

Chapter 12. The Policy Response: Education

Daniele Checchi, Herman G. van de Werfhorst, Michela Braga and Elena Meschi

Abstract

We examine policies that may help to combat educational inequalities in the competences achieved (i.e. quality of education). Using cross-sectional data we demonstrate the existence of correlation between several institutional characteristics of educational systems and student achievement, including early tracking, vocational orientation, and forms of national standardization. When we look at mere schooling we can adopt we take a more longitudinal approach to educational policies. Thanks to new data collection, we describe various policies to combat inequality in educational attainment, both in terms of distributions and in terms of inequality of educational opportunity by social groups. Finally, we encompasses the relationships between the whole set of educational policies, educational distributions and income inequality. By complementing contemporary EU SILC data on educational and earnings attainments with comparative student achievement data from the 1960s onwards, we examine to what extent educational policies affect the quality and quantity of education, and how these educational distributions relate to the level of income inequality. In the concluding section discusses the potential opposition to the implementation of these policies.

1. Introduction

In order to analyse the role of educational policies with respect to observed inequality in earnings and incomes, one needs to investigate separately the relationship between educational policies and educational achievements, and the relationship between educational achievements and the distribution of earnings and incomes. In this chapter on the policy response in the field of education, which complements chapter 5 of this volume on educational distributions, we examine the relationship between educational policies, the distribution of education in terms of attainment and achievement, and the distribution of income and earnings. By focusing on both attainment and achievement, we make the conceptual distinction between quantity of education (i.e. the level of educational attainment) and the quality of education (i.e. student achievement on tested skills). The broad research question that guides our overview of recent scholarship on the matter is: to what extent is there evidence of a relationship between educational policies, the quality and quantity of education and the distribution of income?

In the following section 2 we examine policies that may help to combat educational inequalities in the competences achieved (i.e. quality of education). In this section we also demonstrate the relationship between several institutional characteristics of educational systems and student achievement, including early tracking, vocational orientation, and forms of national standardization. Due to the lack of data overtime, these relationships are examined using cross-sectional variations across countries.

Then, from section 3 onwards, we take a more longitudinal approach to educational policies. In this section we describe various policies to combat inequality in educational attainment, both in terms of distributions and in terms of inequality of educational opportunity by social groups. This section presents measures of educational policies across time for most European countries, mostly relying on published work by Braga et al. (2013). We distinguish between the following types of policy, partly relying on a classification of Krueger and Lindahl (2009): the structure and length of pre-primary education; length of compulsory education; school tracking; school autonomy; school accountability; teacher qualification; student funding; university autonomy and selectivity. It is shown to what extent policies have changed across Europe.

Then, in section 4 we examine how educational policies and institutions come about. How can we explain why certain policies emerge? Following a framework borrowed from Iversen and Stephens (2008) the importance is examined, among others, of political factors such as the colour of government.

Section 5, finally, encompasses the relationships between the whole set of educational policies, educational distributions and income inequality. By complementing contemporary EU SILC data on educational and earnings attainments with comparative student achievement data from the 1960s onwards, we examine to what extent educational policies affect the quality and quantity of education, and how these educational distributions relate to the level of income inequality.

The concluding section discusses the potential opposition to the implementation of these policies.

2. Policies to reduce inequalities in competences

We start by a general discussion of how the educational institutional structure in a society is related to the level of inequality in the quality of education, measured by competences possessed by students or adults. In this section, we cannot exploit temporal variation, because surveys on competences are relatively recent, and we are therefore forced to rely on cross-country variation. Most of what is presented here derives from Bol and Van de Werfhorst (2013a, 2013b). It should be noted that the number of countries that are analyzed is sometimes larger than the pool of countries under investigation of the larger GINI project.

The field of comparative stratification has made a distinction in three broad dimensions on which educational systems may differ (Allmendinger 1989; Kerckhoff 2001; Shavit and Müller 1998). First, educational systems differ between countries, and across time within countries, in the **extent to which students are separated in clearly distinct educational curricula** during secondary education. The most evident form of separation is in the form of *tracking*, in which students are sorted into different tracks catering students of different learning abilities. The age at which such tracking occurs varies substantially between countries.¹ Tracking may have severe consequences for the distribution of skills, both with regard to the mean and the dispersion.

Second, it has been considered relevant to distinguish the **standardization** of the educational system. Standardization is a general term referring to the extent to which education meets the same standards nationwide. It can include standardization of *input*, in the form of curricular standardization, standardization of teacher quality, or standardization of resources across schools. Standardization of input has also been referred to as *centralization* (Horn 2009), or as an antonym of school autonomy. Standardization can also refer to standardization of *output*, most clearly marked by the existence of central exit examinations (sometimes called *accountability*, Horn 2009). These two types of standardization can have very different impacts on the distribution of skills. Standardization of input is generally assumed to equalize performances of students across different schools, thereby reducing the variance, and possibly also reducing the average performance of students. Standardization of output may however also increase competition between schools, certainly if school performance is used to hold schools accountable for their performance. This may lead to enhanced variability between students, and increased average performances.

Third, educational systems have been classified according to the **vocational orientation** of the system. Vocational orientation often refers to the upper secondary school system, where some countries have educational systems with vocational schools with strong links to the labour market, whereas other countries lack such an occupationally relevant orientation.

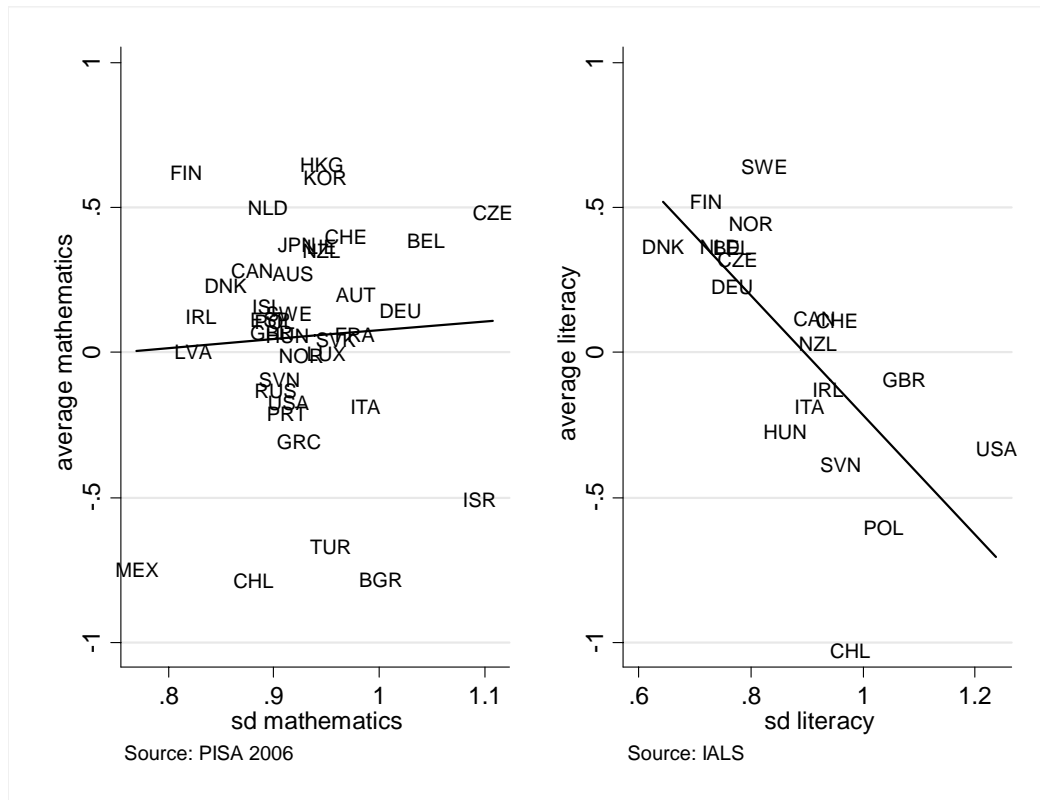
For the assessment of the relevance of educational institutions on the distribution of quality of education (mostly based on student surveys at the mid-teen age - TIMSS, PISA) we initially review some of the existing literature with a cross-country perspective, and then provide additional new evidence. Earlier research has interpreted the association between average student performance and the dispersion in performance as a trade-off between equality and efficiency (Hanushek and Wössmann 2005, Micklewright and Schnepf 2007; Van de Werfhorst and Mijs 2010). Such a trade-off would exist if higher average performances would coincide with larger dispersions. If evidence is found for such a trade-off, educational policy may have to choose between enhancing the average skill level and reducing inequality among students.

If the relationship between average performance and dispersion in performance is examined using cross-sectional data on a large number of countries, there is little evidence for the existence of a trade-off (Hanushek and Wössmann 2005; Brown et al. 2007; Micklewright and Schnepf 2007). In figure 1 achievement scores are displayed, both in terms of country averages (standardized at mean=0 and standard deviation=1 across all individuals) and country standard deviations. This is done for mathematics collected in the PISA 2006 data among 15-year olds, and on literacy among 16-35 year olds in the International Adult Literacy Survey of 1994-1998. The figure shows that there is no association between a country's average position on mid-teenage mathematics achievement and the dispersion across students. With regard to adult literacy we even see a negative

¹ In Germany children are separated as early as the age of ten, in the Netherlands at the age of twelve, and in Finland and Sweden much later at the age of sixteen. Countries have sometimes also changed their level of tracking, most notably in the 1960s and 1970s, and these changes are exploited for identification in the following paragraphs. For instance, in Finland, France and England an early tracked educational system was abolished and replaced with comprehensive secondary education in the 1970s.

relationship between averages and dispersions. So there is no evidence for the trade-off hypothesis that higher average performance can be achieved by allowing for greater dispersions.

