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Background Paper

The Learning Generation

Education Financing in Decentralized Systems

Enquiries Into the Allocative Efficiency of Educational Investment and the Effects on Other Dimensions of Quality Education Policies

Marcelo Souto Simão, Verónica Millenaar and Luisa Iñigo
UNESCO International Institute for Educational Planning

United Nations Educational, Scientific and Cultural Organization

International Institute for Educational Planning

Education Financing in Decentralized Systems – enquiries into the allocative efficiency of educational investment and the effects on other dimensions of quality education policies

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Coordinated by:

- Marcelo Souto Simão
- Mariela Buonomo Zabaleta

Research team:

- Marcelo Souto Simão
- Verónica Millenaar
- Luisa Iñigo
- Santiago Cunial
- Ieva Raudonyte
- Paulo Henrique Arcas
- Ana Grijalva Espinoza

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Executive Summary

Purposes of the study

The present study offers an exploratory approach to the relation between education decentralization, in general, and decentralization of educational financing, in particular, and policy effectiveness, equity and efficiency. The following research questions are addressed:

1. What are the main modalities of decentralization in financing primary and secondary education?
2. What is the available evidence of the effects of education financing decentralization on the overall education expenditure level and in primary and secondary education?
3. What is the available evidence of the effects of education financing decentralization on student's learning outcomes? Are different patterns of financial decentralization in education associated with different educational outcomes?
4. What is the available evidence on the effects of education financing decentralization on educational equity? What mechanisms are in place to counter inequalities across sub-national levels? What conditions are associated with the transfers?
5. What is the available evidence on the effects of decentralization of education financing on the technical efficiency of education expenditures?
6. What is the available evidence of the effects of decentralization of education financing on the efficient distribution of resources at sub-national level? What mechanisms are in place at the sub-national level to increase budget allocation to education?

Research work consisted of a literature review focusing on questions 2 to 6, and qualitative and quantitative analyses of qualitative data produced for a set of 23 countries, based on constitutional texts and education legislation. Qualitative analysis aimed mainly at answering research question 1 and providing examples of ongoing policies related to questions 4 and 6. Quantitative analysis also addressed question 1 and used our qualitative data to address the second part of research question 3. The three components are developed in Chapters 2, 4 and 5, respectively. Chapter 3 develops the analytical framework and methodological strategy used in the qualitative and quantitative analyses. Chapters with the Introduction and Conclusions complete the body of the report.

Operational definitions and methodological strategy

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The operational definition of education decentralization adopted in this study encompasses three dimensions:

- *Decentralization of executive autonomy*: defined as the decentralization of decision-making authority on specific items of educational policy. It included both decisions with direct financial implications – such as development of physical structures, payment of teachers and definition of schools budgets – and decisions with indirect expenditure consequences – selection of textbooks, admission of students and selection of teaching methods. It was identified at which level of the education system each of those decisions are taken, whether they are an exclusive or a shared competence of different levels and whether they are constrained by standards and/or oversight from actors at higher levels of the system.
- *Decentralization of allocative autonomy over transfers*: defined according to the modalities under which transfers are made from higher to lower levels of the system. It considers that transfers made on a discretional basis, whose amount is defined arbitrarily and resources are earmarked for specific purposes provide receivers with less autonomy to define on the allocation of those resources in comparison to automatic, formula-based and lump-sum transfers.
- *Accountability mechanisms*: distinction is made between public and social, as well as managerial and pedagogical accountability mechanisms. The study mapped the presence of specific accountability tools in each country, such as external evaluation of schools, mandatory parental participation in school boards, dissemination of evaluation results, etc.

Countries covered in the analysis include a large sample of OECD members (17 out of 34) with varied performance in PISA, selected on an intentional basis that pursued patterned variability as regards selected indicators. Three cases from Latin American and three from Africa were added to the sample, resulting in an unsystematic inclusion of important regional economies.

The qualitative analysis (Chapter 4) and the first section of the quantitative exercise (Chapter 5, Section A) refer to the full set of 23 countries and had a mainly descriptive purpose. Regression analyses (Chapter 5, Section B and C), in turn, was restricted to the group of OECD and Latin American cases and aimed at revealing an eventual association across the variables of interest. Its results should not be interpreted as evidence of a causal relationship, although they provide information for the formulation of working hypotheses in this sense.

