

## **Conservative and Homogeneous: road to educational inequality**

*A hypothesis on how educational regimes differ*

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## **Abstract**

*The explanation on the link between educational regimes and state characteristics has been lacking the focus on equality; however this is unquestionably one of the most important aims of the welfare state.*

*In an attempt to bring several fields of study together I present a hypothesis on how state characteristics align with educational regimes. I claim that educational stratification is used by conservative states, where “maintaining the status differential” (Esping-Andersen 1990) is important, while standardization is more frequent in more divided, heterogeneous societies, where social cohesion is lacking and is a desirable goal. Educational stratification is shown to reproduce existing differences within society and thus good for social-reproduction but, logically, undermines equality of opportunity. Standardization or centralization is considered to be beneficial to social cohesion by providing the same education for all, thus creating bases for common culture, or knowledge, whilst decentralization fosters educational effectiveness.*

*Therefore non-conservative states will show smaller educational inequalities due to their non-stratifying educational system, while conservative states pursuing to maintain status differentials with stratifying education will end up with a more unequal educational system. Similarly those states that experience great social divisions and hence use centralized education will have smaller educational inequalities compared to those states where social cohesion is relatively high and hence decentralized education is used.*

*Therefore, conservative states with high social cohesion will have the highest educational inequality, while non-conservative states, where problems of social cohesion are present will have the highest equality in education.*

*I utilize the PISA 2003 and other OECD data using both a two-step estimation procedure and simple correlations – micro and macro models – to support my argumentation.*

## **Preface**

*Stratified* and *standardized*: two of the most common dimensions that social scientist use to evaluate (describe) educational systems. The “transition from school to work” research highlights the importance of these two characteristics of education to account for cross-country differences in labor market attributes. These traits are also used by political economists to rationalize differences between social protection regimes. More specific, but comparable, “stratifying” and “standardizing” institutions are selected by education economists to explain differences between educational production functions, and answer relatively policy oriented questions of effectiveness and equality.

This paper will also rest on these two dimensions of educational institutions to look at inequality differences, and move a step forward and establish a hypothesis about why there are different educational regimes in different countries. Although a rather appealing functionalist theory on the association between educational and welfare state regimes has already been established (Estevez-Abe et al. 2001), it focuses mainly on effectiveness/productivity issues and does not tackle questions of inequality, which are undeniably focal to the welfare states. Most of the political economy research on education is based on indirect, labor force outcomes; however there is still one-step, one possible level of analysis between the two: the recent international educational surveys allow us to look at a more direct outcome, the literacy of students, and evaluate the role of institutions and the state based on these measures.

Below I summarize quickly the main lines of thought in the transition from school to work literature, and its connection with the welfare state, and recapitulate the research on institutional impacts on the direct educational outcomes. In the second part of the paper I sketch a theory that would explain the link between some initial features of the state and the type of its educational system; finally I show some empirical support for the presented theory.

## **School to work transitions**

The two most commonly recognized feature of the educational system is its *stratification* and *standardization*. The former usually refers to tracking, streaming, sorting or grouping of children; i.e. the phenomena that children with similar ability, socio-economic characteristics or interest study in separate groups/schools. The latter can be understood as “the degree to which the quality of education meets the same standard nationwide,” (Allmendinger 1989) but can also be associated with the centralization of the system; i.e. how much government can influence individual schools either through budgeting, curriculum, personnel matters or

otherwise. Although the two institutions differ somewhat, I will use standardization and centralization interchangeably throughout the paper.

The empirical results show that in states with stratified educational systems occupational status is closely determined by educational attainment, while standardization fosters less frequent job changes, since in these systems employers can rely on the standardized certificates; hence the more stratified and the more standardized the system is, the tighter the educational credential-occupation linkage. (Allmendinger 1989; Kerckhoff 2000) In stratified systems students are sorted early into tracks that provide different educational qualifications that are easily recognized by the labor market. This strengthens the linkage between qualification and occupation. Standardization, on the other hand, helps the comparability of qualifications, makes the product of education more predictable, and thus helps the employer to select the most suited worker for the job. This again supports a stronger credential-occupation linkage. (Shavit and Müller 1998)

Estevez-Abe et al. (2001) has provided an appealing theory that connects this categorization of educational systems with the welfare state, i.e. the type of social protection. They argue that the inherent features of the educational system go hand in hand with that of the labor market. In states with stratified and standardized educational systems the labor market regulations will protect the workers: social protection – both employed and unemployed protection – will be high. On the other hand, in systems with no strong association between credentials and occupation (i.e. less stratified and less standardized) social protection will be negligible. The key to this argument is the composition of skills. Stratified systems offer specialized skills, that are useful for only few firms/industries, and are hardly transferable in between. People will only invest in these specific skills, if they see that their future is secured, if their investment risk is low. This security can be provided by the state, with high social protection, robust employer and unemployment protection. On the other hand, in states with no or small social protection people rather invest in transferable, general skills, that are useful for many industries/firms, therefore protecting themselves, that even if unforeseen consequences abound in the selected industry/firm, they still can transfer themselves to another one. The less stratified education systems provide these general skills. Hence the system of education – the “skill specifying regime” – and the social protection of the state should necessarily go together. The two archetypical cases would be the highly stratified and

standardized German educational system, with high social protection; and the less stratified and decentralized system of the United States, with very weak social protection.<sup>1</sup>

### ***Institutional impact on equality, direct educational outcomes***

Most of the studies using literacy scores or other direct educational outcomes focus on separate, more policy-amenable institutions, such as tracking, school choice, pre-school training, levels of decision making and so on. These, however, can be more-or-less matched with the two dimensions of stratification and standardization.

Moreover, while the center of attention in school to work transition research is the match between educational institutions and occupational status/labor market characteristics, here the main line of interest is the effectiveness and also the *equality* of education. In other words the question is how the different institutions associate with the students literacy scores (effectiveness), with the spread of these scores or with the parental background effect of the students (both equality).

A larger part of the economics of education research focuses on effectiveness issues, but there are a growing number of studies that concentrate on equality. Additionally it is likely that questions of effectiveness and equality are not inseparable, and can be addressed independently. (Brunello and Giannini 2000; Hanushek and Wössmann 2005).

The most important institution influencing *equality* is tracking. This can easily be equated with stratification. The logic behind the inequality advancing effect of early tracking/selection is that the earlier children are separated according to ability or merit, the more their family background will have an impact on this ability, and thus the more homogeneous groups of children will go to the same schools. (Dustmann 2004) Lower status families will also consider this choice a “hurdle” rather than a real option and thus family status will have a greater impact on this choice. (Erikson and Jonsson 1996) Moreover if similar status children are grouped together, peer-group effect will be lower in lower status schools; relying on the observation that children’s achievement depends not only on students’ own abilities but also on the average ability of the class, this selection will hurt lower status students more. (Betts and Shkolnik 2000) In addition to all this, if early selection groups children into different

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<sup>1</sup> Note, that I debate the high decentralization of the American system: Although the federal state has very little say in educational issues (that started to increase rapidly in the last decade), schools themselves have also very little autonomy; it is mostly the school districts and the individual states that decide over budgeting, curricular, assessment and personnel issues. Nonetheless the claim that employers cannot lean on secondary-school credentials is correct, because practically everyone achieves this level, hence a secondary-school degree carries no additional information for the employer.

tracks that are valued differently by the labor market, the family background will also have a major impact on future wages of the child. (Dustmann 2004) Hence the more stratified a system is, the more disadvantaged families will lose.