Figure 1 – The association between equality and efficiency in mid-teen mathematics and adult literacy



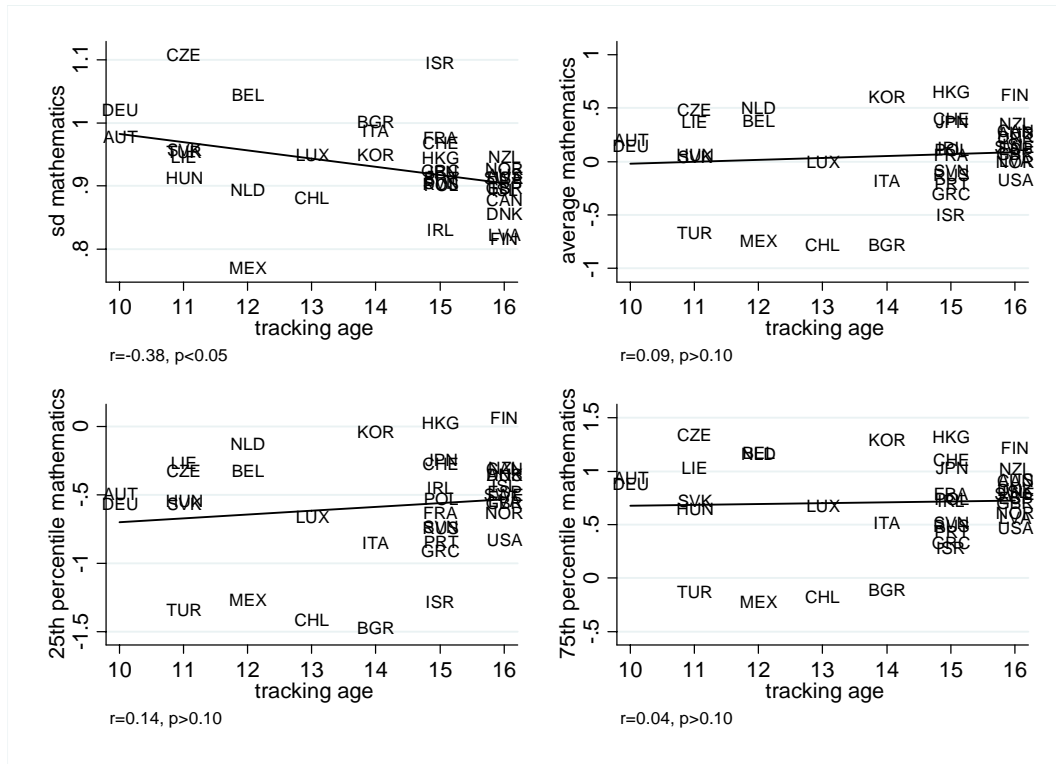
So how do the three dimensions of institutional variability relate to inequalities and average performances? First of all, the evidence on the association between educational policies aimed at the tracking of students and the dispersion in test scores is mixed. Although the most authoritative studies point to higher dispersions (inequalities) in countries with more strongly tracked educational systems, also when a difference-in-difference design is used to study change between primary and secondary school (Hanushek and Wössmann 2005; Huang 2009), some other studies have found contradicting evidence (Duru-Bellat and Suchaut 2005; see Van de Werfhorst and Mijs 2010 for a review).

When we consider alternative inequality measures in relationship with tracking age, we find mixed evidence. Using PISA 2006 data for 38 countries, figure 2 shows bivariate relationships at the country level between the age at which tracking starts² and the standard deviation in mathematics performance, the average mathematics performance, and the mathematics performance at the 25th and 75th percentile. It appears evident that only the standard deviation is statistically significantly related to the age of selection; countries with later tracking have lower standard deviations. The average performance is not enlarged, nor is the 75th percentile. So whereas proponents of tracking may claim that education can be organized more efficiently by tracking in order to maximize performance (or at least maximize performance at the top), we do not see evidence of this in a cross-sectional design for either the average or the top performers. There is however another form of inequality in learning that is strongly related to tracking: inequality of educational opportunity by

² Tracking age is assessed through the OECD Education at a Glance database, and is referring to the cohort that is analysed.

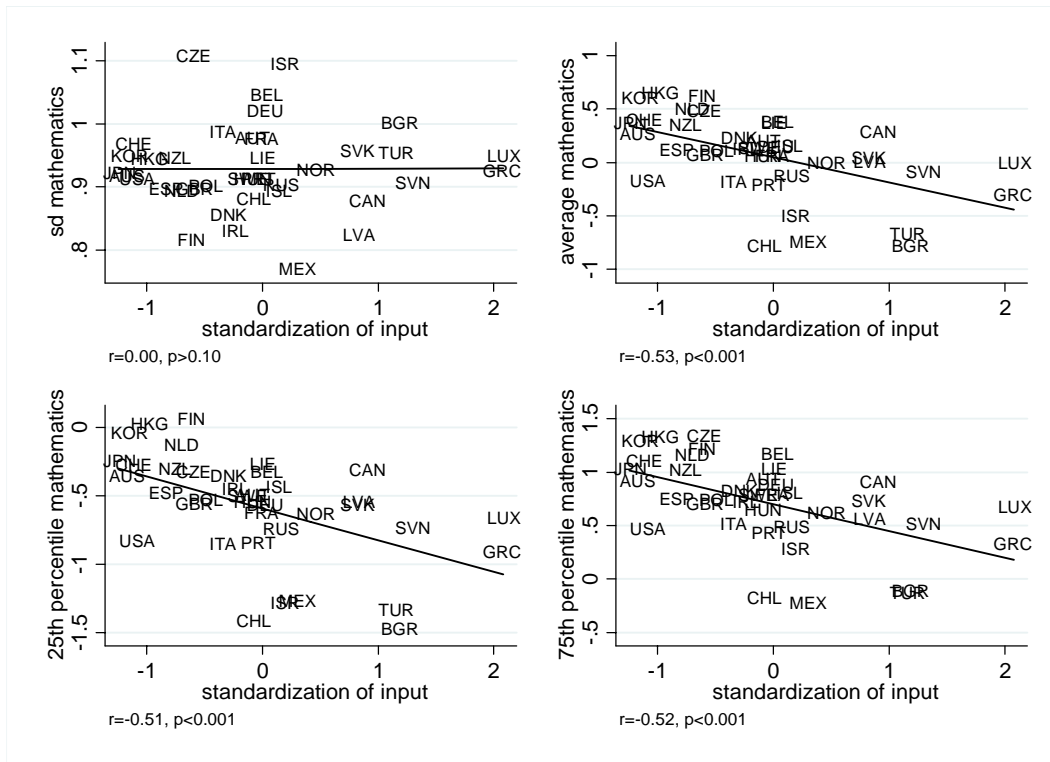
social origin. Generally it has been reported that systems in which students are tracked earlier, have larger skill inequalities between students of different origins than systems with comprehensive education (Brunello and Checchi 2007; Bol and Van de Werfhorst 2013b; Marks 2005; Horn 2009; Schütz et al. 2008).

Figure 2 – The distribution of mathematics achievement by age at which tracking starts



With regard to the relationship between standardization of input and skill distributions the pattern is like what is seen in figure 3 over the same sample of 38 countries. Standardization of input is measured by aggregating school principals' responses to the PISA questionnaires to the country level. Questions are asked about who decides about the textbook used, who determines which courses are offered, and what is taught in these courses. One of the answer categories to these questions was that the state or country decides on these issues. Using a dichotomized version of the variables (state/country versus other), the country-level aggregations of these items can be taken, after which a scale can be produced using factor analysis. The average skill quality and the skill level at the bottom and the top of the distribution are negatively correlated to standardization. Other research has demonstrated similar findings using difference-in-difference designs that capture changes in regulations on school autonomy. School autonomy (i.e. a lack of standardization of input) is found to enhance average performance because it leads to efficiency gains due to stronger competition between schools (Hanushek, Link and Wössmann 2013). The dispersion in student achievement (as measured by the standard deviation) is not related to the level of standardization of input in the cross-sectional data depicted in figure 3, because the entire distribution is shifted.

Figure 3 – The distribution of mathematics achievement by level of standardization of input



Finally, the distribution of skills is assessed in relation to the existence of central exit examinations. Following earlier work (Bishop 1997; Bol and Van de Werfhorst 2013a) we define central exit examinations by the joint occurrence of the following conditions: (i) exams have real consequences, rather than just be symbolic; (ii) the degrees given after successful examination are tested against an external standard; (iii) the standardized exams are organized by subject; (iv) the exam does not just have a pass/fail outcome, but has various potential outcomes on a continuum; and (v) the exam is meant for secondary school students, and a large majority of the secondary school population is covered. Most countries score either a 0 (no central exit examinations) or a 1 (with central examinations), except countries in which there is regional variation in the existence of central exams. For these countries we took the proportion of regional entities (provinces, states) in which there are central exit examinations. The variable can be constructed for 36 countries. Figure 4 shows the statistical relationships with average performance, the standard deviation and performance at the 25th and 75th percentile. From the figure it emerges that only the standard deviation in mathematics achievement is significantly related to the existence of central exit examinations; in countries with centralized exams the dispersion in mathematics achievement is lower. Average performance and the performance at the bottom and the top are unrelated to whether a country has a centralized examination system. It should be noted that other research has found a positive association between centralized exams and the average performance (Jürges et al. 2005; Wössmann, 2003, 2005).

Figure 4 – The distribution of mathematics achievement by central exit examinations