Conclusions

Quantitative exploratory analysis carried out in the present study indicates that decentralization of executive autonomy to implement educational policy, including financial allocations and pedagogical choices, seems to be significantly and positively associated with higher country's average performance of students in standardized exams.

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This association might not be linear. The effect of decentralization could be dependent on the modalities of intergovernmental transfers to finance delegated functions. Transfer modalities that grant sub-central governments with higher autonomy to decide on the allocation of resources are found to be negatively associated with policy effectiveness.

In turn, countries with moderate to high levels of decentralization of executive autonomy over decisions with direct financial implications and that, concomitantly, provide school actors with moderate to high levels of autonomy to decide on the allocation of transfers achieve better results in PISA than their counterparts with lower levels of decentralization of executive autonomy.

Qualitative analysis reveals that, most frequently, transfers to sub-national governments are done through mechanisms granting high allocative autonomy, embedded in broad fiscal decentralization arrangements covering other sectors beyond education, particularly when the payment of teachers is decentralized at this level.

Moderate levels of allocative autonomy are a more frequent attribute of transfers to sub-central governments when they are destined to finance the development of in-service teacher training and school development plans, but these resources account for a marginal role in total education expenditures.

Transfers to school actors usually entail lower levels of allocative autonomy. Only in two countries schools undertake the payment of teacher salaries – Finland and Poland. In six countries schools are involved both in the development of in-service teacher training and the definition of their own budget. In another six countries, schools are engaged in the definition of their budgets, but have no executive autonomy regarding in-service training of teachers. In the two countries where schools have the competence to provide in-service training, but are not involved in the definition of school budgets – Finland and Colombia – school actors seem to enjoy relatively higher levels of autonomy to allocate government transfers.

The results of the qualitative and quantitative analyses dialogue with the partial evidence found in the **literature review** on the relationship between decentralization and **policy effectiveness**. It converges with Falch et al. (2008) and Díaz-Serrano et al. (2012) analyses of OECD countries to the extent that these show a positive association between *broad* fiscal decentralization and students' achievement, although statistical significance is not reached in some model specifications or in all subject areas. Further investigation is required in order to understand the potentialities and limitations of broad and sector-specific decentralization as mechanisms to leverage the effectiveness of education systems.

The results also resemble Freikman and Plekhanov's (2009) analysis of the causal factors behind the provision of pre-schooling in Russian education systems, where they observe a positive and significant association between sector-specific fiscal decentralization, when controlling for other variables capturing institutional dimensions of decentralization. This similarity is also found in the authors' analysis of the causal factors of students' performance in national standardized exams.

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Convergence with Blöchlinger (2013) is patent, to the extent that both studies observe a positive association between education decentralization and country average students' achievements in PISA. Blöchlinger finds that the positive effect of decentralization on students' achievements is statistically significant particularly for unitary countries, but does not develop a hypothesis to explain this association. The federal/unitary divide has not been a category of analysis in the present study, but the qualitative analysis revealed that some accountability mechanisms are more recurrent within federal countries, suggesting that there may be decentralization modalities that are more frequent in this group of countries.

Finally, the exploratory conclusions of this enquiry converge with results obtained by Galiani and Schardgrodsky (2002) and Barankay and Lockwood (2006), for Argentina and Switzerland, respectively, despite methodological differences. They converge to find that institutions constraining fiscal autonomy of sub-central governments could leverage the effects of decentralization of executive autonomy in education.

As regards the literature exploring the effects of decentralization on **regional inequality**, the studies reviewed converge to the extent that they fail to provide evidence supporting the hypothesis that decentralisation could be beneficial to educational equity. But only Galiani, Getler and Schardgrodsky's (2005) analysis of the Argentinean experience offers evidence of its deleterious effect. Akai et al. (2007) and Costa-Font (2010) studies for the United States (the former) and Spain (the latter) provide an account of the limitations of fiscal decentralisation to cope with regional inequalities, respectively in terms of students' learning achievements and subnational investment in education.