Some studies use the recent internationally comparable datasets measuring students' literacy scores to analyze the effect of stratification. Like that of Hanushek and Wössmann (2005) concluding that "the results consistently indicate that early tracking increases inequality in achievement," however they find no evidence for an effectiveness-equality trade-off. (13) Correspondingly Amermüller (2005) shows that "streaming and private education benefit the performance of students from a better social background" (27), or Jenkins et al. (2006) calculate two different indexes of segregation (dissimilarity index and the square root index) for 27 rich industrialized countries, and show that these indexes are the highest for those countries where separate school tracks for academic and vocational training exist. A model of Shütz et al. (2005) concerning tracking problems and other systemic features comes, again, to similar conclusions.

Other proxies of stratification could be the age of entering school (cf. (Fertig and Kluge 2005), the number of school types, the ratio of students in vocational training or the existence of free school choice (cf. (Robertson and Symons 2003).

The impact of standardization on equality is less well researched. The most straightforward proxy is the general level of decision making, the degree of school autonomy. The more centralized the education system is, the less local interest groups can influence the curriculum, budget...etc., hence the more similar each school will be. If every school is similar - within the specific track, if there are any – then it would not matter where the child entered the school, thus the lower parental background effect on the literacy scores would be.

Gamoran (1996) has looked at the Scottish educational reform between 1984 and 1990. He, among other things, concludes that "when national systems of curricula and examinations are aligned, centrally directed reforms can be a mechanism both for raising standards, and for reducing inequality."(17) Gamoran also emphasizes that this conclusion "may be overly simplistic," since Scotland is a small and rather homogeneous country, but "the merits of standardized curricula linked to nationally recognized examinations should be seriously considered" (18)

School accountability (e.g. exit exams) can also be understood as an attempt to standardize education. The impact of higher school accountability on educational performance has a clear logic in affecting performance (see below) but less clear in affecting equality. Bishop and

Mane (2004) test the effect of increased academic standards on equality of opportunity. They find that a strict mode of raising academic standards – namely the curriculum-based external exit exams – do lower the achievement gap between high and low status students, however other voluntary exit exams or minimum number of courses that has to be taken are not effective.

Pre-school or kindergarten training can also be considered as one aspect of standardization, if provided compulsorily to everyone. The argument is that the more children are socialized into schooling, the less likely they will fail later. Schütz et al. (2005) model and test the effect of pre-school training. They find that long pre-school cycle is beneficial to equality, but the enrolment rate is also important: low levels of enrolment are detrimental to equality, while higher – higher than 50% - rates are beneficial.

The two major ideas in economics concerning the *effectiveness* of education are competition and accountability. Both of which can be understood as different aspects of centralization; competition – although not necessarily – is associated with decentralization, while high accountability requires some sort of centralizes measures.

Free school choice, most of the time equated by competition, has been assumed to advance the productivity of schools. It was, among others, Milton Friedman, who advocated free school choice throughout the last century, arguing that free school choice will increase effectiveness in education. (cf. (Friedman 1955; Friedman 1997; Raganzas 1997) The argument is that more choice will induce more competition between schools that will enhance their effectiveness.

Choice it itself, however, might only lead to high inequality by selecting the most able, or highest class students into separate schools. (Robertson and Symons 2003) accountability, the power to observe schoolwork, is also a requirement for high productivity. According to Hanushek and Raymond (2002) it is not the question, whether accountability systems are necessary or not, which is important, but the type of system, and the incentives it creates that need to be studied more carefully. Bishop and Mane (2004), for instance, test the affect of increased academic standards on equality of opportunity on US data. They find that a strict mode of raising academic standards – namely the curriculum-based external exit exams – do lower the achievement gap between high and low status students, however other voluntary exit exams or minimum number of courses that has to be taken are not effective.

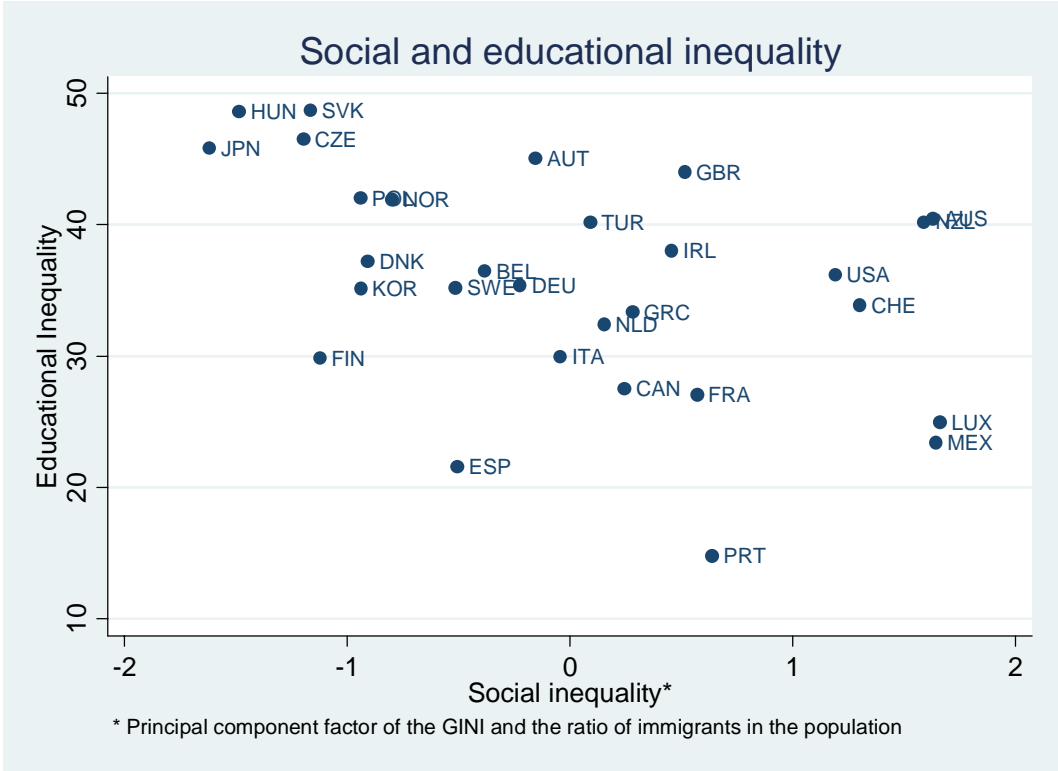
In sum, it is clear that high stratification increases inequality in education, and we can also suspect that standardization helps equality, but it is unclear how standardization in general will advance effectiveness, since both competition – as a form of decentralization, – and accountability – form of centralization – increases schools’ productivity.

**A theory on why educational systems differ**

In the second half of this paper I would like to present a hypothesis based on a seemingly surprising observation and also show some empirical support based on the PISA 2003 data.

The surprising observation is that the countries with higher social inequality tend to have lower educational inequality. Educational inequality is understood as the parental background effect on students’ literacy scores (see the following chapter for details),<sup>2</sup> while the proxy for social inequality is a factor of a GINI coefficient (UN Human Report 2004) and the ratio of immigrants in the PISA population. Note that the correlation between GINI and the ratio of immigrants is 0,0351 and not significant; hence we can safely assume that they represent different aspects of (the lack of) social cohesion. Figure 1. below compares the equality of opportunity of 15-year-olds with a wide measure of social inequality.