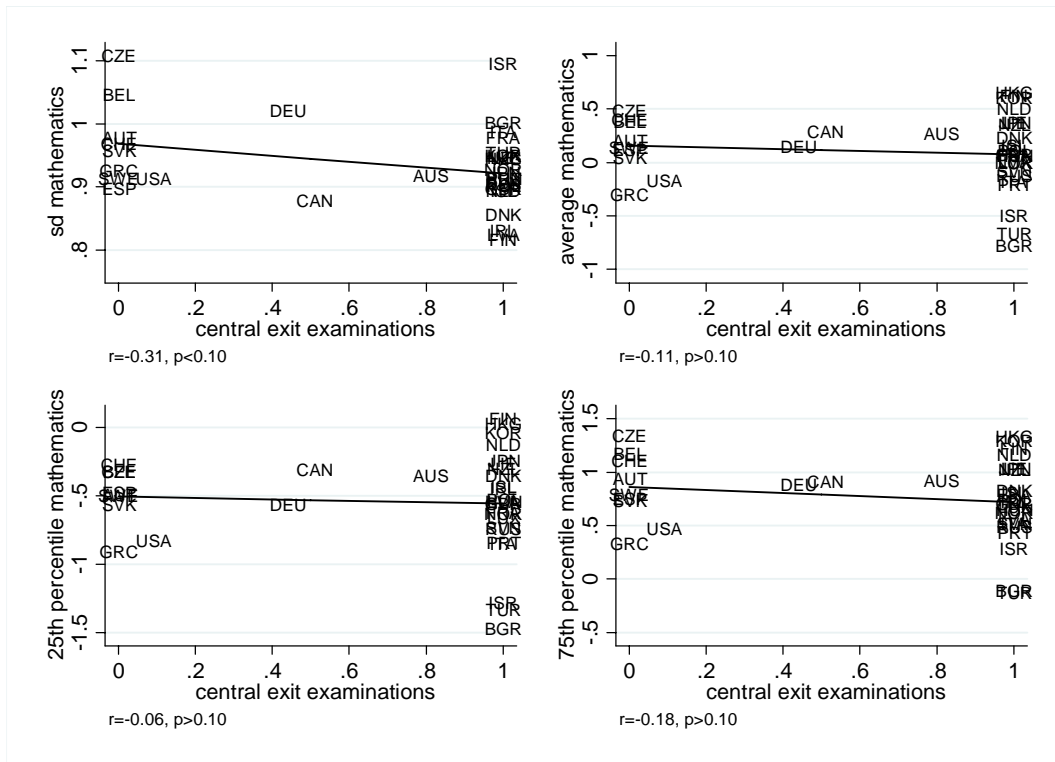
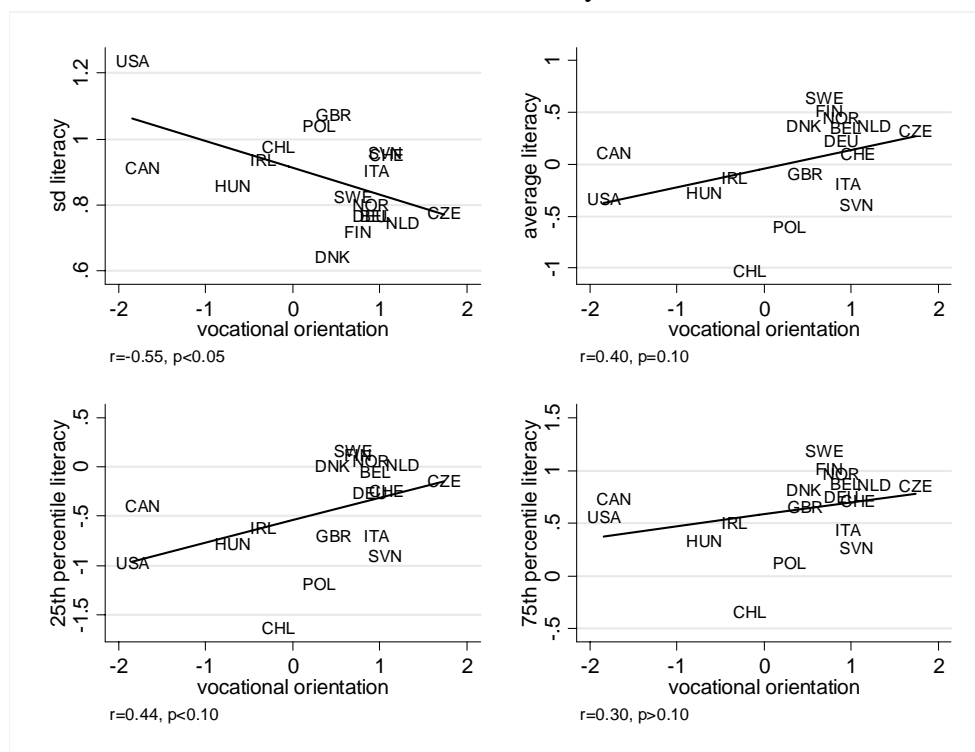


Figure 5 – The distribution of young adult literacy by the vocational orientation of the educational system



The relevance of the vocational orientation of the system for the distribution of skills should be investigated at a later age than the standard mid-teenage tests of PISA or TIMSS. The vocational orientation is usually assessed by the proportion of students within upper secondary education that is enrolled in vocational education. In Figure 5 we therefore relate the vocational orientation of educational systems to the distribution of literacy as assessed in the International Adult Literacy

Survey data of 1994-1998. These data are rather old, but at least available for a reasonable number of countries. The relationship between vocational education and the dispersion of skills appears to be quite strong. In societies with a strong vocational sector, the dispersion is lower, particularly because the bottom of the skills distribution performs rather well. This finding substantiates that vocational education can function rather inclusively, by promoting achievement of the lower part of the distribution. A similar conclusion has been reached by Brunello and Checchi (2007) where they consider early tracking as harmful to social equality, whereas vocational education promotes equality of opportunity.

Some evidence has also been presented on the relevance of school system characteristics for other types of outcomes than academic ones. For instance, Janmaat (2011) has shown that the between-school variance in civic engagement is larger in tracked educational systems than in comprehensive educational systems. Van de Werfhorst (2007a) has examined civic participation among young adults, and found that the educational gradient in participation is stronger in strongly tracked educational systems. Also the average level of civic participation is lower in these countries (Bol and Van de Werfhorst 2013b). Koçer and Van de Werfhorst (2012) examined the relationship between tracking and vocational orientation of educational systems and opinions on income redistribution. Their study showed that early tracking is related to larger dispersions in the people's orientations towards redistribution. Potentially this could threaten the realization of consensus on important political issues concerning the income distribution in societies whose educational systems are tracking students at 'formative ages' when attitudes are formed.

Summing up the results of this section, we identify three main messages. The first is that there is no evident trade-off between average achievement in competences and its dispersion, at least during schooling time, whereas some negative correlation could emerge later in life. The second message is that postponing age of tracking may contribute to a reduction in dispersion of competences, while rising the degree of standardisation of inputs (i.e. reducing the degree of school autonomy) and/or introducing central examination seems less effective in reducing educational inequality in competences. Finally, the vocational orientation of the secondary school system, by retaining in schools the least motivated students (who often coincide with students with poorer cultural backgrounds), reduces the dispersion in competences in the adult population. Overall these findings together may lead to the conclusion that early tracking is harmful to equality and shapes antagonized interests, whereas a strong vocational sector in the education system functions rather inclusionary rather than diverging.

3. Policies to reduce inequalities in educational attainment

While the previous section took a cross-sectional approach to the study of the relationship between educational systems and policies on the one hand and the quality of education on the other, it should be stressed that educational policies can and do change across time within countries. In the remainder of this chapter we take a longitudinal approach to educational policy, and study changes in policies (this section), how the emergence of policies can be explained (section 4), and how policies, educational distributions and income distributions are related. In this section we mostly rely on the analysis which led to the published version of Braga et al. (2013). The existing literature on the expected impact of educational policies onto the distribution of educational attainment as measured by years of schooling is reviewed, mainly focussing on cross-country studies.

We classify the institutional characteristics of school systems in eight categories: structure and length of pre-primary education; length of compulsory education; school tracking; school autonomy; school accountability; teacher qualification; student funding; university autonomy and selectivity. For each of these characteristics of the school system, we shall discuss their expected

impact on educational attainment and on educational inequality, thus highlighting potential trade offs between equity and efficiency (see also the related discussion in Wössmann, 2008).

3.1 Pre-primary education

The economic literature seems to agree on the positive effects of pre-school education on both efficiency and equity of the education system. The theory behind this idea is explained in various models developed by James Heckman and co-authors describing the technology of skill formation (see Cunha et al., 2006; Cunha and Heckman, 2007, 2008 and 2009). Building on the traditional theory of human capital, they model the formation of skills as a life cycle process that exhibits both recursive productivity and dynamic complementarity. Recursive productivity means that the skills acquired at one stage are inputs into the learning process of the next stage, while dynamic complementarity implies that the stock of skill acquired in a period makes the investment in the next period more productive. Therefore investment in education at one stage raises the skills not only directly attained at that stage, but also indirectly the productivity with which educational investments will be transformed into further skills in the next stages. This implies that investments in early education are more productive than those at later stages and can thus increase the efficiency of the following learning process.

The empirical literature, mainly based on US studies, confirms that interventions in early childhood are generally efficient, especially when targeted at disadvantaged children, and that the positive effects are persistent over time (see surveys in Currie 2001 and Waldvogel 2002). Results for other countries are fewer but tend to reach similar conclusions. The cross-country evidence on the topic is significantly scander. Esping-Andersen (2004) shows that the impact of family background is smaller in countries with extensive pre-school day care. Schütz et al. (2008) find that the length of a country's pre-school education system is positively associated with cognitive performance in middle school. They also show that more extensive systems of pre-school education – in terms of both enrolment and duration – significantly increase equality of opportunity, as measured by a lower dependence of eighth-grade students' test scores on their family background.

3.2 Expansion of compulsory education

Few cross-country studies have investigated the impact of compulsory schooling legislation on the actual educational attainment of the population. Brunello, Fort and Weber (2009) exploit the exogenous variation provided by minimum school leaving age laws to identify the effect of education on earnings using data from 12 European countries. They find that compulsory school reforms significantly affect educational attainment. Murtin and Viarengo (2011) study the expansion of compulsory schooling in fifteen Western European countries over 1950–2000 and investigate the effectiveness of this policy to increase average education in post-war Europe. They regress the average years of schooling in the population older than 15 in a given country and period onto lagged compulsory years of schooling and show that the increase in compulsory schooling is a robust determinant of current changes in school attainment.

3.3 School tracking

School tracking is a specific aspect of school stratification (or differentiation). A school system is characterised by tracking when children are allocated – at some stages of their career – to different tracks, characterised by different curricula offered (generally distinguishing between academic or vocational education) and different average ability of the enrolled students. School tracking introduces therefore a selection in the schooling process either in the form of self-selection or in the form of admission based on ability tests (Brunello and Checchi, 2007). National school systems differ widely in the amount of ability tracking of students they provide in school: in the age at

which the selection takes place, in the degree of differentiation, in the share of students attending one track, in the vocational orientation of the more labour-market oriented tracks. In the majority of OECD countries, tracking takes place at age 15 or 16, but in other countries the first tracking occurs much earlier (at age 10 in Austria and Germany, at age 11 in Czech Republic, Hungary and Slovakia, at age Netherlands and Belgium at 12).

The empirical evidence has generally confirmed the inequality enhancing effect of early school tracking, while the evidence on efficiency is more mixed. Both Hanushek and Wössmann (2006) and Ammermuller (2005) adopts similar identification strategy (differences-in-differences approach using PISA and PIRLS) finding that tracking increases educational inequality. Similar conclusions are reached by Schütz, Ursprung and Wössmann (2008) who estimate the effect of different education policies, including school tracking, on equality of educational opportunity in 54 countries. All these analysis are based on student samples surveyed in the last decade or so.

