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Educational inequality in Europe

Tackling inequalities in Europe: the role of social investment

Disclaimer

Acknowledgements

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Table of contents

Table of graphs

Overview of Key Findings

Education can serve as a vital tool in helping overcome income inequality – highly educated individuals earn more over their life time, have access to wider employment opportunities, and see increased overall economic and personal satisfaction. Even if educational inequality persists throughout Europe, socially oriented investment can potentially target educational sectors to help overcome inequality of opportunity issues.

Reducing educational inequality provides national gains… – Countries that reduce educational inequalities tend to see wider economic gains (a more productive workforce) as well as societal benefits (increased political participation, social capital and cohesion).

… as well as individual gains – Educated individuals obtain higher economic gains as skilled labour, tend to see personal wellbeing increase, and see positive socio-economic outcomes. Moreover, they are less likely to see drops in employment and wages during hard economic times.

Familial background strongly influences educational attainment – Poor households tend to have lower levels of parental education, are less likely to invest in education, and have less time to devote to extra-educational activities. All of these factors negatively affect a child's educational outcomes, and trap a child into a multi-generational cycle of educational underperformance.

Investing in education should work to overcome social differences – Investment in education must ensure an equal playing field for all, regardless of socio-economic background. This means investing at all levels. Since the crisis, educational spending has decreased in many European countries, threatening educational equality.

Pre-primary Investment – The highest social gains come from investing during early years. Poor children are less likely to have access to early education and to be prepared for the formal educational system, - increasing the risk that they will fall behind their affluent counterparts.

Compulsory education – Poor schools often teach the poorest children, who require more resources – naturally investment should be catered to addressing those specific needs to ensure adequate resources are available to help disadvantaged children gain from the system.

Post-secondary education and adult learning – Post-secondary education investment (be it university, community college, or vocational) can give everyone wider educational opportunities, but support services must be available to help low-income students take advantage of those opportunities. Later in life, individuals can benefit greatly from having access to adult learning to continuously upgrade skills and adapt to labour market changes.

Financing education through multiple channels – Governments can raise the necessary funds via capital markets; via the private sector (private-public partnerships), and via socially-oriented investments (e.g. social impact bonds).

The Council of Europe Development Bank (CEB) can play a constructive financing role with its unique social mandate to help governments at all levels achieve socially-oriented educational investment goals.

Chapter 1: Education as an Opportunity to Overcome Inequality

Those who are more educated tend to perform better in terms of personal finances, health outcomes, social and political participation. Education is thus a long-term tool that can help societies work to overcome overall inequality and many of its symptoms.

This section touches briefly upon the channels through which education can reduce income inequality, as a more educated citizenry can, on the whole, earn more through stable employment and help narrow persistent income inequalities. However, education is strongly influenced by the socio-economic conditions in which one grows up – poor households on average tend to be less educated, have fewer educational opportunities and are thus likely to have similar education outcomes to those of their parents. Rich and educated families, on the other hand, have far more educational opportunities offered to them. It is therefore important to ensure that there is an even playing field in which everyone, regardless of socio-economic background, has access to the same quality of education – i.e. equitable educational opportunities.

1.1. How education reduces inequality

In the field of economics (and complementary fields) it is widely considered that education is the most important factor that can help an individual overcome initial income inequality. The literature examining the relationship between education attainment, educational opportunity and intergenerational mobility is extensive. This section provides a brief overview of that work from the historical, theoretical, and empirical viewpoints, in order to appreciate the significant role education plays in reducing inequality.

The relationship between education and country-level growth has been firmly established. **As a larger proportion of people obtain education, the human capital of a society increases, which has a generally positive effect on economic growth** (Krueger and Lindhal 2001, Mincer 1975). Countries with higher quality education systems see this translate into a higher quality labour force that is more productive and can therefore generate larger economic gains (Hanushek and Kimko 2000) – thus emphasising how important it is to focus on quality and not just quantity.

Education has also been shown to be a strong predictor of future earnings and employability, as educated people perform better in the labour market (Card 1999). Time series analysis has shown that the relationship between education attainment and quality (measured via test performance and teacher-to–pupil ratios) on the one hand and income on the other hold over time (Ferrall and Bedard 2003). Higher education is also related to other socio-economic outcomes such as better health status and higher democratic political participation (Ferreira and Gignoux 2011).

However, the most evident way in which education is able to fight inequality is by helping achieve **intergenerational mobility** (that is for individuals to achieve higher educational and thus income levels than their parents). The primary concept of intergenerational mobility stems from the notion that parental socio-economic background often has a strong influence on the socio-economic outcomes their children will achieve (i.e. how parents' inequality can be transmitted to children). Thus intergenerational mobility refers to how children move away from their parents' socio-economic status, in either direction, but hopefully for the better.

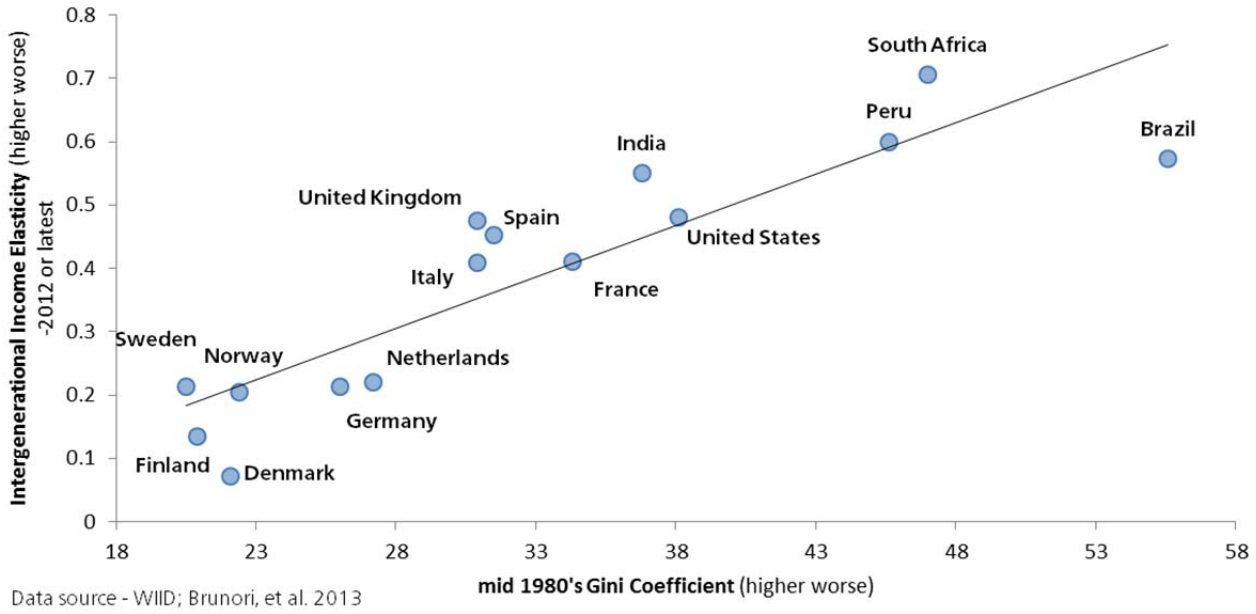
When children from lower-income households are able to access higher levels of education, they are more likely to overcome some of the socio-economic hardships faced by their parents. Socio-economic mobility is dependent on factors such as innate abilities (work ethic, "effort", social norms, etc.) and individual circumstances which are outside their control (familial background, access to quality education given where they live, etc.) (J. Roemer 1998, J. Roemer 2002, OECD 2010). A society that wishes to reduce inequality through

intergenerational mobility works to help people tackle this "inequality of opportunities" that results from the undesired circumstances people are born into – *section 2.2* will deal with this topic in greater detail.

When societies are able to offer greater access to education to help overcome socio-economic differences, they tend to be far more equal. Corak (2013)[1] has shown that greater income inequality also tends to be correlated with less intergenerational mobility via incomes. Figure 1 below replicates Coark's work, which examines intergenerational earnings elasticity[2] against the elasticity between parental earnings and a child's adult earnings (a proxy for intergenerational mobility) and the Gini coefficient in the mid-1980s. Some of the most equal societies in the world are the ones that have created the necessary conditons to challenge obstacles to intergenerational mobility.

Figure 1– Countries with higher intergenerational income elasticity (more intergenerational mobility) tend to be more equal

(The "Great Gatsby Curve"), replication of Corak (2012)



1.2. Causes of educational inequality

Educational inequality is deeply correlated with overall inequality, as those who come from lower-income quintiles tend to perform worse at school and are less likely to complete higher levels of education. A number of factors play into how educational inequality comes about:

1. ***[Lack of] Intergenerational mobility*** (as explained briefly above) is a strong predictor of a person's educational outcomes (i.e. parental socio-economic background influences a child's socio-economic outcomes, including education);
2. ***The educational system*** can exasperate educational inequality, if it does not ensure **fairness** (gives everyone the same access) and **inclusiveness.**

[1] This paper builds on Corak's earlier work in 2012.

[2] Here we use data from Corak (2013), who defines intergenerational earnings elasticity as follows: "intergenerational economic mobility is measured as the elasticity between paternal earnings and a son's adult earnings, using data on a cohort of children born, roughly speaking, during the early to mid-1960s and measuring their adult outcomes in the mid to late 1990s. The estimates of the intergenerational earnings elasticity are derived from published studies, adjusted for methodological comparability in a way that I describe in the appendix to Corak (2006), updated with a more recent literature review reported in Corak (2013), where I also offer estimates for a total of 22 countries. I only use estimates derived from data that are nationally representative of the population and which are rich enough to make comparisons across generations within the same family".

These two factors are interconnected. Intergenerational mobility is linked to the educational opportunities that a child has access to, given their parents' level of education and income. Thus an effective system should work to overcome these familial restrictions.

A simple conceptual model[3] showcases how educational inequality is shaped from an individual perspective:

$$O = f(c, e)$$

Where ***O*** is the *educational outcome* of an individual, which is a function of two things in their life: ***circumstances (c)*** *and* ***effort (e).*** Circumstances include a series of factors that are exogenous and out of the control of the individual, such as gender, age, ethnicity, geographical location or parental background. Conversely, effort is more endogenous and is based on individual traits such as personal work ethic, talent, or even luck (Checchi, Peragine and Serlenga 2010) – while effort can potentially be determined in part by circumstances, it is generally assumed not to be, and thus effort is what is considered "ethically acceptable" inequality (i.e. inequality that is natural and is difficult to change).

Why individual circumstances matter – breaking the cycle of intergenerational mobility

It is often considered to be ethically unjust that an individual's initial circumstances should be a determinant of future educational and income inequality. Society should thus make an effort to ensure equality of opportunity for all people in order to help overcome initial circumstances (Romer and Unvern 2016, Checchi, Peragine and Serlenga 2010, J. Roemer 1998). Naturally, the most obvious circumstance that is beyond an individual's control is their familial background and its influence on inequality – **intergenerational mobility**. Romer and Unvern (2016) elegantly describe the channels through which intergenerational mobility occurs. Parahrasing their work, children born into poor households obtain lower levels of education because they have fewer educational resources available to them or live in homes that do not support educational endeavours. Furthermore, the poor parents who are unable to provide educational resources in the first place may also potentially lack social connections, which further hinders a child's progress. The cycle becomes self-perpetuating, as the children one day become adults and continue to pass on the same unequal opportunities to their own children.

A large quantity of empirical work has been carried out examining the effect of equality of opportunity on overall equality. Empirical work examining European states has shown **that educational opportunities become more equal among the populations when the education system works to mitigate familial background** – by increasing public investment in both the pre-primary and the overall educational system (Checchi, Peragine and Serlenga 2010). Romer and Unveren (2016) generated a model examining the types of jobs that children of blue and white collar parents obtain (obtaining a white collar job typically meaning higher income[4]) and found that the probability of a child of a blue collar parent obtaining a white collar job is *less* than that of a white collar child.

There is, of course, educational inequality that is further exacerbated by wider societal problems. For example, racial and ethnic differences tend to influence the socio-economic and educational opportunties made available to children. In many European countries, individuals from different racial/ethnic backgrounds who at the same time are often of immigrant background, perform considerably worse on many socio-economic outcomes than their "native" counterparts (lower levels of education, higher unemployment figures and lower earning) – thus these groups in particular face particular challenges in opportunity inequalities. The scope of this paper is to provide a general picture of inequality. However, future work by the CEB will focus on the specific inequalities that persist within certain sub-populations across the continent (including gender-based inequalities).

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[3] This formula is a replication of a number of theoretical studies, which are summarised in Salverda, 2011 – see bibliography.

[4] Although the authors of the paper did indicate that in some instances blue collar jobs did received larger incomes than certain white collar jobs, and thus that educational investment to help overcome lack of educational opportunity should focus on parental income and not parental occupation.

Changing the circumstances to create an equal playing field

A child that does not have access to better educational resources or, social connections, or is discriminated against due to gender, race, or ethnicity, cannot be held accountable for such limitations. It is therefore imperative that the cycle is broken by ensuring that children, regardless of circumstances, are given equal opportunity in education.

Educational systems must work to not exacerbate a child's circumstances by encompassing two overarching goals as defined by the OECD (Field, Kuczera and Pont 2007, OECD 2012):

1. **Fairness -** children are able to achieve their educational potential by being able to access educational opportunities regardless of their individual circumstances.

2. **Inclusion -** indicates an educational system that ensures a minimum standard all children should achieve upon completing the formal education system (e.g. literacy, mathematics, etc.), thus ensuring that the investment in education is effective in achieving this goal.

Ensuring these elements can help overcome the basic educational disparities that may arise due to a child's initial circumstances. But this is not the entire story. Most importantly, education systems need to ensure a host of other elements in order to create a truly "equal playing" field.

One of the most important ways to combat initial circumstances is to invest heavily in *pre-primary education* (see more detail in Chapter 3, sub-section *Pre-Primary education inevestment).* When children have access to pre-primary education (e.g. pre-school, nursery school, kindergarten, etc.), they are able to begin to accumulate educational capabilities that they can build upon when entering the compulsory educational system, thereby starting on a firm path towards better learning outcomes. This has a positive return for public educational investment as the child is better equipped to take advantage of the investment at later educational stages in the system (i.e. primary and secondary).

To maintain educational equity (fairness and inclusion), continued investment in compulsory education (primary and secondary) must be ensured. The allocation of funds should be weighted so that the higher instructional costs of disadvantaged students are being met (OECD 2012). However, the institutional make-up[5] of the schools also play a supportive role in ensuring equity. By institutional arangements we refer to three components identified by the OECD; minimising early drop-outs, avoiding early tracking, and increasing school choice – these three components are discussed further in Chapter 3, but fundamentally serve to showcase what effective educational policy design is. Drop-out rates tend to be highest among those from disadvantaged backgrounds. Additional resources are thus needed to help them stay in school and complete compulsory education. Tracking students (i.e. placing children on a vocational or academic curriculum), if done too early, can be influenced by poor socio-economic backgrounds (tracking is based on exams and if administered too early is influenced by familial background. Admittedly, giving parents choice where to send children, if done correctly, can help children be placed in schools that best fit their needs and abilities. However, the necessary information and financial support systems must be in place, as school choice can widen the effect of familial backgrounds (richer individuals can afford the potential higher costs associated with choice and have more knowledge of where the best schools are).

Expansion of higher education should be done with caution, as when university level expansion occurs, the benefits of increased access often tend to be passed on to those from more advantaged backgrounds. Effective support systems should be in place to help children complete secondary education and be able to successfully transition to tertiary education (a difficulty sometimes faced by disadvantaged students). Financial resources need to be made available so that disadvantaged children have the necessary material means to access higher education. Additionally, post-secondary education expansion should not be limited to universities; community

[5] This is beyond the scope of the CEB, as the Bank does not set the educational system policies of a country, but this study would not be complete if it did not speak about the topic as a case of educational inequality.

colleges and vocational education are an alternative means of helping children access post-secondary education more easily. Community colleges (2-year degrees) can also serve as a transition channel that helps prepare students to eventually transfer to tertiary education (i.e. university).

Lastly, later in life, adults should be given a chance to upgrade and develop skills, even after leaving the formal education system. This gives individuals an opportunity to develop the skills that may be required in a changing labour market. By establishing the necessary resources for life-long learning, people of all backgrounds can continuously evolve and see economic gains. However, the current adult education systems are predominantly used by the more affluent and well educated.

Chapter 2: Educational Inequality in Europe: *What the data says*

This chapter briefly showcases the statistical reality of the educational inequalities that exist within Europe. What is evident is that, in terms of both quantity and quality of education, those who come from more affluent backgrounds perform much better. **Higher-income individuals are more likely to complete secondary and tertiary education than their poorer counterparts** (in some countries by exceptionally large margins) and have higher educational outcomes (they tend to score much better on competency exams). All of this showcases in part the intergenerational mobility concerns highlighted in Chapter 1, as familial background can be a strong predictor of a person's educational outcomes.

What is apparent is that, during the latest economic downturn, those who were more highly educated were better placed to weather the financial storms. The highly educated were less likely to be unemployed and tended to see their earnings recover much more quickly after an initial fall. However, regional variations do exist – in Southern Europe, regardless of educational level, incomes have been continually on the decline and are not likely to recover any time soon.

Educational spending has also dropped since the onset of the recession, with spending growth levels either lower than 2008 or in some cases contracting. This reduction in spending on all levels of education can have a detrimental effect, as disadvantaged children may have less access to the necessary educational resources. In fact, in those countries where spending on education has decreased in the last few years disadvantaged schools have seen higher levels of material deprivation and more low-paid teachers resulting in the under-performance of socio-economically disadvantaged students.

