.1% (Denmark) and 15.6% (Finland). Despite significantly differing private internal rates of returns across countries these rates are higher than the real interest rate, suggesting that, in a purely financial sense, personal investment in education pays-off.

3.1.1.2 - Social rates of return to investment in education

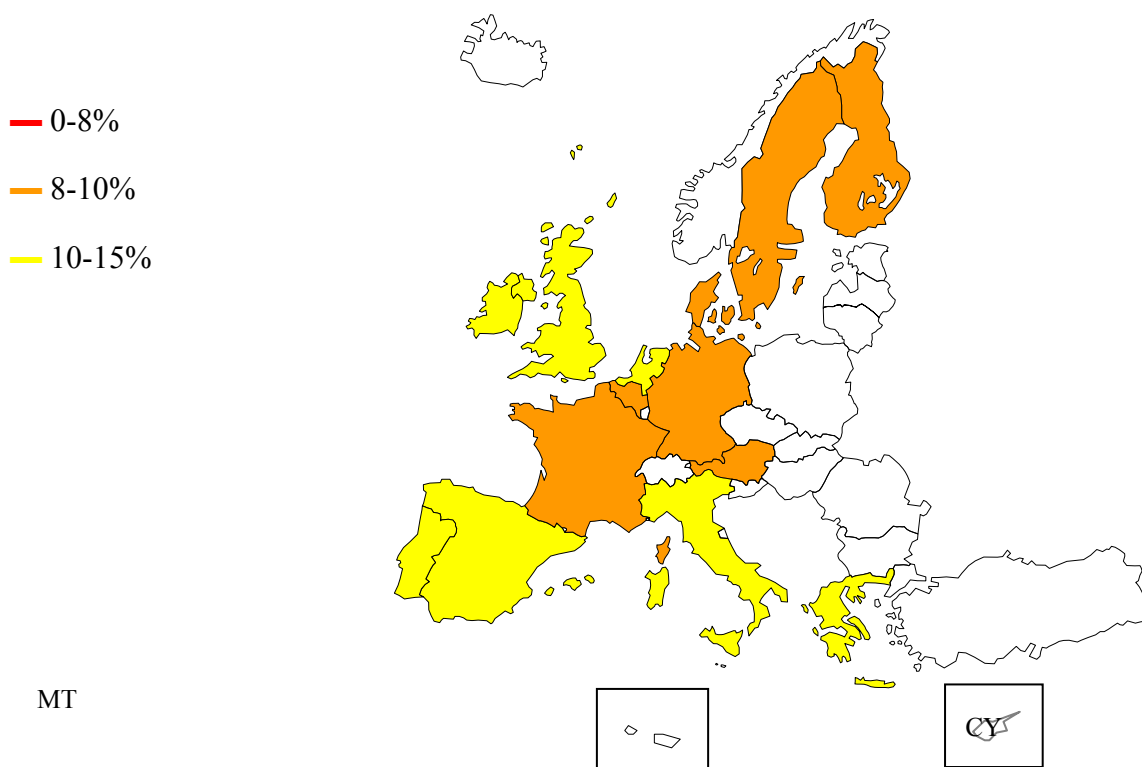
Education impacts on economic growth by increasing its human capital, its innovative power and facilitating the diffusion of technology. For example, de la Fuente (2003) estimates that “each additional year of average school attainment raises productivity in the average EU country by 6.2% on impact and by a further 3.1% in the long run through its contribution to faster technological progress”⁵².

⁵¹ ISCED levels comprise both general education and VET.

⁵² A. de la Fuente: *Human capital in a global and knowledge-based economy*, DG for Employment and Social Affairs, April 03

De la Fuente calculates the social rate of return to education as “the discount rate that equate the present value of the incremental cost and income streams generated by a marginal increase in the schooling of a

a) Social rate of return to schooling (baseline estimate).



Social rate of return to schooling (baseline estimate)

EU 14	PT	IE	ES	EL	UK	IT	NL	BE	FR	DK	DE	SE	AT	FI
10.0	11.6	11.6	11.5	10.8	10.7	10.4	10.2	9.4	9.1	9.1	8.9	8.9	8.8	8.7

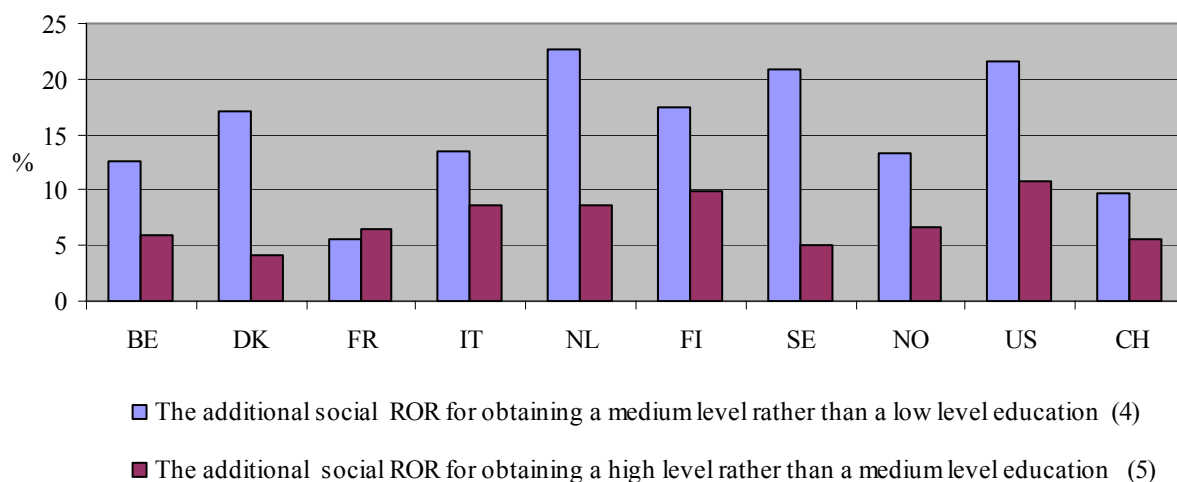
EU 14: 10.0 %

Source: European Commission, Final report for DG Employment and Social Affairs, *Human capital in a global and knowledge-based economy, 2003*, de la Fuente, p 40

Social rates of return to schooling range between 8.7% in Finland and 11.6% in Portugal, with an average level of 10% across the 14 countries. This estimate underlines that returns to human capital are lower in France, German-speaking countries and Scandinavia than in the UK, in Ireland and in some Mediterranean countries. De la Fuente's results suggest that the economic returns to investment in schooling are at least comparable to, and very likely significantly higher than, those from investments in physical capital. The high private and social rates of return should make human capital an attractive investment alternative.

representative individual for each country to whom he attributes the observed average levels of attainment and productivity. To quantify the contribution of schooling to aggregate productivity levels and growth rates, he uses the results of cross-country growth regressions drawn from literature”.

b) Comparison of the social rate of return for individuals achieving different levels of education



Source: OECD. See Annex 3 for notes (www.oecd.org/edu/eag2005).

ROR calculated when the individual immediately acquires the next higher level of education

Un-weighted average between male and female populations

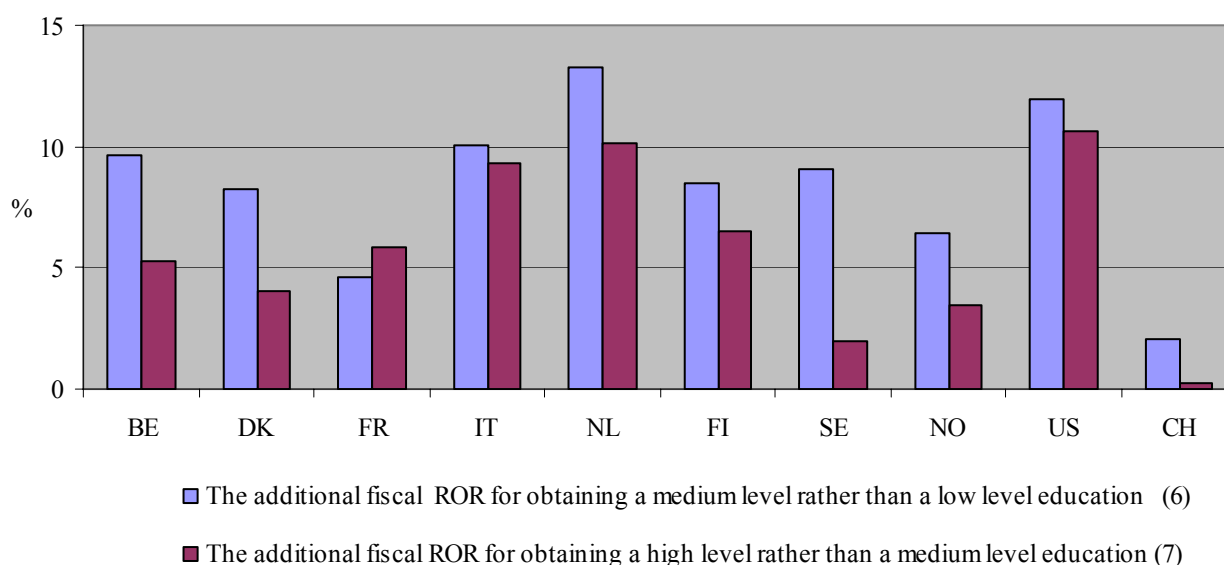
(4) Social internal rates of return (ROR) for an individual who obtains an upper secondary or post-secondary non-tertiary education (ISCED 3/4) as opposed to an individual who obtains only a lower upper secondary level of education (ISCED 0/1/2) (2002)

(5) Social internal rates of return (ROR) for an individual who obtains a university-level degree (ISCED 5/6) as opposed to an individual who obtains only an upper secondary and post-secondary non-tertiary level of education (ISCED 3/4) (2002)

The OECD's estimates of social rates of return exclude non-economic benefits and externality effects. Social internal rates of return are usually lower than private internal rates of return because the social cost of education is typically higher than the private cost. Social rates of return to education are particularly high at the lowest level of education especially in the Netherlands, Sweden and the USA (above 20%), though the returns from tertiary education are also above 10% in Finland and in the USA. In most countries, social rates of return for upper secondary education tend to be higher than for tertiary education, though the opposite is true for France.

3.1.1.3 - Fiscal rates of return to investment in education

Comparison of the fiscal rate of return for individuals achieving different levels of education



Source: OECD. See Annex 3 for notes (www.oecd.org/edu/eag2005).

ROR calculated when the individual immediately acquires the next higher level of education

Un-weighted average between male and female populations

(6) Fiscal internal rates of return (ROR) for an individual who obtains an upper secondary or post-secondary non-tertiary education (ISCED 3/4) as opposed to an individual who obtains only a lower upper secondary level of education (ISCED 0/1/2) (2002)

(7) Fiscal internal rates of return (ROR) for an individual who obtains a university-level degree (ISCED 5/6) as opposed to an individual who obtains only an upper secondary and post-secondary non-tertiary level of education (ISCED 3/4) (2002)

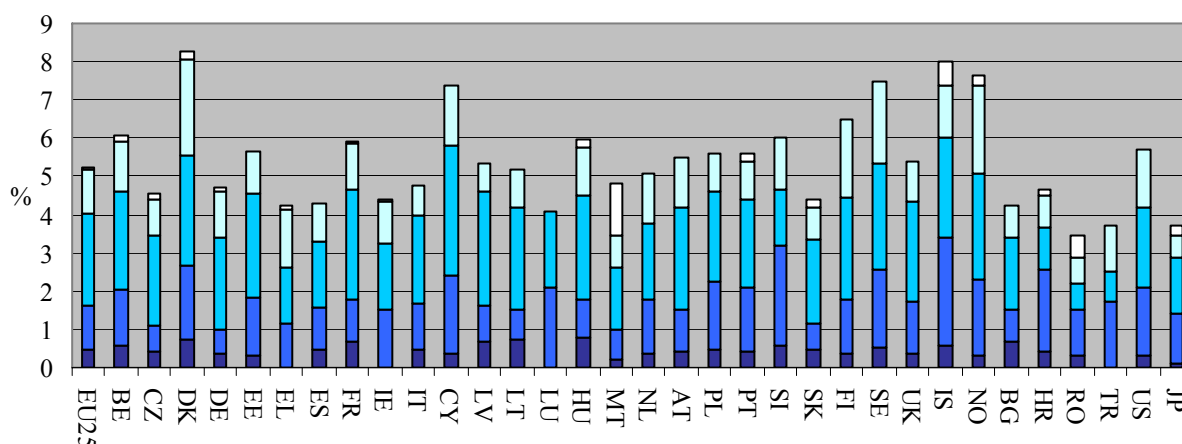
The OECD also presents fiscal rates of return from investments in education which consider the public costs and receipts from education. Public provision of education entails indirect costs from tax losses associated with those who are studying and not working and direct costs because of subsidies. On the benefit side, public investment in education brings higher tax revenue from those who graduate and have higher incomes. Fiscal rates of return are relatively high and demonstrate that public investment in education makes sound economic sense. In the Netherlands, the USA and Italy, the rates of return for both secondary and tertiary education are above 10%. However, in several other countries (Sweden, Norway and Switzerland) the fiscal returns for tertiary education are significantly lower (below 5%). Depending on the country, a low fiscal rate of return might reflect wage compression or high public funding for higher education and/or lower taxes.

3.1.2 – Inputs into the education and training systems

This section presents indicators on spending on education and training which give a picture of European investment in education.

3.1.2.1 – Total public expenditure on education⁵³ as a percentage of GDP, 2003

a) Total public expenditure on education, for all activities, as percentage of GDP, by level of education, 2003⁵⁴



- Total public expenditure on education as % of GDP, not allocated by level
- Total public expenditure on education (for all activities, including both education and research) as % of GDP, at tertiary level of education (ISCED 5-6)
- Total public expenditure on education as % of GDP, at secondary level of education (ISCED 2-4)
- Total public expenditure on education as % of GDP, at primary level of education (ISCED 1)
- Total public expenditure on education as % of GDP, at pre-primary level of education (ISCED 0)

■ EU 25: 0.44 % (estimate) ■ EU 25: 1.17 % (estimate) ■ EU 25: 2.41 % (estimate) ■ EU 25: 1.15 % (estimate)

□ EU 25: 0.05 % (estimate)

EU 25 Total public expenditure: 5.22 %

Source: EUROSTAT 2003 (UOE data collection)

The data do not include spending on non-formal and adult education.

Spending on tertiary education sector includes R&D spending at higher education institutions.

The structure of spending by educational level varies among the countries. In the EU25 nearly half of total public expenditure is spent on secondary education. Spending on tertiary

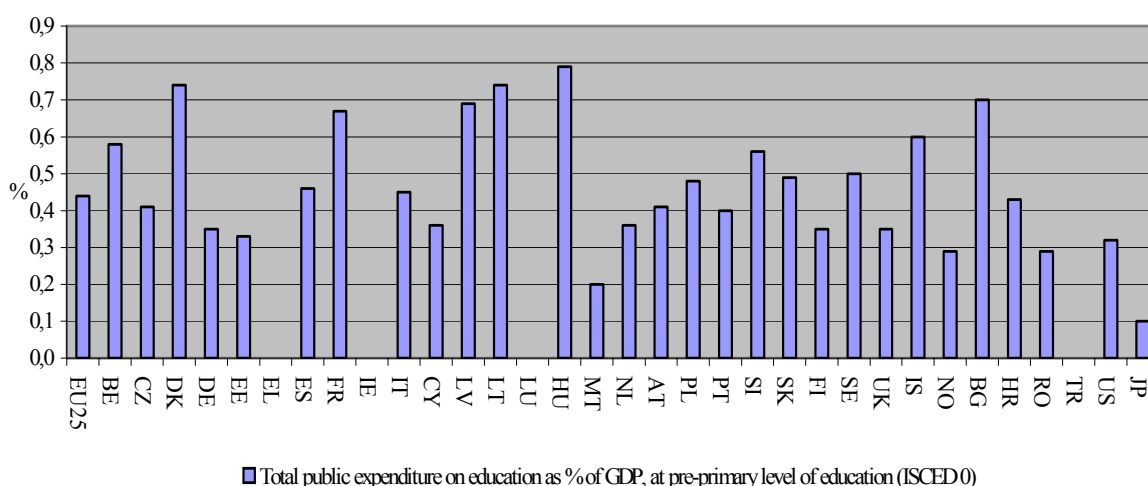
⁵³ Expenditure on education covers expenditure on educational institutions and transfers to the private sector (i.e. scholarships, student loans etc.).