As regards the effects on **education expenditures**, the present review failed to find robust evidence either supporting or rejecting the hypothesis that decentralisation in education effectively creates incentives for subnational governments to increase their investment efforts in the sector. Evidence on the effects of broad fiscal decentralization is also conflicting. While Busemeyer's (2007) cross-country analysis for OECD countries reveals an average positive and significant association between fiscal decentralisation and investment in education, his results do not converge with those found in Costa-Font's (2010) analysis of Spain, nor by evidence from non-OECD countries. Luo and Chen's (2010) analysis of China reveals a negative and very strong association between fiscal decentralisation and educational investment measured in different ways. Freinkman and Plekhanov's (2009) study of the Russian case, in turn, reports no significant relationship between fiscal decentralisation and selected educational inputs, although the latter appear to be robustly determined, among other things, by educational expenditure per student.

Concerning the **productive efficiency** of education expenditure, the pieces of evidence identified are even scarcer. Coelho (2009) finds that, in 18 OECD countries, in years 2000 and 2003, productive efficiency of primary and secondary education investment appears to be negatively associated with the share of public providers and positively associated with higher decentralisation of decision in education to local governments and schools. Alternatively, Sow and Razafimahefa (2015) suggest that the impact of broad fiscal decentralisation on the technical efficiency of education expenditures depends on the

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level of economic development of countries: while in advanced economies fiscal decentralisation seems to favour higher efficiency, the opposite effect prevails in emerging and developing economies. However, the authors fail to find robust results across different model specifications. These studies can be taken as cumulative evidence against the general claim that decentralisation in education unambiguously leads to higher efficiency of public educational expenditure.

Finally, the literature review also failed to identify empirical studies addressing specifically the effects of decentralization of education financing on the **allocative efficiency** of education spending. This apparent gap may be due to lack of internationally comparable data meeting disaggregation requirements of this kind of analysis. Alternatively, studies that enquiry into the effects of broad fiscal decentralization, but not decentralization of education financing specifically, were reviewed. Only two out of the four studies explicitly interested in the question of allocative efficiency actually go as far as investigating how it is affected by fiscal decentralization. Evidence from Bolivia (Faguet, 2004) and Pakistan (Hasnain, 2008) suggest that decentralization in those two countries seem to have fostered investments of local governments in areas that the theory usually advise for more centralization due to the presence of economies of scale. This invites for a revision of some of the assumptions upon which the literature on fiscal decentralization has been based. What are the actual economies of scale in the provision of education that would justify for central intervention? This is a question calling for further empirical scrutiny. Another interesting feature of the Bolivian and Pakistan experiences is that decentralization in those countries did not seem to entail the substitution of higher for lower government levels, but rather a change in the complement role played by each stance. They also suggests that the assumption that in decentralized systems greater efficiency can be achieved due to competition of elected officials across and within government levels might neglect or even misinterpret the importance of actual coordination and cooperation in the crafting of educational policy. From a different angle, results by Diaz-Serrano and Pose (2014) can be reinterpreted to suggest that in political regimes where authoritative power is less concentrated, citizens are more willing to manifest their discontent with public policies. The influence of political openness on citizens' perceptions and voice is only one of the reasons why citizens' opinions may not be the best barometer to measure social welfare. Both in Bolivia and in Pakistan, bringing the government closer to the people seems to have contributed to increasing state's response to citizen's needs, particularly in most disadvantaged areas. Still, it could be indicating that citizens do not want to vote with their feet, but rather want governors – central, regional or local – to be responsive to their needs.

This leads back to the need to learn, in greater detail, how accountability mechanisms work in different contexts. Qualitative analysis carried out for the present study suggests that accountability systems vary in a patterned way along the decentralization spectrum. While trends are not unambiguous, they seem to point to the more frequent presence of social accountability tools and harder public accountability arrangements in more decentralized systems. Further research should investigate whether differences among

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more decentralized systems regarding policy effectiveness are associated to more nuanced differences in accountability systems. Recent studies in this field have put into question the effectiveness of some of these arrangements, particularly those aiming to foster market-like incentives to improve school performance (Smith, 2016).