2.1. The gap in educational attainment and outcomes

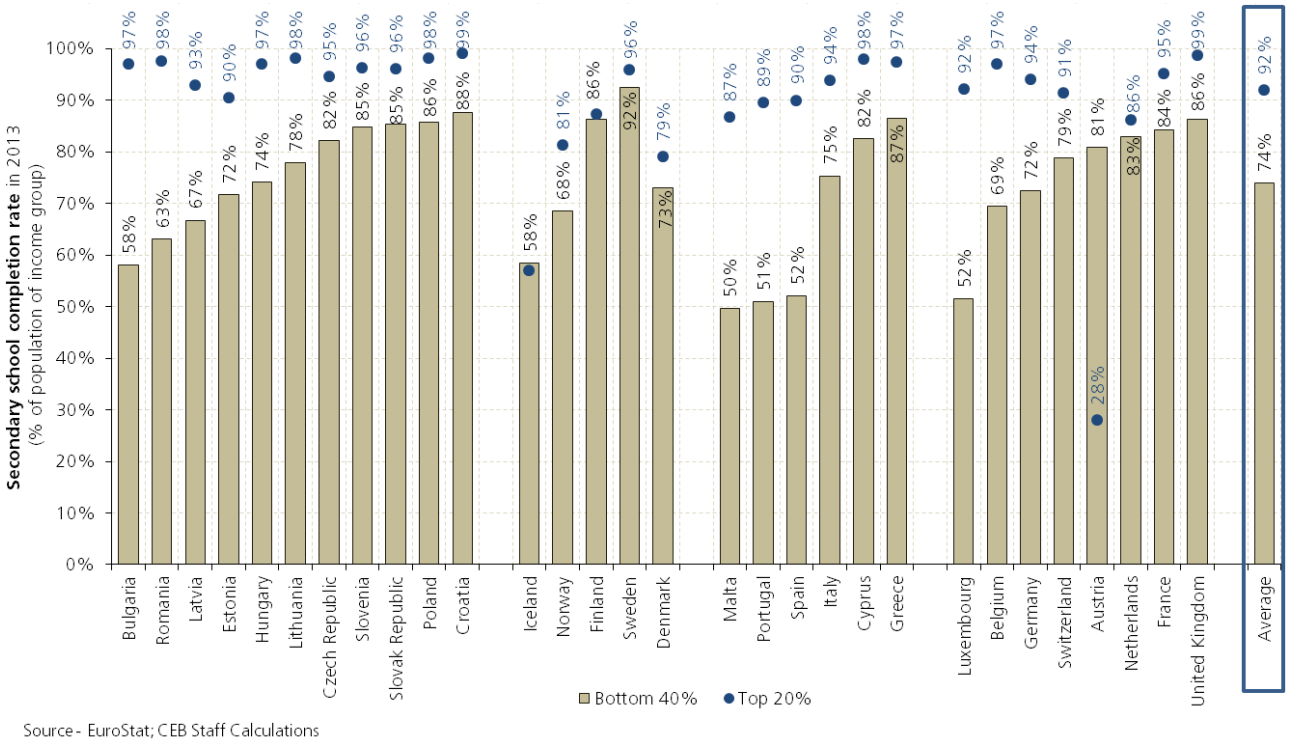
The educational divide between rich and poor is significant throughout Europe, in terms of both quantity (years of education) and quality (educational outcomes). Those in the upper income brackets tend to complete higher levels of education and take away more from the time spent in education.

As a starting point, let us look at secondary education. **Throughout Europe, 92% of those in the top 20% of the income distribution have completed secondary education, while less than 74% of those in the bottom 40% are able to say the same** – a difference of 18% (see Figure 2 below). Naturally, as is always the case in Europe, some regions do better than others. The difference is much less pronounced in Nordic countries, where being in the top income groups does not automatically mean completion of secondary education (aside from Sweden, the average secondary completion rate for the top 20% is below the European average). Central-Eastern Europe has a range of differences, with some countries in Central Europe and the Western Balkans having a much narrower completion difference between income groups than the EU average – a result of the concentrated efforts of previous socialist governments to ensure equal educational attainment for all socio-economic classes. The gap is the widest in Southern European states where in Malta, Portugal and Spain just over half of those in the bottom 40% have completed secondary education.

A similar narrative emerges when examining tertiary educational attainment – see Figure 3. Here, the overall difference is far more pronounced, with **only a quarter of those in the bottom 40% having completed some form of tertiary education (not including vocational training), while over 54% of those in the top 20% hold a higher education degree.** In some parts of Europe, the difference can be rather extreme - see Belgium (57% difference), Romania, Portugal, and Luxembourg (approx. 49%). Even in the equal North, some countries such as Finland see 62% of the better-off having finished higher education, compared to just 23.5% of the bottom 40%. In prosperous France and the United Kingdom, wealthier people are nearly 40% more likely to have a tertiary degree than those in the bottom 40%.

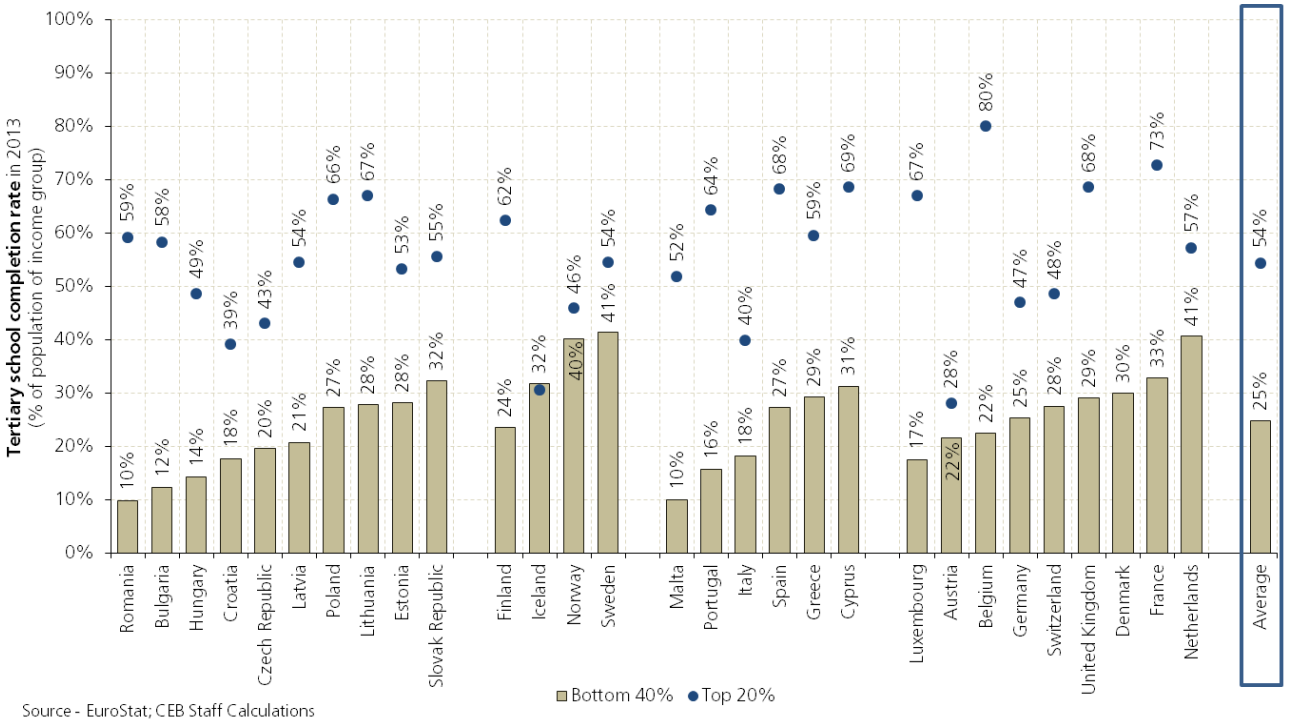
The disparity in educational attainment between the bottom 40% and the top 20% in both secondary and tertiary education supports concern regarding the lack of intergenerational mobility across the continent and the risk of low-education remaining a persistent challenge for those in lower-income groups.

Figure 2 – Secondary school completion rate (% of population of income group)



Source - EuroStat; CEB Staff Calculations

Figure 3 – Tertiary school completion rate (% of population of income group)



Source - EuroStat; CEB Staff Calculations

Even more worrying is the fact that lower-income students obtain much lower learning outcomes than richer students – meaning they gain less from the education system. Table 1 shows the country comparable 2015 PISA[6] exam results in Europe for three topics (science, reading, and mathematics). What is immediately noteworthy is that in every country those in the bottom 25% consistently score lower on all topics than their counterparts in the top 25%. The score differences between the rich and poor tend to be the lowest in Nordic countries mainly because the average score in the bottom quartiles tend to be the highest in Europe for that income quartile (i.e. the highest scores in Europe for low-income students) - while richer students in the North do not always have the highest score in Europe for their group. The largest disparities between the rich and poor in all three topics can be found in Western Europe – with most countries seeing a 100-point difference in scores in all three topics, showcasing the vast effort needed to be undertaken to reduce the gaps. The rich and poor divide on scores is lowest in Central-Eastern Europe, but it is important to note that for all income groups the test results are among the lowest for all income quartiles throughout Europe. In part, this reflects the lower spending on quality staff and resources in the region (although this is not true for all countries).

Table 1 – PISA exam results, for science, reading, and mathematics, by socio-economic quartile

	Science - Pisa test result				**Reading** - Pisa test result				**Mathematics** - Pisa test result			
Country	Average	Bottom quartile	Top Quartile	Difference bottom and top	Average	Bottom quartile	Top Quartile	Difference bottom and top	Average	Bottom quartile	Top Quartile	Difference bottom and top
Central-Eastern	458	424	504	80	450	414	498	84	454	421	500	79
Albania	427	-	-	-	405	-	-	-	413	-	-	-
Belarus	-	-	-	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	446	395	502	107	432	372	496	124	441	396	496	100
Croatia	475	444	522	78	487	455	534	79	464	433	512	79
Czech Republic	493	444	551	107	487	435	545	110	492	442	549	107
Estonia	534	504	573	69	519	490	555	65	520	489	557	68
FYR Macedonia	384	358	413	55	352	321	381	60	371	337	406	69
Hungary	477	420	537	117	470	411	530	119	477	423	537	114
Kosovo	378	363	405	42	347	330	371	41	362	342	388	46
Latvia	490	461	524	63	488	456	523	67	482	450	517	67
Lithuania	475	438	520	82	472	433	517	84	478	443	520	77
Republic of Moldova	428	392	468	76	416	373	462	89	420	382	460	78
Montenegro	411	389	441	52	427	400	462	62	418	396	447	51
Poland	501	463	549	86	506	467	551	84	504	469	548	79
Romania	435	401	477	76	434	390	483	93	444	404	493	89
Serbia	-	-	-	-	-	-	-	-	-	-	-	-
Slovak Republic	461	413	513	100	453	401	507	106	475	428	523	95
Slovenia	513	471	560	89	505	470	547	77	510	476	549	73
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-
Northern	499	464	538	73.8	505	472	541	69.3	499	464	537	72.5
Finland	531	494	572	78	526	491	566	75	511	477	549	72
Iceland	473	448	500	52	482	454	508	54	488	458	520	62
Norway	498	463	535	72	513	482	544	62	502	469	536	67
Sweden	493	450	543	93	500	459	545	86	494	452	541	89
Southern	471	430	519	88.5	473	432	519	87.0	473	433	519	85.3
Cyprus	433	399	474	75	443	410	481	71	437	399	480	81
Greece	455	415	503	88	467	425	518	93	454	419	497	78
Italy	481	442	518	76	485	442	524	82	490	451	529	78
Malta	465	412	525	113	447	398	503	105	479	431	527	96
Portugal	501	459	556	97	498	458	549	91	492	451	548	97
Spain	493	454	536	82	496	458	538	80	486	448	530	82
Western	501	456	555	99.3	499	455	551	95.5	503	461	551	89.9
Austria	495	448	545	97	485	439	537	98	497	453	542	89
Belgium	502	450	560	110	499	449	554	105	507	458	562	104
Denmark	502	467	543	76	500	467	540	73	511	478	547	69
France	495	441	558	117	499	443	565	122	493	442	552	110
Germany	509	466	569	103	509	472	564	92	506	467	556	89
Ireland	503	465	545	80	521	483	561	78	504	468	544	76
Luxembourg	483	425	551	126	481	423	548	125	486	436	547	111
Netherlands	509	465	559	94	503	463	552	89	512	476	556	80
Switzerland	506	455	561	106	492	447	543	96	521	478	569	91
United Kingdom	509	473	557	84	498	466	543	77	492	458	538	80
Average	477	438	525	86.2	473	435	521	86.1	476	439	522	82.7

Source - OECD Pisa 2015

[6] The PISA test is an OECD initiative to compare the educational attainment of students around the world, as defined by the OECD "The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. In 2015 over half a million students, representing 28 million 15-year-olds in 72 countries and economies, took the internationally agreed two-hour test. Students were assessed in science, mathematics, reading, collaborative problem solving and financial literacy"

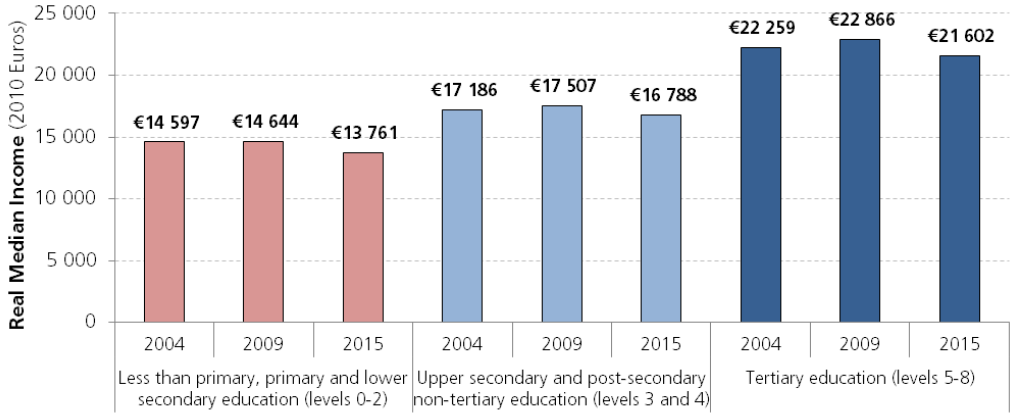
2.2. The economic resilience of higher education

The lower educational attainment (and the lower quality of education) of those in the bottom income quartiles translates to lower economic gains over their life time. As was noted in the CEB's 2017 study "An introduction to Inequality", in the last few decades a "skill-premium" has arisen in the labour market, where higher skilled (i.e. more educated) individuals are better placed to take advantage of the productivity-enhancing technology that is being incorporated in every type of industry (blue or white collar). Since lower education attainment is persistent in lower income groups, the loss of economic opportunity is evident as the figures below show.

In terms of both real median income and employment (See Figures 4 and 6), **higher educated individuals throughout Europe on average do considerably better compared to their less educated counterparts**. In 2015, tertiary educated people earned 57% more than those with less than secondary education and 28% more than those with just secondary school (see Figure 4). Over 80% of those with a tertiary degree were employed in 2015, while the same figure stood at 69.1% for those with a secondary education degree, and only 41.9% for those with less than secondary education. Just from this snapshot we can see a vast difference between educational levels and by corollary extension, the level of income inequality. However, all education groups, on average, have much lower real median income levels today compared with the highs in 2009.

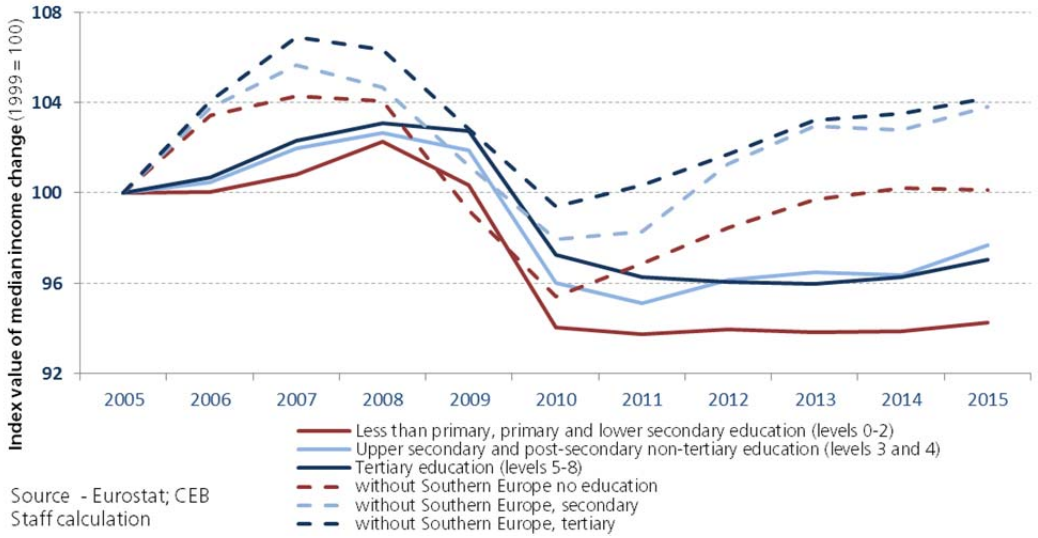
A key finding from this data is the **economic resilience** of those with higher education during the recent crisis as opposed to those with less formal education. In terms of real median income, regardless of education, everyone took a sharp dip in earnings, but higher educated individuals in many countries got back onto a path of recovery much more quickly (see Figure 5 below). The pattern of resilience has very different regional stories. In the case of Western Europe, the initial "dip" in median incomes lasted for a short period and today incomes for all levels of education are on the rise – with the highest educated earning well above pre-recessionary peaks (see Appendix Figure 1.8). The Nordic countries saw an extremely sharp fall in real median incomes and slow-going recoveries, with no group reaching pre-recessionary peaks - with the caveat that secondary educated people perform the best there – (see Appendix Figure 1.4). Central-Eastern Europe saw a noticeable dip, with real incomes on a downward and stagnate path for all levels of education, but in the last few years they have begun to return to historical highs (see Appendix Figure 1.2). Sadly, in Southern Europe, the fall in real median income for all levels of education has only been on a downward path, and no sign of recovery appears to be on the horizon (see Appendix Figure 1.6).