**Figure 1**



<sup>2</sup> The association between different measures of educational inequality (e.g. the variance of the net literacy scores) and different measures of social cohesion (e.g. the percentage of immigrants) is less straightforward: the correlation is not significant, but still negative.

## **Hypothesis:**

Stratification is employed in countries where “maintaining the status differential” is a priority (conservative states), while standardization is more frequent in more divided, heterogeneous societies, where social cohesion is lacking and is a desirable goal. The proposed reasoning rests on the idea that educational systems are formed and maintained by interest groups, mainly by upper-classes: in “conservative” states the upper-class has the goal to sustain its status (Esping-Andersen 1990), but at the same time, if major problems of social cohesion are present (e.g. large minorities, large income differences), the aim of the upper-classes will also be the restoration of social cohesion.

In conservative and heterogeneous states the trade-off between status-maintenance and minority integration/cohesion restoration could be solved by a stratified but also standardized education system, where children are tracked to conserve status differentials, while standardization facilitates the integration of minorities into the society or the reparation of social cohesion. Furthermore, in homogeneous states decentralized education is preferred, because it is assumed to be beneficial to educational effectiveness.

Therefore those states that experience great social divisions and hence use centralized education will have smaller educational inequalities compared to those states where social cohesion is relatively high and decentralized education is used. Similarly non-conservative states will show smaller educational inequalities due to their non-stratifying educational system, while conservative states pursuing to maintain status differentials with stratifying education will end up with a more unequal educational system.<sup>3</sup>

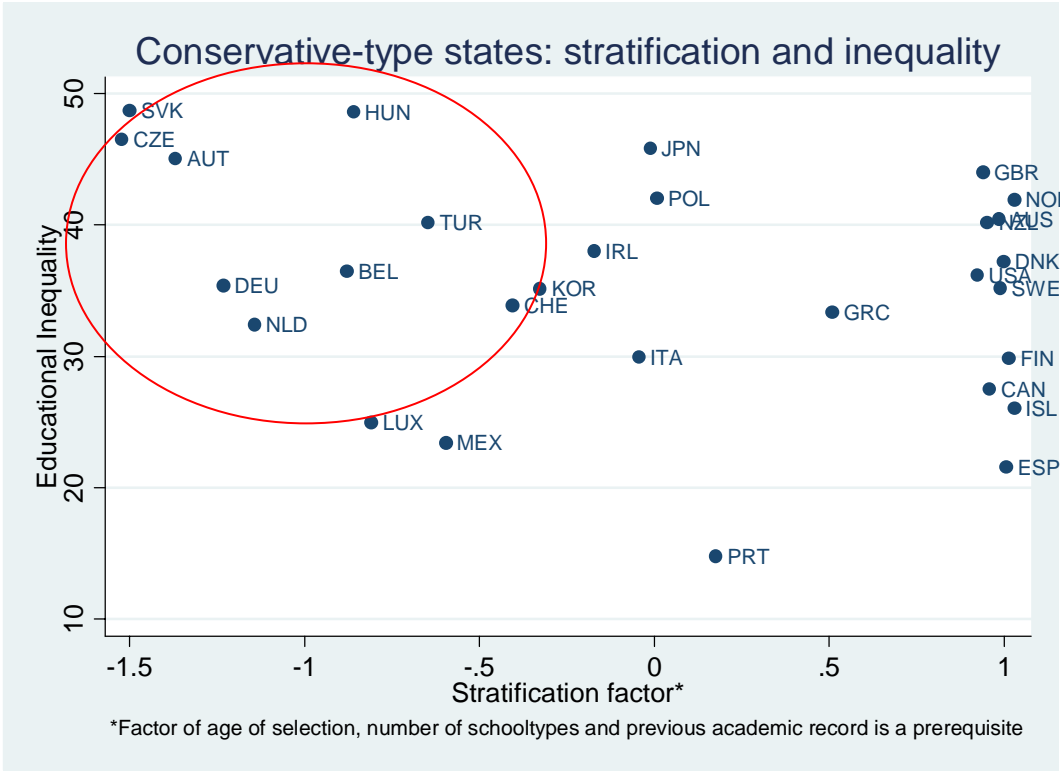
Some of the empirical literature that focus on different issues have already pinpointed – as possible further ways of study – that countries with strongly stratifying educational systems tend to be the ones that are most of the times labeled as “conservative” or “coordinated” states. (Jenkins et al. 2006) Hega and Hokenmeier (2002) addressing the association between welfare states and education look at macro variables – such as spending on education, public spending or the enrollment in vocational training – and conclude that educational systems cluster according to the Esping-Andersen’s regimes, states “exhibit the tendency to choose between educational opportunities or social insurance programs as alternative policy strategies.” (2002, 1)

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<sup>3</sup> Note that this theory cannot resolve questions of educational institutional evolution. The data below is only cross-sectional; no change in institutional features can be tracked. It might be that the reader recalls cases where centralized education was surely not developed in order to integrate minorities into the society, or to wipe out social divisions, but this does not mean that already existing centralized education cannot accomplish this goal.

The logic of the strong association between stratified education and conservative states can be straightforwardly adapted from the Varieties of Capitalism literature. Conservative states, according to Esping-Andresen (1990), are the ones where the preservation of status differentials is important, rights are attached to class and status, and de-commodification is moderate. Education has long been seen as one of the most important tools for status reproduction (Bourdieu and Passeron 1977) and the above listed empirical research has also shown that stratified educational institutions are important means to achieve this. Therefore it is not at all surprising to see that conservative states have stratified education. Austria, Germany, Belgium, Switzerland have very early selection to secondary education, and many types of school tracks. (See the appendix, Table A4, for descriptive data.) Moreover some of the Central and Eastern European states that can also be considered as conservative states according to the Esping-Andersen typology – namely Poland, Czech Republic, Slovakia, Hungary – have highly stratifying educational system as well. (See figure 2.)

**Figure 2**



Standardization, however, cannot be straightforwardly connected to the political economy literature. Why do some state have centralized, while others de-centralized education?

According to the empirical results, and most of the economic theoretical considerations, decentralized systems foster higher literacy scores, i.e. states should attempt to allocate as much autonomy to the local level as possible to increase human capital accumulation. This is however not the case.

I claim that those states, where the problems of social cohesion are immense will use centralized educational system, and especially centralized curriculum to eliminate these inherent differences. Problems with a large minority, many migrants, wide income gaps or religious differences within a country can urge the decision makers to utilize education and try to soothe the situation.

The idea is far from new. Education as a tool for nation building is a rather popular idea among sociologists or historians of education (Benavot et al. 1991; Meyer et al. 1979; Ramirez and Boli 1987) It is well recorded that education was indeed developed in order to form nations from previously highly divided communities. Ramirez and Boli argue that “European States became engaged in authorizing, funding, and managing mass schooling as part of an endeavor to construct a unified national policy.”(1987) They also claim that external threats were also highly important components to the development of the mass education, in that the threats intensified the domestic problems (e.g. clergy, class-based privileges, subunit political autonomy), and education was used to lessen these. On a similar basis, Meyer et al. (1979) have argued earlier that public education in America was formed through a sequence of nation-building social movements, and not through urbanization or industrialization, as previous studies had argued.

