Chapter 5

Decentralised funding and inequality in education

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This chapter explores the link between the decentralisation of education funding to the local level and inequality in outcomes. In most countries, autonomous local taxes fund, at most, a small share of education expenses. They play a significant role, however, in a few Nordic countries and in Switzerland. The economic literature suggests that local funding makes educational systems more efficient at the expense of equity. However, inequality is not systematically larger in more decentralised countries. This finding does not appear to be driven by differences in socio-economic homogeneity, but rather by a range of policies that mitigate or offset any adverse impact. Some of these policies may still bear an equity-efficiency trade-off.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Introduction

One of the central tenets of the fiscal federalism literature is that funding local services by local taxes enhances efficiency and accountability. Local voters are more likely to choose efficient provision levels when they pay the proper price. Local funding provides them with a financial incentive to monitor productive efficiency and to benchmark performance across jurisdictions. Moreover, households can sort across local jurisdictions to find a package of services and taxes that best suits their preferences, thus inducing competition in a market for local services (Tiebout, 1956). Capitalisation of the value of this package into local house prices provides homeowners with a further incentive to scrutinise local service production. Fischel (2001) reviews these arguments in depth for what is in many countries the most important local service: education.

In spite of these proclaimed advantages, local funding of education is a highly contentious issue, because of its potentially adverse impact on equity. Communities may vary in the amount of funds they dedicate to education, in accord with local preferences and incomes. Moreover, decentralisation of funding may incentivise communities to attract high-income families, which could bias the distribution of funds even further towards children of high-income families – rather than the needy. Such differences in funding may well reinforce differences in educational attainment.

Inequality in education outcomes matters. It affects income inequality and its transmission across generations, as well as broader outcomes such as health, crime and citizenship. Inequality may also harm macroeconomic growth, as the high and low-skilled complement each other in the aggregate economy (Benabou, 1996). Inclusiveness of the educational system is, therefore, a critical aspect of inclusive growth and from this perspective, it is essential to understand how institutional features such as decentralisation of funding affect inclusiveness.

Despite its social relevance, our empirical knowledge about the link between decentralisation of education funding and inequality in outcomes is limited. It has been studied most extensively in the United States, where a series of court-imposed reforms in school finance equalisation have created an opportunity to establish causal effects. Although this literature is not unequivocal, it tends to support the equity-efficiency trade-off that economic theory suggests: centralisation of school funding appears to have reduced efficiency of educational systems, while improving equity. However, there is no systematic evidence on the link between decentralisation of education funding and inequality in outcomes across countries. This chapter aims to fill that gap.

The basic idea of the chapter is to confront measures of inequality in education outcomes across OECD countries with information about the role of autonomous local taxes in funding education. The OECD Programme for International Student Assessment (PISA) readily provides a range of inequality measures. In order to construct a measure for the extent to which education is funded through local taxes on which local citizens really have a say, we combine information on the share of funds for public education that originates from the local level with information on the relative importance of local taxes and on local tax autonomy.

It turns out that in most countries, the role for autonomous local taxes in funding education is limited, but there are some notable exceptions. In contrast to what the economic literature predicts, we do not find a statistically significant positive relationship between decentralisation of funds and inequality in education outcomes. The education system appears to be equitable in several Nordic countries, in spite of being funded locally to a considerable degree. The same holds for Switzerland – albeit at the cantonal level.

Furthermore, countries in which funding is decentralised do not appear to be systematically more homogeneous in terms of the socio-economic background of students, nor do they necessarily spend more on education.

The next section provides a bird's eye view of the literature on the link between decentralisation and efficiency and equity of educational systems, with a particular focus on the US experiment in school finance centralisation. The third section discusses the measurement of the role of autonomous local taxes in funding education. This measure will be confronted with several measures of inequality in education outcomes in the fourth section, as well as with measures for socio-economic heterogeneity and education spending. The final section draws conclusions and discusses policies that may mitigate or offset any adverse impact of decentralisation on inequality.

Literature

Empirical evidence tends to support the notion that the decentralisation of tasks and funds to sub-national governments makes education systems more efficient. This literature generally relates measures of decentralisation to student performance. The underlying idea is that higher test scores indicate more productive efficiency, provided that other inputs are adequately controlled for in the framework of an education production function (Hanushek, 1986).

Studies at the cross-country level include Falch and Fischer (2012), Blöchliger, Égert and Bonesmo Fredriksen (2013) and Salinas (2014). These studies consider a range of decentralisation measures, with varying effects on education performance. One common thread is that the decentralisation of decision-making power is more important than the decentralisation of spending.[1] Salinas (2014) finds that a significant role for sub-national taxes, which gives sub-national governments more spending autonomy, reinforces the impact of decentralised decision making on education outcomes. Blöchliger, Égert and Bonesmo Fredriksen (2013) find that increasing the autonomy of schools serves as a substitute for decentralisation to sub-national governments, with similar effects on education performance.

A small number of studies that exploit variation in decentralisation measures within countries confirm the positive effect of decentralisation on student performance. The evidence based on court-imposed school finance reforms in US states, discussed in Box 5.1, is of particular interest in this respect because these reforms enable a clear identification of the effect of a precisely measured type of decentralisation. Barankay and Lockwood (2007) study differences across Swiss cantons in the share of education expenses shouldered by local governments and find that more decentralisation is associated with better student performance. Galiani, Gertler and Schargrodsky (2008) find that a transfer of schools from the central to the provincial level in Argentina has improved student performance – though not in the most impoverished places.

Turning to the impact of decentralisation on inequality, the evidence stems mostly from country-specific studies. The Galiani, Gertler and Schargrodsky (2008) study of the Argentina school reform clearly indicates that decentralisation may lead to a divergence in outcomes between rich and poor jurisdictions. Evidence from Borge, Brueckner and Rattso (2014), who study a reform in Norway that increased the spending discretion of local governments, points in the same direction. The reform made local service provision more responsive to local demand conditions, yet it also introduced a positive link between local income and the number of teachers per student. Evidence from the US experiment in school finance centralisation, discussed in Box 5.1, also tends to support the existence of an equity-efficiency trade-off.

Box 5.1. Court-mandated school finance reforms in the United States

Prior to the 1970s, primary and secondary education in the United States was mainly funded through local property taxes. In Serrano II, 1976, the California Supreme Court required equal public spending per pupil throughout the state. The apparent purpose was to reduce disparities in educational opportunity. This ruling had far-reaching consequences for school funding in California and the rest of the United States. The state legislature introduced a school finance equalisation system that disconnected local taxes from local school spending. Arguably as a result, voters drastically reduced local taxes and the educational system became mainly state-funded (Fischel, 2001). The California ruling inspired several other state supreme courts, which overturned school finance systems in 28 states between 1971 and 2010. The school finance equalisation schemes that these states introduced, however, varied in important dimensions and so did their impact on public school spending (Hoxby, 2001).

Notwithstanding differences in implementation across states, the overall effect of these court-imposed reforms was an equalisation and centralisation of school funding. The equalisation schemes weakened the link between local taxes and local school funds, limiting the ability of local communities to differentiate on school quality. Equalisation thus stifled competition between public schools, which may have made schools less efficient. A second channel through which these reforms may have impaired efficiency of the educational system is the increase in state regulation that came with a more significant share of state funds – at the expense of local autonomy. Husted and Kenny (2000) provide empirical support for both mechanisms.

While the promotion of equity was an important goal of the reforms, several mechanisms may have hampered its achievement. Besides the negative impact on overall school spending in some states, one fundamental issue with property tax based equalisation is that poor children do not necessarily live in property-poor districts, so the money is ill-targeted (Fischel, 2001). Another issue is that the redistribution of funds through equalisation will capitalise on property values, further offsetting the benefit to poor households who see their rents increased (Dee, 2000).

Nevertheless, Jackson, Johnson and Persico (2016) find that children of low-income households who benefited from court-mandated changes in funding experienced higher wages and less poverty in adult life. This suggests that overall, these reforms have been effective in reducing inequality and the intergenerational transmission of poverty. Similarly, Card and Payne (2002) find that court-mandated school finance reforms have reduced the gap in test scores between low- and high-income students. The evidence is not unequivocal, though, as other studies, such as Downes and Figlio (1998) and Husted and Kenny (2000), obtain mixed or insignificant results for the effect on the distribution of test scores.

We are not aware of any previous systematic analysis of the link between decentralisation and inequality in education outcomes at the cross-country level. There is some evidence on the link between competition between schools and stratification. Notably, OECD (2010) finds that competition strengthens the relationship between a school's average socio-economic background and the school's average student performance. OECD (2012a) provides a broader cross-country analysis of the determinants of equity in education, such as policies with regard to grade repetition and early tracking.