Figure 4 – Real median wages in Europe, by educational attainment



Source - Eurostat; CEB Staff calculation

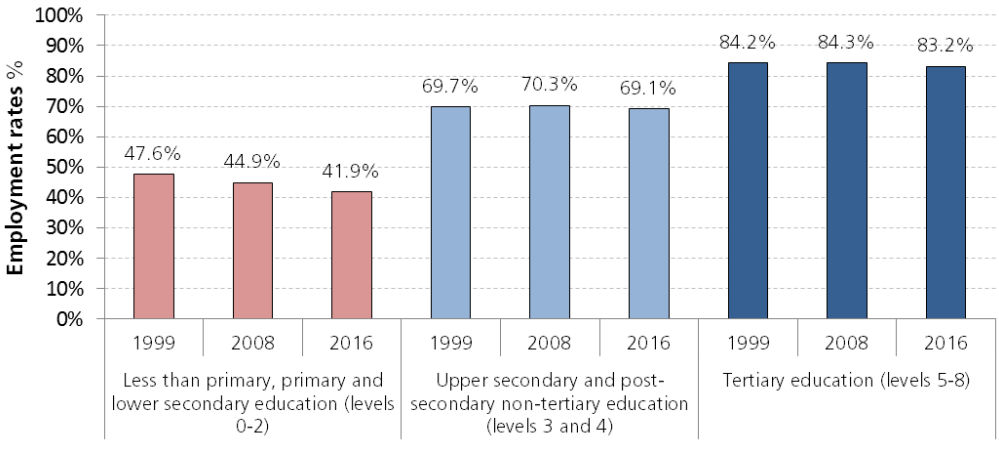
Figure 5 – Indexed value of median income changes (2005 = 100)



The resilience story is far more pronounced in terms of employment (see Figure 6 below). On average in Europe, those with a tertiary and secondary degree did, of course, see a drop in employment after the onset of the financial crisis, and the slow economic recovery meant that only in recent years have both groups begun to recover to 2008 levels. However, **those with the lowest education attainment saw a much sharper drop in employment, which only added to the downward trajectory that group has faced for the last decade and a half**. While the lowest educated have also seen employment levels slowly start to tick up, this recovery will not return their employment levels to pre-recessionary levels, let alone 1999 levels, any time soon.

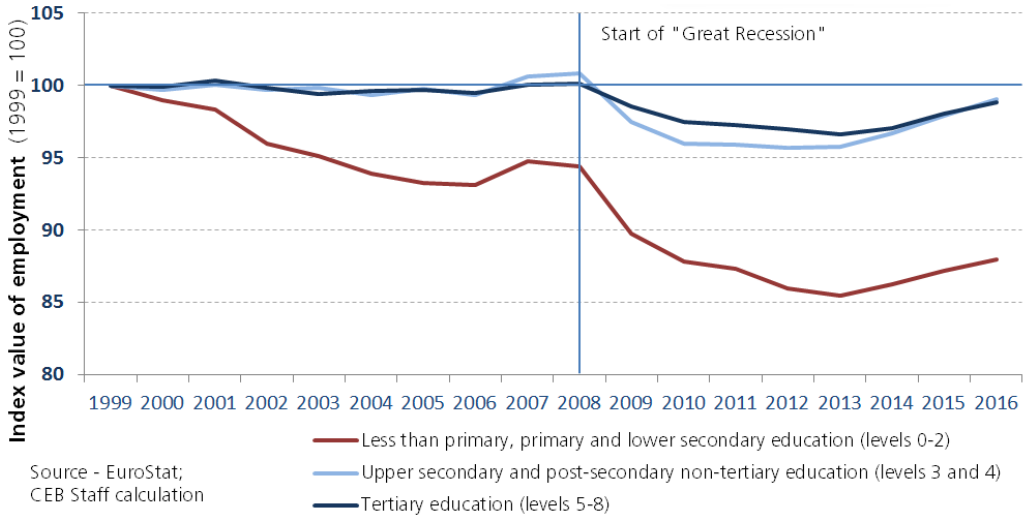
This phenomenon is persistent throughout all regions. In the Northern, Western and Central-Eastern regions, the employment growth paths of the three groups mirror what we see in Figure 7 below (see Appendix Figure 1.3 for Northern Europe, Appendix Figure 1.7 for Western Europe and Appendix Figure 1.1 for Central-Eastern Europe). In Southern Europe, employment levels grew for all groups prior to the recession, with secondary educated people seeing the largest gains in employment (although still relatively lower employment levels overall than for the tertiary educated). After the recession, all three groups saw a drop in employment levels, with the least educated seeing the most pronounced drops, followed by secondary and the tertiary – none of the three groups have returned to their historic peaks. **Put simply, the less educated tend to feel the pain of economic shocks more acutely than those with more education, thus making them more vulnerable.**

Figure 6 – Employment rate in Europe by educational attainment level



Source - EuroStat; CEB Staff calculation

Figure 7 – Indexed value of employment levels by educational attainment level (1999=100)

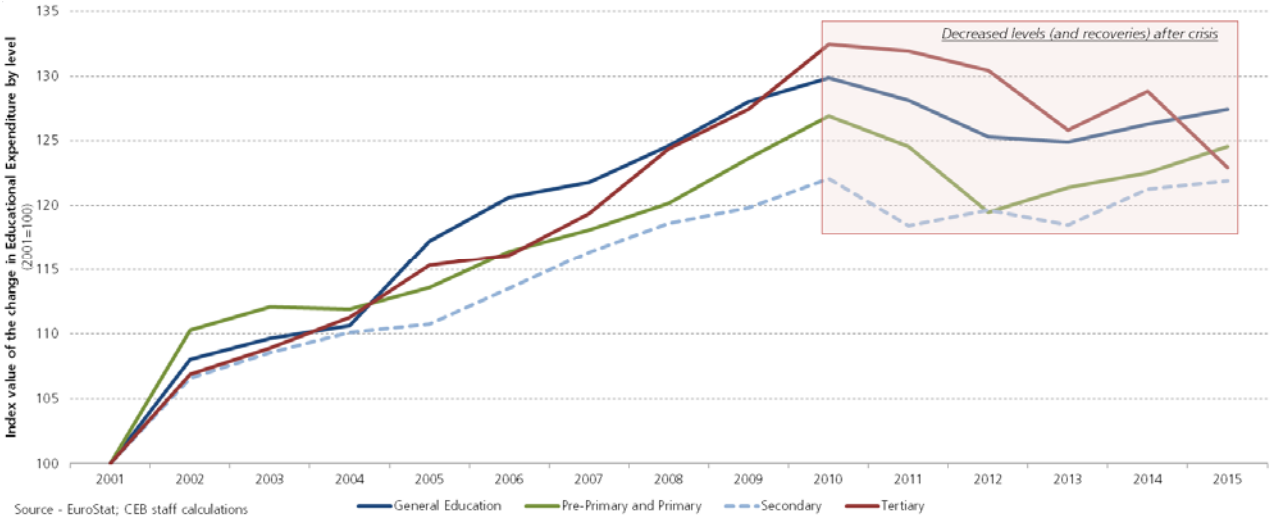


2.3. Educational investment in Europe

The recessionary cycle that most European economies experienced (and in several cases are still experiencing) was exasperated by the deep fiscal consolidation plans that severely affected the delivery of many public services - educational expenditure at all levels was not spared. **The decline in overall educational spending in the last few years threatens to create a situation of under-provision of the quality educational resources needed to support the educational outcomes of socio-economically disadvantaged students.**

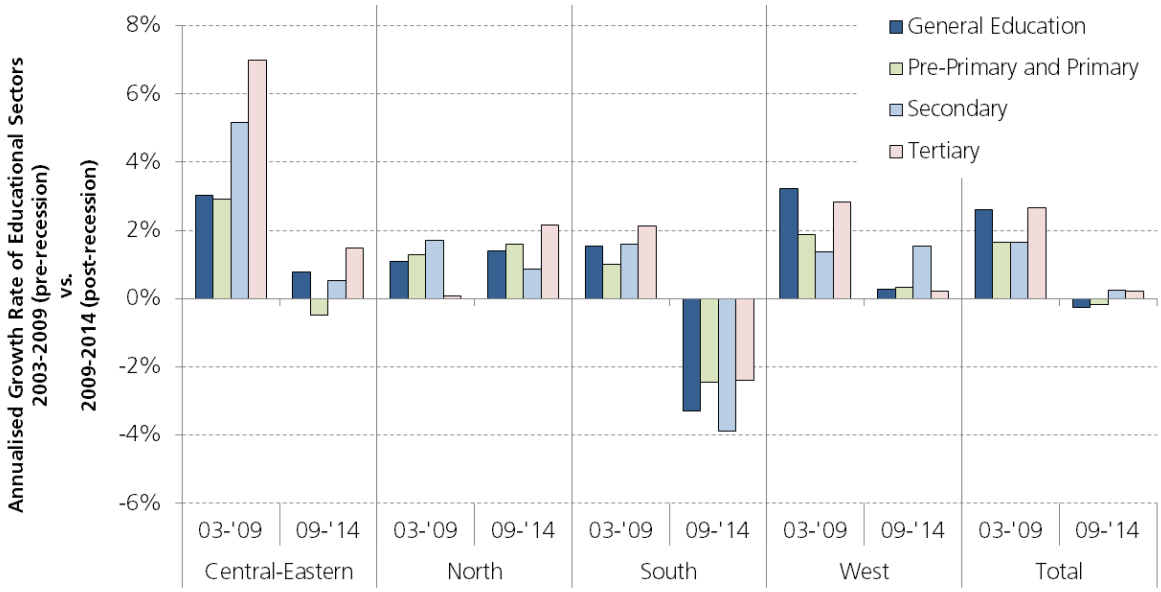
Since 2000, Europe has seen general educational expenditure grow at a healthy and sustained rate and, despite a dip in 2010, general educational spending is recovering slowly (see Figure 8 below). When examining the granular elements of educational expenditure in pre-primary and primary and secondary education, we see a similar picture. On average, in Europe, both types of education took a sharp dip right before the 2008 financial crisis – levels began to grow after the recession as governments had committed to spending programmes prior to the onset of the crisis. This culminated in 2010, with pre-primary and primary, secondary, and tertiary education expenditure reaching peak levels for the decade, only to decline sharply soon afterwards – all types of education as of 1016 have yet to fully recover to 2010 peaks, although pre-primary and primary and secondary education expenditure has once again started on an upward growth path. Worryingly, tertiary education expenditure in Europe has for the most part stayed below the expenditure levels of 2010, and remains on a volatile downward trend.

Figure 8 – Indexed value of change in European educational investment (by level of education)



The changes in educational expenditure are not the same in the different regions (see Figure 9 below). **While all types of education saw healthy annual growth prior to the recession, in most regions after the recession those annualised growth levels were generally lower and, in some cases, have even been contracting**. The only exception is in the Northern region, where the annualised growth rates of all levels of education are growing faster in the post-recessionary period – except for secondary education, where the growth rate is much lower. In fact, for every region except Western Europe, annual growth rates for secondary education expenditure are lower. Central-Eastern Europe has seen annual growth rates which are significantly lower in the post-recessionary period and, in the case of pre-primary and primary, spending has been contracting annually since 2009. In Southern Europe, the annual contraction in all three sectors since the onset of the recession is immediately visible in the figure and, worryingly, shows a region which will be lagging behind its European counterparts in the type of education that it will be able to deliver to all students (not just disadvantaged low-income ones). The general decline in annual educational growth expenditure since 2009 depicts a continent that is potentially under spending in providing the necessary resources for effective learning outcomes, in the last several years.

Figure 9 – Annualised growth rates between 2003-2009 and 2009-2014 periods, by education level and European region



Source - EuroStat; CEB staff calculation

The different annual growth rates for educational spending throughout Europe calls into question how this translates into effective spending (or lack of spending) on the resource allocation to disadvantaged students. Figure 10 below examines at country level the annual growth rate of educational expenditure from 2009 to 2015, and the PISA teacher survey of the degree of material deprivation in the most disadvantaged schools in the country (the bottom 25% of schools based on socio-economic indicators[7] - by extension it is typically assumed that these schools often serve students of low-income families).

Unsurprisingly, the countries in the top left-hand corner saw large contractions in educational spending which correlated to teachers being more likely to report that their school (disadvantaged school) was materially deprived of the necessary resources for effective teaching – most of these countries are Southern European states which have seen the largest annual contractions in education spending. Conversely, the countries in the

[7] This refers to the PISA index of economic, social and cultural status which as defined by the OECD, was "created on the basis of the following variables: the International Socio-Economic Index of Occupational Status (ISEI); the highest level of education of the student's parents, converted into years of schooling; the PISA index of family wealth; the PISA index of home educational resources; and the PISA index of possessions related to "classical" culture in the family home".

bottom right corner saw positive growth and naturally teachers there were more likely to indicate that their disadvantaged school was less likely to be materially deprived of necessary resources.

Perplexing stories emerge in the other two quartiles. Countries in the bottom left-hand corner saw declines in educational spending, and yet teachers were less likely to report that their disadvantaged schools were materially deprived, thus indicating potential efficiency gains for existing spending. However, countries in the top right-hand corner saw increases in educational spending, but with teachers more likely to report that their disadvantaged school was likely to be materially deprived, indicating that the increases in educational spending were perhaps not being utilised in the most effective manner.

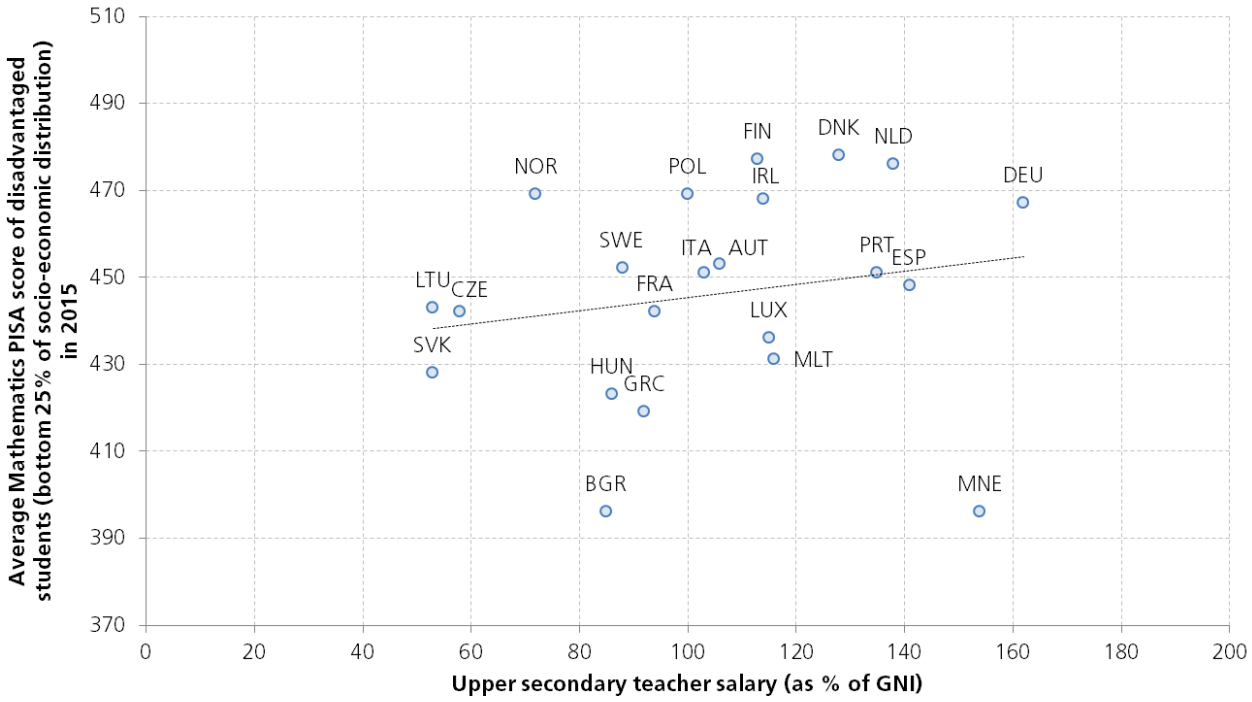
Figure 10 – Annualised growth rate of educational expenditure vs. material deprivation of disadvantaged schools

Source – Eurostat and OECD Pisa; CEB Staff calculations

It would be an inadvertence for this chapter not to briefly touch upon the softer components of educational spending – namely teacher salaries and their effect on educational attainment outcomes. As Figure 11 below shows, countries that spend more on teacher salaries often tend to see higher academic achievement by disadvantaged students (in terms of PISA science scores[8]). Although teacher salaries are only one element of the many that contribute to better educational outcomes, focusing investment towards increasing salaries seems to have a positive correlation with lower-income student performance.

[8] The correlation holds for science and, to a lesser degree, for the reading subject exams

Figure 11 – Secondary school teacher salary and disadvantaged students' mathematics scores



Source - OECD Pisa , utilising only European countries

Chapter 3: Investment Targets to Overcome Educational Inequality

Given the deep recession, in many countries investment and spending to provide educational services at all levels (pre-primary, primary, secondary, post-secondary) has taken a hit. This section highlights why investment at these different stages can work to counter the educational inequalities that we see today.

Social investment can play a vital role in helping meet the educational opportunities, as investment that is geared with a vision to tackle educational inequality can contribute to reducing income inequality as well as generate wide socio-economic benefits such as increased social cohesion, government participation and general social capital. For investment to achieve all of this it should be focused on three general points within the educational systems

1. **Pre-primary education** – investing in education before formal education begins can work to overcome many of the educational disparities that exist between children due to their socio-economic differences. Accessing early childhood education allows children to develop a basis of skills, which enables them to be better prepared for the formal system and helps them develop educational/learning habits that they will carry over later into their lives. Investment at this stage is relatively lower than in later stages but has the potential for the largest amount of inequality minimising returns.
2. **Primary and secondary education** – at this stage of the process, investment should work to address the differences between the schools that poor and rich children attend. Poorer schools tend to have more material deprivation and are less likely to have experienced and trained staff. Investments should therefore be made to ensure that, despite their economic background, all children have access to the same resources. Additionally, investment should be sensitive to the fact that the needs of poorer schools are vastly different from those of richer schools (e.g. the need for more after-school programmes or extra staff to minimise drop-outs).
3. **Post-secondary and adult training** – finally, investment should be geared to helping individuals access both post-secondary education (tertiary and vocational) and adult training (the opportunity to continually upgrade their skills throughout life). Investment in post-secondary education can often become an expansion of educational opportunity for those who are already educationally/economically well-off (see details below). It is therefore important that financial sources are made available to those who are less well-off to access post-secondary education, but just as importantly to give students a wide range of post-secondary educational opportunities. Even after the formal education process has been completed, adults should have the opportunity to access formal and informal training programmes to help upgrade their skills so as not to get left behind in an ever-changing labour market, which could lead to a further widening of income inequalities.

3.1. The important role of pre-primary education

Investing in pre-primary education can act as a powerful means to stem the negative impacts of low intergenerational mobility at an early stage. Research has analysed how early childhood development is highly influenced by a range of factors from genetic endowments to familial "pro-education" environments – the latter of which may be underprovided in poor households and thus negatively affect a child's development and thus their ability in school (see summary of intergenerational mobility in Chapter 1).

Thus, if formal pre-primary schooling is able to step in at an early enough age, it can help counter some of the negative environmental effects on a child's educational outcomes (Cunha, Heckman and Lochner, et al. 2006). Evidence has shown that early-childhood experiences can affect brain development in children; poor socio-economic surroundings can foster an environment where children are vulnerable to missing out on healthy development and fail to obtain skills at the early stages of the human capital development process (Shonkof and Phillips 2000, Knudsen 2004).