Economists have also found the centralized curriculum quite beneficial for social cohesion. Gradstein and Justman (2000; Gradstein and Justman 2002) have developed models that claim that an integrated, centralized schooling system helps increasing social cohesion. They argue that public education is not only advantageous to human capital but also for social capital. “Public schooling instills common cultural norms and ethical values that lower economic transaction costs and reduce social tensions between different population groups.” (2000) Somewhat connectedly Kremer and Sarychev’s (1998) model states that “vouchers lead to ideological sorting,” that is the less impact the central government has on schools, the more ideologically diverse the society will be.

## ***Empirical support***

### **Institutions and educational outcomes**

Based on the PISA 2003 data, and on other OECD sources (mainly Education at a Glance, hereafter EAG) (OECD 2004; OECD 2005a) I analyzed the association between the students' mathematical and reading literacy and the educational institutions on the one hand (as the effectiveness dimension), and the association between the student family background effect and educational institutions on the other (as equality dimension).

Although previous empirical studies have already analyzed this issue they focused more on different measures of educational inequality – e.g. the variance of the outcome – and not the equality measure used here; however I believe, this measure is more in line with the goals of the welfare state. Educational inequality here is understood as the pupils' economic, social and cultural background effect (parental background effect) on their mathematical and reading literacy scores; i.e. the more the parental background affects the students' literacy score the more unequal the society is. This equality indicator proxies the equality of opportunity, as compared to the variance of the literacy scores where the equality of outcome is measured.

Moreover this exercise is useful for validating the subsequently used proxies; e.g. the educational “standardizing” institutions that associate with educational equality should be defined similarly to those that are used for testing the association between social inequality and standardization.

For the analysis a two-step estimation procedure was utilized: separate individual level linear OLS regressions with balanced repeated replication (1 step) were ran for each country,<sup>4</sup> and FGLS regressions (using the inverse square-root of the variance of the estimated coefficients as weights), estimating the impact of educational institutions on the adjusted literacy scores<sup>5</sup> and on the estimated parental background coefficient<sup>6</sup>, were applied in the 2<sup>nd</sup> step. The two step procedure is preferable to a one-step multilevel estimation if missing values are present at the second level: while both procedures provide unbiased and effective results and face similar methodological challenges (Franzese 2005; Jusko and Shively 2005; Lewis and Linzer 2005), the two-step estimation offers fewer case-losses. In other words, when institutional (2<sup>nd</sup>

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<sup>4</sup> In order to estimate sampling and imputation variance correctly PISA uses BRR weighting. For more on this see PISA 2003 Technical Report

OECD. 2005c. "PISA 2003 Technical Report." OECD. and the PISA 2003 Data Analysis Manual  
OECD. 2005b. "PISA 2003 Data Analysis Manual." OECD.

<sup>5</sup> The constant from the 1<sup>st</sup> step equations.

<sup>6</sup> The used parental background coefficient was the economic, social and cultural status (escs) variable created by the OECD. See the PISA 2003 Technical Report for details  
OECD. 2005c. "PISA 2003 Technical Report." OECD.

level) variables are missing in some cases, running one-step multilevel regressions (estimating the 2<sup>nd</sup> level coefficients simultaneously) data are deleted not only for the given coefficient, but also for the whole 2<sup>nd</sup> level (country, in this case); however running separate 2<sup>nd</sup> level regressions allows us to have different number of cases in each estimation, therefore increasing the potential number of cases. Nevertheless the results below were tested with both two-step and multilevel estimation procedures, with virtually similar results.

The outcome variables were the PISA 2003 mathematical and reading literacy scores. Since PISA provides five plausible values for each literacy field (OECD 2005c), ten 1<sup>st</sup> step regressions were run for each country, and the mean of the estimated constants and coefficients were taken as the dependent variable for the 2<sup>nd</sup> step. Besides the students' economic, social and cultural status index (escs), grade, gender, family structure, language at home and immigrant status (1<sup>st</sup> or 2<sup>nd</sup> generation) were controlled for.

Altogether 41 countries have participated in the PISA 2003 study, but additional information were mainly available only for the OECD countries, hence I have included only these in my investigation; moreover France has not provided PISA school level data, thus were dropped from most parts of the analysis. The remaining countries are:

Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

I have used the following proxies for educational institutions<sup>7</sup>:

**Stratification:**

- Tracking
  - Ratio of “previous record is a prerequisite” for attendance (PISA 2003 School questionnaire: Question 10)
  - Number of school types (EAG 2005, D6.1)
  - Age of selection to secondary school (EAG 2005, D6.1)
- School choice, competition
  - Ratio of “residence is a prerequisite” for attendance (PISA 2003 School questionnaire: Question 10)

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<sup>7</sup> See appendix A4. for descriptive data

- Percentage of private schools (fully independent) (PISA 2003 School questionnaire: Question 3)
- Percentage of govt. funding (PISA 2003 School questionnaire: Question 4)
- Percentage of Vocational training
  - Percentage of upper. secondary enrollment in prevoc./vocational programs (EAG 2005 C2.1)

**Standardization:**

- Pre-school/kindergarten training
  - Percentage of children going to kindergarten (more than 1 year) (PISA 2003 Student questionnaire: Question 20)
- Higher accountability/exit exams
  - Exit exams present at the end of secondary (EAG 2005, X1.3)
- Decentralization
  - Rate of full local decision-making (decentralization), absence of direct national or regional influence in staffing, budgeting, instructional content, assessment practices, % of schools (PISA 2003 School questionnaire: Question 27)
  - Percentage of decisions relating to public sector, lower secondary education, taken at local or school level, (EAG 2004 D6.1)
- Centralization
  - Rate of full national decision-making, direct national or regional influence in staffing, budgeting, instructional content, assessment practices, % of schools (PISA 2003 School questionnaire: Question 27)
  - Rate of national or regional direct influence in setting the instructional content, % of schools (PISA 2003 School questionnaire: Question 27)
  - Percentage of decisions relating to public sector, lower secondary education, taken at central or state level (EAG 2004 D6.1)

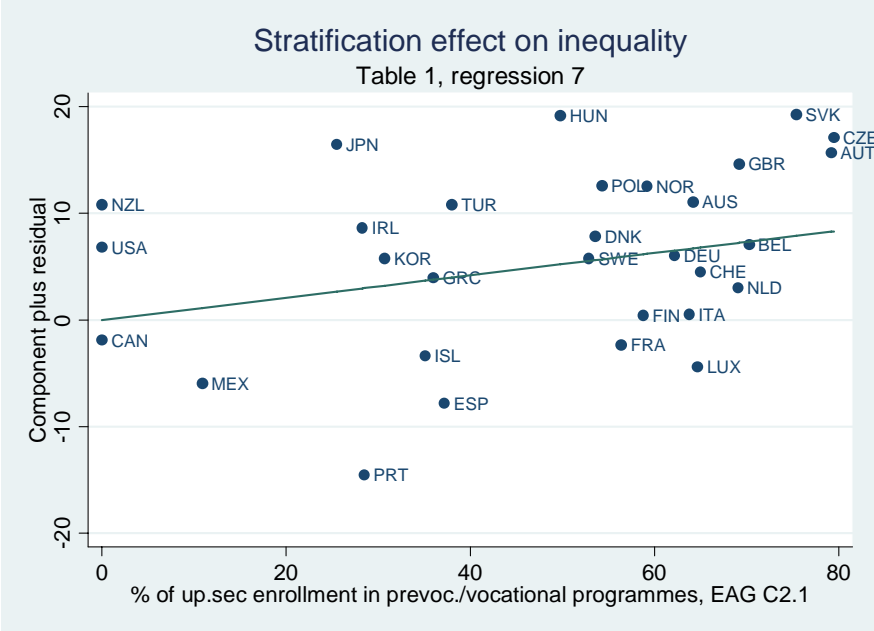
In order to show that the two dimensions of standardization and stratification are indeed different dimensions, that have separate effects on educational equality, I have generated two factors of the above listed institutional proxies. Table A5. in the appendix shows that the coefficients of the factors point in the predicted directions, and have not changed when included simultaneously in the regression. Although the effect of the stratification factor is not significant, Figure 7 in the appendix highlights that it undeniably correlates with educational equality.