Measuring the role of local funding in education

This section develops a measure for the role of autonomous local taxes in funding education. Thus, while the literature considers a broad range of decentralisation measures, pertaining to the spending side, the revenue side, or decision-making power, the focus here is on the decentralisation of funding. Furthermore, we focus on the local level, as this is the level at which Tiebout competition and stratification are most likely to occur. After a descriptive analysis of the new measure, we will verify that local jurisdictions in countries where funding is strongly decentralised also have a significant say in education policies.

The section concludes with a brief analysis of the role of funding at the intermediate level for federal countries. Box 5.2 will zoom in on the role of local funding in Denmark.

In order to approximate the Tiebout setting in which local services are funded through local taxes as closely as possible, the share of public school funding that comes from local taxes on which local jurisdictions really have a say is considered. Alas, this share is not directly observed, so a proxy measure is constructed that takes account of the share of public school funding that comes from the local level, the share of local revenue that is raised through local taxes and the share of local taxes that local governments can influence. The underlying idea is that school funding is truly decentralised to the local level in countries in which all these shares are high, such as in the United States prior to the 1970s. The construction of this measure will now be discussed in detail.

The point of departure is the share of public funds for primary, secondary and post-secondary non-tertiary education that comes from the local government level. Private expenditure is ignored, although it constitutes an even more decentralised source than local public funding, because of its limited role in OECD countries.[2] Public funding data comes from OECD (2015). They refer to 2012 and distinguish the source of funding before and after taking account of intergovernmental transfers. Higher tiers of government often fund a considerable part of education expenditure at the local level through grants. In Canada, for example, local governments fund 86% of public education after taking account of transfers, but 75% of public education funds originate from the provinces. As these grants are earmarked for education, they limit local discretion on expenditure. Furthermore, in such cases, it is likely that these higher tiers of government also have a significant say in education policy. We, therefore, consider the share of public education that is funded from local resources and not from earmarked intergovernmental transfers. Local spending on schools that is not covered by education grants must be funded through local taxes, general grants, or other sources of revenue. Local governments will generally exercise more discretion over these funds, and local voters are more directly confronted with the costs.

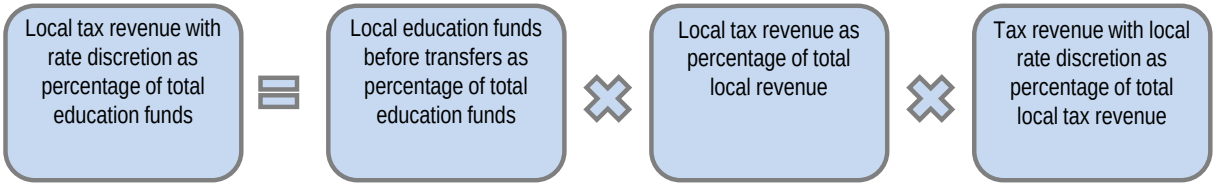
This measure does not yet suit our purposes, however, because when local governments fund public education through general grants, the pay check is still passed on to taxpayers at higher tiers of government. Furthermore, local governments tend to spend general grants, rather than passing them on to residents through a tax cut, a phenomenon well known as the "flypaper effect".[3] Hence, funding through general grants still effectively hampers local spending discretion, and it impairs the local trade-off of benefits and costs that is at the heart of the Tiebout model. It is therefore widely believed to reduce the accountability and efficiency of local service provision (Rodden, 2003; Oates, 2005).

The share of local education funds that comes from local taxes may be gauged by considering local tax revenue as a percentage of total revenue at the local level. The *OECD Fiscal Decentralisation Database* provides this information on the basis of National Accounts.[4] For most countries, it is available for 2012. By multiplying this share with the share of public education funds that originates from the local level, a proxy is constructed for the share of public education that is funded through local taxes. In practice, one cannot say how local governments allocate revenue sources over expenditure items, so this measure should be interpreted with caution. Still, a high value indicates that a significant share of public education funds comes from the local level and that local governments fund a significant share of local expenditure with local taxes.

Even if local governments fund a significant share of education with local taxes, however, they still cannot raise the quality of local education and pass the bill to local voters, or cut expenses and local taxes, without a certain measure of tax autonomy. In

Norway, for example, a significant share of public education funding originates from local governments that are in turn mainly funded through local taxes, yet in practice, municipalities have no tax autonomy as all set the same rates. Hence, we construct the share of local taxes on which local governments have some rate discretion, using information on local tax autonomy from the *OECD Fiscal Decentralisation Database*.[5] Multiplication with the share of education funds from local taxes yields a proxy for the share of education funds from autonomous local taxes – as illustrated in Figure 5.1. This proxy takes on high values in countries where local governments fund a significant share of public education, where local taxes are an important source of local revenues and where local governments have considerable revenue autonomy. We, therefore, interpret a high value as indicating a significant role for local funding in education, which facilitates Tiebout competition.

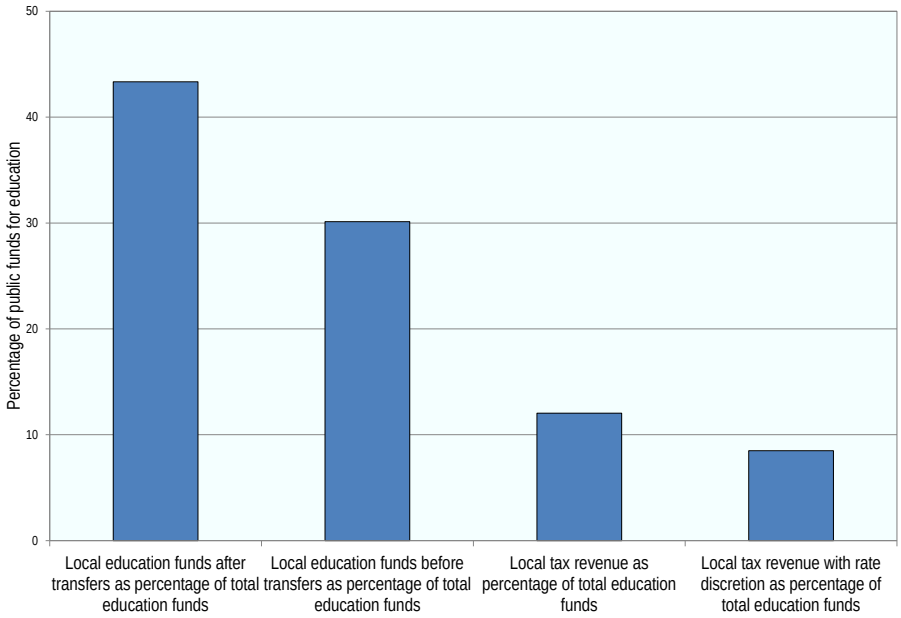
Figure 5.1. **A proxy for the share of local funding in education**



Source: Author's elaboration.

Turning to a descriptive analysis, Figure 5.2 illustrates how the share of local funding in education, averaged over all countries for which our funding data are complete, declines once stricter criteria are imposed – the underlying data are reported in Annex Table 5.A1.1. When intergovernmental transfers are taken into account, almost half of all public funds for primary, secondary and post-secondary non-tertiary education comes from the local level. This share drops by more than 10 percentage points if we only consider funds that originate from the local level. An even more substantial drop occurs when we multiply this share with the share of local revenue that is covered by local taxes. On average, the revenue of local taxes subject to local rate discretion accounts for less than 10% of public education funds, in our approximation. The reality in many countries thus appears to be far removed from the Tiebout world in which local taxes fund local services, and local voters have a say in both. The US pre-1970 setting turns out to be the exception rather than the rule.