⁵⁴ See footnotes in the appendix to the Statistical description

education is strongly affected by participation rates and includes spending for R&D activities⁵⁵.

Total public expenditure on education represents 5 to 6 % of GDP in almost half of European countries with an average rate of 5.2% in the EU25 countries in 2003. Total public expenditure on education as a percentage of GDP varies considerably between EU countries. Among the countries considered, Denmark, Sweden, Norway and Cyprus (as well as Iceland) have levels of expenditure above 7% of GDP.

b) Total public expenditure on education as % of GDP at pre-primary level of education, 2003⁵⁶



Source: EUROSTAT, 2003

EL, LU, TR: data not available

Of all education levels, the lowest share of public expenditure is spent on pre-primary education despite the fact that this investment brings high long-term returns. At the pre-primary level, strong complementarities exist between efficiency and equity especially when expenditure is targeted at disadvantaged children⁵⁷.

Spending on pre-primary education varies between countries. It is particularly affected by demographic factors, enrolment rates -i.e. non-compulsory nature of pre-primary programmes in many countries, lengths of programmes (usually children aged over 3 and less than 6

⁵⁵ The EU currently spends only 1.2% of GDP on higher education institutions (including both public and private funding, for all activities performed, including education, research and other) compared to 2.6% in the US. The gap is mainly a result of greater private funding in the US. The Commission has proposed that the EU should aim, within a decade, to devote at least 2% of GDP to the higher education sector for all its activities (including both public and private funding)

See Communication from the Commission “*Delivering on the modernisation agenda for universities: education, research and innovation*”, COM(2006)208, of 10 May 2006.

⁵⁶ See footnotes to the Statistical description

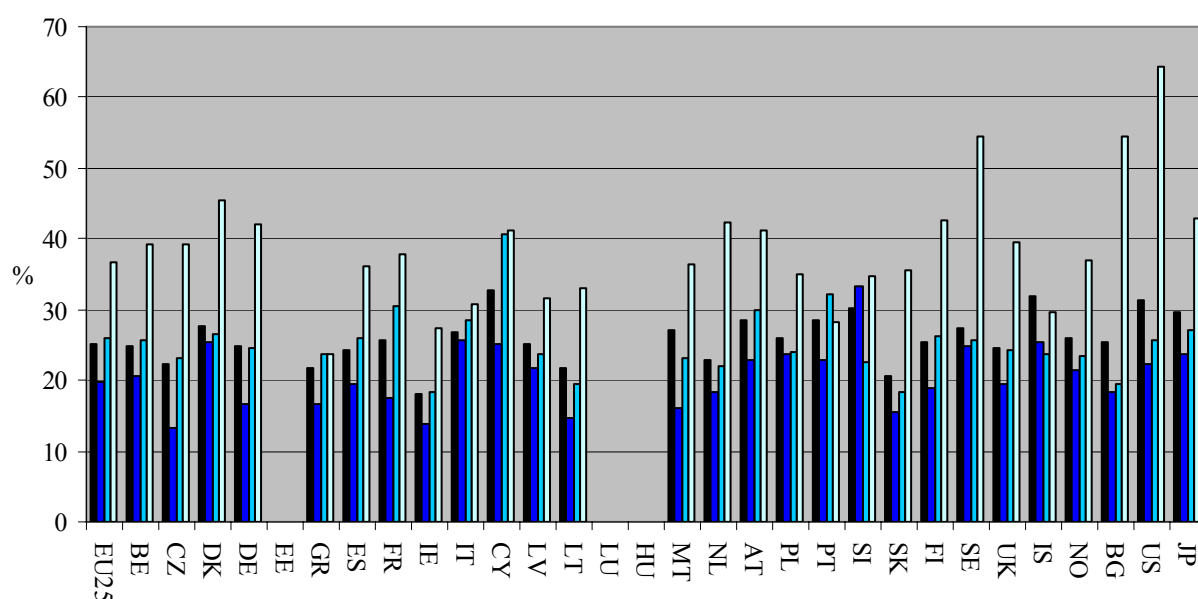
⁵⁷ See Staff Working Paper, section 2

years)- and by complex local cultural and social traditions⁵⁸. Comparisons between countries are also hindered by the quality of the available data.

Expenditure at pre-primary level of education is highest in Hungary, Denmark, Lithuania, Bulgaria, Latvia, France and in Iceland, although these rates remain relatively low between 0.6% and 0.8% of GDP

3.1.2.2 - Expenditure on educational institutions from private and public sources

a) Expenditure on public and private educational institutions per pupil/student compared to GDP per capita; 2003⁵⁹



- Annual expenditure on public and private educational institutions per pupil/student compared to GDP per capita, for all levels of education combined
- Annual expenditure on public and private educational institutions per pupil compared to GDP per capita, at primary level of education (ISCED 1)
- Annual expenditure on public and private educational institutions per pupil compared to GDP per capita, at secondary level of education (ISCED 2-4)
- Annual expenditure on public and private educational institutions per student compared to GDP per capita, at tertiary level of education (ISCED 5-6)

■ EU 25: 25.1 % (estimate) ■ EU 25: 19.7 % (estimate) ■ EU 25: 25.9 % (estimate) ■ EU 25: 36.7 % (estimate)

Source: EUROSTAT, 2003

EE, LU, HU: data not available

Annual expenditure on public and private educational institutions per pupils compared to GDP per capita per level of education, based on full-time equivalents. Spending on tertiary education institutions includes R&D spending.

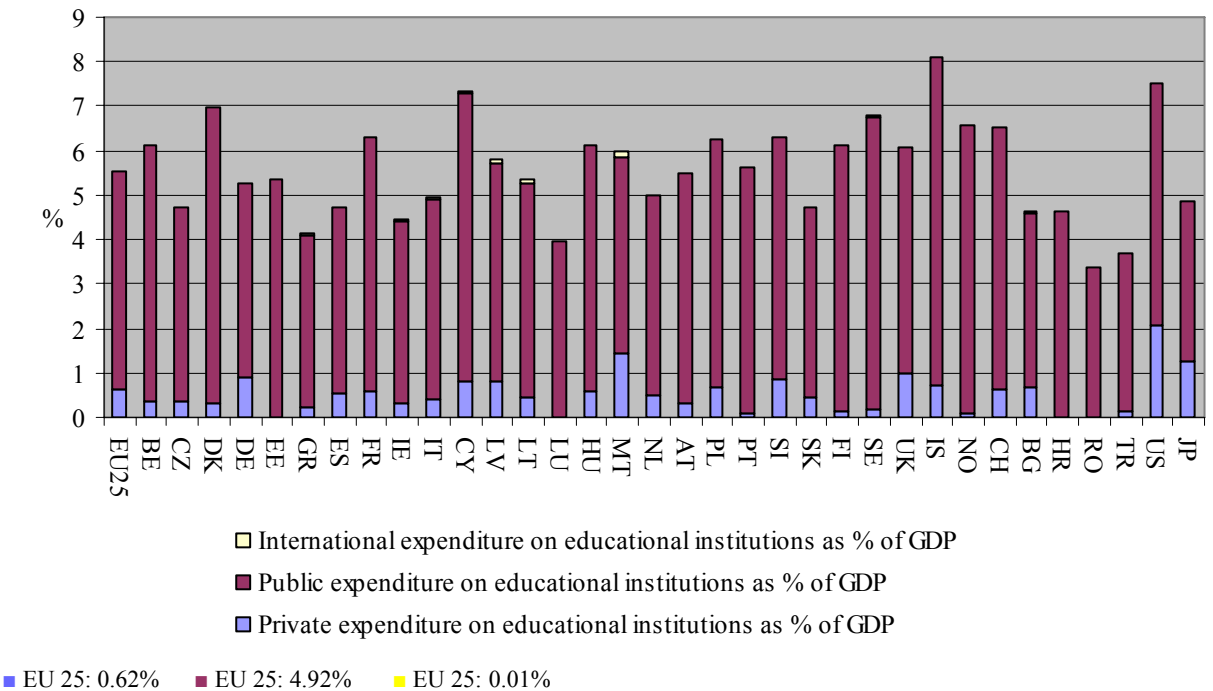
⁵⁸ See section 3 : Mapping analysis

⁵⁹ See footnotes in the appendix to the Statistical description

Cyprus (as well as Iceland and the US) spend the most on educational institutions per student compared to GDP per capita for all levels of education combined (with over 5 percentage points above the EU25 average). The comparison of spending at different educational levels shows that in most countries spending rises sharply between primary and tertiary education. The difference is the most pronounced in the Czech Republic and Germany (as well as in Bulgaria and the US) and the least in Slovenia, Greece, Italy and Portugal (as well as in Iceland).

In Sweden and Bulgaria, spending per tertiary level student reaches over 50% of GDP per capita. Compared with 36.7% on average in EU-countries, expenditure per tertiary student is over 25% higher in the US (64.4% GDP per capita). In terms of expenditure per student in EUR PPS (purchasing power standards), the USA spending per tertiary student for all activities, including research, is over 20,600 EUR, that is more than twice the EU level (8,100 EUR PPS). This difference in level of resources available is one important aspect of the bottlenecks in the research labour market faced by European graduates that are contributing to the tendency of some of the best brains to leave Europe for the US.⁶⁰

b) Public, international and private expenditure on educational institutions as % of GDP, 2003, for all levels of education combined⁶¹



Source: EUROSTAT, 2003

⁶⁰ See European Commission, *Commission Staff Working Document, Progress towards the Lisbon objectives in Education and Training, Report based on indicators and benchmarks, Report 2006*

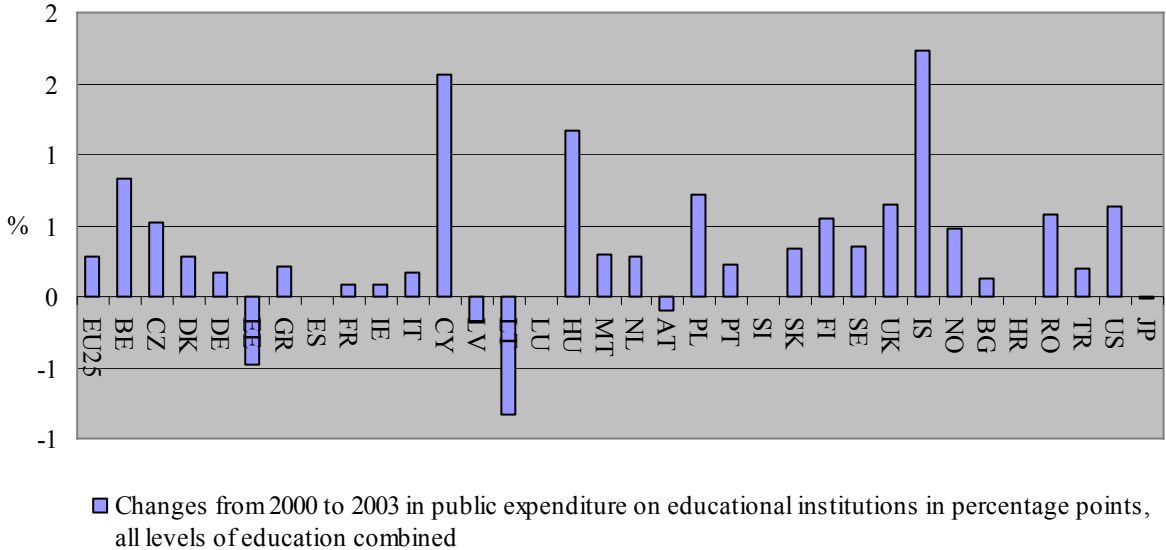
<http://ec.europa.eu/education/policies/2010/doc/progressreport06.pdf>

⁶¹ See footnotes in the appendix to the Statistical description

“Public, international and private expenditure on educational institutions” covers all expenditures within an educational institution as transferred by the public sector (all government levels), the private sector (households, enterprises or other private organisations) or from abroad (international agencies and other foreign sources). Transfers from the government sector to the private sector which are subsequently spent on education in an educational institution are included once (for example public scholarships given to students who subsequently spend them on fees for attending education at a given educational institution). Expenditure on education outside educational institutions (purchase of books or stationery by households) is not covered.

In 2003, private expenditure on educational institutions was 0.6% of GDP in Europe, 1.3% in Japan and 2.1% in the US. Except in Malta, private investment in education was below 1% in all EU countries. Although private expenditure in the US is similar to Europe at primary and secondary levels, it is seven times higher at the tertiary level, where expenditures in research activities are also included.

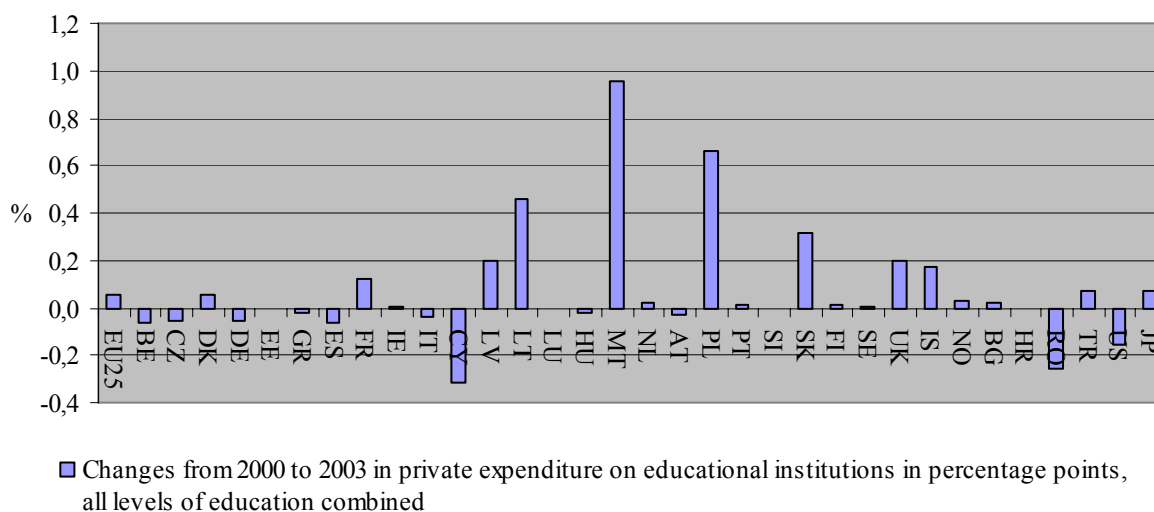
c) Changes from 2000 to 2003 in public expenditure on educational institutions in percentage points, all levels of education combined⁶²



Source: EUROSTAT, UOE collection

⁶² See footnotes in the appendix to the Statistical description

d) Changes from 2000 to 2003 in private expenditure on educational institutions in percentage points, all levels of education combined⁶³