In short, the present study highlights that the availability of quantitative comparative studies on education decentralization, in general, and its financial dimension, in particular, seems to be incongruent with the relevance of this topic to the policy agenda. Such studies are scarce and knowledge accumulation is severely limited by conceptual and methodological concerns. Consequently one general recommendation that social scientists should give to decision makers in this policy area probably is not to trust people claiming that by decentralizing their education systems will work better. At the same time, they should not trust either those claiming that centralization will do it instead. Social scientists cannot foretell what will work and, unfortunately, researchers are still trying to map what has actually worked, what has not and why. Social science may not be able give straightforward answers to these questions. But it must inform policy makers of the best evidence available, which in this case, seems to be limited.

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Introduction

What is the evidence on the effects of education financing decentralization on the efficiency, effectiveness and equity of the education system?

This is the general question addressed in this report, which presents the results of the research project: *Education financing in decentralized systems: enquires into allocative efficiency of educational investment and the effects on the other dimensions of quality education policies*. The research was commissioned by the International Commission on Financing Global Education Opportunity and the International Institute for Educational Planning, UNESCO, and carried out by researchers from Latin America and Europe between February and May 2016. Its general purpose was to take stock of different modalities of decentralized education financing systems and assess the available evidence of the effects of education financing decentralization on the efficiency, effectiveness and equity of the education policy.

An initial perception motivated this research project: since 1980's, several countries have implemented reforms including some form of decentralization of education financing systems. At least two main groups of arguments have been used to justify these reforms. The first group stresses the potential gains of decentralization in terms of education relevance and pertinence, by means of narrowing the gap between decision makers and school actors, enhanced community participation and increased school autonomy. A second group of argument, from an economics perspective, claims that decentralization would lead to a more efficient allocation of resources than a centralized system, because subnational level agents have more and better information than the central power, thus making local government more responsive to individual preferences.

Despite the wide range of decentralization of education finance reforms implemented, there still seems to lack a systematic enquiry regarding the validity of the economic efficiency argument. Indeed, decentralization could also be associated with increased inequalities in the overall distribution of resources, and local level agents may have a lower technical capacity to develop the delegated competences. This research aims at addressing the state of the art in this knowledge area and identifying its gaps. As well, aims at leading the way to a more systematic assessment of the performance of education financing systems in terms of their economic efficiency. The relevance of addressing these issues is particularly high when states with scarce resources are required to increase and improve their investment in education.

Some specific questions are addressed throughout the several chapters that follow. The first part of the study is based in literature review. Chapter 1 offers an introduction to the problem of the study and definitions around broad fiscal decentralization and education-specific financial decentralization, and discusses the theoretical debates around the expected effects of decentralization on effectiveness, equity and efficiency of education policies. Following these arguments, Chapter 2 reviews a wide range of empirical studies that investigate the effects of fiscal decentralization and education-specific fiscal decentralization on spending, educational effectiveness and regional inequalities. The research questions that guides the first two chapters are the following: What is the

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available evidence of the effects of education financing decentralization on the overall education expenditure level in primary and secondary education? What is the available evidence of the effects of education financing decentralization on student's learning outcomes and educational equity? What is the evidence available on the effects of decentralization on the technical efficiency of education expenditures and the efficient distribution of resources at subnational level?

The second part of the study presents the qualitative and quantitative analysis developed in this research project, based on an intentional selection of 23 different education systems, with a variety of financial architecture of modalities of decentralization. Case selection was based on a preliminary typology combined elements of education, fiscal and political decentralization, resulting in a large sample of OECD countries (18 countries), to which we intentionally two new Latin American and three African cases. Data collection was based on secondary sources, mainly national and official legislations and policy documents, relevant national websites and on-line databases on education systems, education financing and learning assessments. Chapter 3 presents the epistemological and methodological approach of the qualitative and quantitative analysis developed, as well as the dimensions of analysis, operational definitions, assumptions and working hypotheses. In addition, it presents the criteria used for the case selection and the data sources and tools for the data collection. Chapter 4 presents the results of the qualitative analysis and develops, from an exploratory and descriptive perspective, some preliminary responses to the following questions: what are the main modalities of decentralization in financing primary and secondary compulsory education? What mechanisms are in place at the subnational level to increase budget allocation to education? What mechanisms are in place to counter inequalities across sub-national levels? As for Chapter 5, it presents the results of the quantitative analysis, based on the qualitative data collected, aiming at answering the following question: are different patterns of financial decentralization associated with different levels of policy effectiveness?