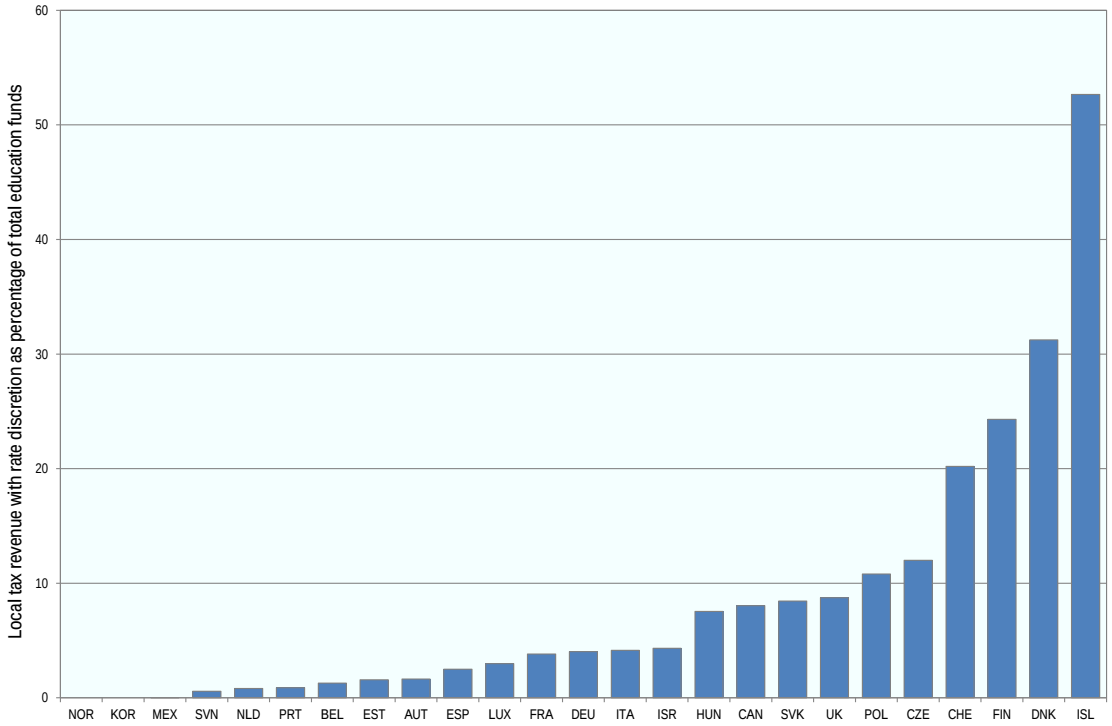
Figure 5.2. **The role of local funding in education**



Source: Author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Even if the role of autonomous local funding appears to be small in general, there is meaningful variation across countries. Figure 5.3 illustrates that in some countries, the role of local funding is considerable. In Iceland in particular, about three-quarters of public funds for education originate from local governments, which in turn obtain three-quarters of their revenues from local taxes on which they have discretion. In Denmark and Finland, autonomous local taxes fund about one-third of public education expenditure according to our proxy measure, so the role of local funding is still substantial. Even for these countries, though, a large role of autonomous taxes does not necessarily imply fierce Tiebout-style competition at the local service. Local taxation in Denmark, for example, is still characterised by a considerable degree of co-ordination. Box 5.2 provides more background on public education funding and local taxation in this country.

Figure 5.3. **The role of autonomous local taxes across countries**



Source: Author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Box 5.2. **How local is education funding in Denmark?**

Denmark is amongst the most fiscally decentralised countries in the OECD area and providing primary and lower secondary education is one of the core tasks of the municipalities. Almost all public funds for education originate from the local level, while municipalities obtain about one-third of their revenue from autonomous local taxes – of which the income tax is the main component. This means that the central government still shoulders the more significant part of education expenses, albeit indirectly through general grants.

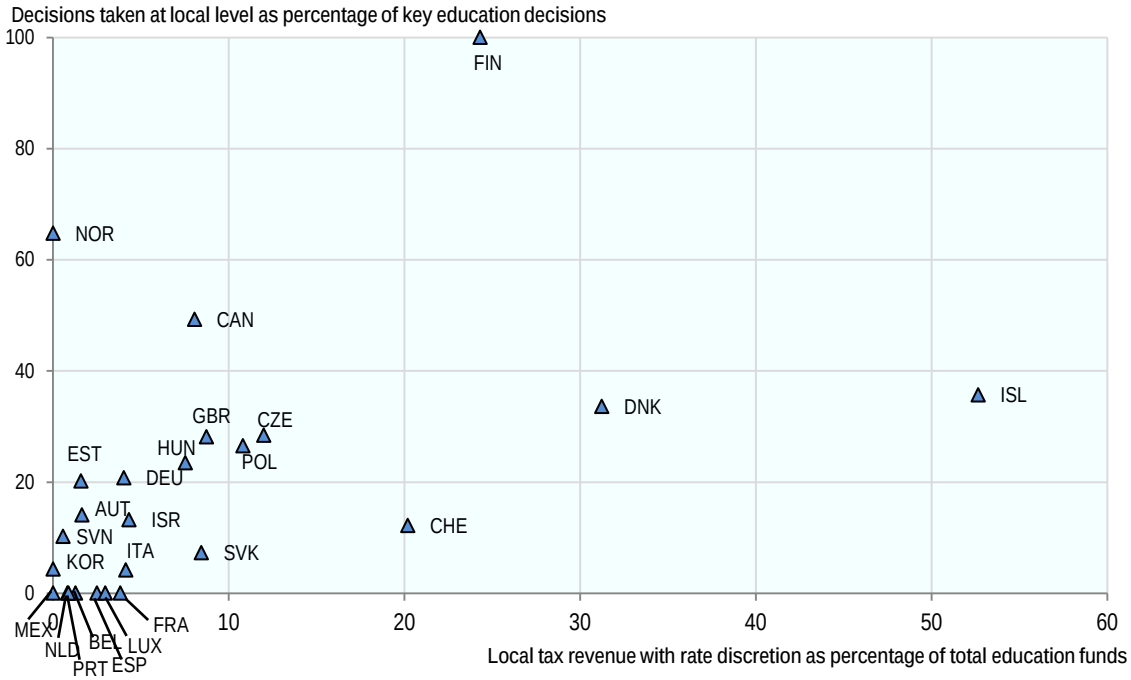
The considerable share of local expenses that is funded through local taxes has the potential to function as a powerful source of fiscal discipline, incentivising municipalities to provide an attractive service and tax package. In practice, however, tax competition appears to play a small role. In annual negotiations with the central government, local associations agree to recommend to their members to keep tax rates and expenditure increases within specified limits. In the wake of the financial crisis of 2008, the central government enforced these agreements by making general grants conditional on municipal compliance. This has arguably led to a "tax freeze" that effectively eliminated local tax autonomy (Lotz, Blom-Hansen and Hartmann Hede, 2015).

Moreover, it appears that municipalities do not compete on school quality either. While the performance of students, schools and municipalities is monitored through national tests, the results of these tests are confidential. Thus, municipalities cannot benchmark themselves against other municipalities; school leaders cannot compare themselves to other schools and parents cannot compare different schools' average test results (Houlberg et al., 2016). This serves to illustrate just how far reality stands apart from the Tiebout model of competition on tax and service levels – even in a highly decentralised country like Denmark.

It does not make much sense to accord a large role to autonomous local taxes if local governments have little influence on education policy. Hence, as a check on the proxy measure for the role of local funding, we verify that it goes hand in hand with local decision-making power on education matters. OECD (2012b) documents where key decisions are made in public institutions at the lower secondary level of education, distinguishing different tiers of government and the school level.[6] It considers a representative set of 46 key decisions in the four broad domains of the organisation of instruction, personnel management, planning and structures and resource management. The data refer to 2011. We consider the share of decisions that is taken at the local level. A low share does not necessarily mean that school policy is centralised, because it may also result from a significant degree of school autonomy, yet this measure suits our purposes, as we are interested in the extent to which decision-making power at the local level coincides with local funding.

Figure 5.4 scatters the share of decisions taken at the local level against our proxy measure for the share of public education funded by autonomous local taxes. It indicates that the two tend to go hand in hand – the correlation coefficient is 0.45 and it is statistically significant at the 5% level. Finland, Denmark and Iceland stand out as countries in which local governments have a comparably large say in both education policy and funding. The next section will therefore explore how these countries perform on equity aspects.

Figure 5.4. **Local funding and local decision-making power tend to go hand in hand**



Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators*, http://dx.doi.org/10.1787/eag-2012-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

While measures have been constructed for the decentralisation of funds and for decision-making power at the lowest local level available, the intermediate level in federal countries often plays a vital role in education funding and policy as well. For these countries, Annex Table 5.A1.2 reports the share of public education expenditure funded with autonomous taxes at the intermediate level and the share of decisions made at this level, using the same sources and approach as for the local level. It indicates that of the countries for which our data are complete, autonomous taxes at the intermediate level play a significant role only in Canada, Spain, Switzerland and the United States. Of these countries, only the cantons in Switzerland would appear to be small enough to enable Tiebout competition.[7] The Swiss cantonal level funds one-third of public education through autonomous taxes and it takes about 60% of decisions. If we add the share of autonomous taxes and decisions from the local level, it turns out to be one of the most decentralised countries in our sample. Moreover, tax competition across Swiss jurisdictions could well be stronger than in Nordic countries like Denmark.