When looking at life time consequences of tracking, Brunello and Checchi (2007) show that the negative effect of early school tracking on equality of opportunity persist beyond the school age, reducing intergenerational mobility. More recently, Hanushek, Wössmann and Zhang (2011) have shown that having attended vocational schools (at secondary or tertiary level) provides an advantage in the short run (represented by a higher probability of employment), which decays during the life course; for some countries, vocational education is also associated to a wage penalty. Overall, the cross-country literature suggested that early tracking accentuates the role of family background on pupils' attainment and therefore increases educational inequality. It has also points to the dis-equalising effects of tracking beyond school age, affecting labour market transition and life time income. In contrast, we are not aware of robust evidence finding beneficial effects of tracking as a mean to increase average performance.³

3.4. School autonomy

School autonomy (or decentralisation of decision making power) is expected to exert positive effects on student outcomes, because local decision-makers tend to have superior information than central government. On the other hand, where their interests are not strictly aligned with improving student achievement, local decision-makers may act opportunistically unless they are held accountable for the achievement of their students (see Wössmann 2005 for a discussion of this topic in a principal-agent framework). Few empirical papers have studied the role of school autonomy in a cross-country framework, possibly because of the difficulty of measuring school autonomy in a comparable way across countries. Wössmann et al. (2009) show that students perform significantly better in schools that have autonomy in process and personnel decisions (such as purchase of supplies, budget allocations, hiring and rewarding of teachers, textbooks choice, instructional methods, and the like). Similarly, students perform better if their teachers have both incentives and possibilities to select appropriate teaching methods. By contrast, school autonomy in budget formation and teacher autonomy over the content to be covered in class – two decision-making areas that are likely subject to substantial opportunism but little superior local knowledge – are negatively associated with student achievement. Wössmann et al. (2009) also find that the effect of school autonomy depends on the extent of accountability that affects the incentive for opportunistic behaviours. In particular, when they interact measures of autonomy with measures of accountability, they show that school autonomy is negatively associated with student achievement in systems without external exit exams (low accountability), but the association turns into positive when combined with external exit exams. No clear results are obtained over the distributions of test scores.

³ These results are largely confirmed by the empirical evidence based on country specific studies: see for example, Dustmann (2004) for Germany; Bauer and Riphahn (2006) for Switzerland; Meghir and Palme (2005) for Sweden; Pekkarinen et al. (2006) for Finland and Galindo-Rueda and Vignoles (2004) for the UK.

3.5. School accountability

Pupils' educational attainment can also be affected by the extent of school accountability, generally proxied by the presence or not of external exit exams. Cross-country evidence indicates that introducing accountability by externally testing and making students' and schools' exams public creates incentives to improve educational performance (see Bishop 2006). The results of centralised standardised exams, by being more comparable, are more valuable as signals on the job market than the results of non-central examinations. In addition, student test results can be also used to monitor teacher and teaching quality on a regular basis and the reputation of entire schools can be based on the achievement of its students, with good schools attracting good students when the results of the tests are made public. Over the last decades forms of accountability have been introduced in many countries to raise school performance. However, the impact of these policies in terms of inequality and other aspects than performance are not clear yet.

Hanushek and Raymond (2003) review the literature discussing the unintended consequences that accountability has produced: (average) teachers have reacted by narrowing their teaching focus to better performing students, ignoring other aspects of pupils' development. More importantly, public disclosure of school performance has increased their exposure; schools have become more selective, and aim at choosing the best students, in order to improve school scores, not necessarily changing the quality of the teaching. If school accountability policies are ill-designed, namely based on performance levels rather than value-added, they may give undue advantages to schools serving students from high socio-economic backgrounds. Even in the case when they are based on value added, schools may still have an incentive to exclude disadvantaged students from official exams and place them in special education or counsel them to be absent on the days of testing. These mechanisms have clearly negative consequences in terms of equity, since they imply more exclusion, higher dropout rates, and a narrowing of the curriculum. However there is a scarcity of empirical works that have specifically looked at the impact of accountability on educational inequality. Cross-country evidence is provided by Wössmann (2005): using student-level data from three international student test surveys (TIMSS, TIMSS repeated and PISA), he analyses the impact of external exit exams on student performance and finds heterogeneous effects depending on students' backgrounds, students' ability and schools' specific settings, as well as increasing effects over the course of secondary education. Using also quantile regressions to estimate the effect of central exams on student performance for students at different points on student ability distribution, he finds that the positive impact of central examination in performance is stronger for high ability students, which would tend to widen the achievement distribution.

3.6 Teacher qualifications

Measuring teaching quality is complicated because the most common observable teachers' characteristics (such as gender, age, qualifications or experience) appear to be relatively uncorrelated to (unobservable) teachers' quality as estimated from students' testing scores, once family and school effects are taken into account (Rivkin, Hanushek, and Kain, 2005). There is a large literature that investigates the role of teacher quality and teacher incentives in improving educational outcomes, considering as outcome of interest test scores (Hanushek and Rivkin, 2006).

Most of the recent policy recommendations to improve educational systems point to attracting, motivating and retaining good teachers. The possibility of attracting better applicants into the profession, combined with stimulating their effort through appropriate wage policies, explains the observed correlation between teachers pay and students performance observed in a cross-country perspective (Dolton and Marcenaro-Gutierrez, 2011).

3.7 University autonomy and selectivity

Most European countries experienced a significant expansion in tertiary education enrolment in the recent decades, without sizeable changes in the internal organisation. The vast majority of European universities are centrally organised and financed, and this reduce the internal degree of competition, especially when compared to US universities. Jacobs and van der Ploeg (2006) have clearly described the outcome of such framework: *“European universities seem more comfortable providing a decent education for all with not much selection based on national exams and/or interviews or exams set by the universities themselves. Of course, abstaining from selection may be a legitimate policy choice, but it hurts efficiency and excellence. One big consequence is that there will be less competition on academic excellence among secondary schools, especially if there is no national exam or the national exam only sets a minimum standard.”* (p.557). They advocate a greater internal differentiation among European universities, in terms of mission, funding and student selection. This can be accomplished by shifting funding to students and diminishing governmental control. Less attention is paid to the implications of increased university autonomy onto student access. By observing the American market for tertiary education, it is an easy prediction that increased autonomy/competition among European universities will lead to increased selectivity in admission to better universities, which will be probably accompanied by rising tuitions as well as expected wages (for a review of the US experience see Hoxby 2009). Less clear is the overall impact, since a raise of the signalling value of tertiary degrees may be accompanied by a rising number of applicants and/or by a rising number of seats. Even more uncertain may be the implications with respect to equality of opportunities.

3.8 Student financial support

Several studies have suggested that liquidity constraints may prevent the children of poorer households from proceeding in their educational career up to secondary and tertiary levels (for a recent review of the literature see Lochner and Monge-Naranjo 2011). The empirical difficulty in assessing the extent of constrainedness is related to disentangling the contribution of other factors (either biological and/or cultural) to generating intergenerational dependence of children choices from parental conditions. Olivera et al. (2007) reviews the existing student loan situation in most OECD countries, showing that when available, loan systems are designed not only to limit individual financial risks but also to provide a direct subsidy (through interest rate subsidisation, high income thresholds for repayment and long amortisation period). Despite this, in many countries the take-up rate remains low, students preferring part-time work as alternative source of funding. The alternative of student grants has universal coverage only in a limited number of countries (US, Scandinavia, Netherlands). They also show that the ratio of direct costs to available funds from alternative sources (loans, grants, family income) is a significant predictor of graduation rates in a panel sample of 19 OECD countries over the period 1992-2002.

3.9 Summary of the literature and additional new evidence

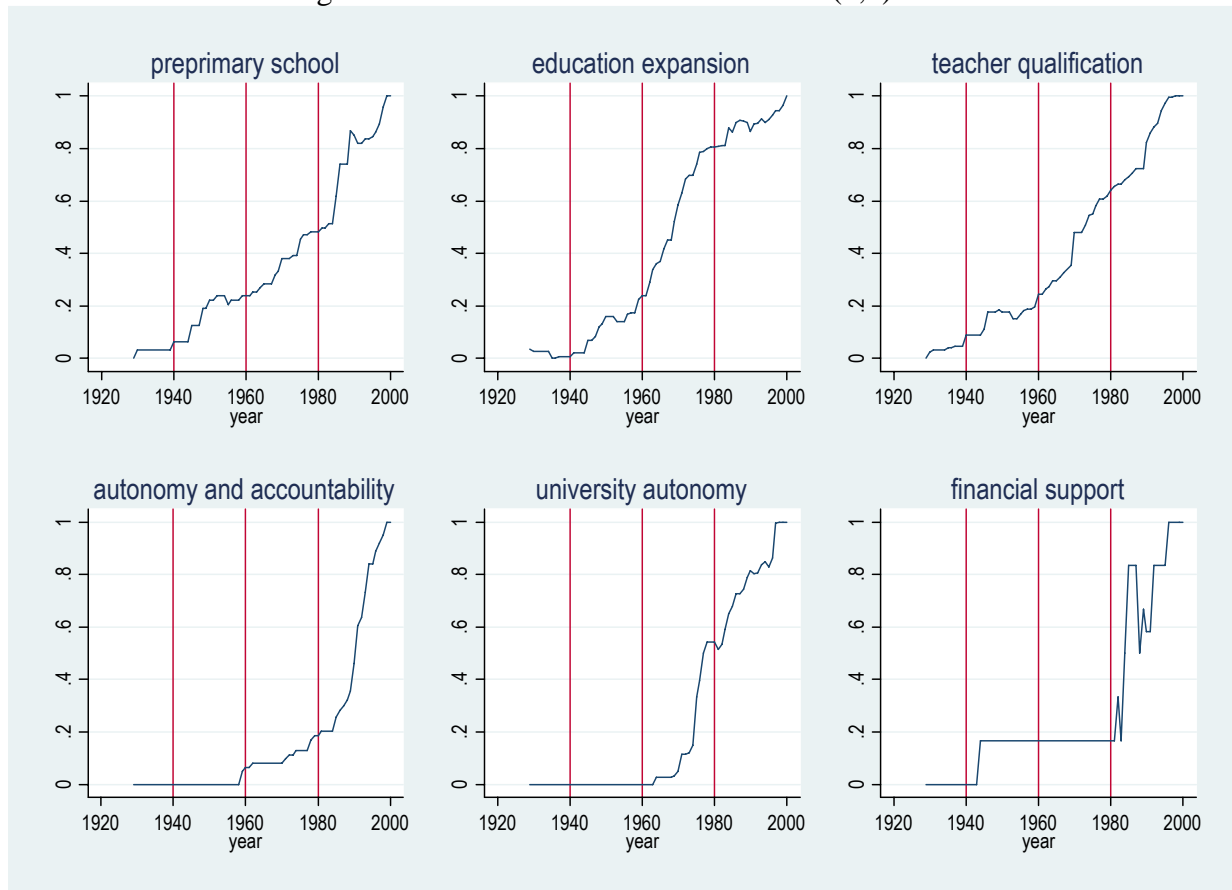
If we focus on the impact of the reviewed policies onto school inequality, we can summarise the main findings of the previously reviewed literature in table 1. We notice that some policies (like expansion of compulsory education or financial support to college) have a clear impact on reducing inequality, mostly through the raising of the bottom tail of the distribution of intended attainments, while others (especially those aiming to expand autonomies of educational institutions) may have more uncertain effects on inequality, since they foster differentiation among schools and universities, thus boosting the attainment of better endowed students at the risk of leaving behind students from weaker backgrounds.