Additionally, **early-childhood intervention creates a foundation for the development of basic life skills such as how to interact within society, how to operate with autonomy and begin to develop basic problem solving skills** (OECD 2011). Early school intervention can help raise cognitive skills (IQ) and non-cognitive outcomes such as improving school performance, labour market outcomes, and socio-economic and behavioural outcomes (e.g. teen pregnancy and criminal activity) (Cunha, Heckman and Lochner, et al. 2006, Heckman, Stixrud and Urzua 2006).

The underlying rationale for how early education can help overcome inequality issues builds on the theory that human capital formation is a dynamic life-cycle process – skills and abilities acquired in one stage of the life cycle process have a direct impact on the productivity of education at the following stage - *recursive productivity* (Cunha, Heckman and Lochner, et al. 2006). Additionally, the formation of human capital at an early stage has a *complementarity effect* on later stages, as an individual acquires a stock of skills which make investment in education at later stages more productive (Gini Research Project 2011).

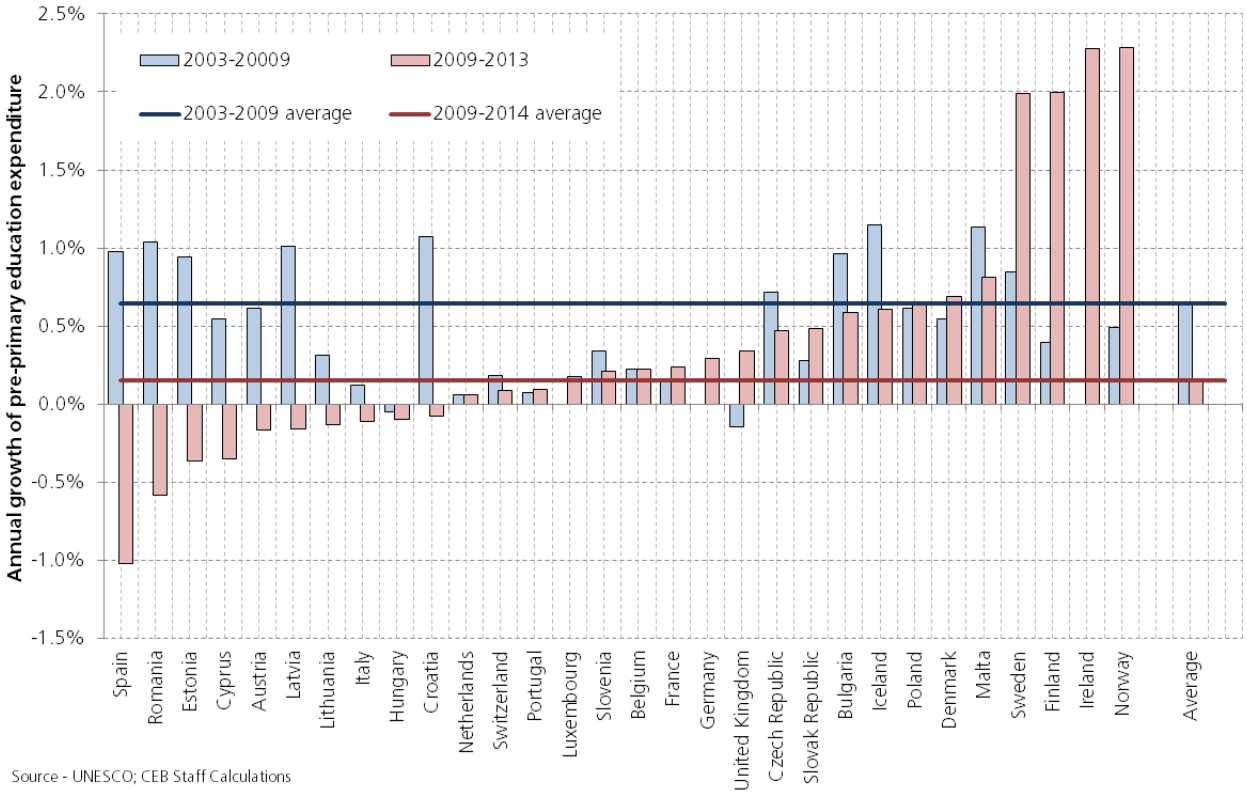
The marginal rate of return on pre-primary education is much higher than the rate of return on investment at a later stage – i.e. the opportunity cost of pre-primary education is much lower as the gains are substantially higher. Remedial education programmes that work with drop-outs and adults at later stages of education are far more costly than early interventions (OECD 2011) – and, in fact, early intervention can help reduce drop-out rates. Timely investments in early intervention programmes for disadvantaged children have been shown to help overcome the gaps that increase socio-economic differences and help build better cognitive and non-cognitive skills, while investments in later stages of the life cycle fail to produce equitable results (Heckman and Cunha 2010, Cunha, Heckman and Schennach 2010).

Empirical research in Argentina has shown that expanding pre-primary education has a positive effect on a child's performance in primary school (via higher test scores) and improves a string of other education based behaviours such as attention, participation, discipline, effort, etc. (Berlinski, Galiani and Gertler 2009). Similar work in the Netherlands shows that disadvantaged students perform better in exams when they are able to access education at early stages of life (Leuven, et al. 2009). However, it is important that the appropriate investments are made to ensure that there are minimum standards within the early-childhood education programmes to ensure equality for all students, regardless of economic background (OECD 2011).

In terms of investment in early-childhood education in Europe, the picture is rather mixed. The annual growth rate of expenditure on pre-primary education was positive for many countries in Europe (see Figure 12 below). Unfortunately, **since the onset of the 2008 financial crisis the majority of governments have cut back on pre-primary educational expenditure**. For instance, Spain, Romania, Estonia, Cyprus, Austria, Latvia, Lithuania, Italy, Croatia, which all had *positive* annualised growth rates prior to the crisis (many of which were above the European pre-crisis growth average), are now experiencing annualised contractions in pre-primary education expenditure. Even countries which remained at positive annualised growth rates after the crisis are still below their pre-crisis rates, indicating an overall reduced focus on the sector. Notably, all the Nordic countries (bar Iceland) have dramatically stepped up their post-crisis spending on pre-primary education.

The overall decline in spending on the sector threatens to create a situation in which disadvantaged children will not be able to benefit from the inequality fighting benefits of pre-primary schooling, thus increasing their risk of future vulnerability. From a societal standpoint, the current reduced current investment may result in more costly interventions in the future.

Figure 12 – Annualised growth rates of pre-primary education expenditure



Source - UNESCO; CEB Staff Calculations

3.2. Effective primary and secondary education

In terms of how to alleviate inequality once children start formal compulsory education, the measures are a mix of policy and investment priorities. Given that the CEB is not a policy setting institution, this section will touch only briefly on equality enhancing educational policies. As for investment priorities, nations should seek to ensure that school funding schemes cater to the distinct needs of disadvantaged schools, especially at a time of reduced educational spending.

Policy choices to overcome educational inequality

In an effort to minimise educational inequality, schools should work to address a number of recurring institutional elements, namely to *minimise grade repetition; undertake early tracking of students*; *provide school choice* (OECD 2012). Grade repetition is seen as a short-term solution by re-teaching topics that a student failed to adequately understand during the formal education year. Typically, those who repeat grades come from disadvantaged backgrounds and are more likely to drop out of school altogether, all of which can exasperate existing educational gaps between rich and poor (UNICEF 2012). The financial costs of allocating resources to re-teach students are considered to be very high, and these students often enter the labour market later and thus begin to contribute economically later (OECD 2012). In order to limit the use of repetition of grades, the OECD advocates that schools establish support programmes (e.g. additional instruction time) to help students get back on a path to completion before the end of the school year. This also requires that effective assessment systems are in place to measure the progress of students and step in when trouble signs begin to appear[9]. Helping children progress through the educational system means, they are more likely to complete secondary education and this in turn helps reduce societal inequality issues.

[9] For a more comprehensive examination of the policies that could help please refer to OECD 2012 and UNICEF 2012.

School tracking (that is placing students in vocational or academic based educational tracks), when undertaken too early, can exasperate existing socio-economic inequalities. Educational systems often work to provide access to a comprehensive school system up to a certain level (typically around the age of 15), but eventually most countries split students into different curriculums and classes based on performance and ability (OECD 2012). The separation of students based on ability is argued to have positive effects in that it allows students of similar ability to work together and teachers to define a curriculum that serves the different types of classes more effectively. However, studies have shown that, while clustering high-performing students together enhances their performance, the clustering of low ability students reduces theirs as they no longer benefit from working alongside and learning from high-ability students, i.e. peer group benefits (Coe, et al. 2008). Moreover, if the selection process (typically via exams) is administered at too young an age, the socioeconomic differences and educational background gaps may be reflected, thus placing students in the wrong track – with disadvantaged students being tracked into lower-educational performing tracks. Empirical evidence has shown that early tracking systems enhance educational inequalities between students, widen achievement scores, and intensify familial background effects (Coe, et al. 2008, Burgess, Dickson and Macmillan 2014, Schutz, Ursprung and WoBmann 2008).

One of the central issues of education policy design to reduce inequality is to ensure that giving children different school choices do not result in segregating poor and rich household students. In many countries in Europe, children are allocated to a public school based on geography (i.e. neighbourhood), with some degree of choice offered to parents (OECD 2012). Increasing parental choice as to where to send their children for education is fundamentally a market-based reform; parents can chose schools that closely reflect what they think their child needs, and schools that see an exodus of students will innovate to attract more students and funding (Gibbons, Machin and Silva 2006). If the choice programme is well designed to take into account equity considerations and work to overcome geographical segregation, it can in fact help disadvantaged students select higher-performing schools and thus reduce education inequality issues (Musset 2012). However, badly designed policies can lead to a situation in which the most demanded schools become highly selective and opt not to select disadvantaged background students, thereby exasperating inequality issues (OECD 2012). Richer families can benefit from more choice as they have more information on options and fewer economic constraints (Gini Research Project 2011). Unless school choice is accompanied by the appropriate funding assistance and efforts to minimise information asymmetries, it can often become an inequality enhancing undertaking[10].

Education spending and investment for disadvantaged students

Importantly, educational spending plans should take into account the needs of disadvantaged schools and students. As the OECD (2012) notes, disadvantaged schools and students often require more resources than other groups; for instance, teachers tend to be less experienced and qualified. Recommendations for effective policy measures indicate that spending formulas should be arranged in order to allocate funds in an efficient, stable and transparent manner; such formulas ensure both horizontal equity (similar schools are funded to the same level) and vertical equity (schools that need more resources receive more funding). There are limitations to such funding mechanisms, such as data availability, transparency, and the fact that they may not cover all school costs (e.g. infrastructure) – see OECD 2012 for complete details.

It is evident that, in European countries, **disadvantaged schools have higher resources demands than less advantaged schools, while at the same time they are not receiving the necessary funds.** As Figure 13 below shows, in 24 European countries (out of 36 in the figure) disadvantaged school principals reported that they lacked the necessary materials for effective teaching, relative to the principles in socioeconomically advantaged schools.. In some countries, both rich and poor schools tend to report high levels of material deprivation, requiring increased funding for all types of schools (primarily found in Central-Eastern and Southern Europe, but also in some Western economies such as France). Funding should be targeted to minimising the gaps between poor and rich schools and, when called for, to lowering material deprivation in all schools.

[10] This is a cursory examination of the topic of school choice, for a more granular review of the topic the reader is referred to OECD (2012) and Gini Research Project (2011)

Similarly, disadvantaged schools also suffer from less qualified teachers who are unable to effectively deliver educational instruction. In figure 14, a comparison is made of the qualifications of science teachers in a disadvantaged school (bottom 25% socio-economic level) with the average PISA science score of a disadvantaged student (bottom 25% socio-economic level). Generally speaking, when teachers have the proper certification in disadvantaged schools, the disadvantaged students in turn tend to see higher science exam scores. Thus an important component of spending should focus on this soft component of investing in certified teachers.

Figure 13 – Material deprivation of school (Index value)

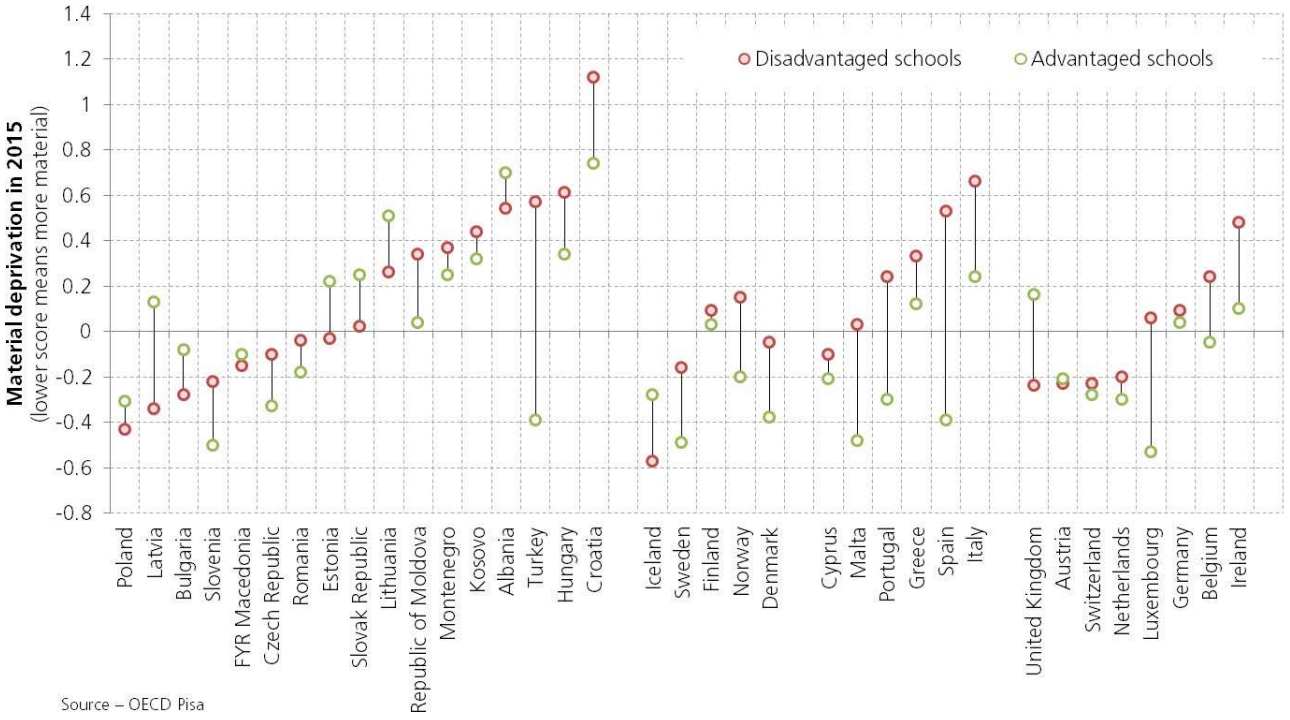
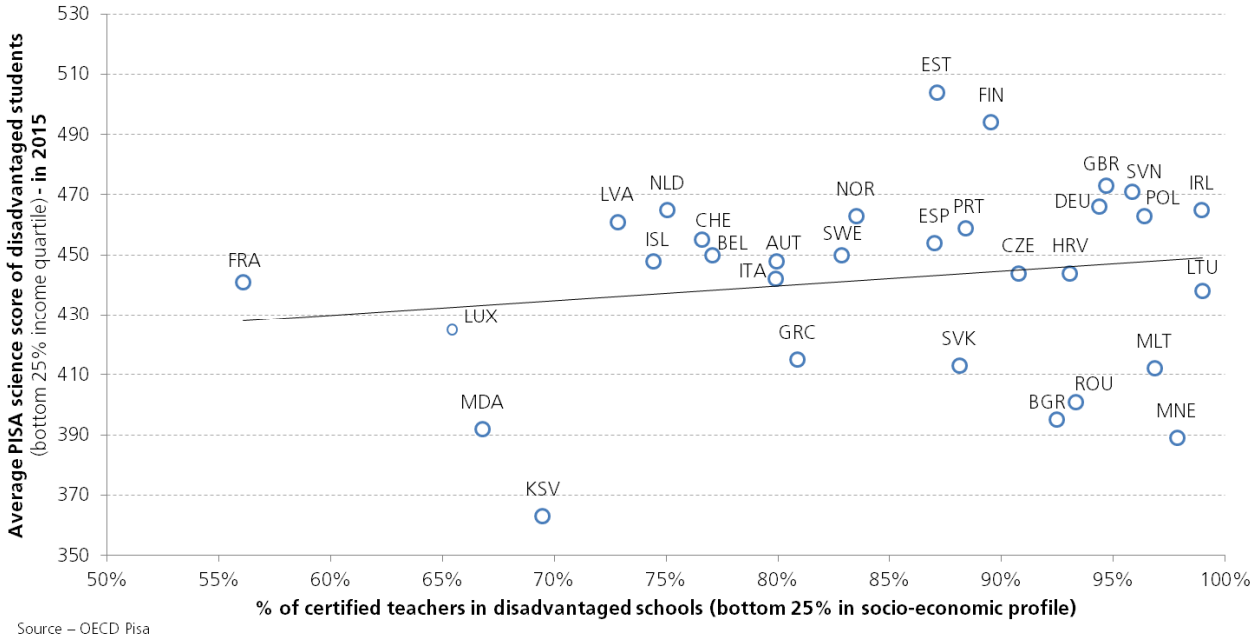


Figure 14 – % of teachers with appropriate certification vs. average PISA score of disadvantaged students



Primary and secondary public spending growth

As is the case for most general education spending, both primary[11] and secondary education spending has fallen in many countries throughout Europe. In both types of education, annual growth rates in 2009-2014 typically fell below the 2003-2009 levels. In many countries, there have been annualised contractions in spending after years of positive growth. These cases are situated primarily in Southern and Central-Eastern Europe. While in some countries the limited change in primary and secondary educational spending (and even slight contractions) may be a sign of more efficient spending (as explained in Figure 10 above), for the vast majority of cases, the drop is a signal of underinvestment in compulsory educational services. In some cases, the spending cuts may result in a reduced provision of resources to disadvantaged schools, which may threaten to further widen educational disparities.