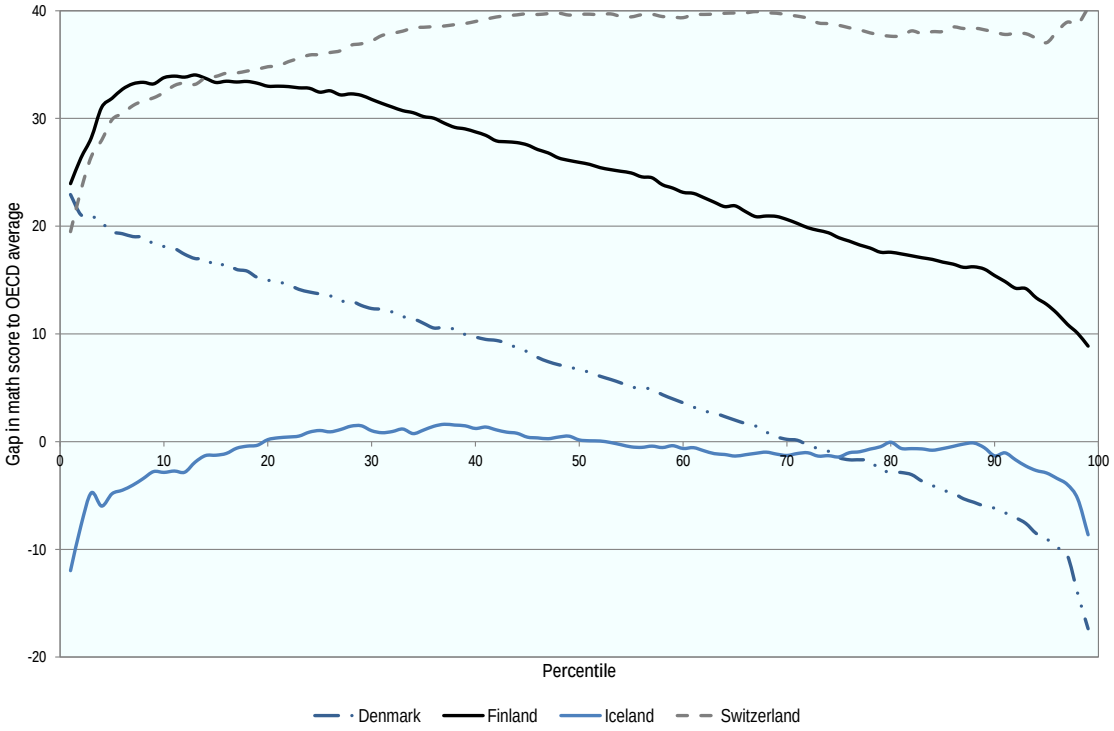
Wrapping up this section, we observe that the new proxy measure for the role of autonomous local funding in education indicates that this role is small in most countries, but considerable in a few critical exceptions – which include Switzerland if one also considers the cantonal level. Reassuringly, the decentralisation of funds according to this measure appears to go hand in hand with the decentralisation of decision-making power to the local level. The next section confronts the role of local funding with measures for inequality in education outcomes.

Results from a confrontation with inequality measures

Inequality in education outcomes is explored on the basis of the OECD Programme for International Student Assessment (PISA). PISA is a triennial international survey which aims to evaluate education systems world-wide by testing the skills and knowledge of 15-year-old students. Outcomes at this age presumably reflect features of both primary and secondary education systems. We use the 2012 results because our decentralisation measures are based on data for this year as well. Around 510 000 students in 65 countries participated in PISA 2012. The survey focused on competencies in mathematics, so in this chapter, we will focus on outcomes for mathematics, too.

Figure 5.5 plots the distribution of math scores relative to the OECD average for Denmark, Finland, Iceland and Switzerland – the countries identified as most decentralised in the previous section. For each percentile of the outcome distribution, the figure shows the difference between test scores for these selected countries and the OECD average. So, for example, the worst performing 1% of students in Iceland score 12 points below the worst performing 1% in all OECD countries. The best performing 1% of students in Switzerland score 40 points higher than the best performing 1% of students in the OECD area.[8]

Figure 5.5. **Gap to OECD average in math scores by percentile in four decentralised countries**

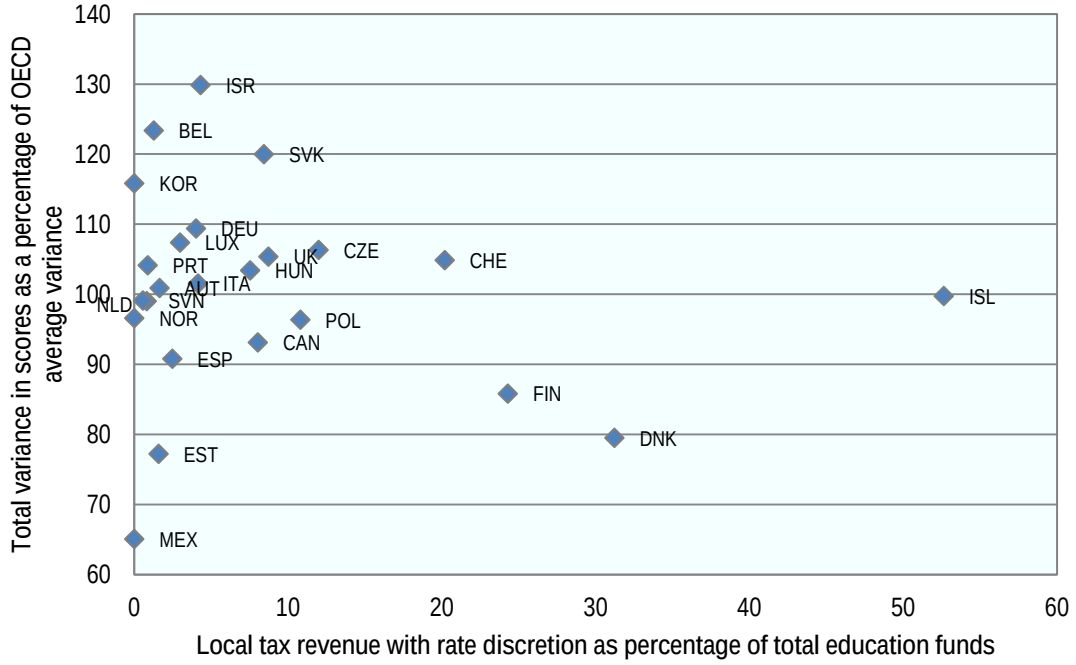


Source: Author's calculations based on PISA 2012, http://www.oecd.org/pisa/pisaproducts/pisa2012database-downloadabledata.htm.

The figure shows that Switzerland outperforms the OECD average over the entire distribution. However, the gap is smaller for students at the lower end than for students who perform above average. This suggests that the Swiss educational system is more geared towards better-performing students and in this sense, it is less equitable. The reverse holds for Denmark and Finland: students at the top of the distribution outperform the OECD by less than students at the bottom, which suggests that educational systems in these countries do relatively well for low achievers. Of course, these differences across countries may also reflect the composition of the student population in terms of talent and background. Nevertheless, Figure 5.5 does not provide *prima facie* evidence for a systematic positive relationship between decentralisation of funding and inequality – the distribution of math scores is consistent with this prediction for only one out of four countries.

Figure 5.6 scatters the variance in outcomes relative to the OECD average variance against our proxy measure for the share of education funds from autonomous local taxes – where for Switzerland, we consider the role of autonomous funding at the local rather than the cantonal level for reasons of consistency. Variances in outcomes are directly related to the slopes of the distributions in Figure 5.5: if test scores relative to the OECD average decline for better-performing students, then the spread in outcomes must be smaller than in the OECD as a whole. Indeed, the figure shows that the spread in outcomes in Iceland equals the OECD average, whereas it is slightly higher in Switzerland and considerably lower in Finland and Denmark. No systematic relationship with the role of local funding appears. Countries in which funding is highly centralised may have either a much larger (Israel, Belgium, the Slovak Republic) or a smaller spread in outcomes (Estonia, Mexico). This suggests that other determinants of equity in education are far more important.