Source: EUROSTAT, UOE collection

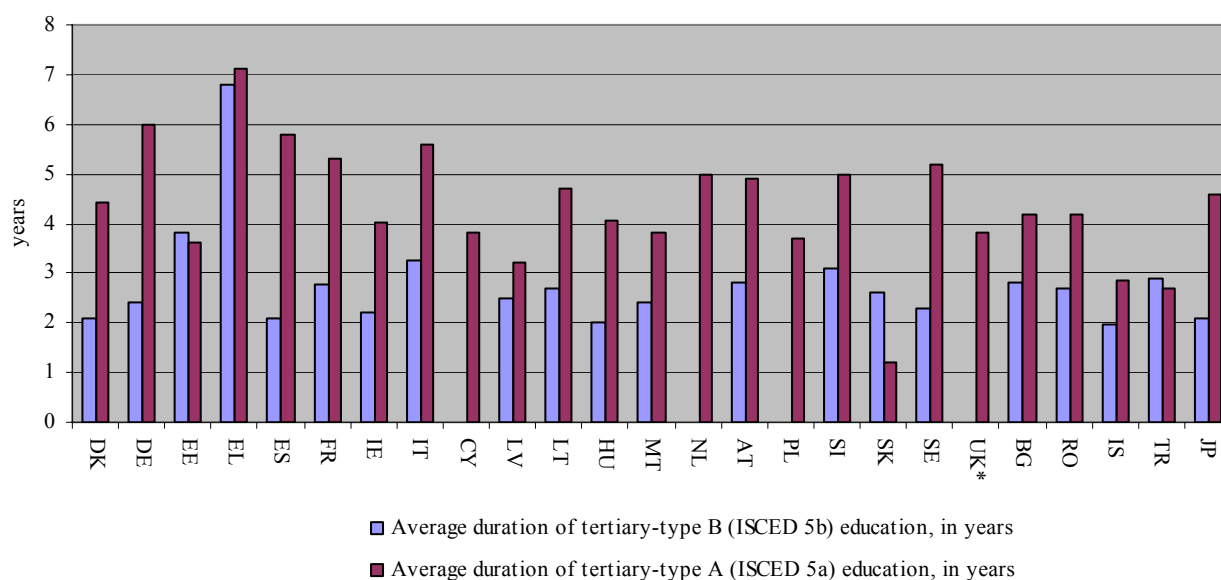
Between 2000 and 2003 total public expenditure as a % of GDP in the EU25 increased, with the largest increases in Cyprus, Hungary, Poland, UK and Iceland. During the same period, spending from private sources as a % of GDP stagnated in the EU25, though trends differed depending on the country. There is still substantial room to increase private investment in educational institutions without reducing public contributions.⁶⁴

⁶³ See footnotes in the appendix to the Statistical description

⁶⁴ Elements of private spending are difficult to measure (e.g. tuition and registration fees, purchase of educational material) so data might be underestimated. Data comparability is affected by definition changes and breaks in series especially for the US (not mentioned in this graph).

3.1.2.3 – Average duration of tertiary education⁶⁵

Average duration of tertiary education for full-time students and part-time students, estimated from data on new entrants, total number of students and number of students per year of study in the academic years 2002/03 and 2003/04⁶⁶



UK*: Average duration of all tertiary education (type A and B)

The time needed to complete a degree influences the opportunity cost of pursuing education and systems supported by private or individual contributions will be affected by the average duration of study.

There are variations between European countries in the duration of higher education studies.⁶⁷ In the countries considered, average duration is much longer for tertiary-type A education than for tertiary-type B education, except in Estonia, Slovakia and Turkey. Tertiary-type A programmes have a minimum cumulative duration (at tertiary level) of three years' full-time equivalent study, although they typically last four or more years. Tertiary-type B programmes have a minimum duration of two years full-time equivalent at the tertiary level, except in Malta where average duration is shorter.

Countries with shorter than average study time (under four years) for type-A education are Slovakia, Iceland, Turkey, Latvia, Estonia, Cyprus, Poland, Malta and United Kingdom. Countries with more than five-year study time are Greece, Germany, Spain, Italia, France, Sweden, Slovenia and the Netherlands. Short durations are due to a number of factors,

⁶⁵ Tertiary-type A education (ISCED 5A): Tertiary-type A programmes (ISCED 5A) are largely theory based and are designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements. Tertiary-type B programmes (ISCED 5B) are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes.

⁶⁶ <http://www.oecd.org/dataoecd/45/17/33692376.pdf>
⁶⁷ See footnotes in the Appendix to the statistical description.

⁶⁷ European Investment Bank: "Student finance schemes: a market assessment" (2003)

including education systems with short degree courses, fewer obstacles to graduation and a higher number of early drop-outs. In a system of higher education funding which includes individual contributions, long study durations without accompanying financial support will discourage participation in HE, especially for the most disadvantaged students.

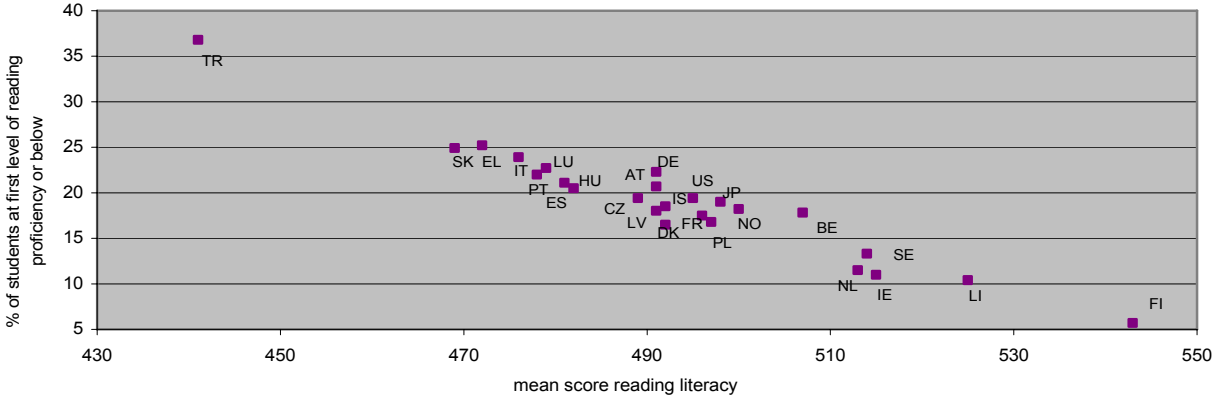
3.1.3 – Internal and external outputs from education and training systems

3.1.3.1 – Internal outputs from education and training systems

This section contains indicators on student performance on the PISA scale. The Program for International Student Assessment (PISA) is an assessment which began in 2000 focusing on 15-year-olds' capabilities in reading, mathematical, and scientific literacy. PISA also includes measures of general or cross-curricular competencies such as learning to learn strategies. PISA emphasises skills that students have acquired as they near the end of compulsory schooling.

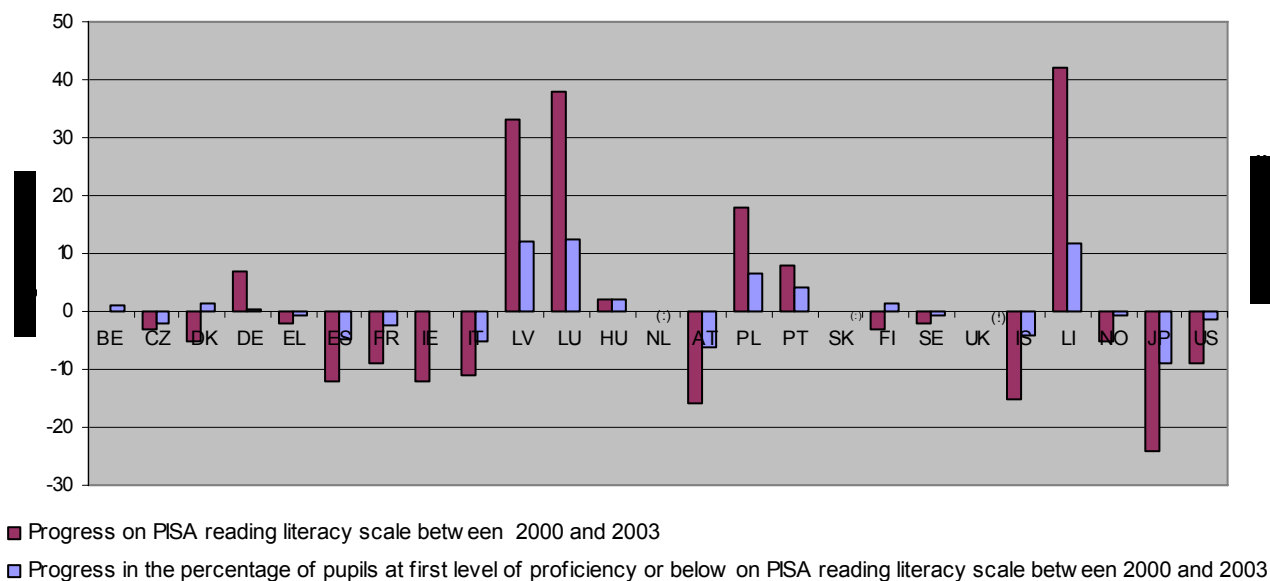
Students' performances on the PISA scale

a) Mean achievement of 15 year old students on PISA 2003 reading literacy scale and percentage of pupils at first level of proficiency in reading literacy or below (EU benchmark)



Source: *Learning for Tomorrow's World – First Results from PISA 2003*, OECD 2004

b) Mean achievement of 15 years old students on the reading literacy scale and percentage of pupils at first level of proficiency or below on the PISA 2003 reading literacy scale, in comparison to the mean performance and the percentage of low achieving students in PISA 2000



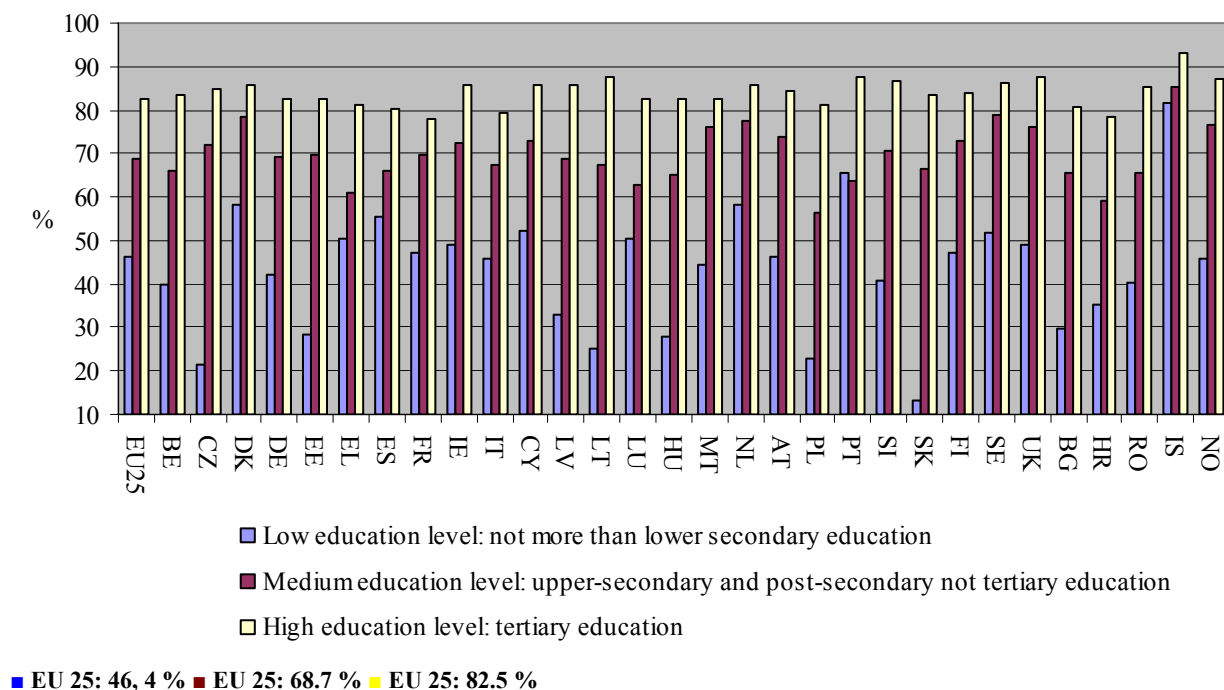
Sources: *Knowledge and skills for life - First results from PISA 2000*, OECD 2001; *Learning for Tomorrow's World – First Results from PISA 2003*, OECD 2004

The analysis of the first graph shows that countries performing best in reading literacy, such as Finland, Liechtenstein, Ireland and Sweden, have the lowest percentage of low achieving students. The second chart presents the change between the results of PISA 2000 and PISA 2003 reading scales. The values below “0” indicate that results in 2003 compared to 2000 have worsened. However, the limited number of common items linking the sample-based assessments, means that the comparison of results between 2000 and 2003 might be less reliable in some countries⁶⁸. Improvements are especially significant in Poland. Decreases in reading literacy are statistically significant in Austria, Ireland, Italy and Spain. The chart suggests that countries that have improved their mean performances, especially Poland, have managed to reduce the number of low achievers. In countries where the mean score has worsened, the proportion of low achieving students has generally risen.

⁶⁸ Sources: *Knowledge and skills for life - First results from PISA 2000*, OECD 2001; *Learning for Tomorrow's World – First Results from PISA 2003*, Table 6.5, OECD 2004

3.1.3.2 - External outputs from education and training systems: employment/unemployment rates per level of education.

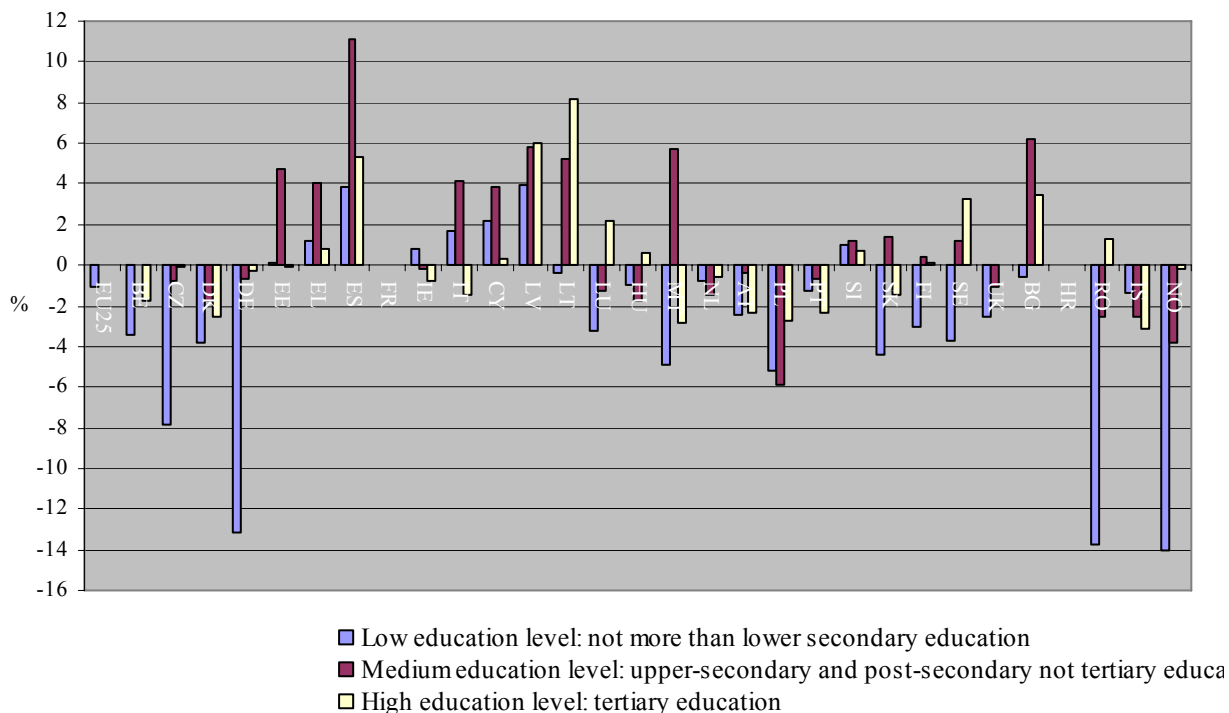
a) *Employment rate of population aged 15-64 by educational attainment, 2005⁶⁹*