Table 1: Educational reforms and expected impact on educational attainment

area of reform	expected impact on schooling inequality
pre-primary education	reduction (through increased educational attainment of students from disadvantaged background)
expansion of compulsory education	reduction (through increased educational attainment of students from disadvantaged background)
school tracking	ambiguous (vocational tracks have shorter duration, prevent academic enrolment but have lower drop-out rates)
school autonomy	ambiguous (adaptability to social environment, increased competition in presence of centralised control)
school accountability	increase (school differentiation, screening and sorting of students)
teacher qualification	ambiguous (better quality benefits students from poorer backgrounds but allows for greater differentiation)
student financial support	reduction (increased enrolment of students from poorer backgrounds)
university autonomy and selectivity	increase (increased signalling value of tertiary education requires a more intensive selectivity in university admissions)

In Braga et al. (2013) we have collected data on reforming activities in 19 educational areas by European government over the last century, then aggregated in six dimensions of policy actions that mostly overlap with the reviewed literature. The cross-country averages of these measures are shown in figure 6. These measures are upward trended, since by construction each reform is summed (subtracted) to another if it has the same (opposite) orientation. However, one can notice a clear sequence in the activity. The initial waves of reforms among European countries in the aftermath of World War II involved pre-primary schooling, teacher qualification and expansion of access. The latter intensified in the following decades, when many countries raised the leaving age for compulsory education and/or increased the comprehensiveness of their secondary school systems. Widening school access required recruiting more teachers, which led to reforms raising the qualification requirements to enter the profession during the same period. At the beginning of the 1980s the pressure for increasing the access to universities led many countries to widen admission rules and/or to introduce grant policies for financially constrained students. Another common trend experienced by European countries is towards increased autonomy for universities, which took off at the end of the 1970s and continued during the 1980s and 1990s. Eventually, by the end of the 1980s we also witness greater emphasis towards the accountability of the educational systems, which pushed many countries to establishing national assessment agencies.

Figure 6 – Temporal evolution of reform summary indexes averaged across countries and rescaled in the (0,1) interval



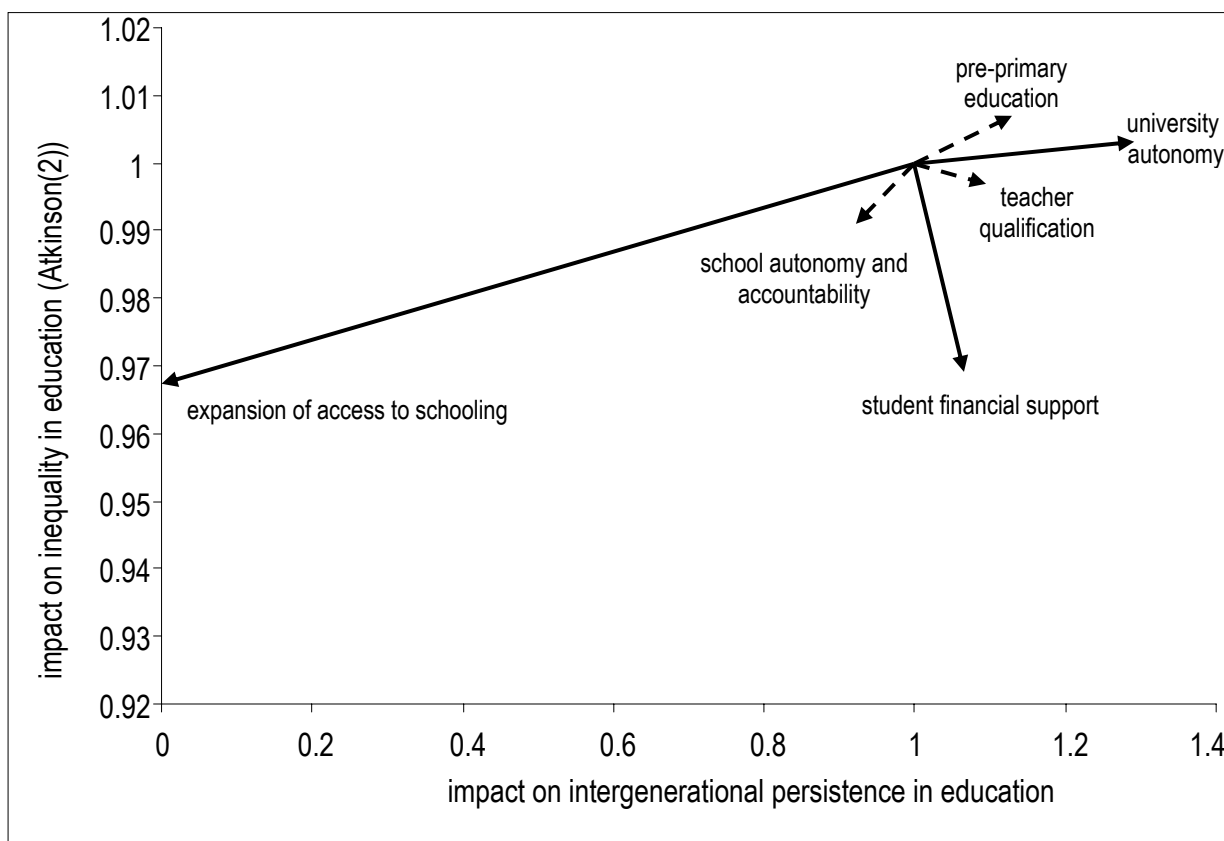
Source: Braga et al. (2013), figure 7.

These proposed measures of reforming activity were then used as regressors to account for schooling inequalities across age cohorts in European countries. Educational inequalities are measured along two dimensions: **within-cohort dispersion in years of schooling** (captured by the Atkinson index ($\epsilon = 2$) because it incorporates an inequality aversion focussing on the bottom tail of the distribution) and **across-cohort persistence** (measured by the correlation between parental education and children attainment – it can be considered as an index of inequality of opportunities in schooling).

The main results of our analysis is reproduced in figure 7, where we have reported the impact of a unitary variation of the policy activities on inequality in educational attainments (horizontal axis) and on intergenerational persistence in education (vertical axis), as estimated in the original paper. Solid lines are used when both coefficients are statistically significant, while dashed lines correspond to cases when at least one of the coefficients is statistically insignificant. Figure 7 represents a sort of “menu of policies” available to governments: they clearly show that “**expansion of access**” policies (which include expansion of compulsory education and detracking) accomplish the simultaneous goals of reducing the dispersion in the distribution of years of schooling and increasing intergenerational mobility in educational attainment. On the contrary, policies addressed to tertiary education tend to reinforce intergenerational persistence (at least according to what have been experienced in European countries over the last century): however “**financial support**” policies reduce educational inequality, whereas “**university autonomy and selectivity**” policies tend to increase it. Remaining policy measures (**pre-primary schooling, teacher qualification and school autonomy and accountability**) exhibit smaller impacts, which do not achieve statistical significance.

There are clear potential complementarities between reforms that we do not explore here and that may increase or reduce the effectiveness of specific policies: expanding pre-primary and/or compulsory education require more teachers; autonomy of schools should be accompanied by strengthening of their accountability, which may require the introduction of student testing; more autonomy for universities may imply greater freedom in setting tuition fees, which in turn require stronger financial support for students; teacher autonomy should be enhanced with an increasing degree of teacher qualification; and so on. In the literature previously reviewed the usual approach is correlating the change of *one* single policy instrument with some educational achievement (either competences or attainments). Neglecting the possible clustering of policies leads to an over-estimate of the impact of each single policy.

Figure 7 – Estimated effects on mean and dispersion of summary indexes of reforms



Source: Braga et al. (2013)

Educational policies are clearly expensive, but some are more expensive than others. Given the fact that schooling is a highly labour intensive process, we expect that most of access/expansion policies be more costly, because in general they require the hiring of more teachers, at all levels. On the contrary, policies that increase schools and teachers autonomy by decentralisation of responsibilities affect the internal organisation of the production technology, and can be relatively less expensive; however they require the financing of potential incentives, as well as the creation of assessment agencies in order to increase the accountability of the system. We thus aim to explore the cost dimension of the reforming activity of governments. Expanding the access to schools or universities, providing financial support to students, hiring better qualified teachers, all these actions implies additional public expenditure. On the other side, each reform generates a change in mean and variance of educational attainments. As long as they translate into GDP points, via growth regressions, they generate benefits accruing to the entire country.

In principle one would like to assess whether the cost of each reform outweighs the benefits, in order to provide a full evaluation of the relative convenience. Unfortunately proper data on costs of education with cross-country coverage are unavailable. One of the best sources going back to the beginning of last century is Flora et al. (1987), which unfortunately groups educational expenditure with social expenditure. Another source (Barro and Lee 2010) contains data on a quinquennial basis but at best starts in the 60's of last century only, excludes expenditure in tertiary education and takes the form of expenditure per student (primary or secondary) over GDP per capita. Eventually, the Unesco Institute for Statistics database (<http://www.uis.unesco.org/Education/Pages/education-finance.aspx>) covers almost all countries on a yearly base, but starts only from 1970's.