Figure 5.6. **Does local funding raise the variance in outcomes?**

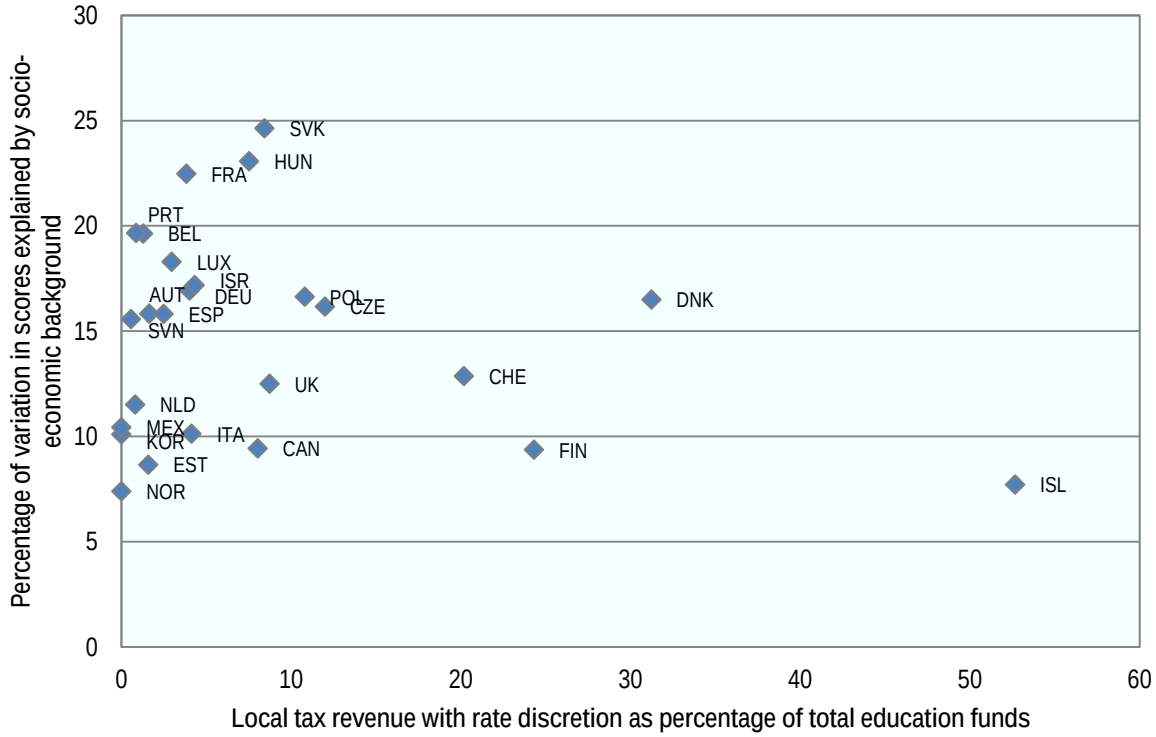


Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

It is important to realise that the spread in outcomes is only one of various ways to measure inequality. In particular, OECD (2013) defines equity in education as providing all students, regardless of gender, family background or socio-economic status, with similar opportunities to benefit from education. In this definition, a stronger relationship between a student's socio-economic status and his or her performance indicates a less equitable school system. Countries may have a large spread in outcomes yet provide access to education independent of a student's status, so the two measures complement each other.

Figure 5.7 scatters the percentage of variation in math scores that is explained by the PISA index of economic, social and cultural status against the share of education funds from autonomous local taxes. This index is based on indicators such as parental education and occupation, the number and type of home possessions that are considered proxies for wealth, and the educational resources available at home. It is built to be internationally comparable (OECD, 2013). The figure does not indicate a systematic relationship between decentralisation and inequality. Notably, Finland and Iceland are amongst the most equitable countries according to this measure, and in Denmark, socio-economic status explains just slightly more than the OECD average of 15% of the variance in outcomes. In most countries, the role of local funding in education is rather limited, yet the equity measure varies considerably – from 7% in Norway to 25% in the Slovak Republic.

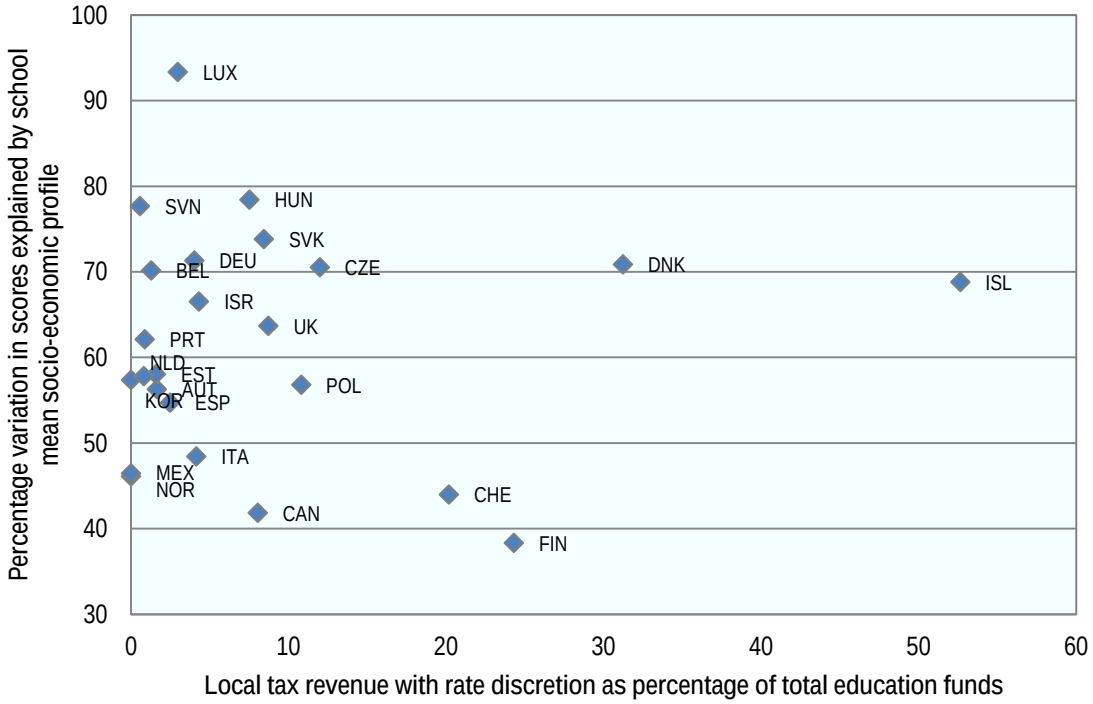
Figure 5.7. **Does local funding raise inequality?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Yet another way to look at inequality is provided by the between-school strength of the relationship between student performance and socio-economic status. This viewpoint is particularly relevant in the context of decentralisation: a strong link indicates that privileged students have access to better schools – a pattern that may well arise in decentralised settings, in which affluent communities dedicate more funds to education. Hence, Figure 5.8 scatters the percentage of variation in math scores explained by the school average PISA index against the share of education funds from autonomous local taxes.[9] Again, no systematic relationship is apparent. In Denmark and Iceland, this share exceeds the OECD average of 63%, yet Switzerland and Finland are amongst the most equitable countries according to this measure.

Figure 5.8. **Does local funding raise between-school inequality?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.1 displays correlations between the three decentralisation measures and the share of education funds from autonomous local taxes. It also reports p-values between brackets. A p-value below 0.05 indicates that the relationship is statistically significant at the 5% level, i.e. absence of a systematic relationship has a probability smaller than 5%. As inferred from Figures 5.6 to 5.8, there is no statistically significant relationship between the share of education funds from autonomous local taxes and any of the inequality measures. The limited number of observations on which these correlations are based should, of course, be borne in mind.

In order to verify the robustness of this result for measurement of the decentralisation of funding, correlations of the inequality measures with alternative decentralisation measures are also shown in Table 5.1. In particular, we consider the four measures shown in Figure 5.2, on which we impose increasingly strict criteria for the role of local funding. Correlations are generally statistically insignificant.[10] Only the share of variation in math scores explained by socio-economic status at the student level appears to relate (borderline) significantly to the share of education funds originating from the local level and to local tax revenue as a percentage of total education funds. However, virtually all correlations are negative, suggesting that more decentralised countries are less unequal – rather than more. These results are driven by Iceland, which is highly decentralised and where socio-economic background plays a comparably limited role.

Table 5.1. **Correlations between decentralisation and inequality measures**

	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile
Local education funds after transfers as percentage of total education funds	-0.21 (0.26) *n* = 30	-0.23 (0.22) *n* =31	-0.27 (0.14) *n* =30
Local education funds before transfers as percentage of total education funds	-0.22 (0.24) *n* =30	-0.29 (0.11) *n* =31	-0.23 (0.22) *n* =30
Local tax revenue as percentage of total education funds	-0.21 (0.31) *n* =25	-0.37 (0.06) *n* =26	-0.18 (0.38) *n* =25
Local tax revenue with rate discretion as percentage of total education funds	-0.15 (0.47) *n* =24	-0.22 (0.29) *n* =25	0.01 (0.98) *n* =24

Note: The table shows pairwise correlations, p-values between brackets and the number of observations *n*.