Source: EUROSTAT, LFS 2005 (spring results)

⁶⁹ Low educational level: Pre-primary, primary and lower secondary education (ISCED 0-2)
 Medium educational level: Upper secondary education and post-secondary non-tertiary education (ISCED 3-4)
 High educational level: Tertiary education (ISCED 5-6)
 ISCED levels comprise both general education and VET.

b) Changes in employment rate of population aged 15-64 by educational attainment, difference in employment rate in 2000 and in 2005



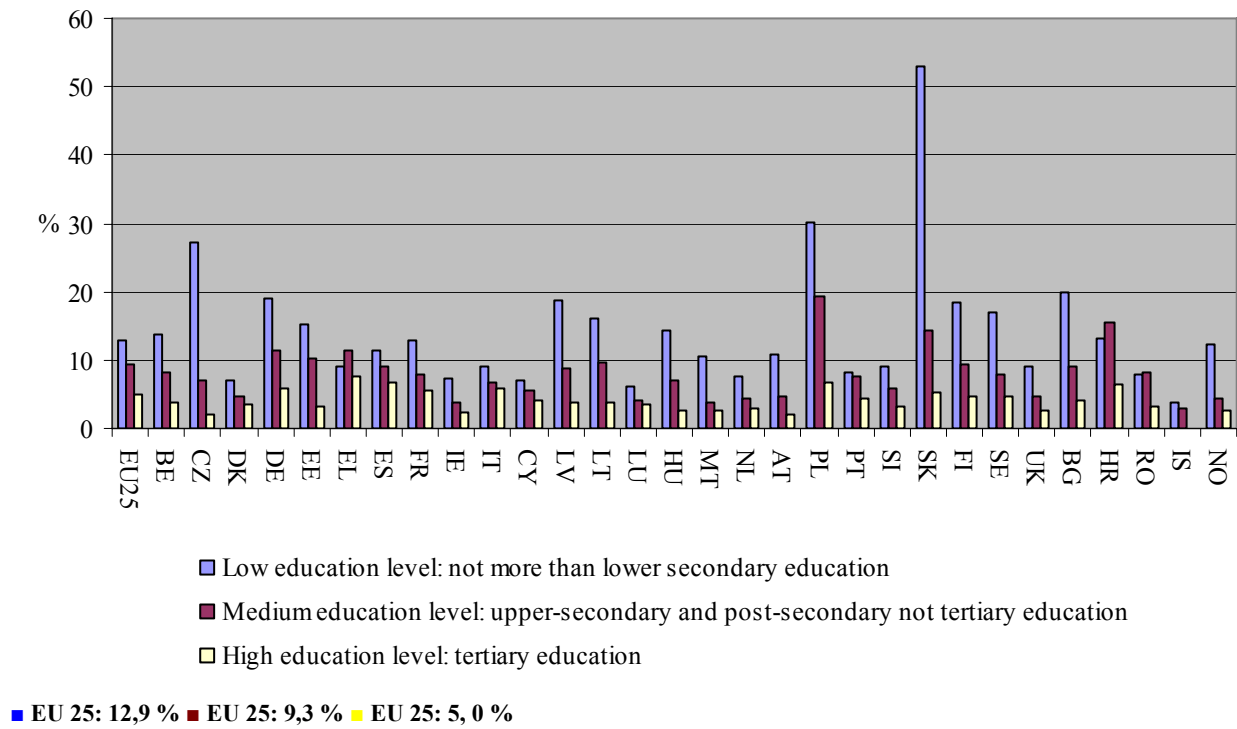
■ EU 25: -1.1 ■ EU 25: 0 ■ EU 25: 0

Source: EUROSTAT, LFS (spring results)

The main trend in the graphs is that those with a higher level of education are more likely to be employed. In the EU25, the employment rate among those with a tertiary educational level is nearly twice as high as for the population with at most lower secondary education.

Between 2000 and 2005 across the EU-25 the greatest fall in the employment rate has been noticed in the group with the lowest levels of education.

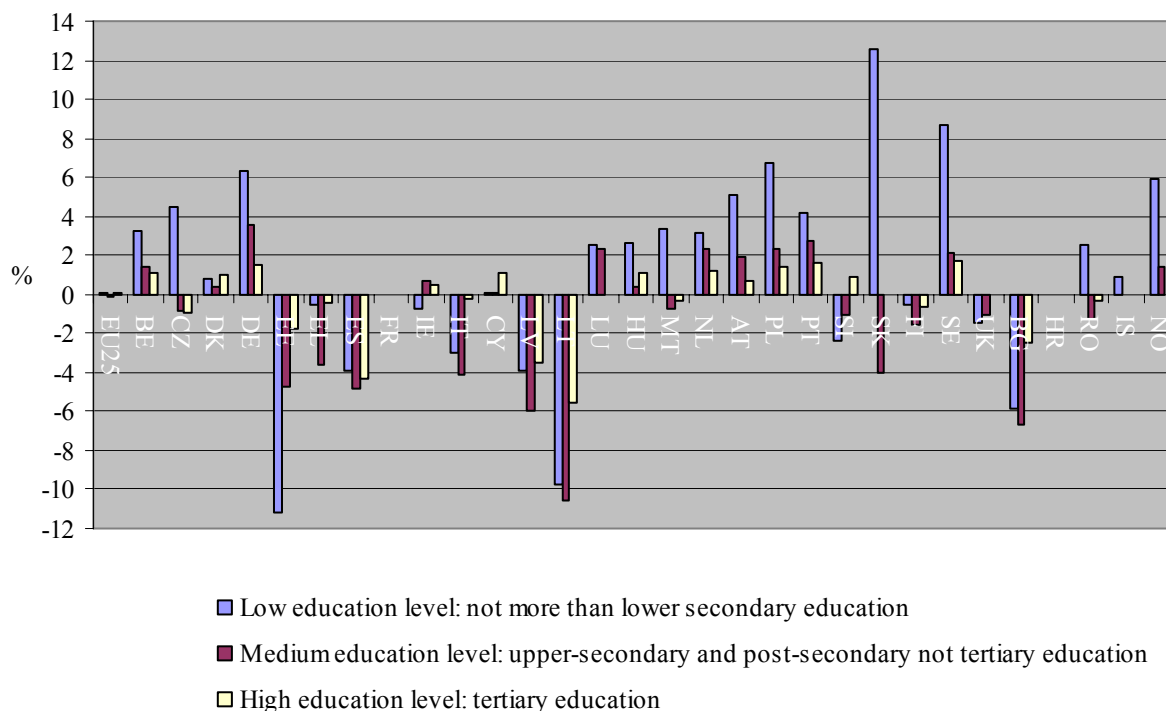
c) Unemployment rate of population aged 15-64, 2005, by educational attainment⁷⁰



Source: EUROSTAT, LFS (spring results)

⁷⁰ Low educational level: Pre-primary, primary and lower secondary education (ISCED 0-2)
 Medium educational level: Upper secondary education and post-secondary non-tertiary education (ISCED 3-4)
 High educational level: Tertiary education (ISCED 5-6)
 ISCED levels comprise both general education and VET.

d) Changes in unemployment rate of population aged 15-64 by educational attainment, difference in unemployment rate in 2000 and in 2005.

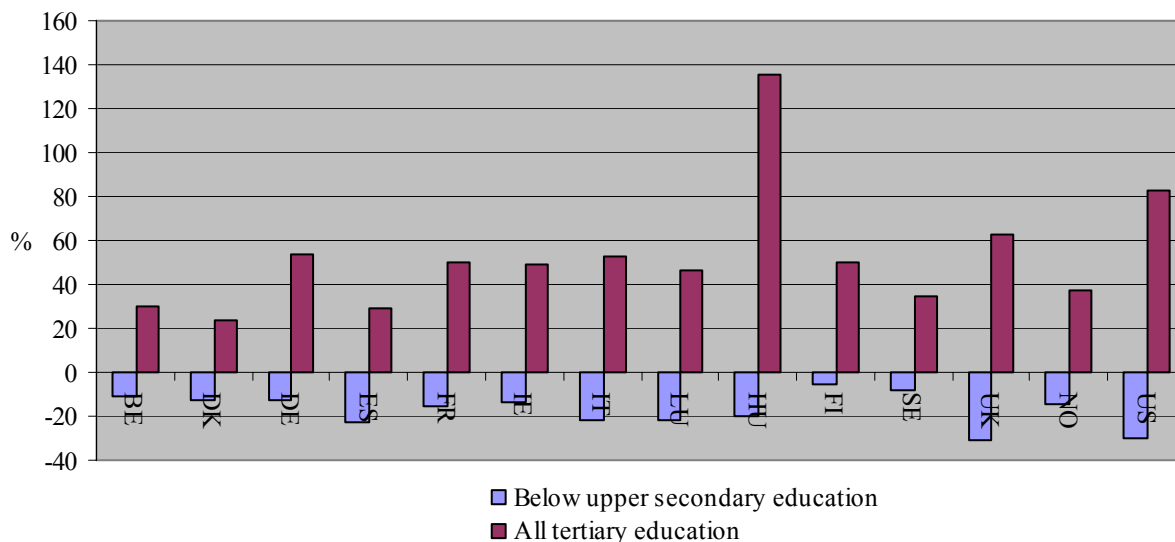


Source: EUROSTAT, LFS (spring results)

The first chart indicates that in the EU25, with the exception of Greece, Croatia, and Romania, the unemployment rate is highest for those people with the lowest levels of educational attainment. Between 2000 and 2005 overall unemployment has increased in Belgium, Germany, Denmark, Cyprus, Hungary, the Netherlands, Austria, Poland, Portugal and Sweden. In these countries, except in Denmark, the increase in unemployment has been the highest for the population with the lower educational level.

3.1.3.3 - External output to education and training systems: earnings per level of education

Relative earnings of the population with income from employment by level of educational attainment for 25-to-64-year-olds (Percent deviation from mean earnings of the upper-secondary level)



Source: OECD (2000-2003), *Education at a glance*, Paris, OECD

BE, DE, HU, SE, UK, US: year of reference 2003

DK, FR, IT, LU, FI, NO: year of reference 2002

ES: year of reference 2001

IE: year of reference 2000

In the countries considered, educational attainment strongly impacts on wages and earnings. Although the effects of training cannot be isolated from other factors, there is strong evidence of the positive impact of education on individual labour-market performances. On average, across Europe, each year of education is associated with more than an eight percent increase in wages (Armon et al., 2001)⁷¹. The earnings of individuals who achieve tertiary education are on average between 25% and 50% higher than those people with only secondary education.⁷² In the UK the figure is 62%, in the US 83% and in Hungary it is 135%. By contrast, the earnings of the low-skilled population are on average at least 10% below the earnings of those with upper-secondary level education. This compares with a particularly large difference in the UK and US of around 30%.

⁷¹ EENEE: “Efficiency and Equity in European Education and Training Systems”

⁷² It should be noted, of course, that for some occupations where training is offered at upper-secondary level, participants would have to switch to a different occupational area in order to continue to study in higher education and this is not reflected in the statistics.

3.2 - EQUITY INDICATORS

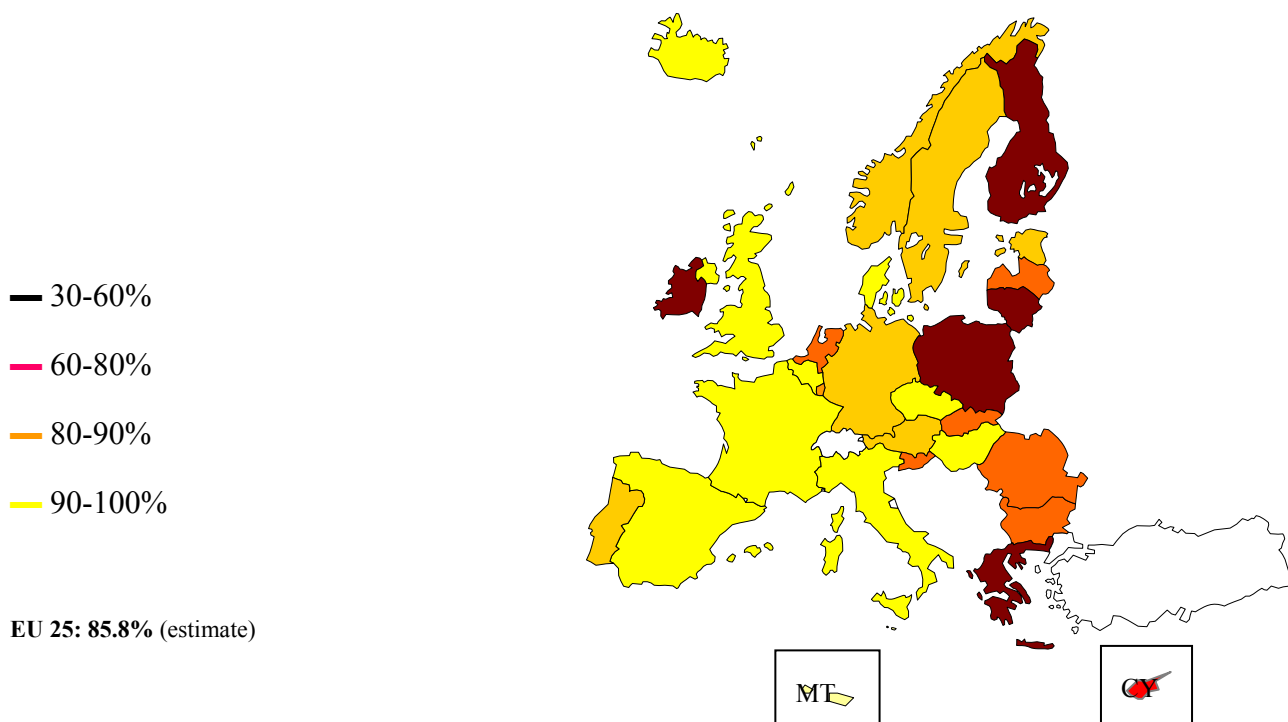
Current equity indicators include participation rates, participation rates in education and training by working status and level of education, and dispersion in outcomes of education.

3.2.1 – Participation in education and training

This part includes indicators on educational participation and graduation from education, early school leavers and educational participation by socio-economic background (SEB).