Figure 15 – Annualised growth rates of pre and primary education expenditure

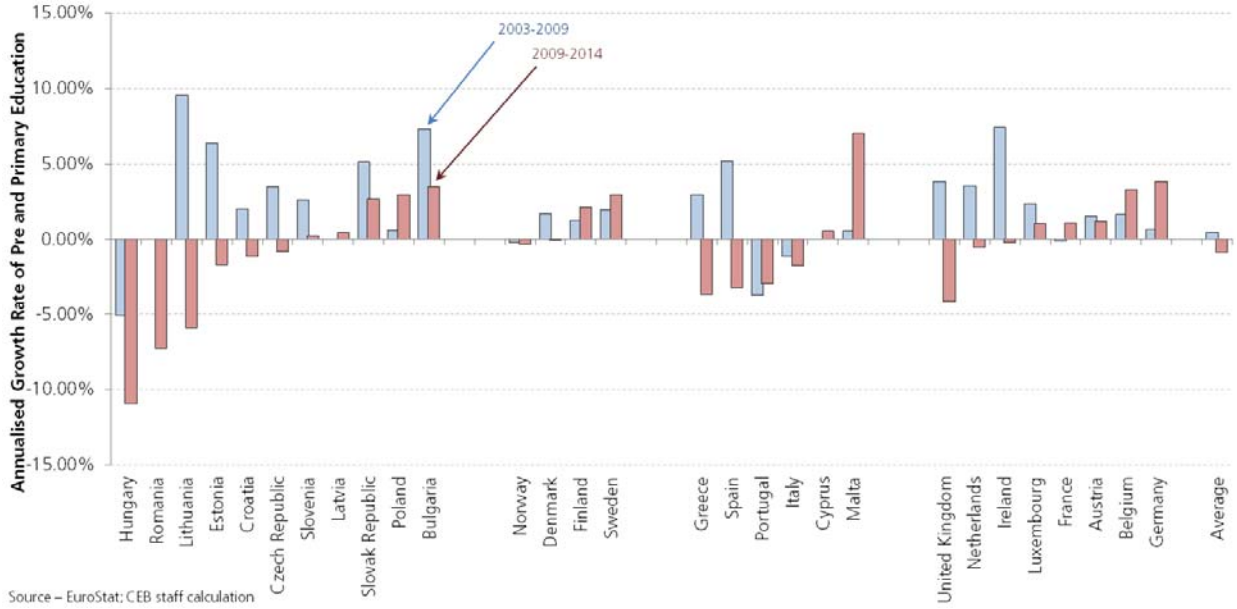
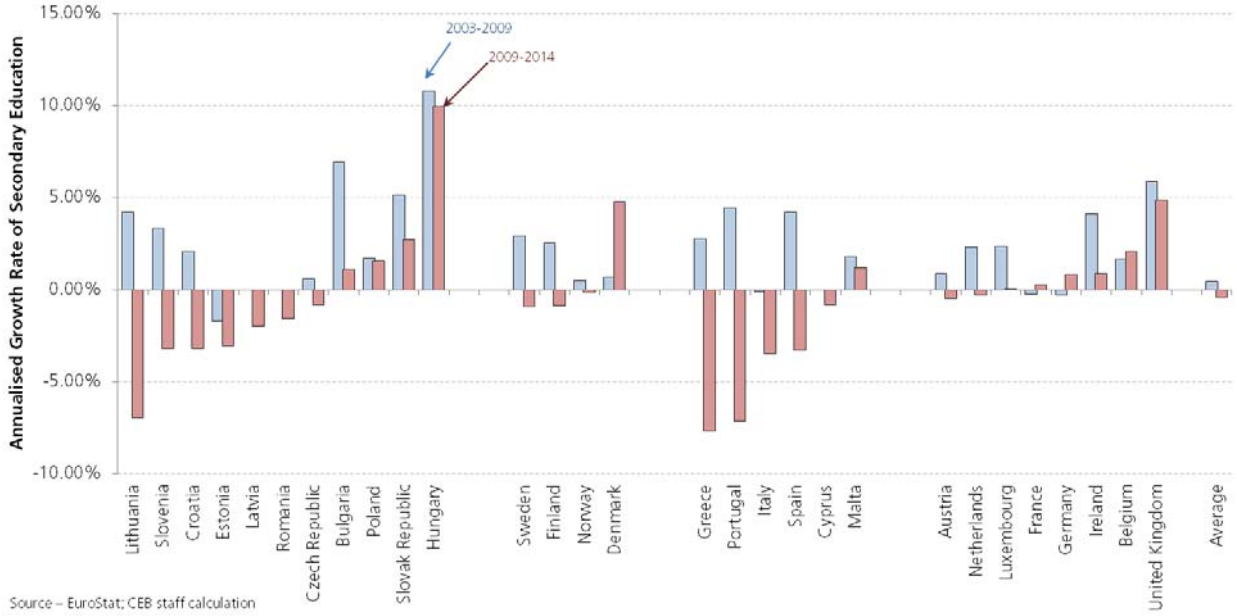


Figure 16 – Annualised growth rates of secondary education expenditure



[11] This data also includes pre-primary, as the data could not be disaggregated.

3.3. Tertiary and adult life-long learning

As has been shown, those with tertiary education are able to obtain large financial returns over their lifetime (See Chapter 2) and often tend to be more resilient during periods of economic shocks. The expansion of tertiary education spending should be part of any government policy mix when attempting to increase educational access for its citizenry. However, tertiary education is just one part of post-secondary education access; just as important is the need to expand effective vocational schooling systems, which can be a pathway for overcoming income inequality without a university degree. Moreover, for those who did not take advantage of formal education when it was made available to them, there should be no reason not to have an opportunity to continue learning in adulthood. The need for adult learning, especially life-long learning, will be imperative as continued technological advances change the skills needed for employment.

Post-secondary education (tertiary and vocational)

The expansion of tertiary educational opportunities is a natural policy response by governments who want to offer more access to a wider range of the population to gain the necessary skills that can take advantage of the skill-premium (see the CEB's 2017 "Introduction to Inequality" Chapter 2.2). But investment in this area should be made with extreme caution in an effort to tackle educational inequality.

Studies have shown that simply increasing post-secondary education in terms of tertiary education may not have the desired effect of reducing educational inequalities. The expansion of tertiary education tends to favour students who come from highly educated families especially in Central-Eastern Europe (Chevalier, Denny and McMahon 2003). Cross-country evidence has shown that expansion of tertiary education may be ineffective in decreasing educational mobility, as investment returns on reducing inequality have a "turning point" around the mean age of seven (Ram 1990). Country-level studies have confirmed that expanding tertiary education tends to favour students from high-income and educated families (Naylor, Smith and Telhaj 2015, Bratti, Checchi and Blasio 2008).

However, that is not to say that there are no advantages in expanding tertiary education - larger numbers of people are completing post-secondary education than in previous generations. **In the past, the expansion of tertiary education was undertaken to tackle "quantity inequality" (i.e. not enough people with tertiary education), but with today's expansion we now have "quality inequality" (i.e. high income individuals are able to access the best types of tertiary education).** Thus future expansion should work to increase the quality premium of higher education.

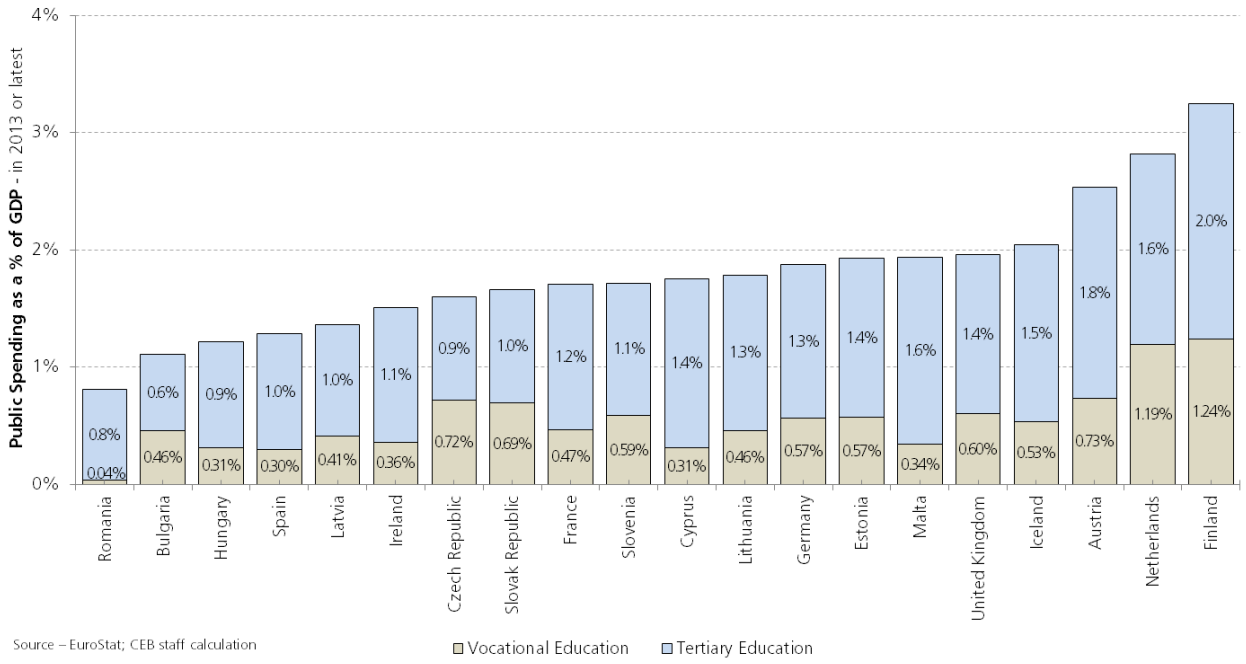
It may be beneficial to include other forms of post-secondary education into the investment mix to give an even wider choice of opportunities**. Expansion of two-year community colleges for instance increases the opportunity to access higher education for lower socio-economic individuals**, who would otherwise not have attended post-secondary education at all (Rouse 1995)[12]. Additionally, vocational training can act as an alternative choice, which gives students an option for post-secondary education that more closely matches their abilities and vocational interests - indeed evidence does exist that lower-income individuals are more likely to choose this path (Gini Research Project 2011). **Vocational training allows individuals to obtain the necessary skills that allow them to enter into the labour market and start earning incomes at a younger age.** However, as noted in the previous chapter, when educational tracking does not begin at an early age, vocational paths can be more equitable and less likely to reflect socio-economic differences.

The current picture of post-secondary education spending in Europe is a difficult one to examine. Due to the various types of educational systems and political funding systems (unitary vs. decentralised) it is often difficult to

[12] However, there is a "diversion" process as the author of the work cites, where low-income students who would have gone to an undergraduate university instead opt to go to a 2-year community college (a loss for them), but on net more people from lower socio-economic backgrounds are able to attend higher education as a result of the community college expansion.

disaggregate post-secondary educational spending. Figure 17 below offers a snapshot of how much countries[13] are spending on tertiary and vocational education as a % of GDP. Most countries have naturally undertaken an effort to expand tertiary education access – vocational education tends to see a lower proportion of spending in the vast majority of countries (Finland and the Netherlands are exceptions with much more equitable levels for both types of systems). Since there is currently insufficient time-series data[14] it is difficult to ascertain what the trends in spending have been between the two sectors.

Figure 17 – Public expenditure on post-secondary education, as a % of GDP



Life-long learning (adult training)

The final element of discussion is how to help adults obtain new skills after they have left the formal education process. Many individuals who did not take full advantage of the formal educational process (for whatever reason, be it socio-economic, personal, or even innate ability) lack the necessary skills to advance in the labour market, as new skills are constantly being demanded. Even those who did complete the formal education system (secondary or tertiary) find themselves needing to continuously upgrade their skills in order to continue advancing.

Adult vocational training is the primary means of providing adult learning opportunities – and of gaining short and long terms benefits at individual, firm, and nation level. In the short-term, individuals will earn more, become more employable and more likely to be satisfied with their work; the firm in turn obtains a more productive worker and has less need to undertake the costly process of hiring more skilled labour (Hoeckel 2008). In the long term, individuals will not only be more adaptable in the changing labour market, but will also be able to undertake further life-long learning activities and further upgrade their accumulated base of skills. At a national level, the investment in vocational programmes can help reduce the costs of unemployment benefits (as those who lack the necessary skills are unable to find work), and in the long term gain a more productive work force, which is economically more versatile, contributes more through taxes and, via higher incomes, helps reduce income inequalities (Hoeckel 2008, Cedefop 2011). Preston and Green (2003) provide an overview of a large number of macro-social benefits from training; these can include increased social cohesion, social capital, reduced criminality and reduced poverty.

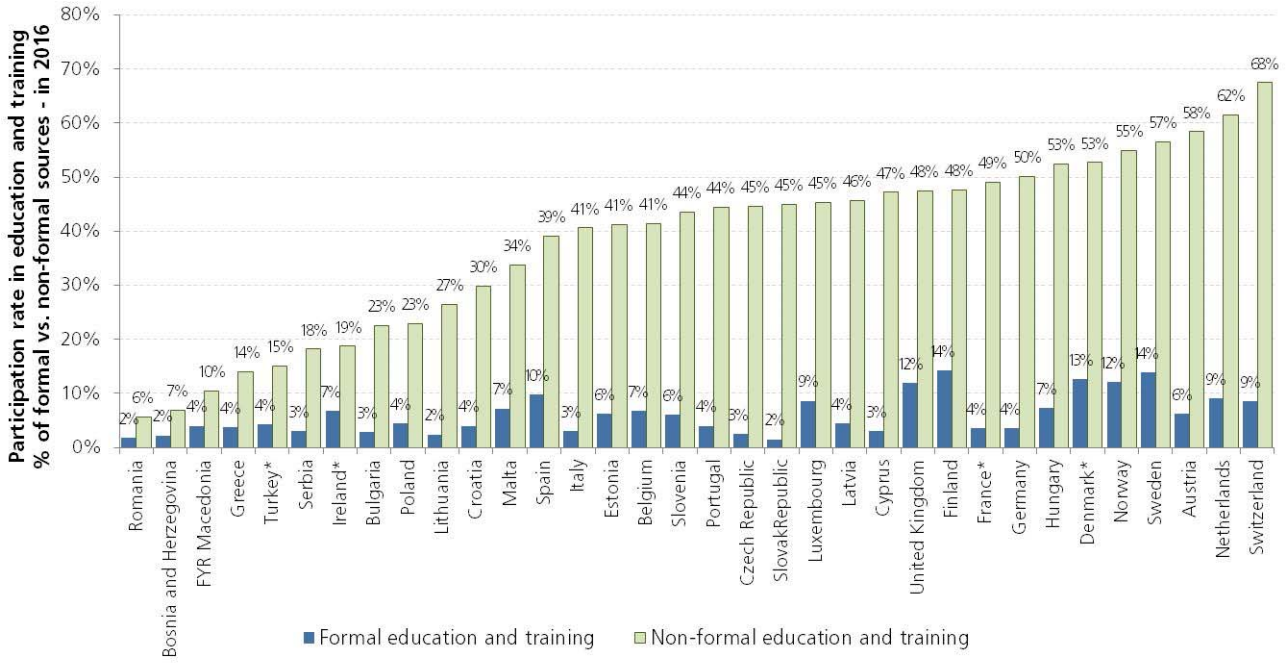
[13] For countries where data is available

[14] There is enough data on overall tertiary education – but it is not disaggregated into vocation and university/community levels.

However, the costs associated with vocational training are considerably higher than standard educational services. The direct costs come from providing basic wages for those going through the training and costs of material/teachers/schools. Indirect costs may arise in the form of government subsidies to programmes and limited tax revenues (as those going through training may not be earning) (Hoeckel 2008). A question that thus arises is who will provide the funding – the government, the individual, or the firm (on-the-job training). In most countries there is a cost-sharing mechanism so that costs are attempted to be equally distributed between the government, the individual, and the firm. Governments also differ widely in the type of intervention (funding vocational schools, transferring funds/subsidies to firms, etc.) but, in the end, all aim to overcome market imperfections in which insufficient access to credit markets (i.e. to obtain financing for education) may deter individuals from acquiring the necessary training.

Currently in Europe the majority of individuals tend to obtain training programmes more from informal sources (for example about 32% get training from their employers), than from the formal educational system (around 10% on average). As Figure 18 below shows, the disparity between obtaining training from formal educational institutions and obtaining training from informal ones is very high in all countries. It is also worth noting there are discrepancies between countries concerning the percentages of people who undertake training – for instance in most Nordic states and in some Western European countries nearly or over half of the population do so.

Figure 18 – Participation rate in adult education/training (formal or non-formal education)

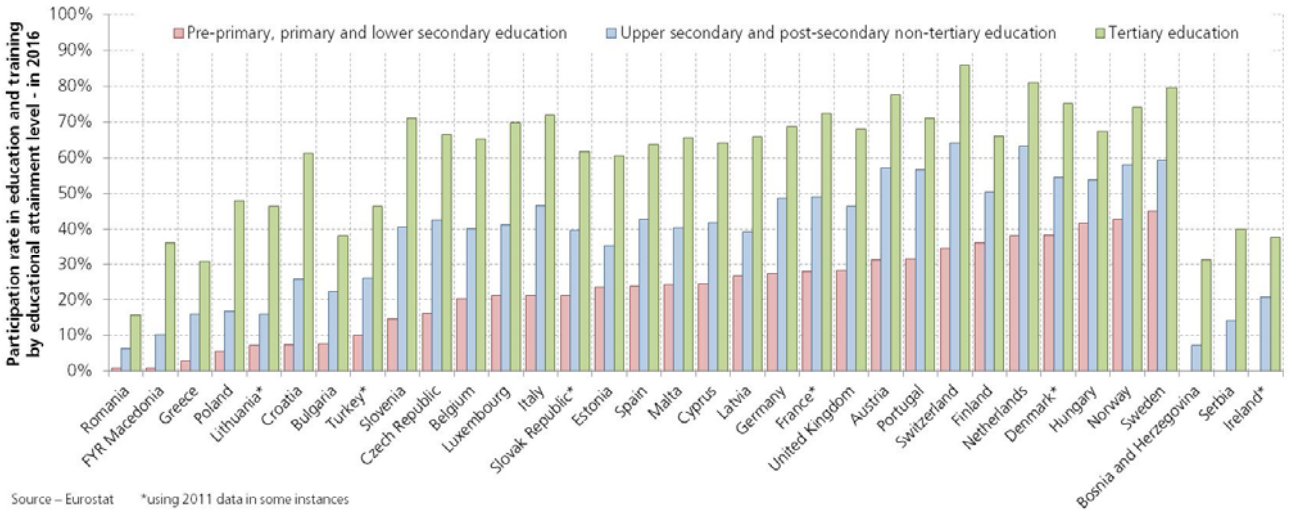


Source – EuroStat *using 2011 data in some instances

Regardless of the type of training a person acquires, what is evident is that those who are initially less educated are less likely to access any kind of training in adult-life – see Figure 19 below. Tertiary and secondary educated people are much more likely to participate in training (tertiary more likely on average). Those without secondary education rates have worryingly low rates in most European countries[15]. This may exasperate existing socio-economic and generational differences between people as lower-educated people have less opportunity to make up for lower skill sets.