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

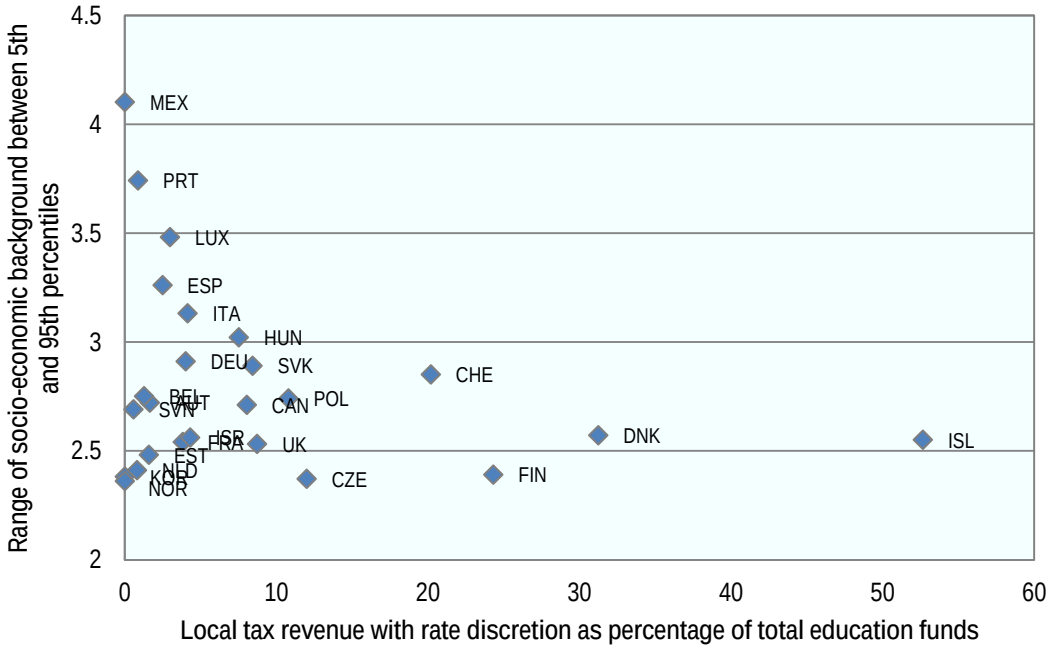
The correlations reported in Table 5.1 do not rule out a causal link between decentralised funding and inequality, as they may be driven by other factors. Any factor that relates systematically to both the role of local funding and inequality in education outcomes would bias the relationships inferred from this table. In particular, inequality in education outcomes may be driven by the overall level of inequality in society – as relected for instance in the dispersion of disposable household incomes, the generosity of social support systems, or the degree of spatial income segregation – and both may be the result of egalitarian preferences. If more egalitarian countries would tend to be more decentralised, the correlations in Table 5.1 underestimate the true relationship. Inequality would be low here, not because there is no effect from decentralisation, but because this effect is offset by a high overall level of equality, and more inequality could result if these countries would choose to decentralise the funding of schools even further – while holding other policies constant.

Socio-economic heterogeneity in student populations, as measured by the range of the PISA index of economic, social and cultural status between the 5th and 95th percentiles, provides an indication of the overall level of inequality in a country. It correlates positively and statistically significantly with the share of variation in math scores that is explained by socio-economic status: socio-economic status tends to matter more in countries in which students vary more in background.[11] The question is, however, whether socio-economic heterogeneity is also systematically smaller in more decentralised countries.

Figure 5.9 scatters the range of socio-economic background between the 5th and 95th percentiles against the share of education funds from autonomous local taxes. Denmark, Finland and Iceland are indeed comparably homogeneous. This finding supports the idea that inequality in outcomes may be comparably small in these countries in spite of decentralised funding and that inequality in outcomes would have been more significant in more heterogeneous countries with a similar level of decentralisation. However, heterogeneity in Switzerland is slightly above the OECD average of 2.83, and yet, inequality measures are near or below the OECD average. Moreover, the variation in heterogeneity across countries in which funding is more centralised is considerable. In

Korea, for instance, local funding plays a negligible role, yet it is more homogeneous than the Nordic countries. Hence, more decentralised countries do not appear to be systematically more or less heterogeneous in terms of socio-economic background.[12] The evidence thus does not point to differences in socio-economic heterogeneity in student populations as the explanation for the absence of a systematic positive relationship between decentralisation of funding and inequality in education outcomes.

Figure 5.9. **Are decentralised countries more homogeneous?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.2 shows partial correlations of the three inequality measures discussed in this chapter with the share of education funds from autonomous local taxes, after accounting for the effect of socio-economic heterogeneity. They confirm the message derived from Figure 5.9: the relationship between decentralisation and inequality does not turn positive and statistically significant once socio-economic heterogeneity is held constant. Israel illustrates this point well: it is about as homogeneous as the three Nordic countries, funding is considerably more centralised, yet there is more inequality in outcomes.

Table 5.2. **Partial correlations between local funding and inequality measures**

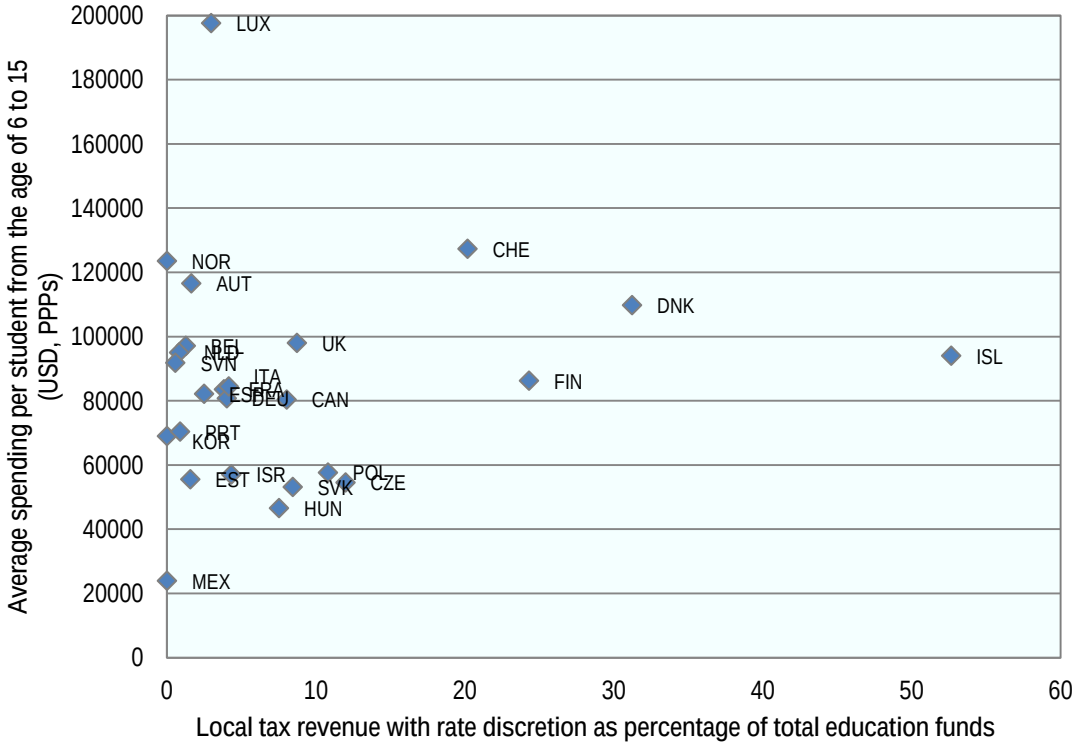
	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile
Range of socio-economic status between the 5th and 95th percentiles partialed out	-0.23 (0.29) *n* = 24	-0.17 (0.43) *n* =25	0.03 (0.90) *n* =24
Spending per student from the age of 6 to 15 partialed out	-0.17 (0.44) *n* =24	-0.21 (0.32) *n* =25	-0.02 (0.93) *n* =24

Note: The table shows partial correlations between inequality measures and local tax revenue with rate discretion as a percentage of total education funds, p-values between brackets and the number of observations *n*.

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Spending is another factor that may confound the relationship between decentralisation and inequality. Do more decentralised countries simply spend more on their students and does this account for less inequality in outcomes? Figure 5.10 scatters average spending per student from the age of 6 to 15, obtained from OECD (2013), against the share of education funds from autonomous local taxes. Spending appears to be high in Denmark and particularly high in Switzerland, yet there is again no systematic link with the role of local funding. In fact, spending is neither significantly correlated with the role of local funding, nor with inequality – as measured by the share variation in math scores that is explained by socio-economic background.[13] Table 5.2 verifies that controlling for education spending does not alter the main finding of this chapter that there is no positive and statistically significant relationship between decentralisation and inequality across countries.