3.2.1.1 - Participation in lifelong learning and graduation from education

a) Educational participation rates of 4-year-olds in education; 2004⁷³



	EU 25		BE	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU	MT
2004	85.8		99.9	91.2	93.4	84.3	83.9	57.2	100	100	46.6	100	61.2	69.1	54.5	83.5	92.3	97.5
	NL	AT	PL	PT	SI	SK	FI	SE	UK	BG	RO	IS	LI	NO	JP	US		
2004	74.0	82.1	35.7	79.9	77.8	71.7	46.1	87.7	92.9	72.6	75.2	95.1	52.2	86.9	95.2	64.1		

Source: Eurostat (UOE data collection), 2004

Additional notes:

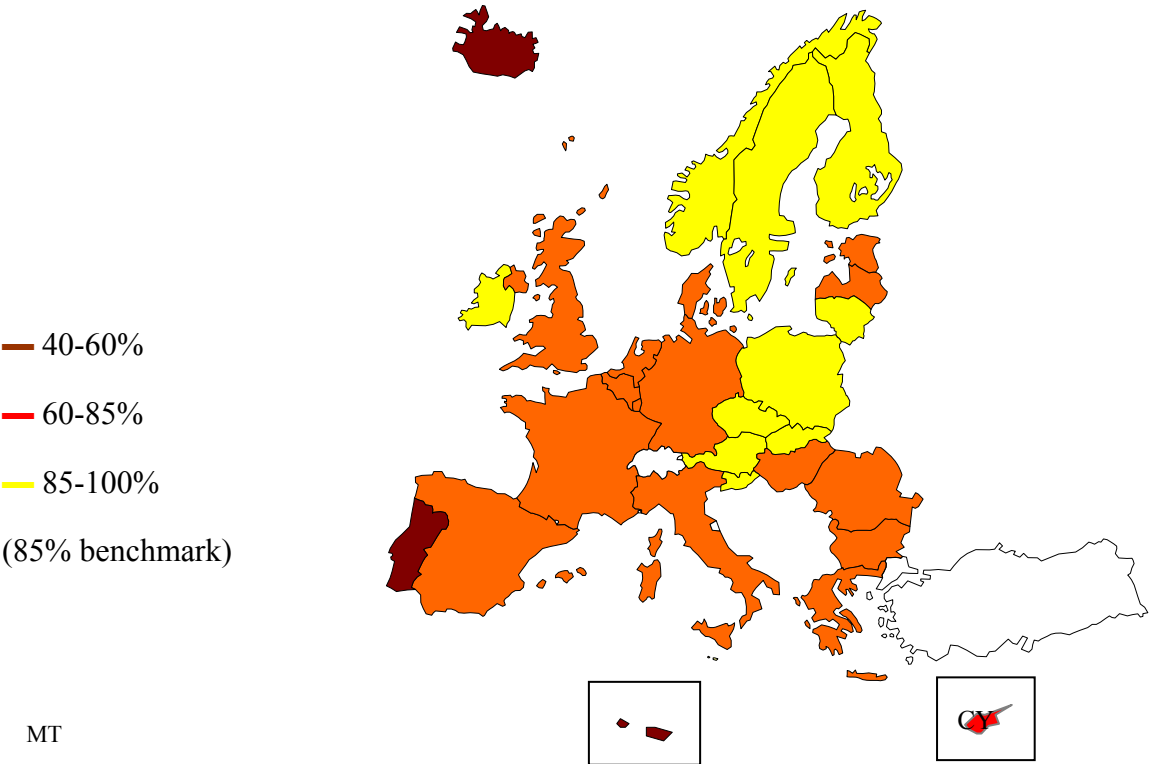
Data include both pre-primary and primary participation.

⁷³ See: European Commission, *Commission Staff Working Document, Progress towards the Lisbon objectives in Education and Training, Report based on indicators and benchmarks, Report 2006*

The chart shows the participation rates of 4 years old children in pre-primary education. The highest participation rates (close to 100%) are in Belgium, Spain, France, Italy, and Malta. Socio-cultural context impacts on participation rates particularly in Poland, Ireland and Finland where it is especially low.⁷⁴

The Barcelona Council of 2002 set a target to increase participation in pre-primary education by children aged from three years to the beginning of compulsory schooling to 90%. Although participation slightly increased from 85.4% in 2000 to 85.8% in 2004, it is still along way short of the European target.

b) Percentage of the population aged 20 to 24 having completed at least upper secondary education, 2005 (EU benchmark)



EU 25: 77,3 % (provisional value)

Change in upper secondary attainment between 2000 and 2005 (in percentage points), country with negative change in dark.

EU25		BE	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU
0,6		-0,6	-0,8	6,2	-3,7	-2,7	4,7	-4,6	1,2	3,7	4,1	1,7	5,0	7,3	-6,4	-0,3
MT	NL	AT	PL	PT	SI	SK	FI	SE	UK	IS	NO	BG	RO			
7.2	2.9	1.2	2.2	5.6	3.6	-3.0	-3.0	2.6	0.7	6.9	1.2	1.9	-0.6			

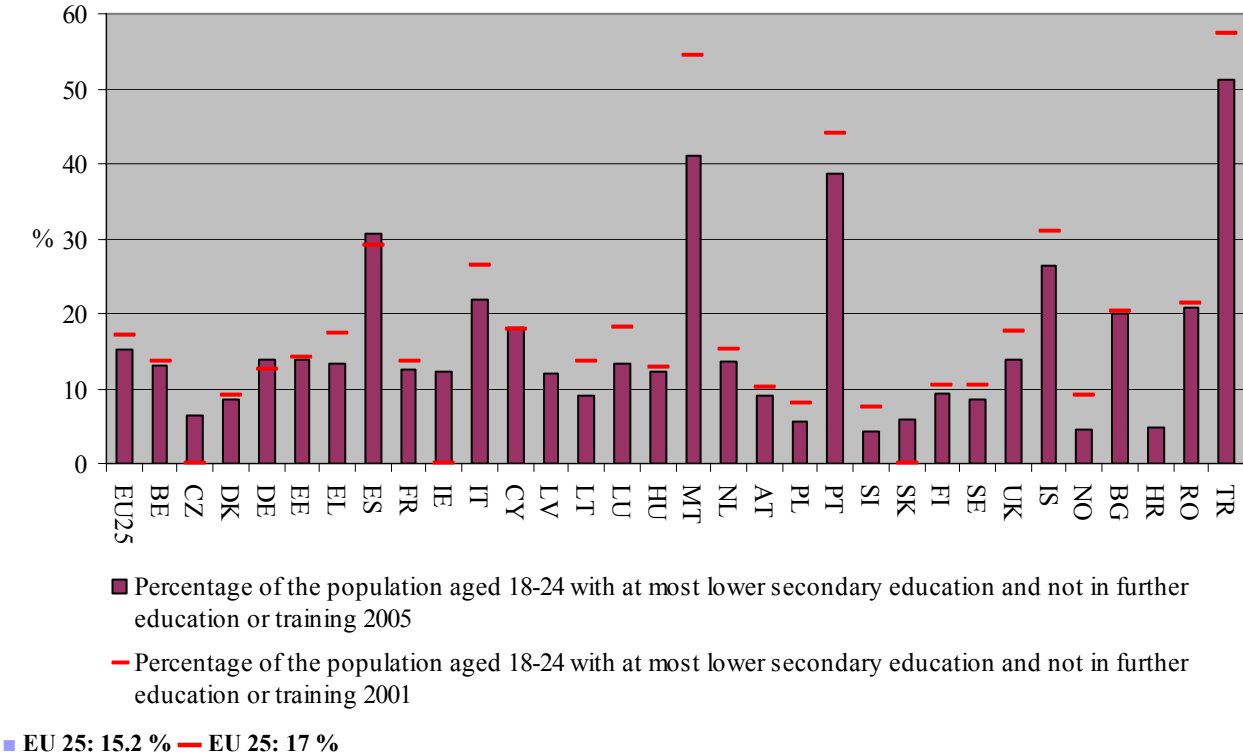
Source: EUROSTAT, LFS 2000, 2005 - structural indicator

⁷⁴ See Section 3 : Mapping analyses

In 2005, nine of the EU25 countries had already reached the EU benchmark that the completion rate from upper secondary education is at least 85%. From 2000 to 2005 in the EU25 the completion rate of upper secondary education increased slightly. The most significant growth of more than 5 percentage points occurred in Iceland, Denmark, Portugal Malta, Lithuania and Latvia.

c) Early school leavers (EU benchmark)⁷⁵

i) Percentage of the population aged 18-24 with at most lower secondary education and not participating in further education or training⁷⁶; 2001, 2005



Source: EUROSTAT, LFS - structural indicator, 2001, 2005

Data for 2001: SE - break in series; LV and HR – data not available

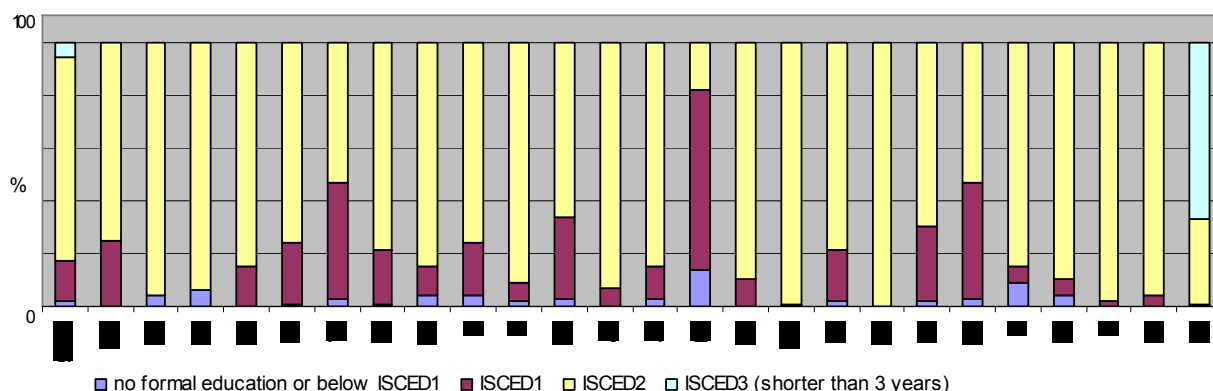
Data for 2005: ES - break in series; IE, LU, MT, FI, SE, UK, IS - unreliable or uncertain data

In 2005, the percentage of Early School Leavers (ESL) in Poland, Slovakia and Czech Republic and in Iceland, Norway and Croatia was much lower than the EU25 average of 14,9% and below the 2010 benchmark. From 2001 to 2005, some EU-Member States have noticed the decrease of the ESL rate, and, particularly those with the highest ESL rate: Malta and Portugal.

⁷⁵ The percentage of ESL should not exceed 10% by 2010.

⁷⁶ Not in education or training in the last 4 weeks before responding to the LFS.

ii) Percentage of early school leavers 18 – 24 by educational attainment, 2004 (box)



■ EU 25: 2 % ■ EU 25: 15 % ■ EU 25: 77 % ■ EU 25: 6 %

Source: DG EAC, Report on ESL

All data 2004 except NL 2003

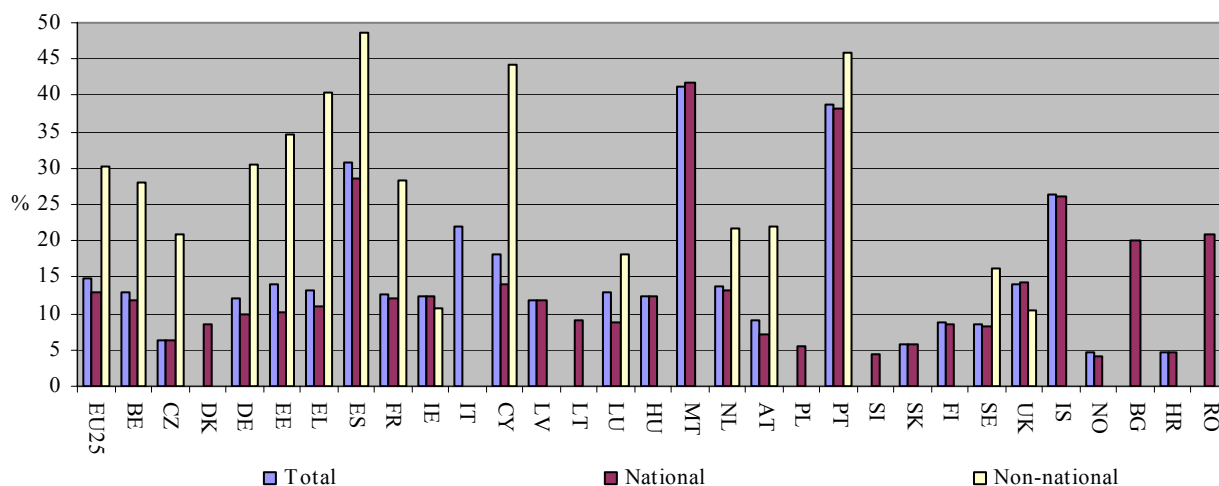
This chart depicts the share of the ESL population according to its educational attainment.. In the EU25 2% of youngsters aged 18-24 who were not in education had not completed primary education; 15% had only primary education and 77% attained lower secondary level education. Between 2000 and 2005, the percentage of early school leavers⁷⁷ decreased in the EU25 countries (from 17.7% to 14.9%). However, every sixth young person aged 18 to 24 still leaves school in the EU25 with low or no qualifications. This rate remains far higher than the European benchmark of no more than 10% to be achieved by 2010.⁷⁸

⁷⁷ Share of the population aged 18-24 with only lower-secondary education and not in education or training, Source: Eurostat (Labour Force Survey)

⁷⁸ See: European Commission, *Commission Staff Working Document, Progress towards the Lisbon objectives in Education and Training, Report based on indicators and benchmarks, Report 2006*

iii) Percentage of early school leavers (ESL) by national status⁷⁹, 2005

(Percentage of the population aged 18-24 with only lower-secondary education and not in education or training, by national status, 2005)



Source: Eurostat (Labour Force Survey), 2005

The reliability of the share of non nationals is used for both rates

Due to implementation of harmonised concepts and definitions in the survey, breaks in time series were noticed in many countries between 2003 and 2005.

In the EU25, the average share of early school leavers (ESL) within the population aged 18-24 years is twice as high for young people who are non-nationals in their country of residence than for nationals (30.1% of non-nationals and 13% of nationals). The rate of ESL among non-nationals aged 18-24 is almost 50% in Spain and more than 40% in Greece, Cyprus and Portugal.

In the EU as a whole, around 90% of all early school leavers are national and around over 10% are non-national⁸⁰.

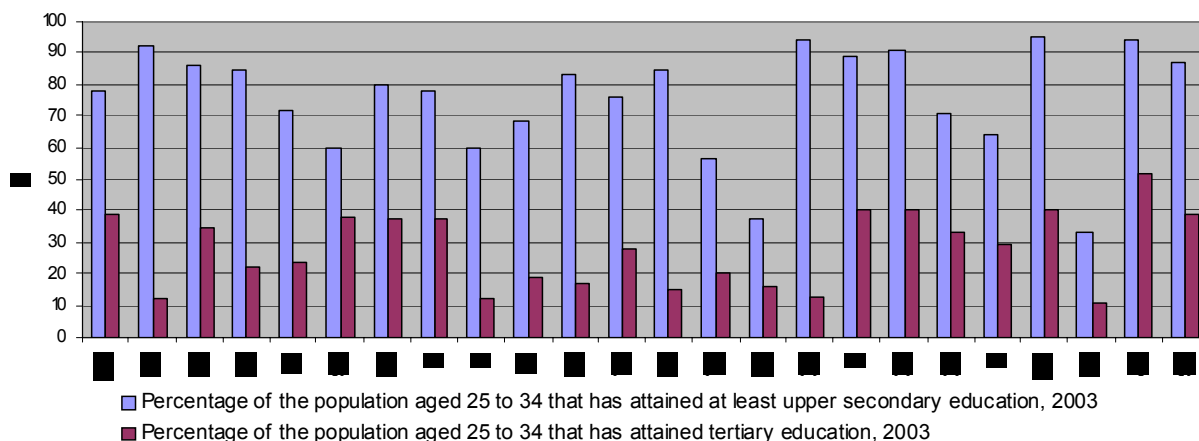
Given data limitations, it is difficult to draw conclusions on the impact of nationality on early school leaving. A more in-depth analysis would be necessary to describe a situation influenced by immigration policy as well as by the country of origin. The language spoken at home and socio-economic background, which often correlate with nationality, have a potentially stronger impact on early school leaving than the single criteria of nationality⁸¹.

⁷⁹ Nationality is interpreted as citizenship. Citizenship is defined as the particular legal bond between an individual and his/her State acquired according to national legislation. It corresponds to the country issuing the passport. For persons with dual or multiple citizenships, who hold the citizenship of the country of residence, that citizenship should be coded. Nationality takes into account own country nationals, a person from another EU25 country or a person from a non-EU25 country. The comparability of the data is limited because this variable is linked to the Member State's specific laws on naturalisation.