Aiming to provide an order of magnitude of potential costs of reforms, we evaluate costs and benefits in terms of GDP points. The aggregate expenditure in education can be decomposed into expenditure per student, student enrolment and age composition of the population. In facts

$$\frac{\text{expenditure in education}}{\text{gross domestic product}} = \frac{\text{expenditure}_{\text{prim}} + \text{expenditure}_{\text{sec}} + \text{expenditure}_{\text{ter}}}{\text{gross domestic product}} =$$

$$= \left(\frac{\text{expend}_{\text{prim}}}{\text{pupil}_{\text{prim}}} \cdot \frac{\text{pupil}_{\text{prim}}}{\text{popul}_{\text{prim}}} \cdot \frac{\text{popul}_{\text{prim}}}{\text{popul}_{\text{tot}}} + \frac{\text{expend}_{\text{sec}}}{\text{pupil}_{\text{sec}}} \cdot \frac{\text{pupil}_{\text{sec}}}{\text{popul}_{\text{sec}}} \cdot \frac{\text{popul}_{\text{sec}}}{\text{popul}_{\text{tot}}} \right) \cdot \frac{\text{popul}_{\text{tot}}}{\text{GDP}} + \frac{\text{expend}_{\text{ter}}}{\text{GDP}} \quad (1)$$

If we consider that duration of primary and secondary school are of comparable length in most countries, we can rewrite it as

$$\frac{\text{expenditure in education}}{\text{gross domestic product}} \cong \left(\frac{\text{pupil}_{\text{prim}}}{\text{popul}_{\text{prim}}} \cdot \frac{\text{expend}_{\text{prim}}}{\text{GDP}} \cdot \frac{\text{popul}_{\text{prim}}}{\text{popul}_{\text{tot}}} + \frac{\text{pupil}_{\text{sec}}}{\text{popul}_{\text{sec}}} \cdot \frac{\text{expend}_{\text{sec}}}{\text{GDP}} \cdot \frac{\text{popul}_{\text{sec}}}{\text{popul}_{\text{tot}}} \right) \cdot \frac{\text{popul}_{\text{prim/sec}}}{\text{popul}_{\text{tot}}} + \frac{\text{expend}_{\text{ter}}}{\text{GDP}} \quad (2)$$

The variable enclosed in brackets in equation (2) are available in the series provided by Barro and Lee (2010). We can therefore study the relationship of public expenditure in schooling with the summary indexes of reforms, after computing their 5-year averages in order to match the frequency of expenditure data. Not surprisingly, we find that reforms expanding access (that normally require hiring additional teachers) are more expensive than organisational reforms concerning accountability or teachers recruitment. Taking the estimated coefficients at face value, and weighting a pupil cohort 1/10 of the entire population (since our constructed dependent variable should be reweighted by the incidence of a primary/secondary school cohort on the entire population), they suggest that pre-primary reforms may cost 2.3 GDP points, while expansion reforms may cost 1.7 GDP points (this is an underestimate because we do not have information on tertiary expenditure). Reforming teacher recruitment or school autonomy does not reach one percent point.

Table 2 – Cost of educational reforms - OLS

VARIABLES	expenditure in education over GDP	Estimated Impact on GDP (β/10)
Pre-primary index	0.228*** (0.067)	0.023
Expansion of access index	0.170*** (0.026)	0.017
Teacher qualification index	0.083*** (0.012)	0.008
School autonomy index	0.099*** (0.019)	0.010

Note: 93 observations referred to 15 countries – reforms are included separately – country fixed effects included

Moving to the benefit side, back of the envelope calculation suggests that additional years of education increases the average human capital of employed workers and therefore total factor productivity. We abstract from distributional effects, which may reinforce the growth impact. Using reported estimates from de la Fuente and Ciccone (2002), table 1, one additional year raises GDP by 4 (macro) up to 6 (Mincerian) percent points among European countries (as in our sample). If we take a conservative view of 5% as return rate, we obtain the following values.

Table 3 – Benefits of educational reforms - OLS

VARIABLES	years of education	Estimated Impact on GDP ($\beta \cdot 0.05$)
Pre-primary index	1.321*** [0.357]	0.066
Expansion of access index	0.566*** [0.178]	0.028
Teacher qualification index	0.172** [0.073]	0.008
School autonomy index	0.735*** [0.147]	0.037

Note: 329102 individual observations, referred to 24 countries – reforms included separately – country and year fixed effects included.

Thus a full pre-primary reform (from 0 to 1) would raise GDP by about 6.5 points, while expansion reform would yield 2.8 GDP points. In both cases gains exceed costs. Reforming teacher recruitment produces 0.85 GDP points, almost in line with costs. Finally school autonomy reforms yield 3.6 points. This is the most cost effective reform, with pre-primary reform reaching similar cost effectiveness.

We can now conclude this section by summarising the main points concerning schooling inequalities and educational policies. The first message is that policies are effective in shaping the distribution: both the cursory review of the literature and our new evidence agree on this point. The second message is that some reforms are more effective than other in reducing inequality, irrespective on whether inequality is measured within-generations or across-generations. In particular we have shown that policies that widen the access to secondary and tertiary education are the most effective in reducing inequality. We have also highlighted the possibility of policies that increase the same inequality because they raise the selectivity in admissions. The third message concerns cost effectiveness: while more detailed data would be necessary to realize a proper cost-benefit evaluation, we have offered rough estimates that nevertheless provide an order of magnitude of these dimensions.

4. What drives educational policies

In previous sections we have shown that earnings inequality is shaped, among others, by educational inequalities in educational attainment and in competences. The question now is what accounts for country differences in their educational policies. In the companion volume, country chapters indicate that the expansion of secondary schooling has been pursued by almost all countries, while differences emerge about their strategies in widening or restricting access to tertiary education. Some countries are enlarging the access (Greece, Korea, Baltics, Sweden) while other were restricting, or at least not encouraging it (Slovenia, Spain). This may be due to several factors, among which one may list:

- a) different (ideological) opinions about the target for a college educated workforce
- b) different (ideological) opinions about the desired extent of public subsidisation

- c) different degree of state indebtedness
- d) different (equilibrium) labour market return to education

While the fourth explanation goes beyond the goal of the present chapter, because it involves the analysis of phenomena like skill biased technological change and globalisation (Acemoglu and Autor 2011), we now provide some cue to a better understanding of the other three points.

Iversen and Stephens (2008) offer a general framework of analysis. They emphasise the mutually reinforcing relationships between social insurance, skill formation, and spending on public education, identifying **three distinct worlds of human capital formation**: a first one (indicated as “Coordinated Market economies with proportional representation and Social Democratic governments”) corresponding to characterized by redistribution and heavy investment in public education and industry-specific and occupation-specific vocational skills; a second one (indicated as “Coordinated Market economies with proportional representation and Christian Democratic governments”) characterized by high social insurance and vocational training in firm-specific and industry specific skills but less spending on public education; and a third one (the traditional “Liberal Market economies with majoritarian representation”) characterized by heavy private investment in general skills but modest spending on public education and redistribution. While the first group of countries invests more public resources in higher education, the other two are rather similar in terms of less spending. However the general skills of the population at the bottom in the second group are significantly better. They attribute this difference to the incentives for general skills acquisition in vocational education (specific skills) systems for those not intending on pursuing higher education. As a consequence, earnings inequality is lowest in the first group and highest in the third one, with vocational education acting as an inequality reducing institution because it raises the level of competences of the least endowed individuals, who are also most likely to end up in the bottom of earnings distribution.⁴

Iversen and Stephens (2008) also provide evidence of the importance of political orientation of governments in selecting level of expenditure in educational policies. In the same vein, Braga et al. (2013) show that the type of educational reforms is correlated to the political orientation of governments. They test the assumption that parties with a left-wing orientation be more supportive of educational expansion policies (that they term “inclusive” policies, because they raise the mean and lower the variance of attainments), because they benefit the lower tail of the educational attainment distribution, where their supporters are largely over-represented. In addition, they may expect a more intense political participation of low class people, which should translate in stronger electoral support. Conversely, conservative parties are assumed to be more reluctant towards any generalised expansion of schooling, for at least two reasons: on one side educational expansions require an expansion in public expenditure; on the other side, they raise people expectations with respect to future life-time incomes, which may translate in higher wage pressure and rigidities. In both cases, policies are undertaken under varying external circumstances, concerning growth and availability of public resources. Parties’ differences may have been attenuated in recent years due to reduced ability to financing public expenditure (Korpi and Palme 2003).

⁴ “Information age literacy is strongly to very strongly related to all policy variables [...]. In addition, it is extremely strongly and negatively related to the degree of inequality, measured here by the Gini index for disposable household income among households in which the household head is aged 25 to 59 years old. The correlations between information age literacy and the 5th and 95th percentile scores indicate that variations in information age literacy are primarily a product of variations at the low end of the distribution, and it is there that the inequality factor plays a large role as indicated by the fact that the national average 5th percentile score is very strongly related to inequality, whereas there is virtually no relationship between the average 95th percentile score and inequality.” (Iversen and Stephens 2008, pg.621).

Our main results are reported in table 4.⁵ From this table one may observe that educational reforms classified as *inclusive* tend to be negatively correlated with a right wing attitude of parliaments. This is always true under any specification for access expansion policies, while reforms of pre-primary schooling and teacher qualification change sign according to the policy measure we use. On the contrary, *selective* policies exhibit positive correlation with right-wing parliaments (in all cases but the school autonomy index). It is then clear that political orientation of the parliament matters for the type of educational policies undertaken. The other regressors suggest that inclusive educational are more likely in richer countries/periods, given the positive association per-capita income, while public expenditure in value added seems to favour reforms. It is worth noticing that reforms associated to school autonomy and accountability do not exhibit statistically significant correlations with either the ideological orientation of parliaments nor with the availability of resources, but tend to be negatively correlated with (log of) GDP per capita. Given the inclusion of country-specific time trends, this suggests that these policies are more likely to occur in recession years.

Table 4 - Educational reform and political variables – OLS – 1950-2000

	1	2	3	4	5	6
	pre-primary	expansion of access	teachers	school autonomy	university autonomy	financial support
right-wing orientation of parliament	-0.006*	-0.026***	0.033**	0.016	0.029**	0.030**
	[0.004]	[0.004]	[0.015]	[0.015]	[0.012]	[0.013]
log GDP per capita	0.190***	0.189***	0.202*	-0.363***	-0.552***	0.467***
	[0.036]	[0.044]	[0.122]	[0.113]	[0.109]	[0.101]
government share	1.131***	0.778***	2.340***	0.117	4.528***	4.942***
	[0.181]	[0.239]	[0.868]	[0.776]	[0.831]	[0.770]
Observations	843	843	843	843	770	770
R ²	0.901	0.899	0.871	0.864	0.893	0.828
Countries	24	24	24	24	17	17

Robust standard errors in brackets - * significant at 10%; ** significant at 5%; *** significant at 1% constant, country and year fixed effects, country-specific time trend included

Despite the set of controls for confounding factors, it is impossible to claim the existence of causal links between electoral outcomes and reforming activity of governments, since reversal causality is a real issue in this type of analysis (that is, people may vote following promises that are implemented later on). However, finding significant correlations with ideological inclinations of parliament reinforces our claim that the reforming activity variables are truly exogenous for individual educational choices, and therefore they matter in shaping the distribution of educational attainment in the populations.