The conclusions of the study recapitulates the main findings of the literature review and the qualitative and quantitative analysis, systematizing preliminary evidences that could serve as answers to the several questions addressed, and offer some working hypothesis that could provide orientations to further research work.

This study was conducted between February and May 2016 by a team of researchers at the UNESCO's International Institute for Educational Planning, upon the request of the International Commission on Financing Global Education Opportunity. It was sponsored by the Rockefeller Philanthropy Advisers. None of these institutions posed any voluntary interference in the work of the research team, who enjoyed of full autonomy to develop the study following its original design. The ideas and opinions expressed herein are solely those of the authors and are not necessarily representative of or endorsed by UNESCO or IIEP. The authors would like to thank Paul Isenmann, Anton de Grauwe and Margarita Poggi for their insights throughout the development of the analysis and for their comments to earlier versions of this report. We are also deeply thankful to Camila Cosse Braslavsky for her editing support. Most importantly, we express our deepest gratitude to

each individual member of the team, whose commitment and enthusiasm was fundamental to enable the completion of a very ambitious agenda within an extremely short timeframe. Without their hard work, critical thought and positive attitude this report would not exist.

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Chapter 1. Achieving effectiveness and equity in education outcomes with scarce resources

This chapter introduces the theoretical arguments and debates on broad fiscal decentralization, as well as on education-specific fiscal decentralization. It presents discussions around definitions on fiscal decentralization, as well as it expected effects on efficiency, effectiveness and equity of education policies.

A. Statement of the problem: reaching education goals with the resources available; the need to increase efficiency in the system.

Recognizing the importance of education, many governments around the world have made significant efforts to expand education provision and improve its quality to meet *Education for All* goals. However, in spite of positive improvements many challenges remain to be addressed. The 2013 Global Monitoring Report notes that an estimated 57 million children are still out of school and the percentage of students dropping out before the end of the primary cycle has not been significantly reduced. Furthermore, the evidence suggests that many children enrolled in schools are not acquiring basic knowledge and skills. The Education 2030 agenda, adopted by 184 UNESCO member states aims to address the above mentioned and other remaining challenges with a clear focus on learning.

Sustainable Development Goal (SDG) 4 aims to ensure universal, free, equitable, and quality primary and secondary education, in a safe, non-violent, inclusive, and effective learning environment. It also aims to substantially increase the supply of qualified teachers, and to eliminate gender disparities in education, among other aspects. The Education 2030 Framework for Action complements SDG 4 and further develops specific targets and strategies. Their implementation will require major efforts from governments around the globe.

One of the most important constraints to implement the Education 2030 agenda and achieve its targets is the scarcity of available financial resources. In this context, education systems' efficiency is a key aspect to consider. Increasing efficiency is essential to improve system's outcomes with the same level of expenditure, particularly in a context of competition from other sectors (Dolton et al., 2014). For instance, the evidence suggests that at current spending levels in secondary education, lower-income group economies could improve their net enrolment rate by 36 percentage points on average (Grigoli, 2014).

B. Decentralization as a strategy to increase efficiency in the education system

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Decentralization is one of the strongly advocated strategies that have been promoted by different international agencies to address the issue of efficiency in education systems. Following this argument, in a context of financial constraints and challenging goals, some countries may decide to decentralize as an option to increase the efficient allocation of resources.

Over the last decades, there has been a clear trend towards decentralization in many developed and developing countries (Díaz-Serrano and Rogríguez-Pose, 2014; Martínez-Vázquez et al., 2015; Rodriguez-Pose and Ezcurra, 2009). Many governments have tried to improve efficiency and reduce costs within the education sector by decentralizing decision-making processes (Carr-Hill et al., 2015). It has, therefore, become even more important to evaluate the impact of decentralization on different policy goals (Martínez-Vázquez et al. 2015).

Different authors have defined education decentralization in various ways. This attests to the plurality in the field, which might sometimes lead to confusion. In its simplest form, education decentralization can be defined as 'regional or local education authorities having total or partial responsibility for educational policies' (Escardibul and Henry, 2015: 3). Different authors complement this basic definition with important conceptual nuances. Winkler defines education decentralization as the way decision-making power is distributed across actors placed at different governance levels of the education system (Winkler, 1989); thus, the author makes distinction between centralization, de-concentration, delegation, and devolution of decision-making.