[15] When data is available

Figure 19 – Participation in education/training by educational attainment level

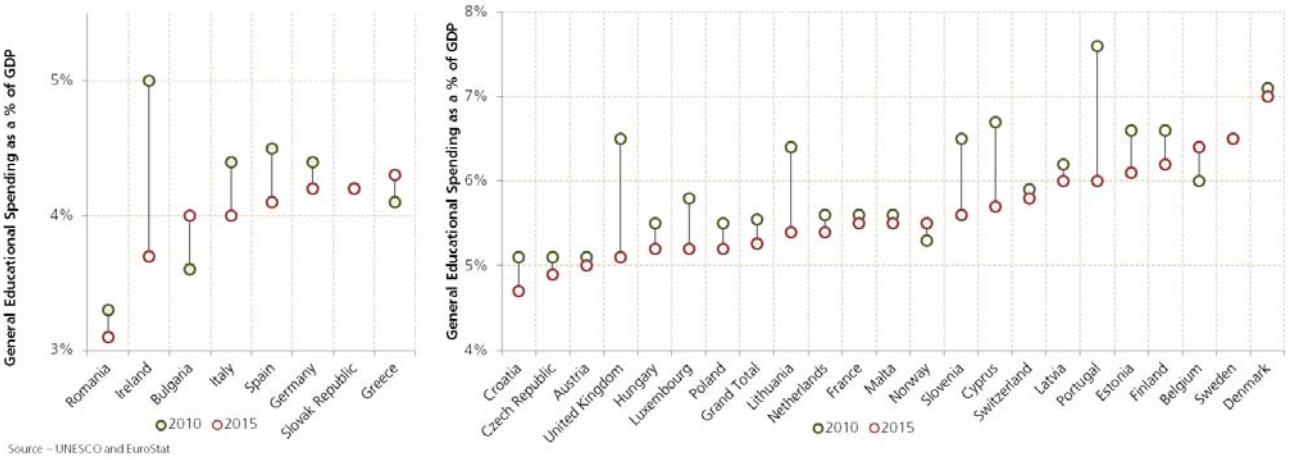


3.4. Financing Channels for Education

Educational systems in Europe primarily depend on public resources to fund current expenditure and investments. Since the 2008 financial crisis and the ensuing fiscal consolidation programmes in many countries, public financing has dropped for all types of public services. While education spending has not seen the deepest cuts relative to other sectors, it has still dropped (see Figure 20 below) – more precisely, after the crisis spending levels actually remained stable for a time, before starting to decrease around 2013. The initial stability stemmed from budget rigidities (i.e. budgets were set before the crisis) and from the fact that public authorities worked to avoid cutting educational spending.

In the midst of the economic difficulties, the European Commission called for countries to increase long-term educational investment in order to ensure access to a quality educational system that can help fight unemployment, boost economic growth, and create a more cohesive European continent (EC 2015, EC 2014). Public authorities recognise this imperative and have been working to address these funding shortfalls – but clearly difficulties exist.

Figure 20 – General government spending on education as a % of GDP (in 2010 and 2015)



Public financing of education in Europe?[16]

In most European countries public financing accounts for an overwhelming amount of the overall funding in the educational system (for all levels of education). Educational funding allocation depends on the level of fiscal decentralisation; funding decisions and transfers can be made by either a central authority, by a local/regional authority, or by a mix of both. There are a varied number of systems in Europe concerning the funding responsibilities of different levels of government. It is well beyond the scope of this paper to fully detail these different systems. That being said, a few common features emerge on the division; for instance teaching staff resources are typically allocated either from a central authority (e.g. typically a Ministry/Department, etc. of Education) or partially shared with the local/regional authority. While resource transfers for operational activity (resources needed for the year to deliver educational services) and capital goods generally involves two, in some cases three, levels of authority (which means that funds typically originate from a central authority, are then transferred to a local authority or another intermediary, before benefiting the actual school). (EC/EACEA/Eurydice 2014).

Regardless of which level of government is making the decision, funds are allocated in an effort to achieve three overarching and interlinked goals: adequacy, efficiency, and equity. Adequacy meaning the necessary level of investment; efficiency meaning to ensure education is effective in producing results (given the level of education spending); and equity meaning to guarantee fair access to all (Toscano 2013). In addition, many school systems utilise a series of assessments which examine the relationship between input (level of investment, teacher-to-pupil ratios, classroom size) and output measures (ex. educational attainment, years of schools, students' performance in literacy/maths/etc., etc.). Naturally such assessments are challenging, but ultimately crucial to ensure that the returns to educational investment guarantees increased educational opportunities for all children.

A second and equally important element is how to allocate the initial educational funds to achieve equitable and quality access for all. For public spending priorities (teaching staff, operational and capital goods), public authorities use either a funding formula[17] or a system of budgetary approval[18]/discretionary determination[19]. For teacher resources and operational goods, typically a funding formula is used, while large capital investments are often more discretionary (where ministries determine fund allocation to local authorities on a case by case basis) (EC/EACEA/Eurydice 2014).When it comes to funding individual schools to meet their specific needs, more precise criteria are put in place. Some authorities have only limited sets of criteria to determine resource allocation (e.g. pupil-staff-ratio), while the majority have a larger range of criteria that take into account the geographical location of the schools, how socioeconomically disadvantaged it is, and pupil characteristics (including socio-economic background). Application of such criteria may result in a school needing additional funds to meet its individual needs. (EC/EACEA/Eurydice 2014).

Supplementing public financing

From a recent historical perspective, the most significant share of the average 2008-2011 spending on educational institutions (as a % of GDP) came from public funding in all European countries[20] (see Figure 21 below). As has already been stated, public funding of education has dropped in recent years after years of economic decline/stagnation resulted in limited fiscal space for maintaining historic spending patterns (and in

[16] This is a summary of the work the European Commission, EACEA, and Eurydice that was described in the report untitled "Financing Schools in Europe: Mechanisms, Methods and Criteria in Public Funding".

[17] Formula funding typically "uses defined criteria and applies a universally agreed rule to these criteria to set the amount of resources to which each school is entitled" (EC/EACEA/Eurydice 2014).

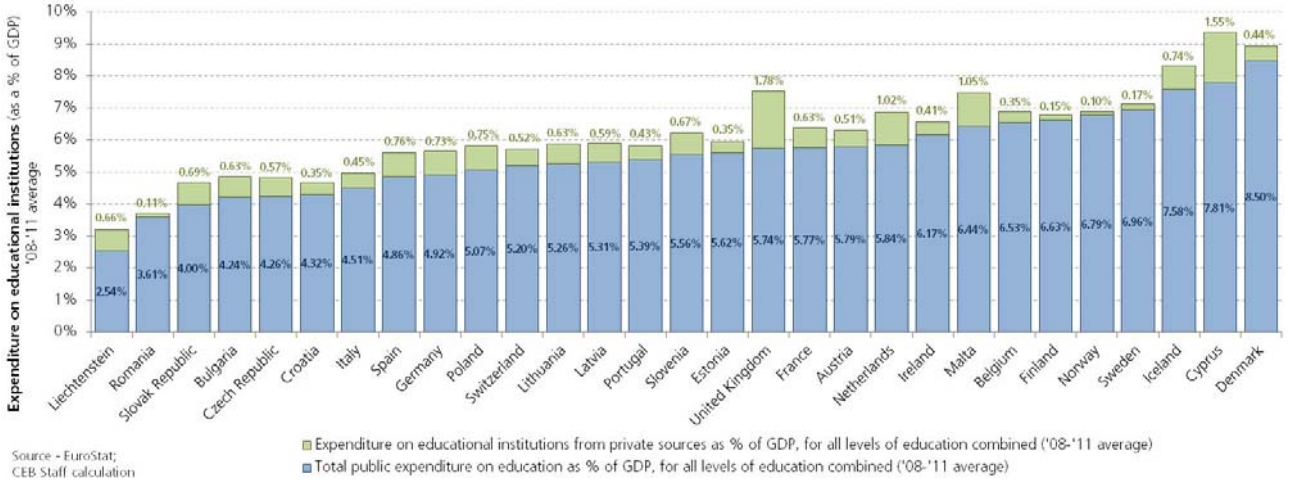
[18] Budgetary approval "involves awarding resources to authorities/schools in line with a budget they have drawn up themselves for approval by the responsible public authority". (EC/EACEA/Eurydice 2014).

[19] Discretionary determination: "… in this system, the amount of resources is determined by the authority concerned. It is fixed without having to refer to any other authority, meaning that there is no set funding formula to calculate the amounts awarded, and that an estimate of needs and the corresponding allocation take place on a case-by-case basis" (EC/EACEA/Eurydice 2014).

[20] Due to data limitations not all countries could be included in Figure 21.

some cases due to stringent fiscal consolidation programmes). Thus, in spite of social limitations, there is renewed interest in utilising private sources of funding as a means of shoring up budget constraints.

Figure 21 – Expenditure on educational institutions by source



The historically limited role of private funding is understandable (and in many countries private funding came from households). Public funding of education is key to ensuring that school access is a public good, inclusive and equitable for all. In addition to the private sector funding sources that have been used the past, new innovative investment tools can also ensure that the investments are socially beneficial.

This section focuses on a select number of sources of private financing that can work to supplement public financing. Each one is vital in a modern day public authority arsenal of financing tools that aim to achieve the criteria of adequacy, efficiency and equity in school investment. The list of funding sources is according to how "socially optimal" the investment can be:

1. **Social Impact Investment - social impact bonds** are a relatively recent financing innovation where an authority issues a bond with an explicit social requirement for the bond to be repaid.
2. **International Financial Institutions/Regional Development Banks** are often mandated to support the development goals of a public authority. In some cases, such as the CEB, with the explicit objective of helping an authority achieve social development goals.
3. **Household-support** is often required in many countries, especially in pre-primary education, to boost the financial support that educational programmes may need on a day to day basis. Parents are keen to support their children whenever they can, and the collective efforts of households can have collective social benefits (i.e. communities work to help lower-income families). Many countries offer subsidies/funding to support poorer families.
4. **Public-Private Partnerships (PPPs)** have been used in many countries as a means to provide certain education-linked services (including support services). While in principle PPPs can be a means to help access the necessary capital, the educational outcome results have been mixed, and can lead to increasing educational inequalities among different groups.
5. **Capital markets** are a necessary and indispensable part of how authorities obtain the necessary funds to achieve their social development goals. However, capital markets are governed by defined market forces and incentives, and thus investments are based on obtaining financial returns. While authorities can shape their investment plans to use capital markets funds for social goals, the capital markets will still require returns, regardless of social impact.

Capital markets

While governments typically utilise their own revenues (taxes) and, in the cases of local governments, a mix of own revenues and central government transfers (typically block grants), these can be supplemented by borrowing additional funds from financial markets. Certain capital-intensive educational spending, such as the construction of schools, requires large amounts of initial financing. Central and local governments may find themselves without the necessary liquidity to fund the initial costs and look to capital markets to obtain supplementary financing.

The benefit of capital markets is that they have long-term repayment schedules which thus ensure that funding can be spread out over a long time horizon, and can ensure a continuous flow of uninterrupted funding. Although this aspect is beyond the scope of this paper, for further information one can refer to the CEB's previous work on "Investing in Public Infrastructure in Europe: A local economy perspective" which summarises, the different options available to public authorities[21] in accessing the financial markets, including the risks (such as taking on an unsustainable amount of debt when strict fiscal borrowing rules are not applied).

International Financial Institutions (IFIs)

While capital markets are part of a modern basket of funding options for governments, the actors in those markets may be reluctant to invest in public services as there are considerable up-front costs and a potential for limited financial returns. However International Financial Institutions (IFIs), such as the CEB, tend to have explicit mandates to help governments at all levels achieve long-term development goals. IFIs tend to work on a co-financing model (that is they pay for a share of the project in partnership with the public national authorities). IFI involvement tends to make a project less risky, which can attract private sector involvement. In addition, IFIs can bring to a project a host of additional benefits such as technical advice, risk mitigation guarantees, co-financing vehicles, and even help in designing an educational project to ensure it effectively delivers the highest social return. Concerning the latter point, the CEB's own social investment mandate is particularly relevant. In effect, the key aim of CEB funded projects is to ensure that the investment delivers the highest societal return. In the case of education, the Bank works with governments to guarantee that educational services are of the highest quality, are effectively able to deliver educational outcomes, and work to ensure equality of opportunity by improving access to the most disadvantaged groups.

Household-support

Access to early childhood education typically comes from both public and private sources. While the public sector often provides the bulk of the funding to ensure equitable access for all (particularly for low socio-economic groups), private households may supplement public services to ensure that their child receives the full benefit of early-childhood programmes. Contributions from private households may not even be voluntary, as some programmes may begin as free services only later to require households to provide additional funds for additional services (e.g. For extra hours) (Belfield 2007, European Commission/EACEA/Eurydice, 2015). To ensure that this financial burden does not put additional stress on low-income households, governments typically offer vouchers and subsidies to ensure access to early childhood education (European Commission/EACEA/Eurydice, 2015)[22]. Funding can come from various channels, such as fund raising from the local community (donations, social clubs, etc.), or trust funds created within the government revenue system to ensure a portion of funding is earmarked for early-childhood education (Belfield 2007). In addition, governments may work with local NGOs to provide early-childhood education and obtain grants and loans from international sources (such as IFIs that can work with governments to ensure that the necessary funding is available when budgets are limited).

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[21] Primarily from a regional/local economy perspective, although at times applicable to central authorities as well.

[22] There is also a host of work on the types of maternity leave programmes and associated funds that are made available to households during this period to invest in early-childhood programmes – see Belfield 2007).

Other non-public sources of educational funding

Naturally, countries have experimented with different methods beyond the capital markets to obtain private sector funding for educational services. Given the need to ensure equality of opportunity, the utilisation of non-public sources of funding must be treated with caution.

Public-Private Partnerships (PPPs)

The public sector in some countries has utilised the private sector more explicitly, through public-private partnerships (PPPs) or variations of these. Simply defined, a PPP is when the government uses the private sector to partially or fully provide a public service. In the education system the potential advantages of public and private co-operation is that it increases the financial resources available for schools so as to allow governments focus on areas they have an advantage in, introduce competitive pressure of public service delivery, allow public education to leverage private sector knowledge, reduce the politicisation of schooling, make costs more transparent (through contracts, cost schemes, and accountability measures), and potentially promote stakeholder participation (including civil society) (Verger and Moschetti 2017). The key ways a PPP administers educational services is through vouchers schemes and charter schools. Work on measuring PPP effect on increased educational opportunity is relatively negative. The educational systems that PPP frameworks produce create an environment in which schools pick the best students who will be least costly to educate well – and thus discriminate against less able students (Gewirtz, Ball and Bowe 1995). Additionally, PPPs may generate negative externalities by creating a profit-driven mode which, when mixed with educational deregulation, may limit equity of opportunity. This may be minimised when the PPPs work with not-for-profit providers and with government oversight to ensure fair delivery (Verger and Moschetti 2017) - but further research on the efficiency of this approach needs to be undertaken.

Social Impact Financing (Social Impact Bonds)

A more encouraging from of private sector involvement can come through social impact bonds (SIB). An SIB, has all the typical characteristics of a bond (with a government issuing a bond to lenders, who will repay them with interest over a set time horizon), but with the slight difference that the repayment of the bond will only occur if the project the bond funds generates a societal return (within the bond's maturity).

SIBs have a unique advantage in that they allow the public sector to fund specific social projects (such as education) which have long-term societal returns, and allow them to be scaled up and even coordinated by relevant institutions to ensure that objectives are met. SIBs are measured strenuously to see if the impact has been achieved (e.g. student exam performance). Education has a unique history in SIB issuance, as it was one of the first sectors to be targeted. Initial results from cases show positive results. One SIB that targeted early childhood education in the USA saw that the students who attended the SIB-funded pre-school programme required fewer special educational services and remedial services after finishing (Goldman Sachs 2015). This naturally resulted in budgetary savings during the later stages of the educational system. An additional programme in Manchester, United Kingdom, provides resources to help 11-14 year olds obtain after-school care by a local authority. The social impact was to provide an environment where the young students could be monitored and encouraged to develop academically outside school, thus minimising deviant youth behaviour (Centre for Social Impact Bonds 2017).

Conclusion

Educational inequalities in Europe look sizeable and prevent individuals from overcoming income inequality. In many countries there are limited educational opportunities for many lower-income individuals resulting in lower wage growth, uncertain employment prospects, and decreased socio-economic outcomes.

Educational differences between socio-economic groups arise from two primary reasons; first, parental education is a strong predictor of an individual's own educational outcomes. The ability to overcome that familial background indicates that there is intergenerational mobility within a society; typically, unequal societies have low levels of intergenerational mobility. **The second reason stems from the educational system itself** which should work to ensure equitable and inclusive access to high levels of education for all. The outcome of an individual's time in education (i.e. how much they learned) is a function of their individual circumstances (parental background, neighbourhood effects, gender, age, ethnicity, etc.) and their own personal effort. While the latter is very difficult to change – from a policy and investment perspective – the former can be changed, by creating fair and inclusive educational systems that do not discriminate access based on socio-economic background and that provide a minimum quality standard.

Despite efforts in almost all European countries to create equitable educational systems, shortfalls continue to exist. Those in the bottom of the income distribution have lower secondary and tertiary school completion rates and often have lower educational outcomes in science, reading, and mathematical subjects. **While regional and country differences exist as to the severity and magnitude of these educational attainment/outcome disparities, in every country lower income individuals always perform worse than their richer counterparts. Conversely, the inability of low income individuals to obtain higher educational outcomes translates into real world economic differences**; lower educated individuals consistently earn less than highly educated individuals and have lower average employment rates. Even more worrying is that the less educated individuals are less economically resilient to economic shocks. The recent 2008 financial crisis painfully shows this; low income individual employment levels have been severely depressed, while higher educated individuals, as of 2016, have seen their employment levels recovered; it is important to note that regional differences exist, especially in Southern Europe where income and employment recoveries look far off for all people.