Some further understanding of the political process underlying the selection of educational policies can be obtained by survey on people attitude towards public expenditure in education. Busemeyer (2012) shows that high levels of socio-economic inequality enhance the conflict between the rich and the poor over public investments in education. By contrast, when access to higher levels of education is effectively restricted, the rich are more likely to support public education spending. This is because higher levels of educational stratification ensure that further public investments in education benefit the rich relatively more than the poor, who in turn become less willing to support this kind of public spending.

⁵ Data on policy orientation of political parties elected in parliament and selected cabinets are taken from ParlGov database (Döring and Manow 2010), which codes each party elected in Parliament on a 0-10 scale, ranging from 0-most left oriented to 10-most right wing oriented. By taking seat-weighted average of parties elected in a legislature or supporting a cabinet, we obtain a measure of the *political orientation of policy makers*. External circumstances are controlled for using data from Penn World Tables v.7.0.

5. How are educational policy, quality and quantity of education, and income inequality related?

Now that we have seen that educational policies are related to the quality and quantity of education in a society, and that we have studied how policies have emerged, an important question in light of this book is how educational quality and quantity are related to the level of income inequality. It is well-known that education and earnings are related (see Card 1999 and Heckman et al. 2006 for reviews of the Mincerian approach). Less attention has been devoted to the relationship between the distribution of schooling and the distribution of earnings (see Peracchi 2006 for a notable exception), probably because causality may go in both directions. An increase in earnings inequality may prevent educational investments when households are liquidity constrained (Galor 2012), but may also represent an incentive to acquire further education. General equilibrium models should account for the relative speeds of expansion of demand and supply for skills (the so-called “Timbergen race”: see Acemoglu and Autor 2011).

More recently, a few studies have investigated the relationship between the distribution of education distinguishing between quantity (typically measured by the years of schooling) and quality of educational attainments (measured by level of competences). As a consequence, inequality in earnings may depend on the distribution of years of education and of competences. Blau and Kahn (2005) were among the first to study this problem using micro-data from IALS.⁶ They claim that the greater dispersion of cognitive test scores in the United States plays a part in explaining higher U.S. wage inequality.⁷ In the same vein, using the Canadian version of the same survey, Green and Riddell (2003) show that the impact of literacy on earnings does not vary across quantiles of the earnings distribution, while the interaction of schooling and literacy is statistically insignificant. Their result can be interpreted as a signal that competences provide an autonomous contribution to observed inequality, conditional on identical school attainment.

A different approach has been followed by Bedard and Ferrall (2003), who study the correlation between the distribution of competences and the wage distribution of workers in the same age cohorts. They show that Lorenz curves for a cohort’s wages always lie above of the cohort’s test score Lorenz curve. However, in their analysis, they do not take into account the mediating role played by schooling, which is intertwined in a complex way with parental background (see again chapter 5 in the present volume). Therefore, in Checchi and Van de Werfhorst (2013) we have replicated a similar exercise, extending the sample size and including the distribution of the years of schooling, in order to consider inequality along both the quantity and quality dimensions.

In chapter 5 of this volume various measures of inequality in educational distributions were presented. It was shown that the dispersion in attained level of education is reduced across time, while elsewhere in this volume it was demonstrated that income inequality has been on the rise in many countries. Even though we will show positive relationships between educational dispersions and income inequality, it must be borne in mind that rising earnings inequalities are to a large extent due to rising within-education-group inequalities (Lemieux 2008; Van de Werfhorst 2007b).

Complemented with the study by Checchi and Van de Werfhorst (2013) we can bring together measures of inequality in years of educational attainment, inequality in mathematics test scores (all

⁶ IALS is a survey collecting information on adult literacy in representative samples for some OECD countries. It was implemented in different years - 1994, 1996, 1998 - for different countries using a common questionnaire. The central element of the survey is the direct assessment of the literacy skills of respondents, but the background questionnaire also includes detailed information on individual socio-demographic characteristics. For more information, see <http://www.statcan.gc.ca/dli-ild/data-donnees/ftp/ials-eiaa-eng.htm>

⁷ They write “*For example, a one standard deviation increase in test scores raises wages by 5.3 to 15.9 percent for men and 0.7 to 16.2 percent for women, while a one standard deviation increase in education raises wages by 4.8 to 16.8 percent for men and 6.8 to 26.6 percent for women.*”

tested in grade 8, around the age of 14), and income inequality, for cohorts born around 1950, 1966, and 1981. Overall we possess an unbalanced panel covering 20 countries with 64 observations (32 county/cohort \times 2 genders). Figure 8 shows the plot of the relevant data.

From the graph we can observe that there is a positive correlation between inequality in quantity and inequality in quality of education for the country/gender/cohort cell available (north-west panel). The quality of education is also positively correlated with earnings inequality (computed over employees – north-east panel). In the last south-east panel we contrast earnings inequality for dependent employees and for total employment: the relationship between the twos is altered by the extent of self-employment, labour market participation (which is significantly varying across countries in accordance with gender), unemployment and early retirement (which are both computed at zero incomes).

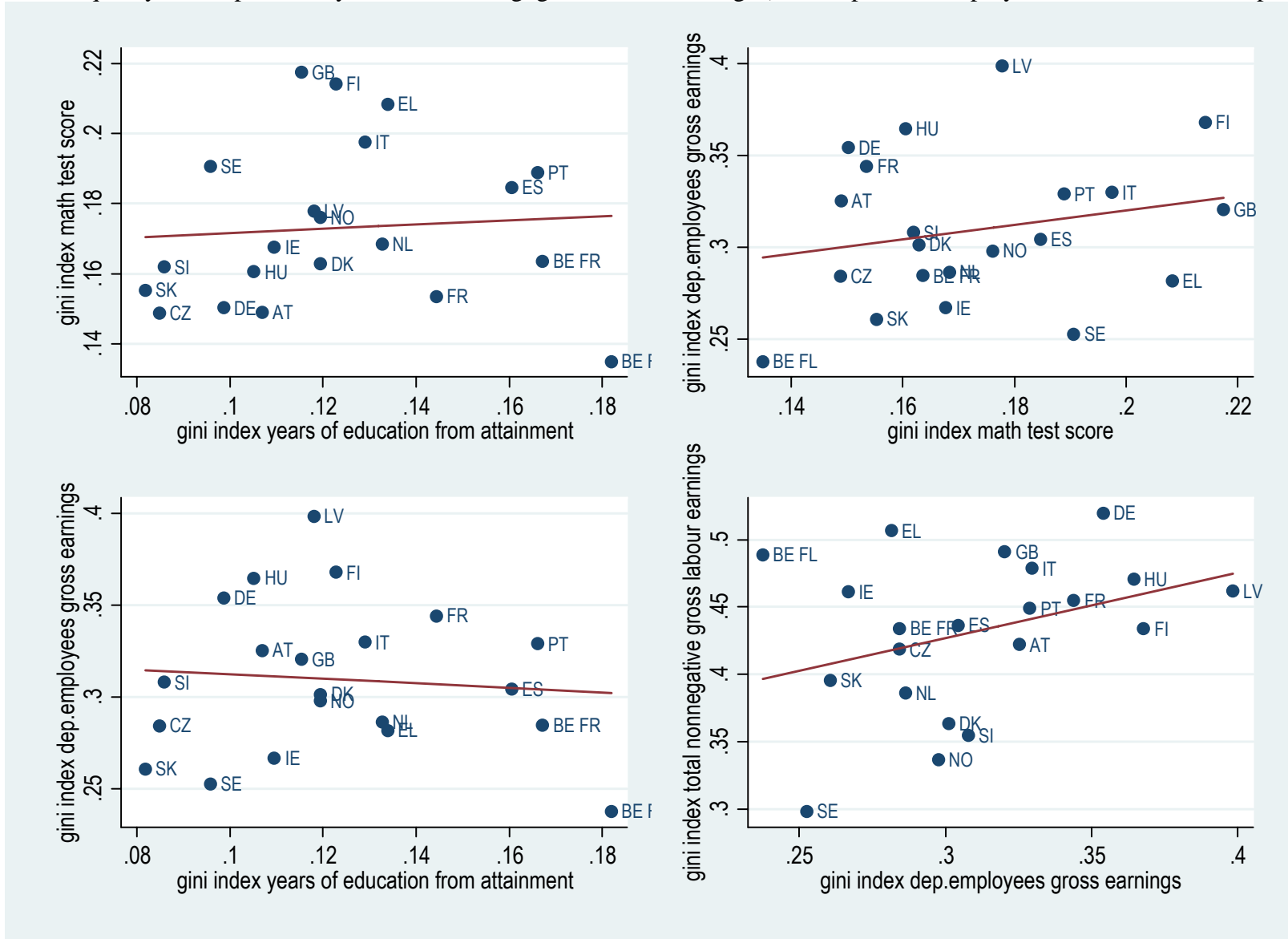
Checchi and Van de Werfhorst (2013) have regressed earnings inequality measures onto corresponding inequality measures for years of schooling (quantity measured over the same population on which non negative/positive earnings are available) and for math test scores when the same cohort was fourteen years old, controlling for country fixed effects. The results confirmed that inequality in quantity and inequality in quality of human capital are related to the observed earnings inequality.⁸

Further analyses of Checchi and Van de Werfhorst (2013) took a more elaborate perspective on the relationship between educational policy change (the data in section 3 based on Braga et al. 2013), the distribution of skills and educational attainment, and income inequality. Using an instrumental variables design to instrument educational quality and quantity on educational policy indicators, adding country and birth year fixed effects, Checchi and Van de Werfhorst (2013) showed that inequality in years of education is reduced in countries which expanded pre-primary education or raised the leaving age for compulsory education. Conversely, inequality in test scores is reduced by reforms introducing standardised tests and/or reinforcing school accountability, while it is enhanced by late tracking and reforms that expand university access. Figure 9 plots the bivariate association between two educational reforms (years of compulsory education and university access policies) and inequality in education. Both types of inequality (in educational quality and quantity) are then positively correlated with earnings inequality, even when instrumented. Figure 10 show the equivalent of a reduced form, where inequality in dependent employment earnings are scatter plotted against educational reforms.