Figure 5.10. **Do decentralised countries spend more on education?**



Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en and author's calculations based on OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en and OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

It should be stressed, however, that these partial correlations provide only a crude check for variables that confound the relationship between decentralisation and inequality. Obviously, the small number of observations limits the statistical power to separate out the effects of different variables. More fundamentally, inequality in education outcomes may be shaped by a myriad of factors, and it is impossible to account for all of them. The analysis of changes in decentralisation and inequality over time may partly overcome these limitations. Alas, the distribution of funds and tasks over different government layers is rather inert – in most countries, the share of education funds from autonomous local taxes has hardly changed since 2000, when PISA was first carried out. One example of a country where local governments did obtain a more significant role in funding and determining education policy in recent years is Norway. Box 5.3 documents that, consistent with the primary finding in this chapter, inequality in outcomes does not seem to have increased as a result.

Box 5.3. **Decentralisation of decisions and funds in Norway**

While in most countries not much has changed over the past 20 years in the distribution of decisions and funds over different layers of government, Norway is an interesting exception. Local governments took 32% of key education decisions in 2003 and 62% in 2011 (OECD, 2008, 2012b). Moreover, in 2002, 43% of public funds for education originated from the local level, whereas in 2012 this share rose to 92% (OECD, 2005, 2015). This shift in decisions and funds is driven by several reforms. Notably, municipalities became responsible for negotiating teachers' pay and work-time agreements in 2004 – although negotiations remained quite centralised. Municipalities received a lump sum grant for teacher salaries. The Knowledge Promotion Reform in 2006 introduced a new outcomes-based curriculum while transferring autonomy on how to attain these outcomes to the local level (Nusche et al., 2011).

These reforms provide an excellent opportunity to investigate the link between decentralisation and inequality in education outcomes because they allow for a comparison between two different settings in the same country. Many factors that influence both decentralisation and inequality, such as the overall level of social inequality in Norway, will have remained more or less constant between 2003 and 2012. This mitigates the risk that the observed relationship between decentralisation and inequality is driven by other factors – although changes in other policies or in the composition of the population of students may still confound empirical findings.

OECD (2013) explores trends in equity between PISA 2003 and PISA 2012. It documents that equity in Norway, as measured by the strength of the relationship between math scores and socio-economic background, has improved notably over this period. The percentage of variation explained by the PISA index of economic, social and cultural status dropped by 5 percentage points. Only a handful of countries registered a steeper drop in inequality according to this measure. The average math score, however, also fell slightly over the same period.

The Norwegian case thus confirms the overall message of this chapter that decentralisation does not have to come at the expense of equity. It also illustrates how decentralisation may go hand in hand with a continued significant role of the central government. The Knowledge Promotion Reform, for example, increased local decision-making power while at the same time stepping up on national outcome targets and their monitoring. Some other reforms in the same period also strengthened the role of the central government. This may well help to explain why equity did not deteriorate as a consequence of decentralisation.

Conclusion

This chapter has explored the link between decentralised funding of education and inequality in outcomes across countries. Although local governments fund almost half of all public expenditure on primary, secondary and post-secondary, non-tertiary education, they obtain most of these funds through earmarked or general grants. The role of taxes on which local governments have a say is small – less than 10% according to a crude approximation. This sets the reality in many countries far apart from the Tiebout world in which local taxes fund local services, and local voters have a say on both – higher tiers of government pay the lion's share of the check, either directly or indirectly.

There are a few countries, however, in which the role of local funding is considerable. The United States provides one of the best examples – mainly before the school finance reforms of the 1970s. In the data, Denmark, Finland and Iceland stand out. Notably, about three-quarters of public funds for education in Iceland originate from local governments, which in turn obtain three-quarters of their revenues from local taxes over which they have discretion. Local governments in these countries also have a large say on education policy. In Switzerland, funding and decision-making power are also highly decentralised at the cantonal level – which may still be small enough to foster Tiebout competition. Hence,

although autonomous local taxes generally fund a limited share of education expenses, there is meaningful variation across countries in the extent to which school funding is decentralised.

A cross-country comparison does not reveal that, as a rule, more decentralised countries are less equal. We consider the variation in PISA scores, the importance of socio-economic background in explaining performance and the between-school strength of the link between performance and background as inequality measures. This last measure may be particularly relevant, as we would expect more privileged students to end up in better schools in a decentralised setting. However, in none of these measures do the three Nordic countries or Switzerland appear particularly unequal. The same measures do vary considerably across countries in which funding is more centralised, indicating that there are more important determinants of inequality than the role of local funding. These findings stand in contrast to a small number of studies of the link between local funding and inequality in specific countries – notably the United States, where the centralisation of school funding does appear to have contributed to more equal outcomes.

The existence of a causal link between decentralisation and inequality cannot be ruled out on the basis of our findings, however, as the observed cross-country correlation between decentralisation and inequality may be driven by a myriad of confounding factors. Differences across countries in how heterogeneous the student population is in terms of socio-economic background and other policies that affect inequality are two obvious candidates. A positive link between decentralisation and inequality could arise once these, or other relevant factors are appropriately taken into account.

With regard to the heterogeneity of the student population in terms of socio-economic background, a crude exploration does not reveal a systematic link with the role of local funding. Denmark, Finland and Iceland are comparably homogeneous societies, but Switzerland is slightly more heterogeneous than the OECD average. There is a large spread in the heterogeneity of socio-economic background across countries in which local funding plays a limited role. This explains why accounting for heterogeneity does not lead to a systematic positive link between decentralisation and inequality. Similarly, accounting for the amount that governments spend on students from the age of 6 to 15 does not change our findings.

This chapter does not test the role of other policies in mitigating the potentially adverse effects of decentralised school funding on inequality. However, we expect the role of other policies to be significant and we proceed to discuss a number of candidates. First of all, higher tiers of government may set targets for student achievement and monitor them through central examinations, while delegating decisions on how to attain them to the local level. In Denmark, for example, so-called Common Objectives specify the knowledge and skills students have to acquire at different form levels in each subject and national tests monitor the attainment of these targets (Houlberg et al., 2016). This type of decentralisation, in which local governments provide social services according to centrally determined objectives rather than catering to local tastes, is sometimes referred to as the Nordic model of administrative federalism (Rattsø, 1998).

The responsiveness of funding schemes to local needs is another element of likely importance. Higher tiers of government may compensate for the local composition of the student population – or local governments may engage in a horizontal equalisation scheme. Fiscal equalisation can be based on broad measures for socio-economic composition or on the number of students with specific needs in a more fine-grained manner. Its impact on local spending on disadvantaged or needy students will depend on the design of the funding scheme and the magnitude of the compensating amounts. Obviously, equalising grants and

regulations on how to spend them reduce the role of autonomous local funding. The descriptive analysis in this chapter suggests that a considerable role for local funding is compatible with an equitable educational system. However, in none of the countries in our dataset is the role of local funding so significant that it rules out substantive fiscal equalisation. As an illustration, Iceland, where autonomous local funding appears to play the most considerable role, still has a sizeable equalisation fund that evens out the difference in income and expenditure of more prosperous or needy local communities (Iceland Ministry of Education, Science and Culture, 2014).

Equity in education outcomes is also influenced by other policies that do not directly relate to the decentralisation of responsibilities and funds. For example, OECD (2012a) recommends to eliminate grade repetition and to avoid early tracking. The Nordics do well in this respect: the percentage of 15-year-old students who have repeated at least one year in Denmark, Finland and Iceland is far below the OECD average, and the first selection of educational track only takes place at the age of 16 in these countries. Such policies may well offset any adverse effect of decentralised funding on equity. Switzerland, in contrast, has a comparably high percentage of grade repetition and selection of educational track already takes place at the age of 12. Hence, late tracking and the elimination of grade repetition do not appear to be necessary conditions for equitable outcomes in decentralised countries.

Summing up, a range of policies exists that has the potential to mitigate or offset any adverse impact of decentralised school funding on inequality. The effectiveness of these policies is an important empirical question, which is beyond the scope of this chapter. Another critical empirical question is the degree to which such policies impair the efficiency gains of decentralised funding. Centrally imposed targets and equalisation schemes, for example, may limit the possibility for local governments to compete on quality or costs. Expenditure on education is not necessarily lower in more decentralised countries. Hence, countries that attribute a significant role to local funding may still face equity-efficiency trade-offs in the design of this decentralisation.

Notes

1. This is not to say that all decisions should be delegated to sub-national governments or schools. In particular, Woessmann (2005) cautions that central examination, aligning local incentives with national objectives, is an important precondition for the beneficial effects of decentralisation.

2. In 2012, public funds covered more than 90% of primary, secondary and post-secondary non-tertiary education expenses in the OECD on average and more than 80% in every single OECD country (OECD, 2015).