**Results:**

*Equality*

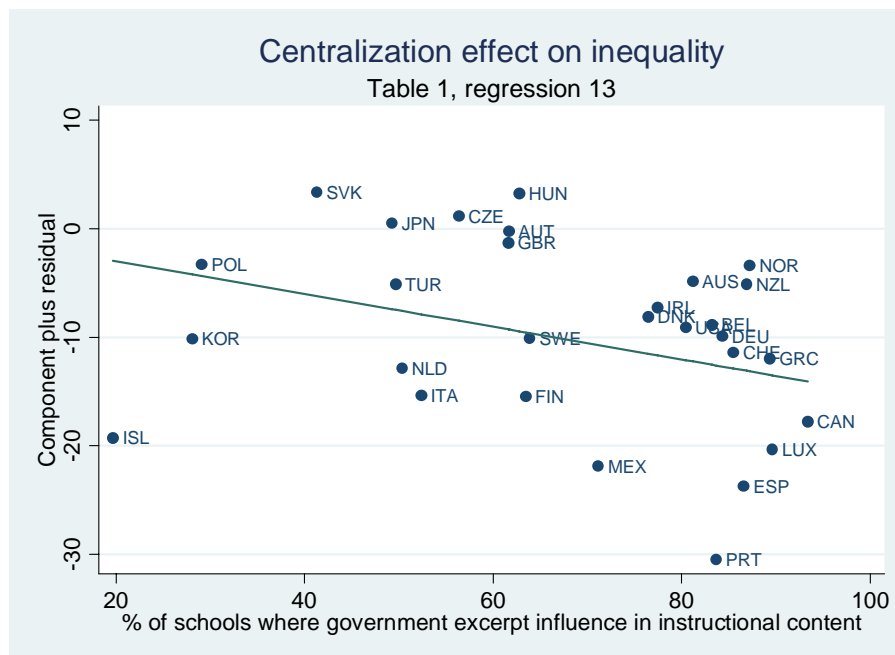
Table A1. in the appendix provides separate regressions for each proposed institutional proxy, multivariate regressions are avoided due to the small number of cases; hence coefficients can be interpreted as simple standardized correlation but the possibility of omitted variable bias must be kept in mind. Nevertheless it can be seen that most of the institutional coefficients show the assumed effect. Stratification, in general increases, inequality, and what is more, the number of students enrolled in vocational tracks seems to correlate significantly with the outcome variable (the parental background effect). That is, the more students are enrolled in vocational education, the higher the effect of parental social status is on the literacy scores of the students. (See figure 3)

**Figure 3**



The proxies for standardization showed more significant effects. Both the “rate of national or regional direct influence in setting the instructional content” (Henceforth: Govt. Influence in curriculum) and the “Percentage of decisions relating to public sector, lower secondary education, taken at central or state level” seems to associate with lower inequality, while the “rate of full local decision-making” (i.e. the percentage of schools where government or region has no direct influence in budgeting, curriculum, personnel matters or assessment techniques) goes strongly hand-in-hand with high inequality. Of these three the government influence in curriculum formation seems to be the most powerful. (Figure 4)

**Figure 4**



In sum it is fair to conclude that both stratification and decentralization has a detrimental effect on equality measured by the parental background effect on students' literacy scores.<sup>8</sup>

### *Effectiveness*

Table A2. in the appendix shows institutional associations with the effectiveness dimension. Clearly, stratification does not correlate with effectiveness; although it seems that the level of public funding does raise the adjusted literacy scores, this is only due to an outlier: Mexico. Mexican students achieved rather low on the PISA 2003 and their government funds little more than the half of schools' expenditure, according to PISA 2003. Moreover the percentage of private schools, the only proxy for school choice, does not correlate significantly with the dependent variable.

Accountability, the presence of exit exam at the end of secondary, on the other hand appears to be important. If a country had an exit exam its pupils scored 25 points higher (adjusted scores).

Although centralization shows significant correlation with the outcome only for the European countries (regressions 11 and 14 contains only 23 European countries), the sign for the other three (de)centralization proxies are in line with the significant ones: countries with

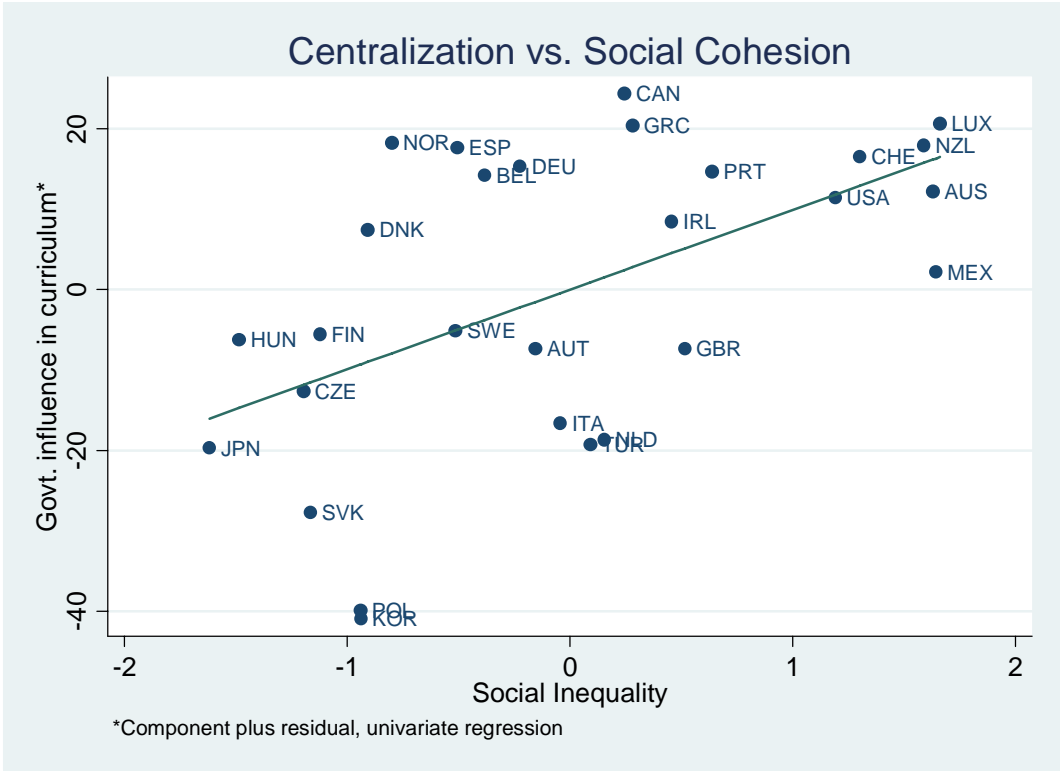
<sup>8</sup> I have tested the association between institutions and immigrant status effect (i.e. the effect of immigrant status – a factor of language at home and the country of birth of pupil and parents – on the literacy scores). The percentage of schools where government exerts direct influence showed a significant negative effect: the higher the government influence the lower the immigrant status effect. This supports the assumption that centralization/standardization is beneficial to minority integration.

decentralized decision making appear to be more effective than the states with centralized one. This is in accordance with the school choice literature, if we accept that more school autonomy (decisions made by the schools themselves) shows the degree of competition between them as well.