The public sector response to educational inequality has been made difficult by the weak economic recovery of the continent that has prevailed until recently. In most countries, educational spending levels are much higher than 2001 (the starting point of this report's analysis), but spending levels took a hard hit after the 2008 crisis and have only begun to slowly recover in recent years. Unfortunately, the drop in public spending on education will contribute to widening educational inequality unless it is altered soon. As this paper outlines, public spending has differing effects to minimise educational inequality depending on which level of education it is targeted.

The largest education spending returns come when countries invest in pre-primary education, when educational differences first begin to show between those who can and cannot access pre-primary education; at this stage, children can learn the basic skills and learning habits for formal primary education. At later stages, public investment returns are smaller, as more money is needed to help socio-economically disadvantaged students "catch up" with their richer counterparts. However, at primary and secondary education level of schooling, the main problem is in the vast material differences between poor and rich background schools. Lower-income individuals often attend schools that are materially deprived, in poor physical condition and often with less qualified/experienced teachers. Thus investment at this stage should ensure that regardless of socioeconomic background all students have access to the same high level of quality teaching and resources. Lastly, investment in post-secondary education should ensure that individuals have access to tertiary, vocational, and adult learning opportunities. However, expansion of post-secondary education (especially tertiary level) can at times just be an expansion of more educational opportunities for the already well to do/highly educated. Thus,

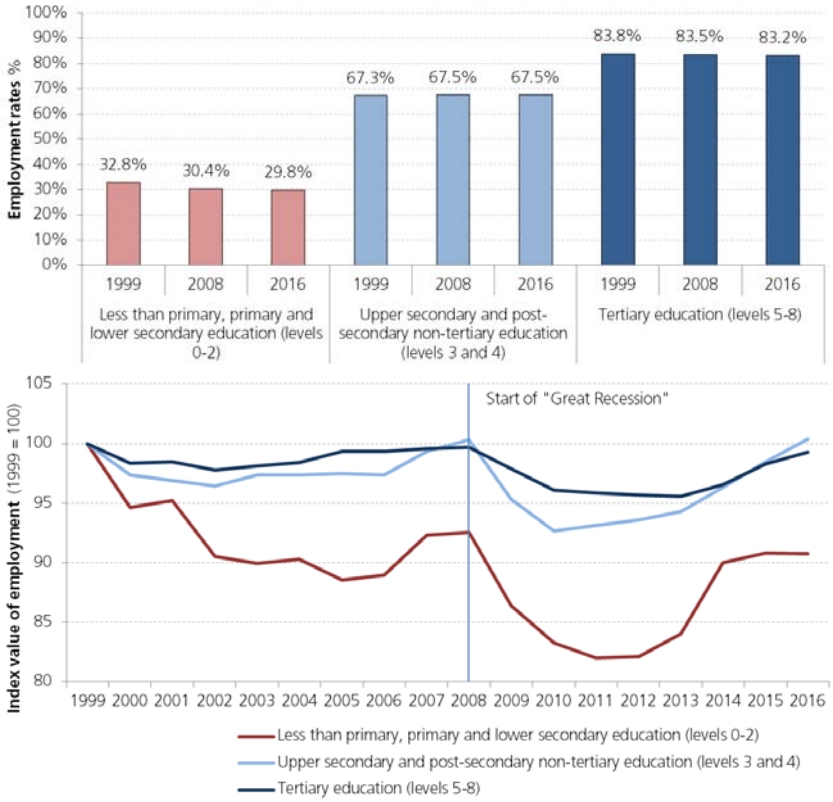
increases in public spending on post-secondary education must include expansion of available financial resources to lower-income individuals to help them access post-secondary educational opportunities. **Moreover, investment in adult-learning**, which serves to help people continually develop new skills, **is crucial** to ensure that they can remain competitive in a fast changing labour market.

The task of increasing public spending to meet the investment challenges at all levels of education may appear daunting, especially under fiscal pressure. Most educational investment and spending come from the public sector, and in most countries those coffers have been hard hit. While countries often apply numerous forms of assessments, funding formulas, etc. to ensure equitable allocation of existing funds, in some cases these efforts have fallen short from a funding perspective (i.e. lower-income schools are still material deprived). **However, public sectors have a range of choices to draw upon to supplement their financing that can help meet educational investment needs** such as: social impact investment, social impact bonds, the use of favourable lending terms from international financial institutions and regional development banks such as the CEB, increased use of household-support (collective action by the community to help poorer households), the use of (with caution) private-public partnerships for certain educational support services, and increased use of capital markets to raise needed funds.

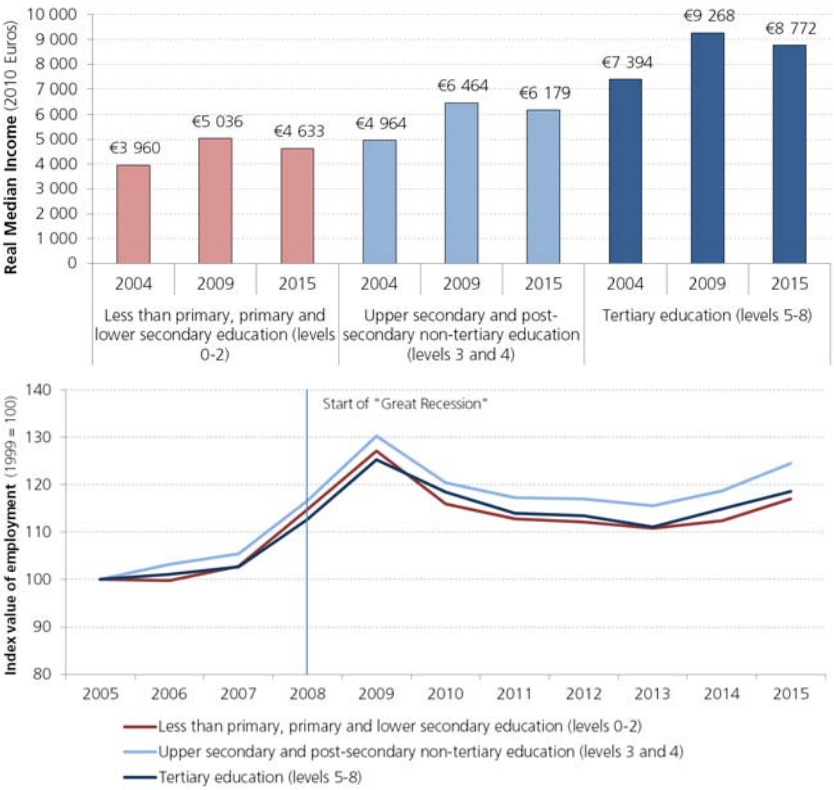
The current educational inequalities in Europe are still too marked, even though many European countries are actively working to ensure the right policy and investment mix is enacted to minimise those inequalities. Supporting efforts to minimise educational inequality not only minimises income inequality, but increases the human capital, democratic participation and overall social cohesion of the whole of a society.

Appendix 1: Employment and Income Statistics by Educational Attainment

Appendix 1.1 - Eastern Europe (employment by education)

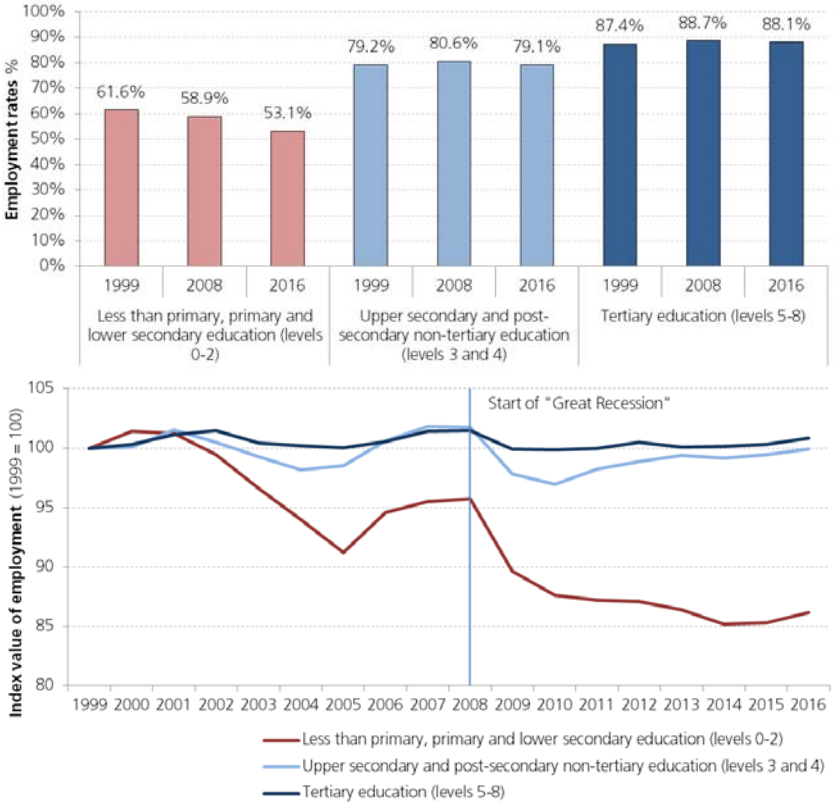


Appendix 1.2 - Eastern Europe (income by education)

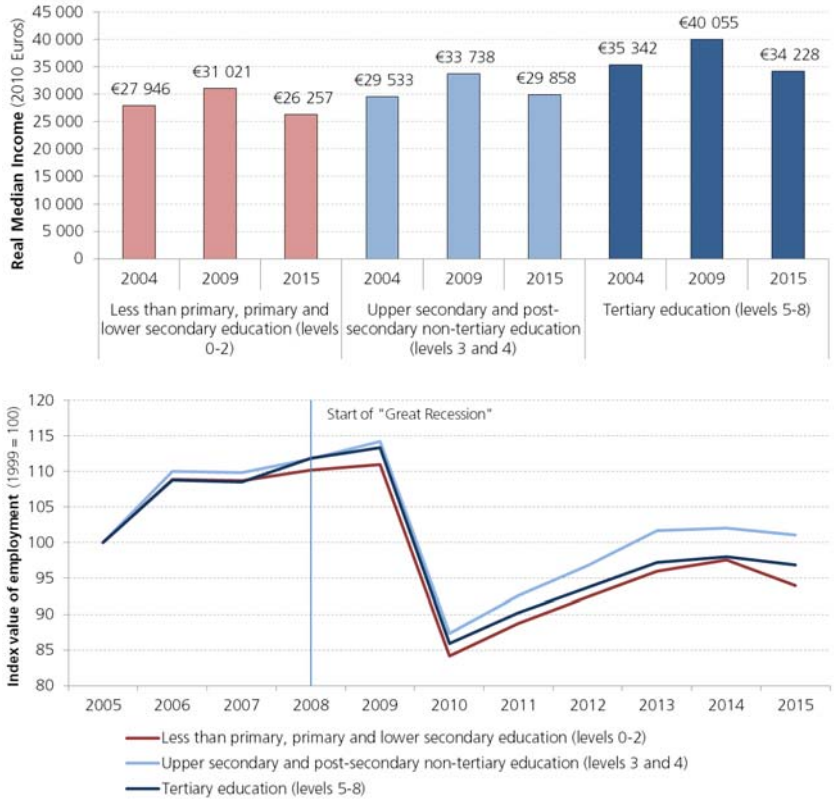


Source - EuroStat; CEB Staff calculation

Appendix 1.3 - Northern Europe (employment by education)

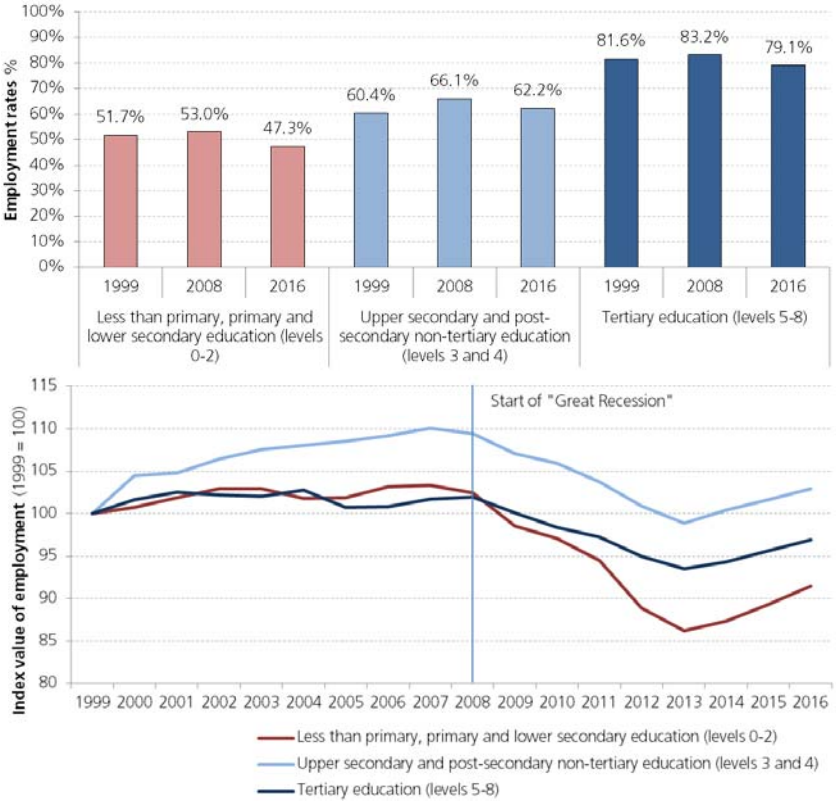


Appendix 1.4 - Northern Europe (income by education)

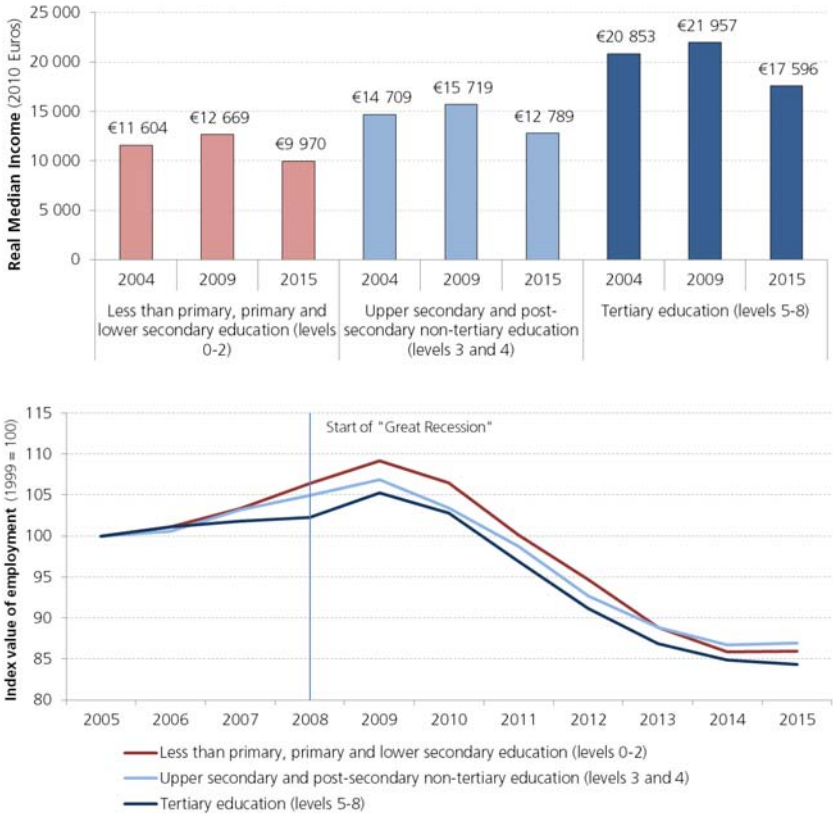


Source - EuroStat; CEB Staff calculation

Appendix 1.5 - Southern Europe (employment by education)

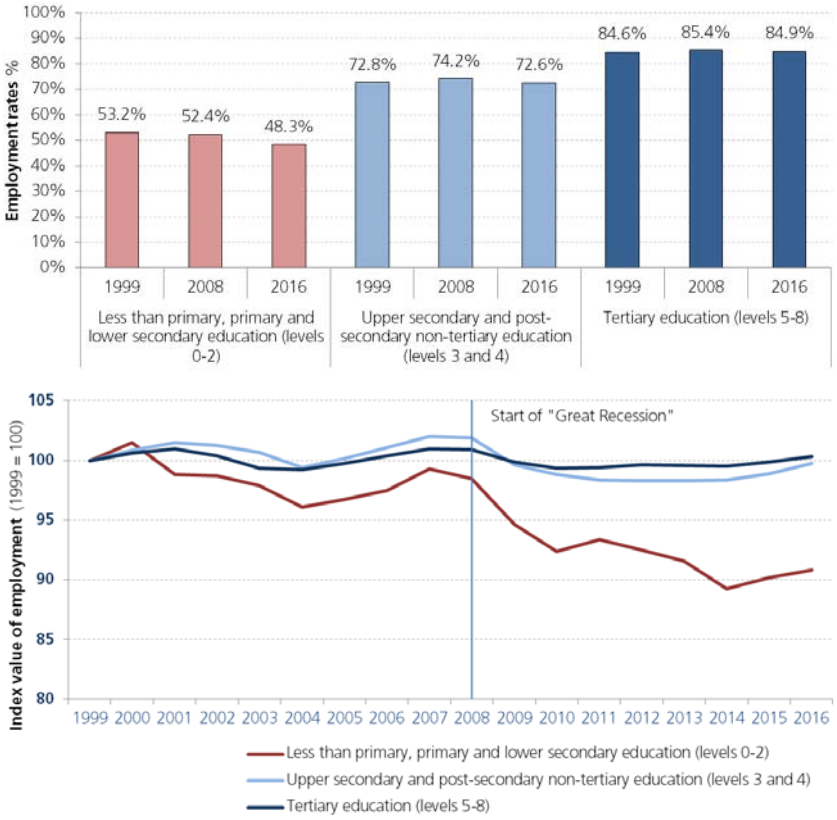


Appendix 1.6 - Southern Europe (income by education)

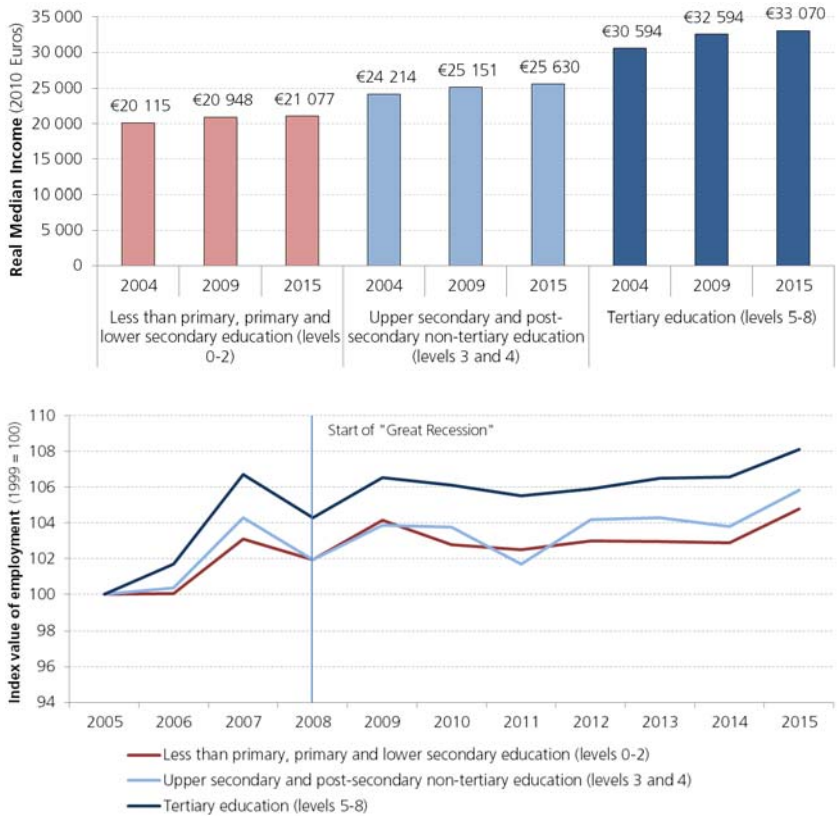


Source - EuroStat; CEB Staff calculation

Appendix 1.7 - Western Europe (employment by education)



Appendix 1.8 - Western Europe (income by education)



Source - EuroStat; CEB Staff calculation

Appendix 2: CEB Lending to Education

Education is a fundamental social right embedded in the principles of the Council of Europe, bringing significant benefits to both individuals and society. On a collective level, an educated and skilled workforce is essential for a country's competitiveness, particularly in today's knowledge economy. On an individual level, educational attainment brings socio-economic gains to people in the form of higher income, better health, longer lives, civic engagement, life satisfaction and social inclusion.