⁸⁰ Eurostat (Labour Force Survey), 2005: Ratio of nationals and non-nationals among early school leavers

⁸¹ See: European Commission, *Commission Staff Working Document, Progress towards the Lisbon objectives in Education and Training, Report based on indicators and benchmarks, Report 2006*

d) Educational attainment of population 25-34 years old, 2003



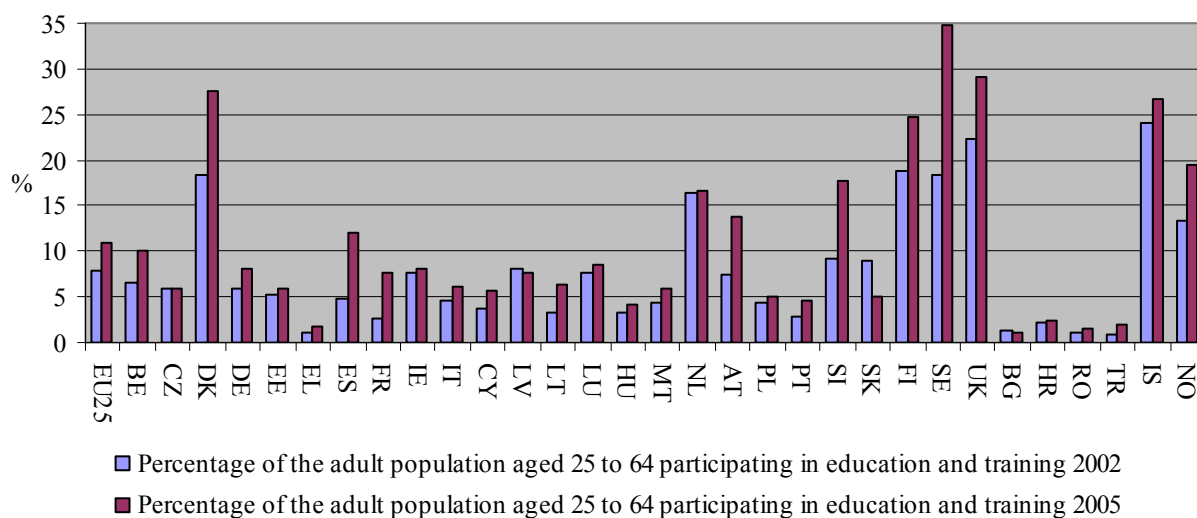
Source: *Education at a Glance*, OECD, 2004

IT, NL, IS: year of reference 2002 for both variables

UK: upper secondary education includes some ISCED 3C short programmes

The chart presents the share of the population aged 25 to 34 years old with at least upper secondary education compared to those with tertiary education. It also shows how many holders of the upper secondary diploma attained tertiary level education. Norway, Japan, Slovakia, the Czech Republic, Sweden and Finland have the highest percentage of the population aged 25 to 34 with at least upper secondary education. The highest percentage of the 25 to 34 year old population attaining tertiary education is in Japan with more than 50%. In some Nordic countries, such as Sweden, Norway and Finland, 40% of 25 to 34 year olds have attained tertiary level education.

e) Percentage of the population aged 25-64 participating in education and training over the four weeks prior to the survey (EU benchmark) ⁸²



■ EU 25: 11,0 % ■ EU 25: 7,9 % (estimate)

Source: EUROSTAT, LFS, 2002, 2005

In 2005 participation by 25 to 64 year olds in education and training was the highest in Sweden (more than three times the EU25 average) and in the UK, Denmark, Iceland and Finland it was more than twice the EU25 average. Between 2002 and 2005, participation rate has heightened in the majority of the EU-Member States. The most significant progress was made in the best performing countries and the smaller in the countries with a low participation rate. The gap between the two groups of countries has therefore increased.

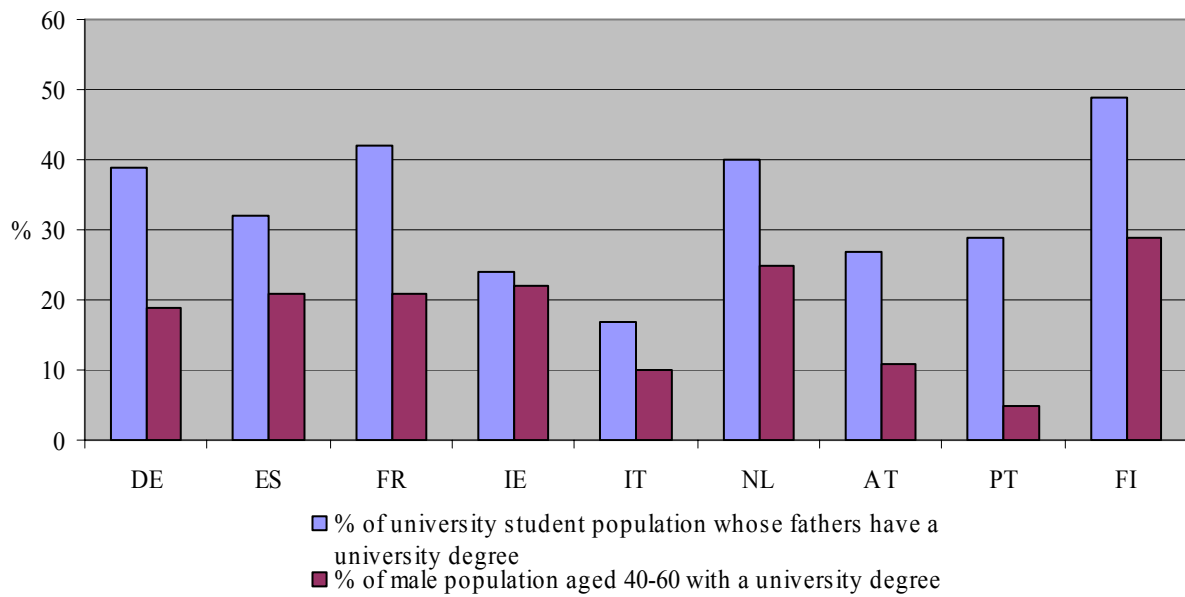
In 2005, an average of 11% of Europeans aged 25-64 participated in education and training activities over a period of four weeks. The target to increase the participation of adults in lifelong learning to 12.5% in 2010 has been part of the European Employment Strategy since 2003. To achieve better progress eight Member States (Belgium, Estonia, Finland, Latvia, Malta, the Netherlands, Portugal and Spain) have set quantified national targets on participation in lifelong learning.⁸³

⁸² Percentage of the population aged 25-64 participating in education and training over the four weeks prior to the survey should reach the level of 12.5% by 2010.

⁸³ See: European Commission, *Commission Staff Working Document, Progress towards the Lisbon objectives in Education and Training, Report based on indicators and benchmarks, Report 2006*

3.2.1.2 - Participation in education by Socio-Economic Background (SEB)

a) *Participation in tertiary education by paternal background , 2005*



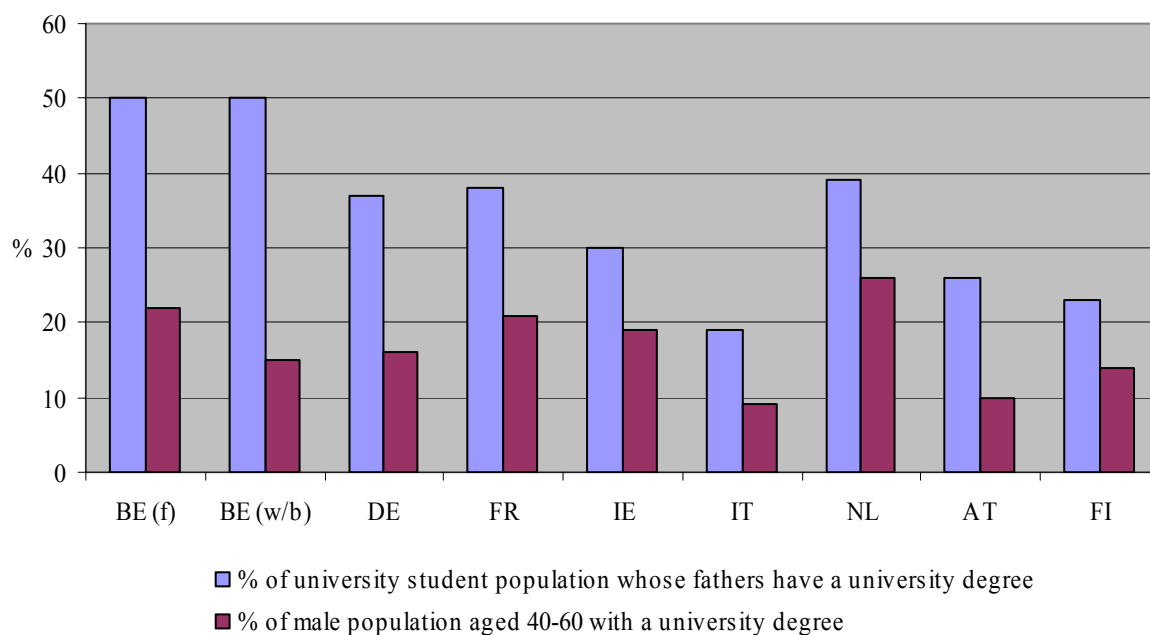
**40-64 in Italy*

Source: Eurostudent 2005 – National Profiles

Source: Eurostudent 2005

Men aged in AT, DE, ES, IE, FI, NL, FR, PT: 40-60; IT: 40-64

b) Participation in tertiary education by paternal background, 2000



Source: Eurostudent 2000

Men aged in NL: 45-60; IE, IT: 40-64; AT, FR, DE: 40-60; BE(f): 25-64; FI: 40-59

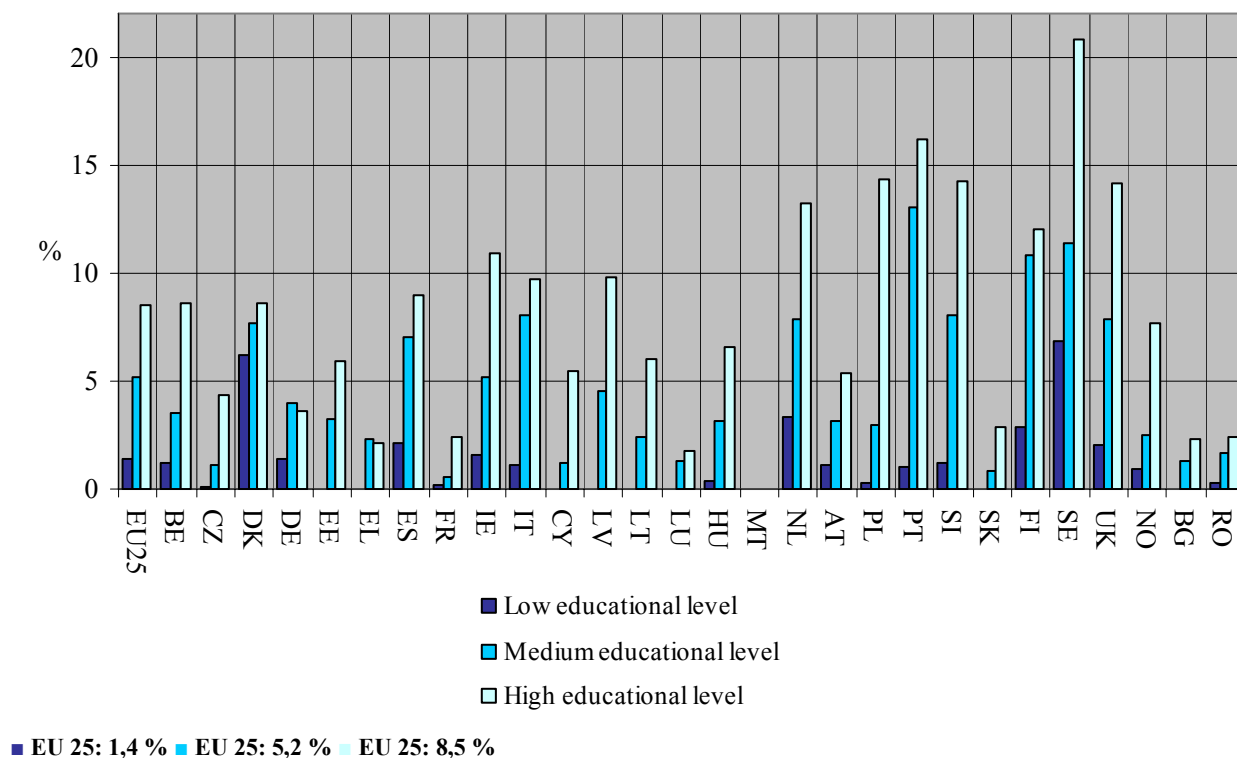
The charts present the percentage of university student population whose fathers have a university degree and the percentage of male population aged 40-60 with a university degree. The proportion of students' fathers who attended higher education varies between the countries. In 2005, the proportion was highest in Finland (49%) and lowest in Italy (17%). In 2000, Belgium (Wallonia), Austria, Germany, Belgium (Flanders) had the greatest difference between the percentage of students' fathers with a university education and percentage of all males of a corresponding age in the whole population. The difference was smallest in the Netherlands, Finland and Ireland.

In all the countries for which we have data, the proportion of students' fathers who attended higher education is significantly greater than the proportion of males in the base population who attended university. In Portugal in 2005 it was 5.5 times greater.. The difference is also striking in Austria, Germany and France where the difference was almost twice as great. The discrepancy is least pronounced in Ireland. These results underline the correspondence between family educational backgrounds and participation in university education.

3.2.2 - Participation in lifelong learning by employment status and educational attainment

3.2.2.1 - Rates of participation in lifelong learning by educational attainment

a)) *Participation of 25-64-year-olds in formal education and training, by educational attainment (%)⁸⁴, 2003*



Source: EUROSTAT, (Labour Force Survey, Ad hoc module on LLL), 2003

Target population: 25-64 years, reference period: 12 months

⁸⁴ “Formal education and training corresponds to education and training in the regular system of schools, universities and colleges” EUROSTAT

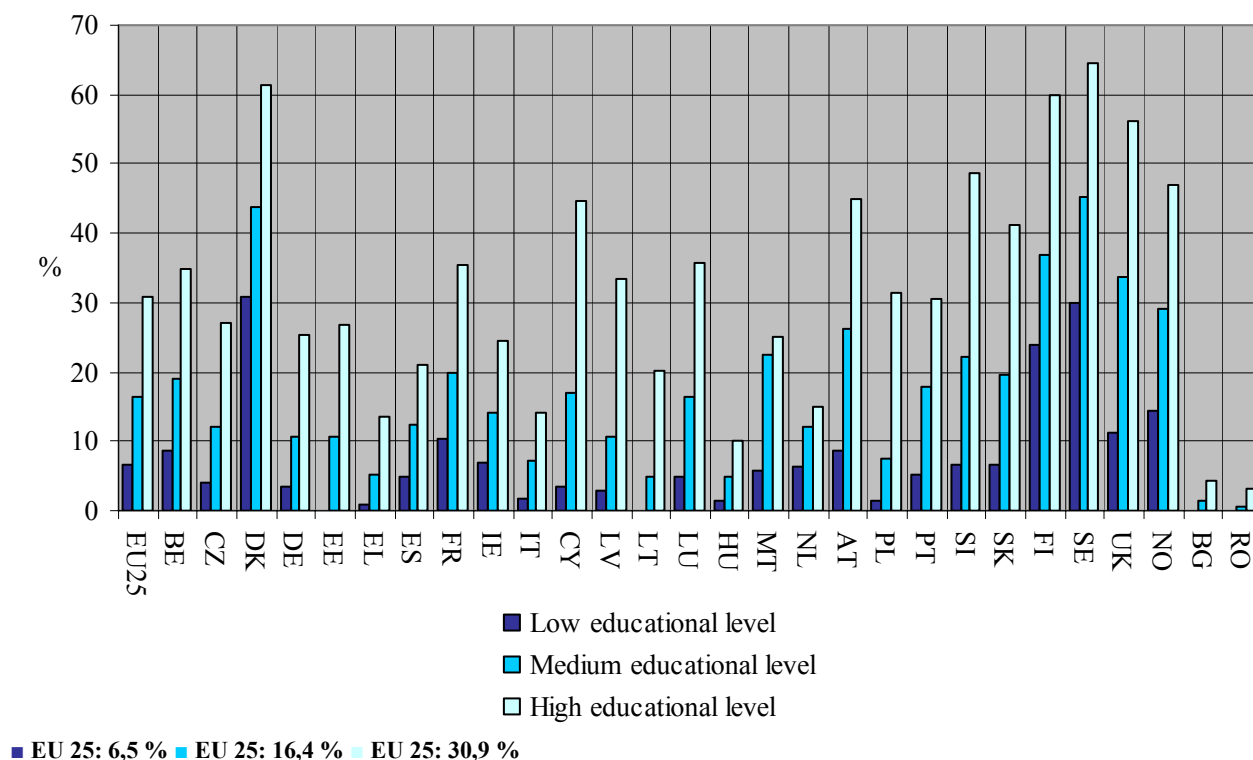
Low educational level: Pre-primary, primary and lower secondary education (ISCED 0-2)