**Institutions and states**

Figure 5. below shows that governments in countries with higher social inequalities tend to influence the curriculum more directly. This association is not as strong as the stratification vs. conservative state one, but given the great number of possible various within country factors that can influence centralization, the data does support the above argument. The correlations between the different proxies of centralization, and of social cohesion also reinforce the “centralization as social cohesion making” claim. (See table 1. below)

**Figure 5**



**Table 1 Pair-wise correlation coefficients of centralization and social cohesion proxies**

	GINI coefficient	Ratio of immigrants	Social Inequality (factor of GINI and ratio of immigrants)
Rate of full local decision-making	-0,2244 (0,2509)	-0,3309 (0,0712)	-0,4033 (0,0333)
Percentage of decisions taken at local or school level	-0,4479 (0,0321)	-0,1004 (0,6487)	-0,4120 (0,0508)
Rate of full national decision-making	0,3298 (0,0866)	0,4615 (0,0117)	0,5464 (0,0026)
Percentage of decisions taken at central or state level	0,5785 (0,0038)	0,2048 (0,3487)	0,5781 (0,0039)
Govt. influence in curriculum	0,1366 (0,4881)	0,6018 (0,0006)	0,5338 (0,0034)

Note: Significance levels are in parentheses

If the hypothesis of “centralization as social cohesion making” is correct, we should see that those states where social inequalities are not severe endeavor to use decentralize systems in order to increase school competition and thus raise the level of productivity. Table A3. in the appendix shows the same univariate regressions as in Table A2 before, with the difference that those countries, which have higher than average immigration ratio and GINI coefficient were not included in the model. The results changed only in one important aspect: decentralization – the rate of full local decision making –became significant.

This result is remarkably in line with Gradstein and Justman’s (2002) model. They argue that centralization can be beneficial to economic growth through creating social cohesion and lowering transaction costs. However, I argue, where social cohesion is not an issue, centralization in education is unnecessary and thus the benefits of decentralization can be collected.

We can thus assume that more homogeneous countries can utilize the effectiveness benefits of decentralization, while heterogeneous countries are better off using centralization, because it might be advantageous for their cohesion problems.

### **The states**

To make my argumentation more comprehensible, let me present the states that fall into the different categories, and the mean values of proxies for the particular categories.

Based on Arts and Gelissen’s summary (2002) of several studies classifying welfare state arrangements I divided the examined countries into conservative and non-conservative groups, and the simplified categories of high/low social cohesion countries are based on he

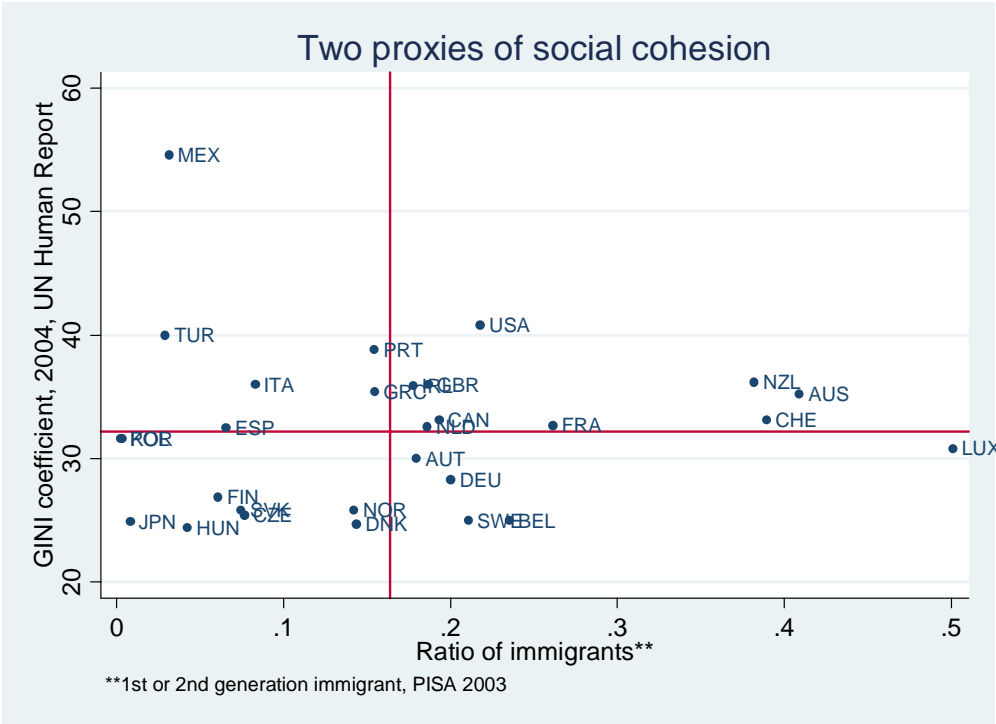
social inequality index: countries below 0 are of high, while countries above 0 are of low social cohesion:

**Table 2 Categorization of countries**

	Low social cohesion	High social cohesion
Non-Conservative states	Ireland, Great Britain, USA, Canada, New Zealand, Australia, Portugal, Turkey, Mexico, Greece	Korea, Japan, Finland, Norway, Denmark, Sweden, Spain, Iceland
Conservative states	Switzerland, Netherlands, France, Luxembourg	Hungary, Czech Republic, Slovakia, Belgium, Poland, Italy, Germany, Austria,

(See also figure 6 below)

**Figure 6**



Similarly to *figure 1*, Table 3. below shows that countries with higher social cohesion seem to have higher inequalities in education. Although this association is more straightforward within the conservative group, it still holds for the non-conservative states as well (note: logically states with high income inequalities or high immigrant population should have higher educational inequalities as well.)<sup>9</sup>

<sup>9</sup> See appendix figure 6 for a visual illustration of the puzzle.

**Table 3**

Educational inequality (parental background effect)	Low social cohesion	High social cohesion
Non-Conservative states	33,54 (9,19) 10	33,43 (8,44) 8
Conservative states	28,75 (4,62) 4	39,80 (6,28) 8

Note: mean (standard deviation) frequency

Table 4 below shows that conservative states with high social cohesion have especially low level of centralization, while non-conservative states with low social cohesion have rather high centralization. It seems that conservative states in general have lower centralization, however – as shown above – centralization associates with social cohesion more significantly.

**Table 4**

Centralization: Govt. influence in curriculum Rate of full national decision-making (% of schools)	Low social cohesion	High social cohesion
Non-Conservative states	77,48 (13,36) 39,95 (11,52)	64,98 (21,23) 19,81 (16,43)
Conservative states	75,16 (21,59) 27,58 (9,12)	58,87 (18,92) 14,34 (8,24)

Note: mean (standard deviation)

### ***Further considerations, limitations***

The theory presented above argues that state characteristics, such as the welfare state arrangements of the conservative states, and the general social cohesion associates with the educational regimes, and through these has an impact on the equality and the effectiveness of education. The theory is not (yet) adequate to explain why the educational regimes evolved; it only states that once educational institutions are in place can be used to serve the aims of the state. Centralized education is advantageous for social cohesion, decentralization for increasing educational effectiveness, while stratification is argued to help status reproduction. Different social science disciplines have already established these associations between institutions and educational outcomes and also between the state characteristics and the institutional setups. The presented theory only attempts to bring these together and establish a relationship between the state and the educational outcome.