3. See, e.g. Dahlberg et al. (2008), Lundqvist (2015), or Allers and Vermeulen (2016) for recent evidence on the flypaper effect for general grants.

4. See www.oecd.org/ctp/federalism/fiscal-decentralisation-database.htm. Caution is warranted as in these data, all sub-national revenues and taxes are lumped together for unitary countries. This is not the case for the data on the source of public funds for education, so the government tiers to which these data sources refer are not always congruent.

5. In Japan, Korea and Norway, this percentage is set to zero, because local jurisdictions have formal autonomy over tax rates, yet in practice they all set the same rate.

6. We have set the percentage of decisions taken at the local level to zero when the category local government did not apply or its magnitude was indicated as either negligible or zero. Since this was the case in both Flanders and Wallonia, I have merged these observations, as Belgium appears as a single country in other data. For the United Kingdom, I take the average of England and Scotland.

7. Changing US states or Canadian provinces would usually require parents to change jobs, which raises the cost of opting for a different package of school quality and taxes considerably. Distances between Swiss cantons are much smaller.

8. Mathematics performance is scaled such that in 2003, when it was first assessed, it had a mean of 500 score points and a standard deviation of 100 score points.

9. Socio-economic status at the student level is held constant in the computation of the percentage of variation in math scores explained by the school average PISA index, so it does not pick up the effect of socio-economic status on math scores at the individual level (OECD, 2013).

10. Adding funding at the cantonal level for Switzerland would not yield any positive and statistically significant correlation in Table 5.1, as outcomes in this country are not more than averagely unequal.

11. The correlation is 0.34 with a p-value of 0.05, based on 35 observations.

12. The correlation is -0.26 with a p-value of 0.30, based on 25 observations.

13. The correlation of average spending per student from the age of 6 to 15 with the share variation in math scores that is explained by socio-economic background equals -0.17 with a p-value of 0.34, based on 34 observations. The correlation with the share of education funds from autonomous local taxes equals 0.11 with a p-value of 0.60, based on 25 observations.

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Further reading

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Annex 5.A1

Overview of country-level data used in the analysis

Table 5.A1.1. **Local funding of education**

Country	Local education funds after transfers as percentage of total education funds	Local education funds before transfers as percentage of total education funds	Local tax revenue as percentage of total local revenue	Tax revenue with local rate discretion as percentage of total local tax revenue	Decisions taken at local level as percentage of key education decisions
Australia				100.0	0.0
Austria	11.8	10.8	66.0	23.0	14.1
Belgium	4.1	4.1	31.4	99.7	0.0
Canada	85.6	21.0	39.2	97.9	49.3
Chile	42.8	5.1		41.6	41.3
Czech Republic	25.3	25.3	47.3	100.0	28.4
Denmark	87.6	94.2	33.8	98.1	33.6
Estonia	73.1	35.3	43.6	10.3	20.2
Finland	89.4	58.7	45.4	91.3	100.0
France	12.9	12.7	48.0	62.9	0.0
Germany	21.8	17.5	39.4	58.4	20.8
Greece			6.8	75.8	4.9
Hungary	70.0	35.6	25.1	84.2	23.5
Iceland	73.3	72.6	73.0	99.3	35.7
Ireland	16.3	0.9	18.4		0.0
Israel	28.4	10.4	41.7[a]	100.0	13.2
Italy	11.6	9.7	45.4	93.7	4.2
Japan	16.8	16.8		0.0[b]	35.4
Korea	68.9	3.4	32.6[a]	0.0[b]	4.3
Latvia	79.2	35.8			
Luxembourg	16.2	10.9	28.2	97.2	0.0
Mexico	0.0	0.0	11.5[a]	100.0	0.0
Netherlands	11.1	8.9	9.4	97.3	0.0
New Zealand	0.0	0.0		99.2	
Norway	91.8	90.7	37.8	0.0[b]	64.8
Poland	94.3	93.3	31.7	36.5	26.5
Portugal	9.2	3.6	33.3	72.9	0.0
Slovak Republic	77.0	18.5	45.8	99.7	7.3
Slovenia	10.0	9.6	42.5	14.1	10.2
Spain	5.9	5.9	51.7	81.2	0.0
Sweden			60.9	97.4	35.3
Switzerland	38.8	34.9	57.8[a]	100.0	12.2
Turkey				0.0	0.0
United Kingdom	65.5	65.5	13.3	100.0	28.1
United States	97.9	50.4			52.8

Note: [a] indicates that data refer to a year earlier than 2012; [b] indicates that tax autonomy is set to zero because local governments all set the same rates in practice.

Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators*, http://dx.doi.org/10.1787/eag-2012-en; OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en; OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.A1.2. **Funding at the intermediate level in federal countries**

Country	Education funds from intermediate level after transfers as percentage of total education funds	Education funds from intermediate level before transfers as percentage of total education funds	Tax revenue as percentage of total revenue at intermediate level	Tax revenue with rate discretion as percentage of total tax revenue at intermediate level	Decisions taken at intermediate level as percentage of key education decisions
Australia	96.1	68.3		100.0	50.8
Austria	48.6	12.6	46.5	38.8	22.2
Belgium	72.0	73.2	15.5	99.5	28.7
Canada	11.5	75.4	54.3	88.9	31.2
Germany	71.4	75.1	66.7	3.1	36.0
Italy	6.7	8.1		47.1	19.2
Mexico	71.5	21.9	5.6	100.0	42.8
Spain	79.8	79.4	65.2	60.1	82.9
Switzerland	61.0	61.5	51.8	100.0	62.5
United States	1.7	38.5	50.7	100.0	25.0

Source: OECD (2012b), *Education at a Glance 2012: OECD Indicators*, http://dx.doi.org/10.1787/eag-2012-en; OECD (2015), *Education at a Glance 2015: OECD Indicators*, http://dx.doi.org/10.1787/eag-2015-en; OECD (2017), *OECD Fiscal Decentralisation Database*, www.oecd.org/tax/federalism/fiscal-decentralisation-database.htm.

Table 5.A1.3. **Inequality measures and control variables**

Country	Total variance in scores as a percentage of OECD average variance	Percentage of variation in scores explained by socio-economic background	Percentage variation in scores explained by school mean socio-economic profile	Range of socio-economic background between 5th and 95th percentiles	Average spending per student from the age of 6 to 15 (USD, PPPs)
Australia	109.3	12.3	55.5	2.48	98 025
Austria	100.9	15.8	56.3	2.72	116 603
Belgium	123.3	19.6	70.1	2.75	97 126
Canada	93.1	9.4	41.8	2.71	80 397
Chile	76.9	23.1	75.4	3.66	32 250
Czech Republic	106.3	16.2	70.5	2.37	54 519
Denmark	79.5	16.5	70.9	2.57	109 746
Estonia	77.2	8.6	58.0	2.48	55 520
Finland	85.8	9.4	38.3	2.39	86 233
France		22.5		2.54	83 582
Germany	109.4	16.9	71.3	2.91	80 796
Greece	90.9	15.5	65.1	3.12	
Hungary	103.4	23.1	78.4	3.02	46 598
Iceland	99.7	7.7	68.8	2.55	93 986
Ireland	84.4	14.6	79.3	2.65	93 117
Israel	129.8	17.2	66.5	2.56	57 013
Italy	101.5	10.1	48.4	3.13	84 416
Japan	103.2	9.8	65.9	2.22	89 724
Korea	115.8	10.1	57.3	2.38	69 037
Latvia	79.1	14.7	62.2	2.77	45 342
Luxembourg	107.3	18.3	93.3	3.48	197 598
Mexico	65.0	10.4	46.1	4.1	23 913
Netherlands	99.0	11.5	57.8	2.41	95 072
New Zealand	117.0	18.4	78.4	2.58	70 650
Norway	96.6	7.4	46.4	2.36	123 591
Poland	96.3	16.6	56.8	2.74	57 644
Portugal	104.1	19.6	62.1	3.74	70 370
Slovak Republic	119.9	24.6	73.8	2.89	53 160
Slovenia	99.1	15.6	77.7	2.69	91 785
Spain	90.8	15.8	54.7	3.26	82 178
Sweden	99.3	10.6	55.5	2.47	95 831
Switzerland	104.8	12.8	44.0	2.85	127 322
Turkey	97.8	14.5	57.6	3.64	19 821
United Kingdom	105.4	12.5	63.6	2.53	98 023
United States	95.2	14.8	57.8	3.12	115 961

Source: OECD (2013), *PISA 2012 Results: Excellence through Equity. Giving Every Student the Chance to Succeed (Volume II)*, http://dx.doi.org/10.1787/9789264201132-en.