Medium educational level: Upper secondary education and post-secondary non-tertiary education (ISCED 3-4)

High educational level: Tertiary education (ISCED 5-6)

ISCED levels comprise both general education and VET

b) Participation of 25-64-year-olds in non-formal education and training, by educational attainment (%)⁸⁵, 2003



Source: EUROSTAT, (Labour Force Survey, Ad hoc module on LLL), 2003

Target population: 25-64 years, reference period: 12 months

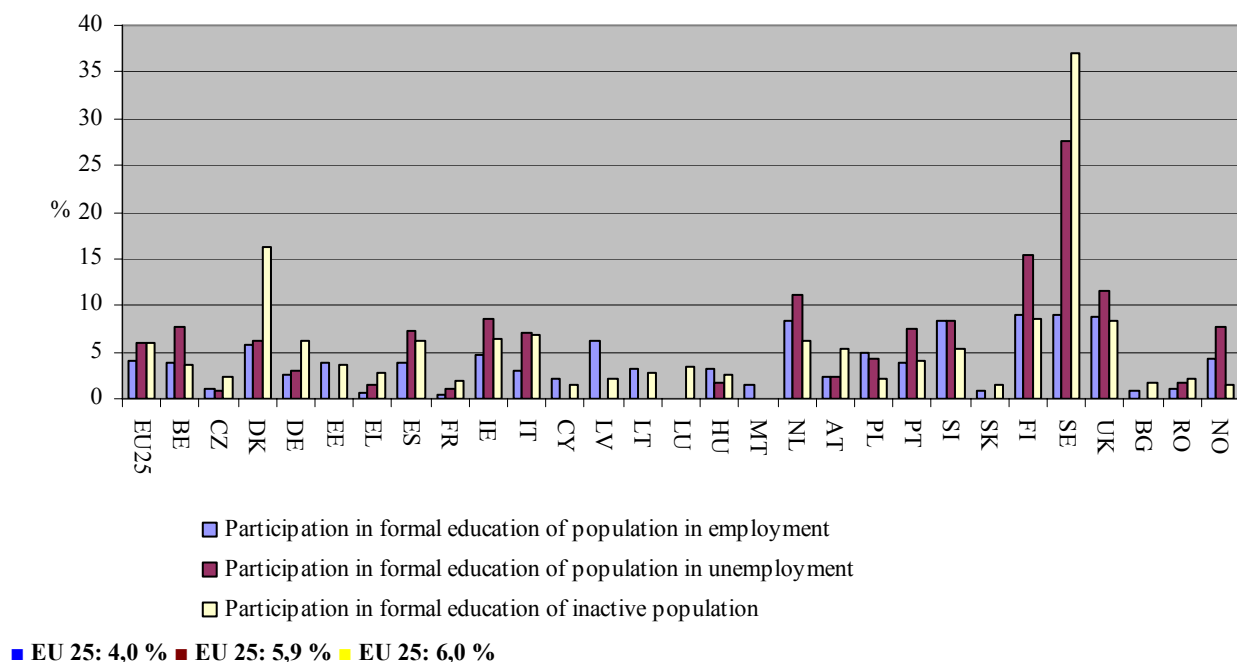
In the EU25 participation by those aged 25 to 64 in non-formal education is four times higher than participation in formal education. People with higher levels of education participate more in formal and non-formal learning than those with lower educational attainment. Germany is the only exception where participation in formal education of those individuals with an upper secondary diploma is higher than the participation of those with ISCED levels 5 to 6.

The proportion of participants in formal education varies considerably between countries. The participation rate in formal education exceeded 7% in Sweden, Finland, the UK, Netherlands, Denmark and Iceland. It should be noted that these high participation rates in formal education may be influenced by late participation of over 25-year-old students in tertiary education. Nearly all these countries also recorded particularly high levels of participation in non-formal education and training.

⁸⁵ "Non-formal education and training includes all types of taught learning activities which are not part of a formal education programme" EUROSTAT

3.2.2.2 - Rates of participation in lifelong learning by employment status

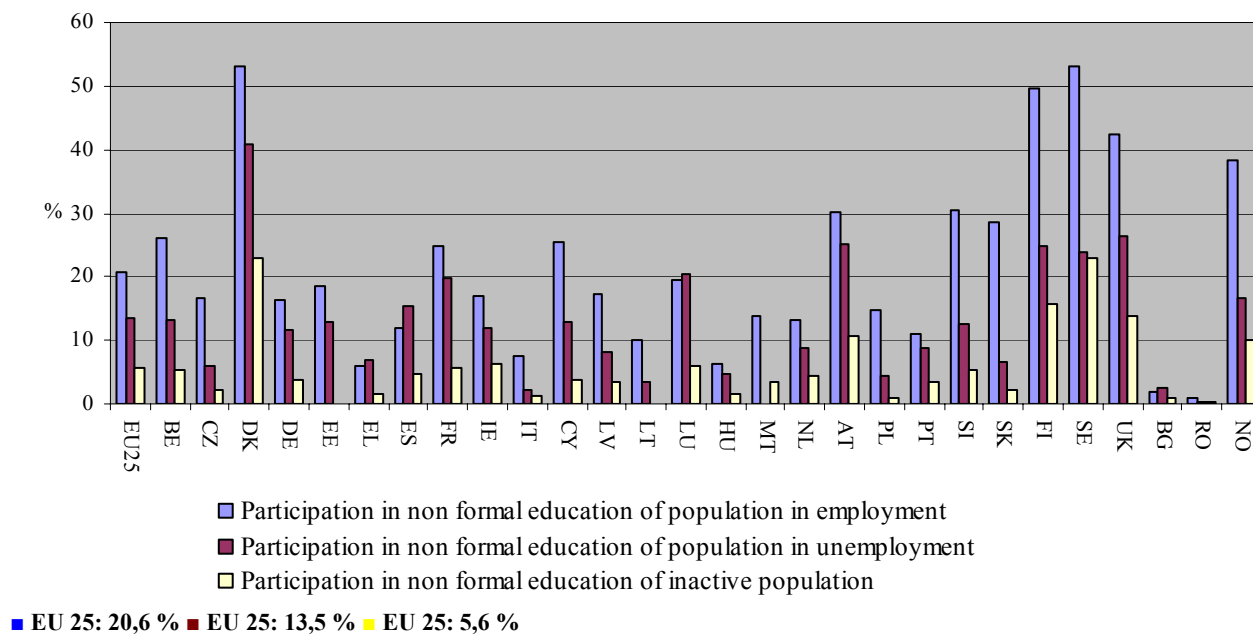
a) Participation of 25-64 year olds in formal education and training, by employment status (%), 2003



Source: EUROSTAT, (Labour Force Survey, Ad hoc module on LLL), 2003

Target population: 25-64 years, reference period: 12 months

b) Participation of 25-64 year olds in non-formal education and training, by employment status (%), 2003



Source: EUROSTAT, (Labour Force Survey, Ad hoc module on LLL), 2003

Target population: 25-64 years, reference period: 12 months

The rate of participation in formal education in the EU25 is the highest among the inactive population and the unemployed who in some countries have to go through formal education courses to upgrade skills. However, the high participation rate of the inactive population in formal education can be explained by the fact that those still in tertiary education are included in this group. This pattern can be observed in Sweden, Denmark, Germany, France, Greece and Romania. However, the share of the population in formal education by working status differs between countries. A counter trend is evident amongst some of the new member states such as Estonia, Cyprus, Latvia, Lithuania, Hungary and Poland.

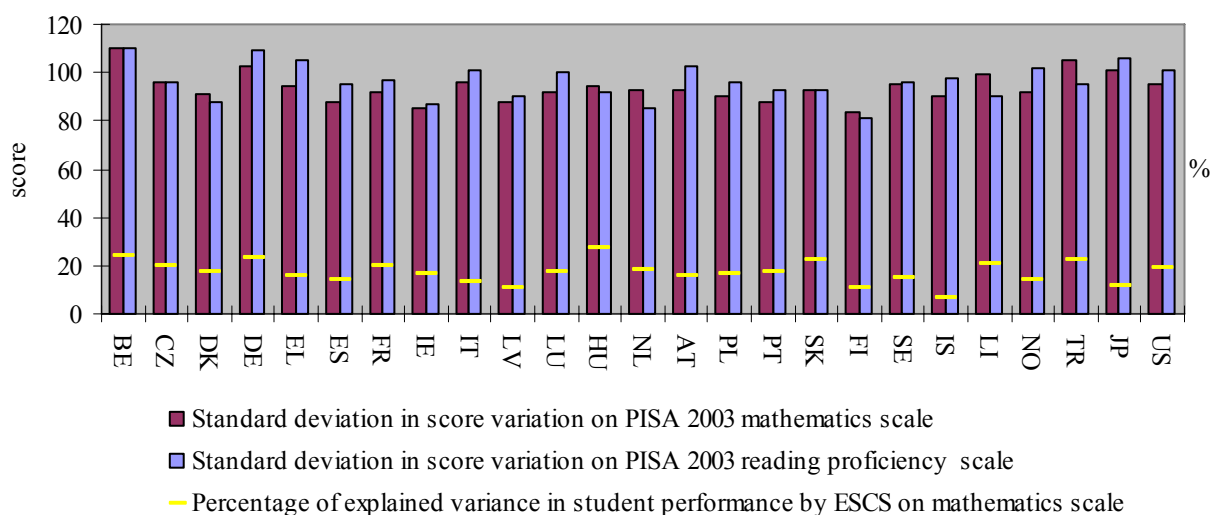
In the EU25, the employed participate in non-formal education nearly one and half times more than the unemployed and nearly four times more than the inactive population. Only in Spain, Hungary, Greece and Bulgaria is participation greatest amongst the unemployed.

3.2.3 – Dispersion in outcomes

The indicators in this section are: indicators on performance distribution on PISA scales and an indicator related to the Gini coefficient of education.

3.2.3.1 - Performance variability on PISA mathematics and reading proficiency scales

Standard deviation⁸⁶ and percentage of variance in student performance explained by Economic Social and Cultural Status⁸⁷ on PISA 2003 scales



Source: Learning for Tomorrow's World – First Results from PISA 2003, OECD 2004

⁸⁶ The test scores for each of the PISA tests were scaled to have a mean of 500 and a standard deviation of 100 for the 29 OECD member countries that participated in PISA 2003, and for the 28 OECD member countries that participated in PISA 2000.

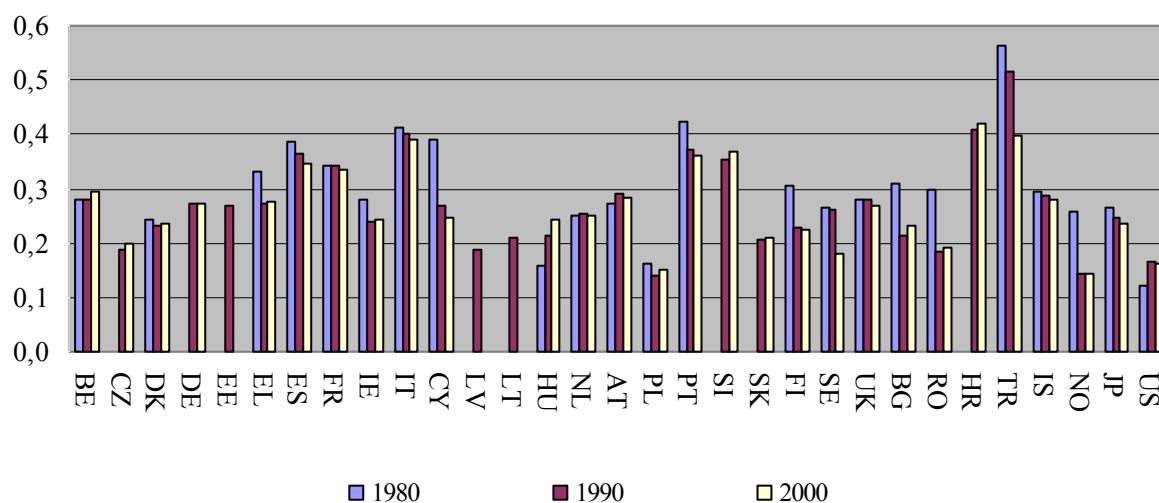
⁸⁷ ESCS: Economic, Social and Cultural Status

Standard deviation is an indicator of performance distribution – the higher the result, the greater the gap between the best and the worst scores. In 2003, the variance in the score distribution was the lowest in Finland and Ireland, both in mathematics and reading, and the highest in Belgium, Germany and Japan. The greatest difference between reading and mathematics performance distributions can be observed in Greece, Norway, Turkey, Lichtenstein, Luxembourg, Netherlands and Iceland, the least in Bulgaria, the Czech Republic, and Slovakia. Economic, social and cultural status has the biggest impact on the variance in student performance on mathematics scale in Hungary, Belgium, Germany, Slovakia and Turkey. In contrast, ESCS explains less than 14% of the variance in students' performance in Iceland, Finland, Japan, Latvia, Spain and Italy.