The definition used by Fiske (1996) underlines that decentralization is 'the process in which subordinate levels of a hierarchy are authorized by a higher body to take decisions about the use of the organization's resources (Fiske, 1996:8)'. In addition, Fiske (1996) underlines that a distinction should be made between political and administrative decentralization. In this line, Galiani et al. (2005) puts emphasis on administrative dimension of decentralization that takes place when schools are transferred from central to sub-national administration.

Whereas the former refers to decision-making power transfer to local authorities, the latter could be considered as a management strategy when the authority of planning and management is delegated. It is therefore important to distinguish discretion in terms of policy implementations by local administrations ('the right to act') from local government political autonomy ('the right to decide') (Falch and Fischer, 2008).

However, authors agree that even if the conceptual definition is important, planners then have to decide on the form that decentralization will take (Fiske, 1996). The latter will vary considerably from one country to another: planners face a 'Rubik's Cube set of possibilities' (Fiske, 1996). Different types of distinctions should be noted here. Channa (2015) differentiates between two key decentralization schemes – decentralization to local governments, that is defined as 'the transfer of authority for decision-making, finance, and management to quasi-autonomous units of local governments' (Channa, 2015:2), and decentralization to schools, that is defined as 'a form of decentralization that identifies the individual school as the primary unit of improvement and relies on the

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redistribution of decision-making authority as the primary means through which improvement might be stimulated' (Channa, 2015:2).

The author notes that there has been a trend of deepening existing decentralization reforms (strengthening legal frameworks for decentralization, fiscal design, and electoral accountability reforms) and that different school decentralization schemes have been adopted as a kind of deepening effort, in a logical extension of broader education decentralization interventions. In addition, the choice has to be made regarding which functions in education system should be decentralized and to what levels (Fiske, 1996; Channa, 2015).

As Winkler notes, 'the degree of centralization in education systems typically varies with the decision-making areas, including school organization, curriculum and teaching methods, examinations and supervision, teacher recruitment and compensation, finance of recurrent expenditures, and school construction and finance' (Winkler, 1989: 1). Decisions in these areas can be taken at one or at several administrative levels (Carr-Hill et al., 2015). However, it is common that the central government sets minimum requirements on the activities of subnational governments (Díaz-Serrano and Rogríguez-Pose, 2014). Decentralization strategies can take infinity of different forms that will depend and vary according to the political environment, cultural and historical context, as well as administrative structures.

C. Theoretical models of decentralization: expected effects on efficiency and effectiveness of education, advantages and challenges

Theoretical predictions on how decentralization, in general, and decentralization of financial responsibilities, in particular, can affect the efficiency, effectiveness, and inequalities in education systems point to different possible results. While many of them underline the positive outcomes it might induce, a great body of literature has a more cautious approach pointing at different preconditions and local specificities that might lead to counterproductive results. It is possible therefore to divide the approaches on decentralization, and its effects, on two large groups of arguments according to the expected consequences**.**

- *Theoretical predictions with positive outcomes*

Fiscal decentralization in education provision is expected to increase *allocative efficiency* while enabling local governments to direct resources to areas that correspond better to local population needs as they have more available information on this aspect (Channa, 2015; Atkinson et al. 2005; Díaz-Serrano and Rodríguez-Pose, 2014; Luo, 2010). One of the most frequently quoted arguments stipulates that education decentralization could 'improve the quality of teaching and learning by locating decisions closer to the point at which they must be carried out (Fiske, 1996: 24).' In other words, when decisions are taken closer to communities it can increase the relevance of the decision-making process

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(Atkinson et al., 2005). This comes as a result of the fact that local governments potentially dispose of greater knowledge when it comes to local needs (Channa, 2015; Atkinson et al., 2005). Through the increased community participation, decentralization can increase flows of information from the community to education providers reducing information asymmetries. Consequently, this can improve targeting as well as performance of the education providers (Eunice Heredia-Ortiz, 2007).