Thus, there is evidence that inequality in education affects inequality in earnings along both dimensions, quality and quantity. Furthermore, inequality in quality (as measured by student test scores) and inequality in quantity (as measured by years of schooling) respond to educational policies.

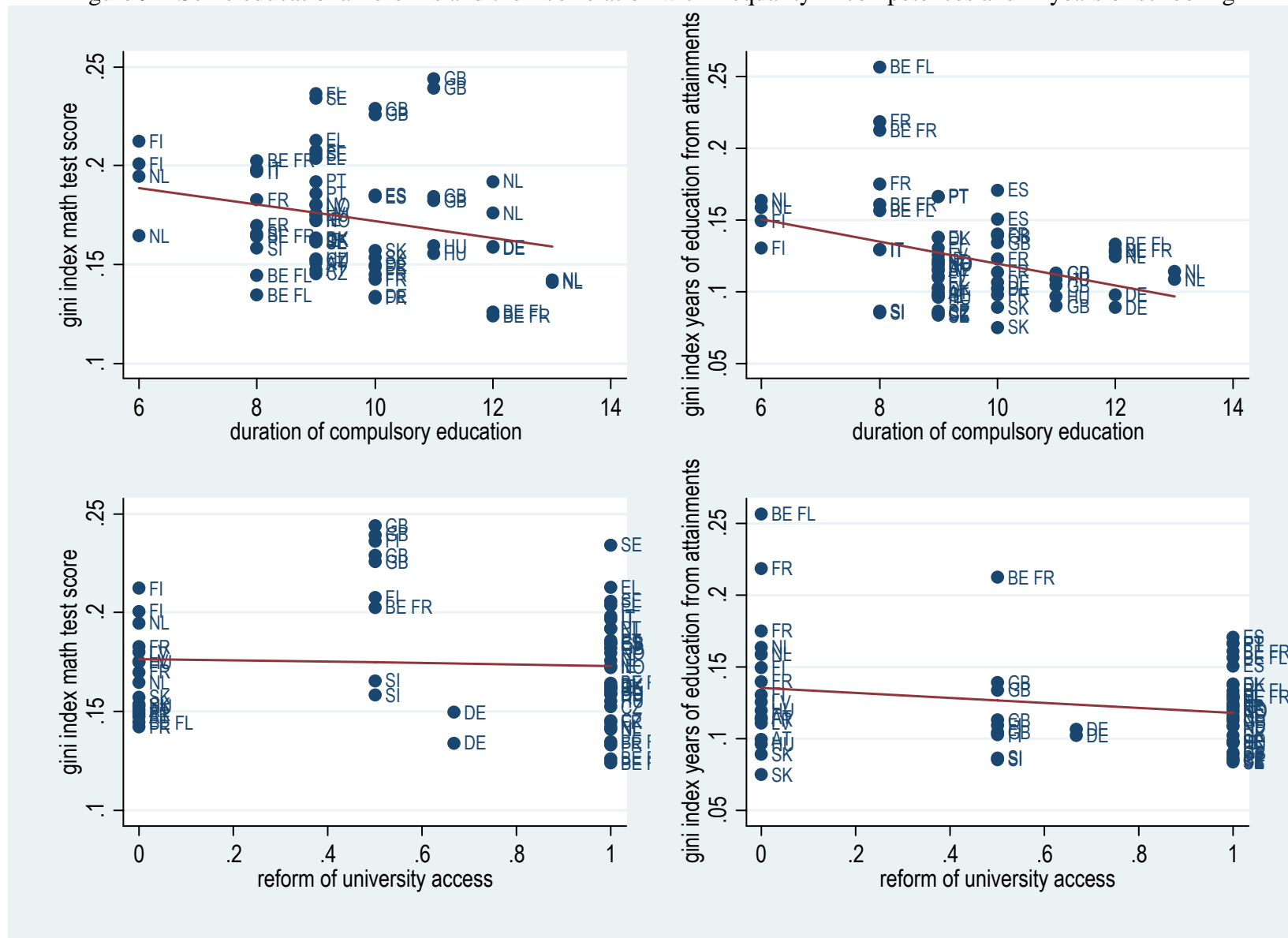
⁸ This is not evident from the south-west panel of figure 8, which however is considering only a bivariate comparison for a subset of country/years. For a wider evidence on this see also chapter 5.

Figure 8 – Inequality in competences, years of schooling, gross labour earnings (from dependent employment and from total employment)



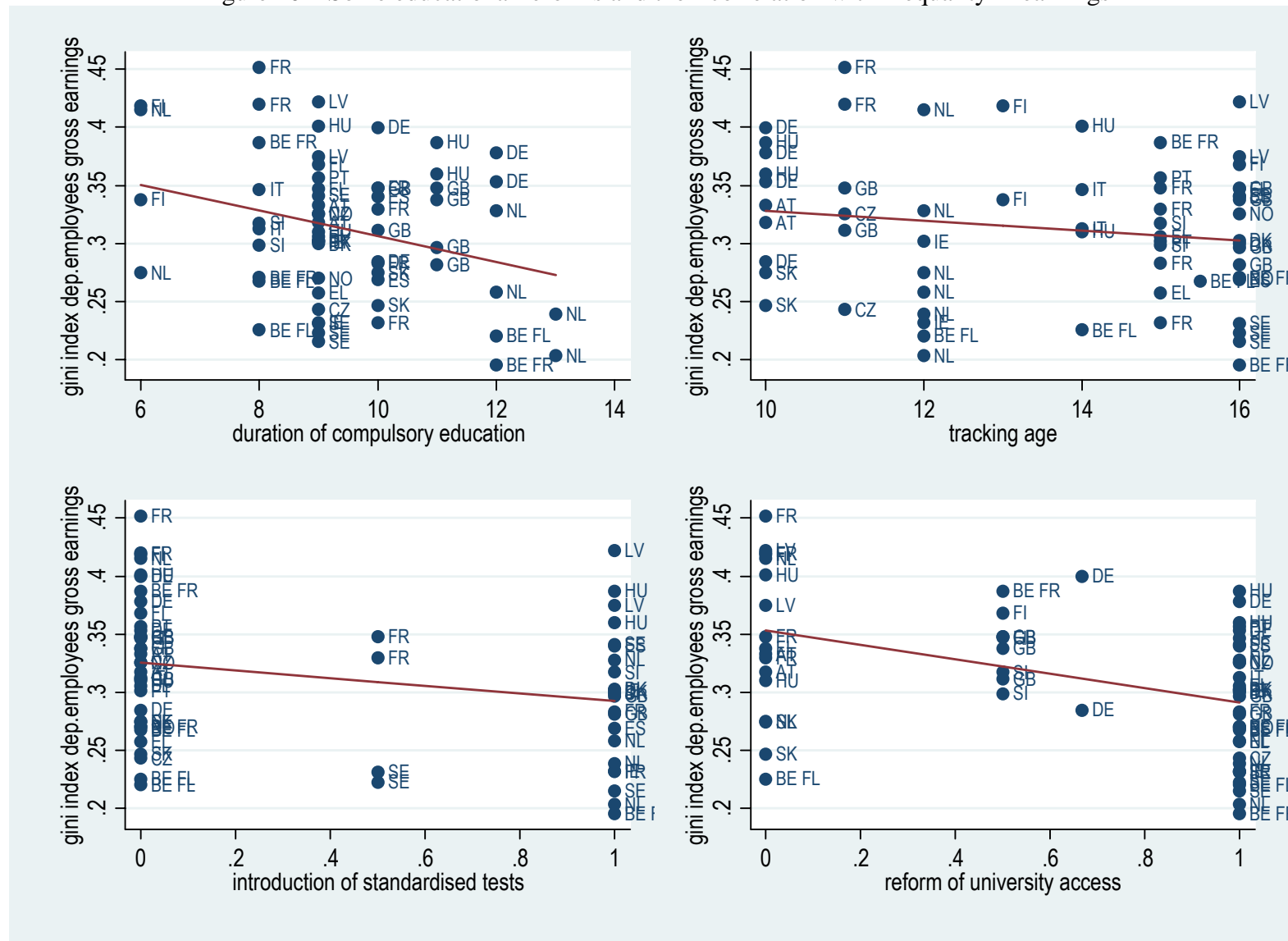
Source: Checchi and van de Werfhorst (2013)

Figure 9 – Some educational reforms and their correlation with inequality in competences and in years of schooling



Source: Checchi and van de Werfhorst (2013)

Figure 10 – Some educational reforms and their correlation with inequality in earnings



Source: Checchi and van de Werfhorst (2013)

6. Concluding remarks

Overall in this chapter we have seen that educational reforms exhibit a complex relationship with income inequality, especially when considering inclusive policies. These policies are effective in reducing earnings inequality, but they are also more expensive. Other things constant, they exacerbate the conflict over the allocation of the public budget. We can therefore observe the equivalent of multiple equilibria, depending on initial conditions.

Countries characterised by low income inequality support high level of investment in education, both from private and public sources. Low inequality in education and income in the parent generation implies lower inequality of opportunities for the children generation, as well as reduced conflict in the selection of (redistributive) public expenditure in education. This in turn yields lower inequality in educational attainments, which reinforces the stability of this configuration.

A different configuration occurs in countries with high initial inequality in incomes. This prevents parental investment in children education for poor families, as well as exacerbating the internal conflict on public expenditure. The resulting equilibrium results in lower public investment in education and greater inequality in educational outcomes. Once in the labour market, the children generation experiences higher earnings inequality, which again reinforce the stability of this alternative equilibrium.

The transition from one equilibrium to another one is not easily identifiable, despite variations in political attitudes observed in many European countries. Social desirability of one or the other outcomes should also be evaluated against the social consequences of inequalities, which have been surveyed in previous chapters of this volume.

Yet, an orientation to educational policies to address income inequalities offer an important complement to other policies addressed in the previous two chapters of this volume. The dispersions in attained level of education has been reducing in many societies, a matter that can be explained by rising educational attainments in educational structures that are rather fixed. Yet, the contemporary political debates in Europe imply that we should focus more on improving excellence also in the distribution of skills in secondary school. If a focus on improved performances in mathematics and languages improves the performance of all, it may be possible to enlarge the stock of skills in society without affecting the income distribution. However, if excellence is generated at the top, while the middle and bottom parts of the skill distribution do not benefit from education policy, it may be the case that rising income inequalities are to be expected.

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