3.2.3.2 - Gini coefficients of education and income

The Gini coefficient is a measure of inequality developed by the Italian statistician Corrado Gini and published in his 1912 paper "Variabilità e mutabilità". The coefficient has values between 0 and 1, where 0 signifies perfect equality (all individuals have the same share) and 1 represents complete inequality (one individual gets everything). Therefore, the higher the coefficient is, the higher the inequality of the distribution. It is often used to measure income inequality, but can be used to measure any form of uneven distribution. In the case of education inequality, the Gini coefficient is constructed by replacing income with years of schooling.

a) Gini coefficient of education



Source: World Bank database

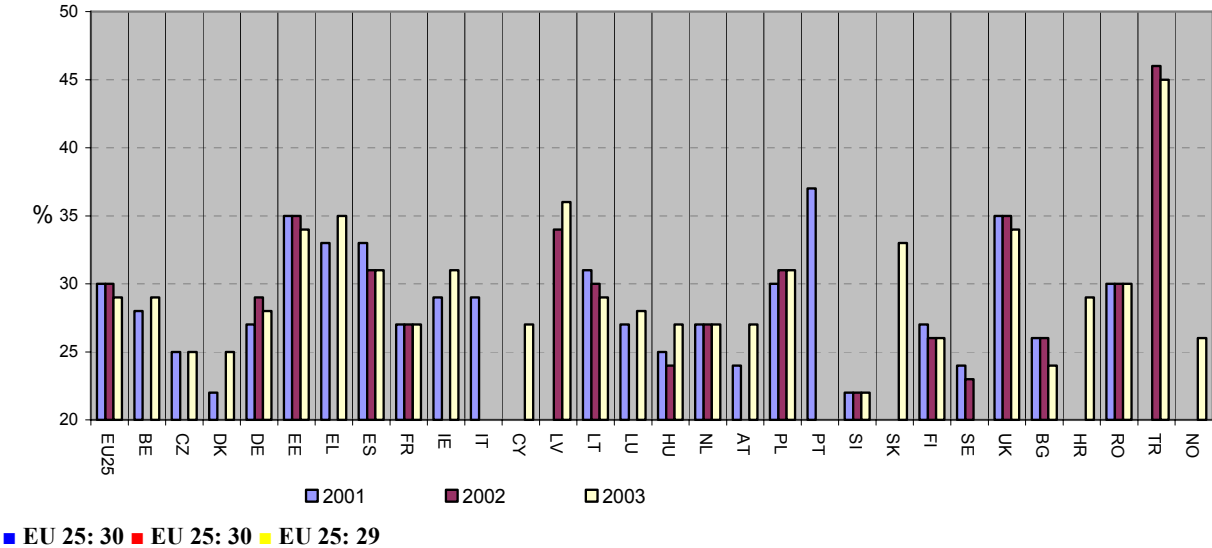
The Gini index of education is based on educational attainment expressed in years of schooling of the population 15 years and over. It ranges from 0 which represents perfect equality in the number of years spent in education (all individuals have the same number of years of schooling), to 1 which represents perfect inequality⁸⁸ (one individual gets all the years of education). In 2000, the Gini index of education reached the lowest value in the Czech Republic, Poland, Sweden, Norway, and the US. The biggest discrepancies in educational

⁸⁸ For more information: Thomas, Vinod; Wang, Yan; Fan, Xibo (2003). "Measuring Education Inequality: Gini Coefficients of Education for 140 Countries (1960-2000)." *Journal of Educational Planning and Administration*. Volume XVII, Number 1, January 2003. New Delhi, India.

attainment were in Croatia, Turkey, Iceland, Portugal and Italy. The comparison between 1980 and 2000 shows that the Gini index of education increased in 9 of the countries for which data are available.

b) Gini coefficient of income

The Gini coefficient of income is not explicitly linked to education issues; nevertheless it provides valuable contextual information on inequalities in society.



Source: EUROSTAT

Data for 2001: DE, FR, FI - break in series; NL - provisional value

Data for 2002: ES, SE - break in series; NL - provisional value

Data for 2003: BE, EL, IE, AT, NO - break in series; DK, LU, NL - provisional value

Incomes were distributed in the most equitable way in Iceland, Bulgaria, Denmark and the Czech Republic while in Turkey, Latvia, Greece, Estonia and UK income inequalities were the most pronounced. Compared with 2001 values, the Gini coefficient fell in Spain, Latvia, Bulgaria, Finland and Estonia.

APPENDIX: FOOTNOTES

3.1.2.1.a) Percentage of GDP spent on education per level of education, 2003

ISCED 0	TOTAL PUBLIC EXPENDITURE ON EDUCATION AT THE PRE-PRIMARY LEVEL (ISCED 0) AS % OF GDP
BE	Expenditure excludes independent private institutions and the German speaking Community.
GR, LU	Expenditure of pre-primary level of education is reported under primary level of education.
GR, PT	Student loans from public sources are not available.
CY	Including financial aid to students studying abroad.
LT, LU, PT, HR, TR	Public transfers to other private entities are not available.
LU, PT, IS, NO, HR	Expenditure for ancillary services is not available.
PL, SK, NO	Including child care expenditure at pre-primary level of education.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
HR	Financial aid to students is not available.
TR	Expenditure at regional and local levels of government is not available.
TR	Expenditure at pre-primary level of education is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.
ISCED 1	TOTAL PUBLIC EXPENDITURE ON EDUCATION AS % OF GDP AT PRIMARY LEVEL OF EDUCATION (ISCED 1)
BE	Expenditure excludes independent private institutions and the German speaking Community.
GR, LU	Expenditure of pre-primary level of education is reported under primary level of education.
GR, PT	Student loans from public sources are not available.
CY	Including financial aid to students studying abroad.
LT, LU, PT, HR, TR	Public transfers to other private entities are not available.
LU, IS, HR	Expenditure for ancillary services is not available.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
SI, RO	Expenditure of lower secondary level of education is reported under primary level of education.

UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
HR	Financial aid to students is not available.
TR	Expenditure at regional and local levels of government is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.
ISCED 234	TOTAL PUBLIC EXPENDITURE ON EDUCATION AS % OF GDP AT SECONDARY LEVEL OF EDUCATION (ISCED 2-4)
BE	Expenditure excludes independent private institutions and the German speaking Community.
DK	Expenditure of post secondary non-tertiary level of education is partially included in upper secondary and tertiary level of education.
GR, PT	Student loans from public sources are not available.
CY	Including financial aid to students studying abroad.
LT, LU, PT, HR, TR	Public transfers to other private entities are not available.
LU, IS, HR	Expenditure for ancillary services is not available.
LU, PT	Expenditure at post-secondary non-tertiary level of education is not available.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
SI, RO	Expenditure of lower secondary level of education is reported under primary level of education.
SK	Expenditure of ISCED 5B is included under upper secondary level of education.
UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
TR	Expenditure at regional and local levels of government is not available.
US	Direct expenditure at post-secondary non-tertiary level of education is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.
ISCED 56	TOTAL PUBLIC EXPENDITURE ON EDUCATION AS % OF GDP AT TERTIARY LEVEL OF EDUCATION (ISCED 56)
BE	Expenditure excludes independent private institutions and the German speaking Community.
DK	Expenditure of post secondary non-tertiary level of education is partially included in upper secondary and tertiary level of education.
GR, RO	Expenditure at local level of government is not available.
ES, IE, PT, UK, IS	Expenditure for ancillary services is not available.
CY	Including financial aid to students studying abroad.
LT, HR, TR	Public transfers to other private entities are not available.

NL, IS	Expenditure at ISCED 5B is not available.
PT, TR	Expenditure at regional and local levels of government is not available.
PT	Imputed retirement expenditure is not available.
SK	Expenditure of ISCED 5B is included under upper secondary level of education.
UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
HR	Scholarships and other grants are not available.
HR	R&D expenditure is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.
US	Direct expenditure at post-secondary non-tertiary level of education is not available.

3.1.2.1.b) Percentage of GDP spent on education at pre-primary level of education; 2003

ISCED 0	TOTAL PUBLIC EXPENDITURE ON EDUCATION AT THE PRE-PRIMARY LEVEL (ISCED 0) AS % OF GDP
BE	Expenditure excludes independent private institutions and the German speaking Community.
GR, LU	Expenditure of pre-primary level of education is reported under primary level of education.
GR, PT	Student loans from public sources are not available.
CY	Including financial aid to students studying abroad.
LT, LU, PT, HR, TR	Public transfers to other private entities are not available.
LU, PT, IS, NO, HR	Expenditure for ancillary services is not available.
PL, SK, NO	Including child care expenditure at pre-primary level of education.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
HR	Financial aid to students is not available.
TR	Expenditure at regional and local levels of government is not available.
TR	Expenditure at pre-primary level of education is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.

3.1.2.2.a) Expenditure on public and private educational institutions per pupil/student compared to GDP per capita; 2003

all levels	FT02_1 ANNUAL EXPENDITURE ON PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS PER PUPIL/STUDENT COMPARED TO GDP PER CAPITA FOR ALL LEVELS OF EDUCATION COMBINED BASED ON FULL-TIME EQUIVALENTS
BE	Expenditure excludes independent private institutions and the German speaking Community.
DK, PL, PT, IS, NO	Payments from other private entities to educational institutions are not available.
NL, IS	Expenditure at ISCED 5B is not available.
AT, PL, PT, IS, NO	Payments from international agencies and other foreign sources to educational institutions are not available.

PL, SK, NO	Including child care expenditure at pre-primary level of education.
PT	Expenditure at post-secondary non-tertiary level of education is not available.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
PT, IS	Expenditure for ancillary services is not available.
US	Direct expenditure at post-secondary non-tertiary level of education is not available.

ISCED 1 FT02_2 ANNUAL EXPENDITURE ON PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS PER PUPIL COMPARED TO GDP PER CAPITA AT PRIMARY LEVEL OF EDUCATION (ISCED 1) BASED ON FULL-TIME EQUIVALENTS

BE	Expenditure excludes independent private institutions and the German speaking Community.
BE, GR, ES, IE, LT, PL, PT, IS, NO	Payments from other private entities to educational institutions are not available.
GR	Expenditure at pre-primary level of education is reported under primary level of education.
GR, AT, PL, PT, SE, IS	Payments from international agencies and other foreign sources to educational institutions are not available.
LT, PT, IS	Payments from households to educational institutions are not available.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
SI	Expenditure of lower secondary level of education is reported under primary level of education.
IS	Expenditure for ancillary services is not available.

ISCED 234 FT02_3 ANNUAL EXPENDITURE ON PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS PER PUPIL COMPARED TO GDP PER CAPITA AT SECONDARY LEVEL OF EDUCATION (ISCED 2-4) BASED ON FULL-TIME EQUIVALENTS

BE	Expenditure excludes independent private institutions and the German speaking Community.
BE, GR, ES, IE, LT, PL, PT, IS, NO	Payments from other private entities to educational institutions are not available.
DK	Expenditure of post secondary non-tertiary level of education is partially included in upper secondary and tertiary level of education.
GR, IT, AT, PL, PT, SE, IS	Payments from international agencies and other foreign sources to educational institutions are not available.
LT, NO	Payments from households to educational institutions for programmes with pre-vocational and vocational orientation are not available.

PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
PT, IS	Expenditure for ancillary services is not available.
SI	Expenditure of lower secondary level of education is reported under primary level of education.
SK	Expenditure of ISCED 5B is included under upper secondary level of education.
US	Direct expenditure at post-secondary non-tertiary level of education is not available.

ISCED 56 FT02_4 ANNUAL EXPENDITURE ON PUBLIC AND PRIVATE EDUCATIONAL INSTITUTIONS PER STUDENT COMPARED TO GDP PER CAPITA AT TERTIARY LEVEL OF EDUCATION (ISCED 56) BASED ON FULL-TIME EQUIVALENTS

BE	Expenditure excludes independent private institutions and the German speaking Community.
DK, PL, PT, UK, IS, NO	Payments from other private entities to educational institutions are not available.
DK	Expenditure of post secondary non-tertiary level of education is partially included in upper secondary and tertiary level of education.
ES, IE, PT	Expenditure for ancillary services is not available.
NL, IS	Expenditure at ISCED 5B is not available.
AT, PL, PT, IS, NO	Payments from international agencies and other foreign sources to educational institutions are not available.
PT	Expenditure at post-secondary non-tertiary level of education is not available.
PT	Expenditure at regional and local levels of government is not available.
PT	Imputed retirement expenditure is not available.
SK	Expenditure of ISCED 5B is included under upper secondary level of education.

3.1.2.2.b) Public, international and private expenditure on educational institutions as % of GDP, 2003, for all levels of education combined

BE	Expenditure excludes independent private institutions and the German speaking Community.
EE, PL, PT, IS, NO, HR, RO	Payments from other private entities to educational institutions are not available.
EE, LU, AT, PL, PT, IS, HR	Payments from international agencies and other foreign sources to educational institutions are not available.
EE, LU, CH, HR, RO	Payments from households to educational institutions are not available.

LU	Expenditure at post-secondary non-tertiary and tertiary levels of education is not available.
LU, IS	Expenditure for ancillary services is not available.
NL, IS	Expenditure at ISCED 5B is not available.
PL, SK, NO	Including child care expenditure at pre-primary level of education.
PT	Expenditure at local level of government is not available.
PT	Imputed retirement expenditure is not available.
PT	Expenditure at post-secondary non-tertiary level of education is not available.
UK, JP	Adjustment of GDP to the financial year that is running from 1st of April to 31st of March.
HR	R&D expenditure is not available.
TR	Expenditure at pre-primary level of education is not available.
TR	Expenditure at regional and local levels of government is not available.
US	Direct expenditure at post-secondary non-tertiary level of education is not available.
US	Adjustment of GDP to the financial year that is running from 1st of July to 30th of June.

3.1.2.2.c) Changes from 2000 to 2003 in public expenditure on educational institutions in percentage points, all levels of education combined⁸⁹

LU, SI, HR:	data not available
BE:	Expenditure excludes independent private institutions and the German speaking Community.
NL, IS:	Expenditure at ISCED 5B is not available.
PL, SK, NO:	Including child care expenditure at pre-primary level of education.
PT:	Expenditure at local level of government is not available.
PT:	Imputed retirement expenditure is not available.
PT:	Expenditure at post-secondary non-tertiary level of education is not available.
IS:	Expenditure for ancillary services are not available.
TR:	Expenditure at pre-primary level of education is not available.
TR:	Expenditure at regional and local levels of government is not available.
US:	Direct expenditure at post-secondary non-tertiary level of education is not available.

⁸⁹ See footnotes in the appendix to the Statistical description

3.1.2.2.d) Changes from 2000 to 2003 in private expenditure on educational institutions in percentage points, all levels of education combined⁹⁰

LU, SI, HR: data not available

BE: Expenditure excludes independent private institutions and the German speaking Community.

EE, PL, PT, IS, NO, RO: Payments from other private entities to educational institutions are not available.

EE, CH, RO: Payments from households to educational institutions are not available.

NL, IS: Expenditure at ISCED 5B is not available.

PT: Expenditure at post-secondary non-tertiary level of education is not available.

TR: Expenditure at pre-primary level of education is not available.

⁹⁰ See footnotes in the appendix to the Statistical description

Explanatory note related to the section 4.1.2.3 – Average duration of tertiary education

Average duration of tertiary education for full-time students and part-time students, estimated from data on new entrants, total number of students and number of students per year of study in the academic years 2002/03 and 2003/04

Eurostat 2004 (Approximation formula): BE, DE, EE, EL, ES, CY (Type A), LV, LT, MT, NL, AT, SI, SK, SE, BG, RO, TR, JP

OECD 2002 (Approximation formula): DK, FR

OECD 2002 (Chain method): IE, IT, HU, PL, UK (Type A), IS

EL: All students are considered full-time

EE: Students in 8th to 11th study year missing are included in 7th year of study, the duration is underestimated

BG: The definition "year of the course" has been used for "year of study"

*UK: Average duration of all tertiary education (type A and B)

Explanatory note

Data collected refer to enrolments by year of study for ISCED 5A, 5B and 6 separately, for full-time and part-time students (and for full-time equivalents). Data are collected for two subsequent academic years 2002/03 and 2003/04.

The approximation method calculates the number of 'leavers' from one year to the other based on the total number of students each year and the new entrants the second year. The average number of students both years is then divided by the average of entrants the second year and leavers the second year. This is a fairly good approximation of the average duration of studies, if the education system is stable. If the system is strongly expanding or diminishing, the method does not work.

The chain method uses data on students by year of study for 2 subsequent academic years. The 'survival rate' from one year of study to the next is calculated, that is, the probabilities for each year of study, which makes it possible to calculate the average duration. As the method just compares the student numbers in year 1 to the numbers in year 2 the next year and not compares the same individuals, it is sensitive to changes in students' behaviour concerning breaks and re-entrances and to changes in the education system. Also, it is a synthetic method, as only two academic years are compared, not the same student cohort over the years.

Both methodologies give estimates of average duration per level and by type A and B programme, for all 'leavers' from the system, for drop-outs and leavers without degree and for graduates, all aggregated.

Country specific notes:

BE: Social advancement education is not included; Year of study refers to year of the course/programme, not year of study of the student

SI: Year of study refers to year of the course/programme, not year of study of the student

BG: Year of study refers to year of the course/programme, not year of study of the student

TR: Data in ISCED 5A exclude students in Master programmes and specialist programmes in medicine

General note: Also in other countries, 'year of study' may refer to 'year of the programme'. The effect on the calculations is however rather limited