Unfortunately the available data is not adequate for a full blown test mainly due to its cross-sectionality; nevertheless it still shows that the explanation presented it not against the quantitative indicators.

In order to develop the theory several supplementary steps should be taken. One possibility is to find adequate – possibly longitudinal – data to test the hypothesis. More qualitative, case studies could also be provided, and checked whether they are supportive or not. Another way of dealing with missing quantitative data could be to model the theory and see whether rigid logic supports or contests it.

Naturally it is not at all impossible that the theory is not complete; for instance, one might argue that electoral regimes or state level decision making mechanisms affect the educational institutions more than the assumed state characteristics, or at least intervene somehow in the process, so that not all socially heterogeneous states can have centralized systems. And finally it is also possible that the presented theory is not at all accurate, and that welfare state arrangements and social heterogeneity are only proxies for some other, independent factors that decide over the presence or absence of educational institutions.

## Appendix

**Table A1: Equality dimension.**

The coefficient of students' economic, social and cultural index on PISA 2003 mathematical and reading literacy

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Stratification							Standardization						
	Ratio of "previous record is a prerequisite" for attendance	Number of secondary school types	Age of selection to secondary	Ratio of "residence is a prerequisite" for attendance	Percentage of private schools	Percentage of govt. funding	% of up.sec enrol-ment in prevoc./ vocational programs	Percentage of children going to kindergarten	Exit exams present at the end of sec., dummy	Rate of full local decision-making	Percentage of decisions relating to public sector, lower secondary education, taken at local or school level,	Rate of full national decision-making	Rate of national direct influence in setting the instructional content,	Percentage of decisions relating to public sector, lower secondary education, taken at central or state level
Constant	32.746*** (15.34)	33.875*** (10.53)	42.553*** (4.24)	33.794*** (11.63)	34.147*** (17.31)	24.359** (2.24)	29.391*** (8.72)	21.536 (1.16)	33.478*** (15.00)	32.515*** (16.73)	30.283*** (7.23)	38.326*** (16.62)	45.313*** (7.49)	40.154*** (15.56)
Independent Variable	0.126 (1.11)	0.214 (0.19)	-0.576 (0.82)	0.021 (0.32)	0.012 (0.03)	0.113 (0.93)	0.105* (1.71)	0.138 (0.70)	2.602 (1.08)	0.324** (2.74)	0.084 (1.25)	-0.141 (1.62)	-0.151* (1.82)	-0.149* (1.84)
Observations	29	29	30	29	28	29	30	30	30	29	23	29	29	23
R-squared	0.06	0.00	0.02	0.00	0.00	0.02	0.09	0.03	0.02	0.11	0.07	0.08	0.13	0.16
Robust t statistics in parentheses														
* significant at 10%; ** significant at 5%; *** significant at 1%														

**Table A2: Effectiveness dimension.**

The constant term on PISA 2003 mathematical and reading literacy

	Stratification							Standardization						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Ratio of "previous record is a prerequisite" for attendance	Number of secondary school types	Age of selection to secondary	Ratio of "residence is a prerequisite" for attendance	Percentage of private schools	Percentage of gov. funding	% of up.sec enrol-ment in prevoc./ vocational programs	Percentage of children going to kindergarten	Exit exams present at the end of sec., dummy	Rate of full local decision-making	Percentage of decisions relating to public sector, lower secondary education, taken at local or school level,	Rate of full national decision-making	Rate of national or regional direct influence in setting the instructional content,	Percentage of decisions relating to public sector, lower secondary education, taken at central or state level
Constant	487.933*** (49.54)	501.030*** (52.74)	370.070*** (4.61)	478.172*** (19.62)	498.267*** (58.36)	378.210*** (6.50)	475.928*** (19.24)	469.300*** (36.00)	484.587*** (37.26)	484.673*** (39.57)	442.979*** (19.09)	476.220*** (19.91)	495.840*** (22.60)	528.813*** (53.20)
Independent variable	0.079 (0.17)	-5.268 (0.91)	8.361 (1.63)	0.341 (0.64)	-2.143 (0.77)	1.354* (2.05)	0.394 (0.91)	22.848 (1.35)	25.257* (1.78)	74.888 (1.62)	0.853** (2.82)	41.520 (0.73)	-0.099 (0.34)	-0.993*** (2.99)
Observations	29	29	30	29	28	29	30	30	30	29	23	29	29	23
R-squared	0.00	0.03	0.20	0.04	0.09	0.34	0.07	0.01	0.08	0.03	0.37	0.04	0.00	0.47
Robust t statistics in parentheses														
* significant at 10%; ** significant at 5%; *** significant at 1%														

**Table A3.: Effectiveness dimension in homogeneous countries**

	Stratification							Standardization						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
											<i>Percentage of decisions relating to public sector, lower secondary education, taken at local or school level,</i>		<i>Rate of national or regional direct influence in setting the instructional content,</i>	<i>Percentage of decisions relating to public sector, lower secondary education, taken at central or state level</i>
	Ratio of "previous record is a prerequisite" for attendance	Number of secondary school types	Age of selection to secondary	Ratio of "residence is a prerequisite" for attendance	Percentage of private schools	<i>Percentage of govt. funding</i>	% of up.sec enrol-ment in prevoc./ vocational programs	Percentage of children going to kindergarten	Exit exams present at the end of sec., dummy	<i>Rate of full local decision-making</i>	<i>Rate of full national decision-making</i>			
Constant	474.169*** (36.05)	482.940*** (29.55)	389.420*** (4.60)	467.456*** (15.66)	489.181*** (57.44)	375.628*** (6.98)	423.587*** (17.99)	470.406*** (35.01)	474.098*** (30.80)	470.671*** (30.14)	433.493*** (18.54)	479.553*** (21.67)	508.810*** (26.81)	530.252*** (42.42)
Independent variable	0.321 (0.74)	-1.820 (0.24)	6.519 (1.17)	0.395 (0.53)	-2.305 (0.81)	1.290** (2.13)	1.353*** (3.09)	8.959 (0.44)	32.112 (1.71)	118.493** (2.29)	0.981*** (2.98)	-5.536 (0.11)	-0.451 (1.57)	-1.097*** (3.09)
Observations	21	21	21	21	21	21	21	21	21	21	21	18	21	21
R-squared	0.01	0.00	0.11	0.04	0.12	0.35	0.46	0.00	0.08	0.08	0.44	0.00	0.05	0.54
<i>Robust t statistics in parentheses</i>														
<i>* significant at 10%; ** significant at 5%; *** significant at 1%</i>														