Scope of action

The CEB takes action at all levels of the education system, whether in preschools, primary and secondary schools or universities. The Bank can finance the construction and modernisation of school and university establishments (**Case Studies 1&2**), including sports and cultural equipment, housing for school and university students, vocational training infrastructure as well as the provision of teaching equipment and learning materials. Given its social mandate, the CEB also supports investments that seek to target disadvantaged groups such as immigrants and refugees (**Case Study 3**) in order to facilitate their integration in society and later in the economy.

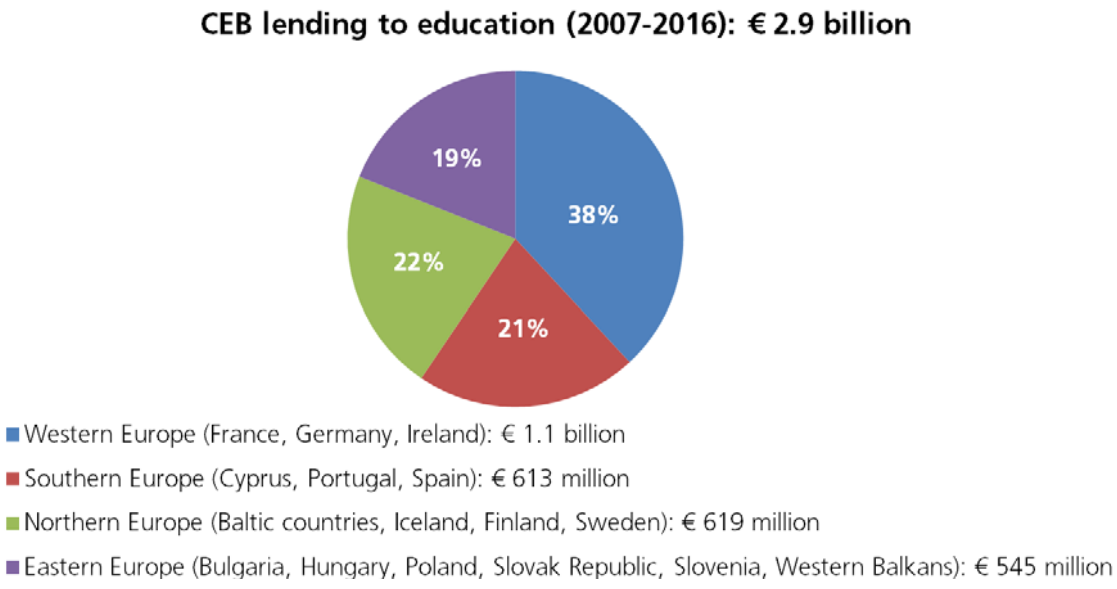
The CEB can also finance investments involving scientific research and development. Furthermore, the Bank finances programmes providing assistance in the training of specialised staff in the social and education sectors, programmes for unemployed and disadvantaged populations, programmes for professional reconversion in declining economic sectors, natural or ecological disaster prevention for members of the civil protection forces, as well as various training programmes for civil servants and government officials.

Amounts approved and disbursed

From its creation to end-2016, the CEB approved close to € 7 billion and disbursed € 4.7 billion in loans to the education sector, representing a stable share of 11% relative to total CEB loans approved and disbursed over the same period. Even though the roots of the Bank's financing in favour of the education sector date back to 1956, this sector of action has become more significant since the mid-1990s and especially so in the last ten years.

	Loans approved	Loans disbursed
1956-2016	**€ 6.7 billion**	**€ 4.7 billion**
1956-2006	€ 3.7 billion	€ 2.6 billion
2007-2016	**€ 3.0 billion**	**€ 2.1 billion**

Geographic distribution



Sectoral distribution

CEB lending has mainly contributed to developing physical infrastructure and equipment in the education sector but soft-side investments, such as professional development, including lifelong learning programmes, have also been coupled with infrastructure development. Hard and soft investments have thus both played a crucial role in the development and functioning of education systems in CEB member states.

The first education projects financed by the CEB initially focused on supporting infrastructure and equipment needs in vocational training (France, Greece, Italy, Portugal and Turkey) and primary schools (Greece). During the 1980s and early 1990s, education projects added a focus on higher education (Turkey). Since then, the CEB has supported infrastructure investments at all levels of education: from kindergartens in Bulgaria, Montenegro and Romania to higher education in Cyprus, Poland and Serbia.

The CEB has participated in the construction and rehabilitation of primary and secondary schools in Iceland, Italy, France and Portugal. In line with its social focus, the reconstruction of schools in war-affected areas was addressed in Croatia and Bosnia and Herzegovina. Romania and "the former Yugoslav Republic of Macedonia" requested support in developing their sports halls and physical education facilities.

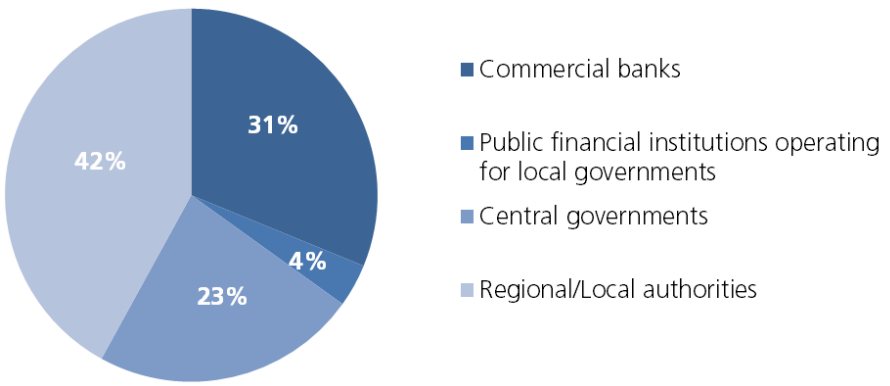
The construction and rehabilitation of child day-care centres and school facilities have also been financed with local authorities in Finland, Norway and Sweden through multi-sector programmes. The Bank has also contributed to the renovation of student housing in Estonia and to energy savings in higher education and science establishments in Lithuania. The CEB has successfully implemented several projects combining hard and soft elements, for instance, in Albania, Cyprus, Hungary, Romania, Serbia and Spain.

Distribution channels

The CEB has implemented education projects mostly with central governments within national sectoral policies. The Bank has also diversified its portfolio and financed a number of multi-sector projects with an education component with local authorities and local banking sectors.

During the period 1957-2016, 24% of CEB borrowers were private financial institutions, i.e. commercial banks, while 76% were public, i.e. central, regional or local public administrations (68%), public financial institutions operating exclusively/mainly for local governments (6%) and public development banks (2%). During the last ten-year period (2007-2016), the public/private distribution of borrowers tipped more in favour of the private sector (69/31).

CEB borrowers in the education sector (2007-2016): € 2.9 billion



From a geographic perspective, in Western and Southern European countries, education projects have mostly been implemented through commercial banks. In CEB target countries, borrowers in the education sector have been almost exclusively central authorities. In Scandinavian countries, the main distribution channels for education lending have been public financial institutions operating for regional/local authorities. In five countries, namely Finland, Germany, Iceland, Poland and Spain, the CEB has operated directly through local authorities.

Grant assistance

Grants to the education sector can be allocated via the CEB's Social Dividend Account (SDA), the Spanish Social Cohesion Account (SCA), the Norway Trust Account for the Western Balkans (NTA) and the CEB's consultancy budget. A total amount of € 11.5 million in such assistance has been allocated to education projects implemented in the following countries:

Type of grant assistance	Amount	Countries
Interest rate subsidies (SDA)	**€ 9 million**	Albania, Bosnia and Herzegovina, Croatia and Romania
Technical assistance (NTA, SCA, CEB's consultancy budget)	**€ 0.5 million**	Albania, "the former Yugoslav Republic of Macedonia" and Serbia
Grant contributions (SDA)	**€ 2 million**	Bulgaria, "the former Yugoslav Republic of Macedonia", Georgia, Republic of Moldova and Romania

Case Study 1: Pre-school and primary education facilities

Case Study 2: Secondary and tertiary education facilities

Case Study 3: Targeted investments in favour of the most disadvantaged

Case study 1. Pre-school and primary education facilities

Developing pre-school education in Montenegro (2013)

Objective: the construction of 7 new preschool units and rehabilitation of some 10-15 existing preschool units in 4 municipalities (Podgorica, Ulcinj, Bar and Plevlja) in line with the Government's "Strategy for Early and Preschool Education (2010-2015)"

Borrower: Government of Montenegro / Ministry of Education and Sports

Beneficiaries: children aged 0-6 years and teachers

CEB loan: € 10 million, covering 59% of the total cost of € 17 million

CEB grant support: € 46,900 allocated in the form of technical assistance from the CEB's consultancy budget

Social effects:
The importance of investing in early childhood education has been confirmed by numerous research studies that attest to its positive impact on the well-being of children and their learning outcomes. More equitable child outcomes result in the reduction of poverty and promote an increase in female labour participation, thus bringing improved social and economic development for society as a whole. It is estimated that half of all intellectual development potential is established by age four. Therefore, investing in early childhood development is the starting point for investing in human development and in a country's future workforce.

The aim of this investment is to increase enrolment ratios in preschools through the expansion of their physical capacity, which will enable the introduction of new and advanced programmes and services that can meet the needs of children of all age groups. 1,600 children aged 0-6 years are expected to benefit directly from the construction of the new preschool units and approximately 7,925 children enrolled in the preschool education system in the municipalities concerned should benefit indirectly from improvements in the physical infrastructure. In a larger context and longer perspective, this is expected to positively affect the enrolment rates and performance indicators for primary education.

"Madrid schools" (2011)

Objective: the construction, renovation (including equipment and furniture) and extension of pre-school, primary, secondary and vocational education buildings and related infrastructure

Borrower: the Autonomous Community of Madrid

Beneficiaries: student population (around 27,000) and teachers of the Autonomous Community of Madrid

CEB loan: € 100 million, covering 17% of the total revised cost of € 622 million

Social effects:
Co-financed together with the European Investment Bank, the project was part of the programme (covering the period 2008-2012) by the Comunidad Autonoma de Madrid, "Madrid Centros Escolares" (Madrid Schools), aimed at addressing the main structural shortcomings in the education system, such as the insufficient and deteriorated school estate and limited integration/availability of new information technology.

Although the project covered investments at all pre-university levels, the major part of the investments were implemented in favour of pre-school and primary education facilities. In addition to i) expanding the capacity of pre-university schools (to reflect the rapid change in population distribution across the region), and ii) to improving learning conditions for pupils and working conditions for teachers, the project also had a very positive environmental impact due to the improved energy efficiency of the buildings.

Case study 2. Secondary and tertiary education facilities

Investment programme of Seine-Saint-Denis "education, families", France (2013, 2014)

Objective: the renovation and expansion of existing school infrastructure, sports equipment, day-care facilities and centres for maternal protection in the county of Seine-Saint-Denis

Borrower:
- Société Générale (1st phase)
- Département de la Seine-Saint-Denis (2nd phase)

Beneficiaries: population of Seine-Saint-Denis, mostly users of the public facilities covered by the project (pupils, teaching and administrative staff, families with children up to the age of six)

CEB loan:
- Approved in 2013, € 107.9 million, covering 50% of the total cost of € 217.3 million (1st phase)
- Approved in 2014, € 200 million, covering 37% of the total cost of € 546 million (2nd phase)

Social effects:
Given the challenging socio-economic context of Seine-Saint-Denis serving some of the most deprived and diverse multicultural populations in France, the social impact of the programme is high. The investment programme primarily helps improve access to and the quality of services and public facilities.

The first phase of CEB financing (2013-2015) allowed for the construction/rehabilitation of 8 lower secondary schools, most of them located in "sensitive urban zones", through a public-private partnership contract with Société Générale. In order to promote sustainability and energy efficiency, all new buildings meet High Environmental Quality standards. Around 5,000 pupils should benefit from the new infrastructure.

The second phase of CEB financing (2015-2017) covers two components: Education and Families. Within the Education component (90% of the investment programme), investments cover the construction and renovation of lower secondary schools and sports facilities to ensure and promote equity in access to quality environments. The Families component (10% of the investment programme) includes investments in the construction and rehabilitation of day-care centres and centres for maternal-child protection.

Supporting education reform and infrastructure in Albania (2005, 2006)

Objective: i) "Tirana Schools Development and Rehabilitation Program": the construction of 7 new basic and secondary schools and the rehabilitation of 12 existing schools in Tirana; ii) "Education Excellence and Equity Program (EEE-P)": quality improvement in learning conditions for all students and increased enrolment in general secondary education, especially for the poor (both projects in collaboration with the World Bank)

Borrower: Republic of Albania through the Ministry of Finance

Beneficiaries: students and teachers

CEB loan:
- Approved in 2005, € 12.4 million, covering 65% of the total revised cost of € 19.2 million
- Approved in 2006, € 11.3 million (revised), covering 23% of the total revised cost of € 50 million

CEB grant support: € 6.3 million allocated from the SDA in the form of interest-rate subsidies

Social effects:
The first project contributed to improving learning conditions in about 17% of existing schools in Tirana and increased the number of basic education schools by 12%. It had a direct impact on the then 16,500 students enrolled in those schools who represented about 25% of total students enrolled or about a third of those enrolled in basic education (grades 1-9). The 7 new schools provided increased capacity for 6,000 students. By reducing overcrowding and providing an improved physical environment for schools, the project has contributed to increasing the capacity of education infrastructure and improving learning conditions in Tirana.

Co-financed by the CEB, the World Bank and the European Investment Bank, the second project supported a comprehensive reform reaching all education levels, with a focus on secondary education. It allowed for the rehabilitation of 518 classrooms in 22 schools throughout the country, ensured that all new schools are equipped with the necessary laboratories, computer classrooms and libraries, and provided the necessary pedagogical science material for all secondary schools in the country.

Case study 3. Targeted investments in favour of the most disadvantaged

Developing school infrastructure in the city of Malmö, Sweden (2016)

Objective: the expansion of compulsory school facilities in Malmö

Borrower: the City of Malmö

Beneficiaries: children (6-15 years old) attending the various stages of compulsory schooling

CEB loan: € 160 million, covering 38% of the total cost of € 420.5 million

Social effects:

The City of Malmö is the third largest city in Sweden with 323,000 inhabitants and a constantly growing population. Education plays a very important role in the integration of migrants in a city where some 35% of the total population are born abroad. While Sweden has always had a large immigrant population, the country had to cope with an unexpectedly large influx of migrants in 2015: 163,000 asylum seekers arrived on its territory putting national systems under pressure. Despite the recognised efforts and policies of the Swedish Government to integrate migrants into society, a gap remains between immigrants and residents, whether relating to children's school results or access to the labour market.

According to estimations, between 2016 and 2019, the population of Malmö is estimated to grow by 33,000 people, about 25% of whom are expected to be asylum seekers under the age of 15. The aim of the municipal investments is to rehabilitate and expand existing compulsory school buildings and to build new facilities to accommodate the increased number of students. In terms of numbers, the additional 8,000 new places to be created by end 2019, representing a 29% increase.

Supporting municipal investments in education in Helsinki, Finland (2013)

Objective: the construction of 15 new and additional buildings, and the renovation and retrofitting of 86 existing facilities (covering around 25% of all educational premises in Helsinki)

Borrower: the City of Helsinki

Beneficiaries: pupils and students (including refugees and immigrants)

CEB loan: € 110 million, covering 37% of the total cost of € 294 million

Social effects:
The Programme has contributed to the implementation of the Investment Plan of the City of Helsinki (2013-2017) responding to the need to improve educational infrastructure and to provide higher standards of education services. The programme has also played a role in preventing social exclusion.

The social effects include:
- improved and modernised studying conditions for 14,700 pupils, aged 6-19 (representing around 20% of all pupils and students in the Helsinki area)
- upgraded infrastructure meeting the required standards in terms of energy efficiency
- a response to demographic and immigration trends leading to an increase in the number of pupils enrolled at all level educational levels
- an innovative environment that stimulates and improves learning results
- improved social integration of immigrants and refugees, as all schools follow the procedures for allowing the integration of foreign cultures in Finnish society.

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