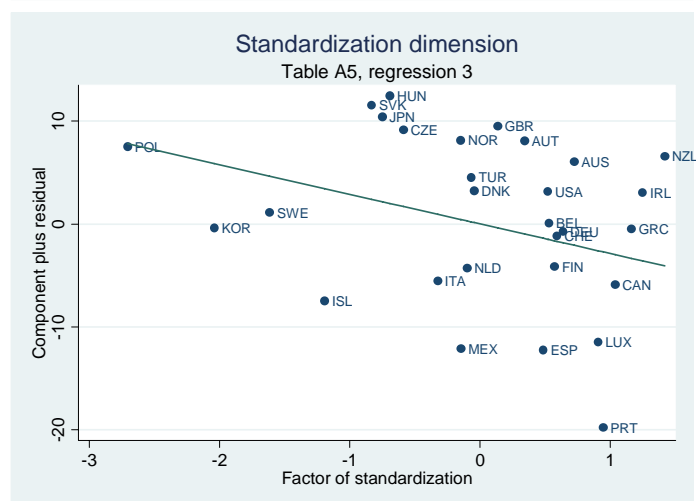
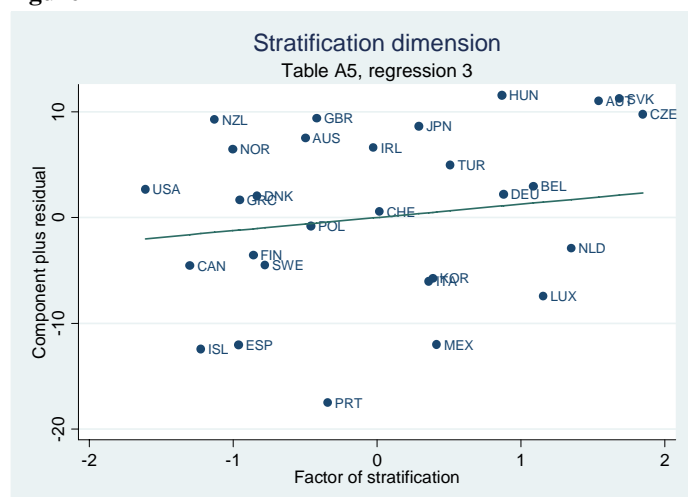
**Table A4.: Descriptive data**

Country	Ratio of "previous record is a prerequisite" for attendance	Number of secondary school types	Age of selection to secondary	Ratio of "residence is a prerequisite" for attendance	Percentage of private schools	Percentage of govt. funding	% of up.sec enrol-ment in prevoc./ vocational programs	Percentage of children going to kindergarten	Exit exams present at the end of sec., dummy	Rate of full local decision-making	Percentage of decisions relating to public sector, lower secondary education, taken at local or school level,	Rate of full national decision-making	Rate of national or regional direct influence in setting the instructional content,	Percentage of decisions relating to public sector, lower secondary education, taken at central or state level
AUS	1,88	1	16	16,14		71,90	64,20	93,02	0	2,82	24	43,26	81,19	76
AUT	42,63	4	10	22,40	1,55	88,04	79,20	95,92	1	2,07	52	28,50	61,66	49
BEL	14,71	4	12	0,73	1,61	85,33	70,30	97,67	1	2,61	43	20,90	83,21	32
CAN	4,00	1	16	36,78	3,73	87,21	0,00	90,97	0	1,12		43,12	93,36	
CHE	29,14	4	15	63,02	2,36	96,05	65,00	96,29	1	3,98		24,12	85,48	
CZE	44,44	5	11	4,69	1,17	94,64	79,50	92,71	0	5,95	92	14,68	56,35	7
DEU	12,63	4	10	30,20	0,50	95,88	62,20	95,62	1	0,00	49	19,12	84,31	34
DNK	1,04	1	16	31,25	0,52	92,85	53,60	97,75	1	10,47	82	17,80	76,44	19
ESP	1,37	1	16	32,61	6,15	83,13	37,20	94,62	0	2,19	28	28,49	86,58	57
FIN	0,51	1	16	35,03	0,00	99,62	58,80	93,05	0	1,52	98	48,22	63,45	2
FRA			15				56,40	98,53	0	0,00	31	0,00		24
GBR	12,83	1	16	20,70	3,20	95,73	69,20	91,25	0	5,68	89	39,46	61,62	11
GRC	0,60	2	15	57,65	2,96	88,52	36,00	94,32	0	0,59	16	50,89	89,35	80
HUN	35,47	3	11	19,49	1,27	93,07	49,80	98,99	0	7,95	97	10,46	62,76	4
IRL	0,76	4	15	12,78	0,78	87,17	28,30	72,65	1	1,50		48,12	77,44	
ISL	0,00	1	16	47,90	1,71	98,81	35,10	93,31	0	0,00		6,84	19,66	
ITA	1,50	3	14	3,23	3,06	72,46	63,80	95,29	1	3,24	61	10,47	52,37	23
JPN	65,73	2	15	23,24	24,65	75,13	25,50	98,67	0	13,38	67	28,87	49,30	13
KOR	39,01	3	14	22,22	19,72	54,37	30,70	96,07	0	20,14	56	5,04	28,06	9
LUX	37,93	4	13	3,45	0,00	96,79	64,70	88,04	0	0,00		37,93	89,66	
MEX	16,15	3	12	5,06	12,40	51,28	10,90	90,31	0	4,74	22	18,66	71,17	75
NLD	37,41	4	12	2,03	0,00	92,41	69,10	97,17	1	2,76	100	20,69	50,34	0
NOR	0,00	1	16	46,20	0,00	99,56	59,20	92,47	0	4,65	37	6,40	87,21	32
NZL	1,84	1	16	22,16	6,13	78,23	0,00	91,68	1	1,19	75	50,60	86,90	25
POL	7,83	3	15	54,22	1,23	94,83	54,30	96,21	0	33,33		2,42	29,09	
PRT	1,32	3	15	22,22	2,65	84,44	28,50	72,18	0	1,31	73	43,79	83,66	50
SVK	36,94	5	11	7,17	0,00	93,04	75,40	92,00	0	1,78	65	8,19	41,28	33
SWE	6,63	1	16	31,32	0,00	99,46	52,90	88,25	0	25,56	83	3,89	63,89	18
TUR	10,32	3	11	18,99	0,67	59,85	38,00	23,69	0	1,32	24	19,87	49,67	49
USA	6,61	1	16	64,47	7,44	86,17	0,00	97,38	0	5,65		41,74	80,43	

**Table A5.: Factor of stratification and standardization on educational equality**

	(1)	(2)	(3)
	Educational Inequality		
Factor of stratification <sup>10</sup>	1.345		1.251
	(0.79)		(0.82)
Factor of standardization <sup>11</sup>		-2.913**	-2.877**
		(2.52)	(2.49)
Constant	34.636***	34.806***	35.033***
	(19.75)	(23.38)	(22.89)
Observations	29	29	29
R-squared	0.02	0.13	0.15
Robust t statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

**Figure 7**



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<sup>10</sup> Principal component factor of Ratio of “previous record is a prerequisite” for attendance, Number of secondary school types, Age of selection to secondary, Ratio of “residence is a prerequisite” for attendance, Percentage of govt. funding, % of up.sec enrolment in prevoc./vocational programs.

Percentage of private schools were left out due to missing cases.

<sup>11</sup> Principal component factor of Percentage of children going to kindergarten, Exit exams present at the end of sec., Rate of full local decision-making, Rate of full national decision-making, Rate of national or regional direct influence in setting the instructional content

Percentage of decisions relating to public sector, lower secondary education, taken at local or school level, and Percentage of decisions relating to public sector, lower secondary education, taken at central or state level were left out due to missing cases.

<sup>12</sup> Note that removing the outliers – POL, KOR and SWE – produces an even more robust association between the outcome and the factor of standardization.

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