Furthermore, financial decentralization in education could potentially lead to reduction of operating costs (Fiske, 1996). A higher internal efficiency could be achieved if prices of educational inputs are allowed to vary with local market conditions and if educational inputs are adjusted for local prices (Winkler, 1989). Besides, decentralization leads to the existence of many suppliers of education which increases 'competitiveness' within the system. Consequently, it might create incentives for providers to perform better. This competition among suppliers could also create incentives to innovate (Eunice Heredia-Ortiz, 2007).

Moreover, the administrative argument for decentralization comes from the observation that centralized systems can lead to bureaucratic inefficiencies and that empowering local authorities could eliminate overlays of bureaucratic procedure at the same time motivating education officials to be more productive (Fiske, 1996; Atkinson et al. 2005). High bureaucratic burden associated with central systems incurs losses of resources and time (Díaz-Serrano and Rogríguez-Pose, 2014). Consequently, high administrative costs increase unit costs and decrease internal efficiency (Winkler, 1989).

In addition, education decentralization might strengthen accountability relationships between education providers and citizens. When decision makers are closer to the community, different stakeholders can voice their concerns and monitor the provision of education more directly. Increased accountability is said to potentially improve education output by giving stronger incentives for quality performance to teachers, education officials, and schools (Eunice Heredia-Ortiz, 2007).

When financial decisions are made closer to communities it can lead to increased transparency, reduced corruption, and higher incentives to invest in high quality teachers and materials (Carr-Hill et al., 2015). Decentralization may give voters increased electoral control over incumbents which would reduce their incentives to divert rents from tax revenue (Barankay and Lockwood, 2006). Accountability can also lead to larger spending devoted to education (Sow and Razafimahefa, 2015).

In terms of pedagogy, education decentralization might create a better environment to tailor education content more adequately to respond to students' needs in terms of the relevance of topics covered or by creating a possibility to spend more time on areas where students have difficulties (Channa, 2015). Moreover, 'finding the right balance of centralized and decentralized responsibilities will improve education provision by focusing more on cultural differences and learning environments (Eunice Heredia-Ortiz, 2007: 20).'

Other potential effects of education decentralization should also be noted. Fiscal decentralization in education could potentially lead to the generation of additional

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resources by making use of local revenues (Fiske, 1996). Education decentralization can lead to redistribution of political power and increased legitimacy of institutions by giving citizens and local communities a greater voice (Hinsz et al, 2006). The redistribution of decision-making is seen as a way to include the less advantaged groups giving better facilities in attending their needs (Díaz-Serrano and Rogríguez-Pose, 2014).

- *Theoretical predictions with negative outcomes*

This literature points to important preconditions that need to be present for decentralization to yield positive results. It also underlines other counterproductive effects decentralization could imply.

When it comes to efficiency, fiscal decentralization in education might reduce the economies of scale (Winkler, 1989). Moreover, another argument posits that central government might be better positioned to attract better teachers, and bargain better wages as well as career prospects (Eunice Heredia-Ortiz, 2007). Decentralization could also increase confusion when it comes to education management leading to conflicting decisions and failures to execute functions, which can negatively affect efficiency (Winkler, 2007).

In terms of effectiveness, education decentralization could lead to increased inconsistencies in curricular and quality standards as well as resistance from teachers' unions. In addition, 'there are some risks that this may result in some fragmentation of the system, non-compliance with national policy initiatives (for example on life skills education) or misused to promote local interest groups (local majority ethnic group self-interest at the expense of local minorities)' (Hinsz et al., 2006: 5).

Critics underline the possibilities of elite capture (Winkler 1989; Fiske 1996; Díaz-Serrano and Rogríguez-Pose, 2014). If service provision is designed to cater to the interests of local special interest groups, fiscal decentralization might have negative consequences. Decentralization can also increase further corruption within school systems (Carr-Hill et al., 2015).

Different authors attest that there are various important preconditions that are required for education decentralization to result in a positive impact. Local governments need to have sufficient institutional capacity to assume new responsibilities (Eunice Heredia-Ortiz, 2007; Díaz-Serrano and Rogríguez-Pose, 2014). Moreover, local governments have to be willing and able to respond to local needs that they identify. They need to have sufficient financial resources for that. For instance, when functions are decentralized to schools, these need to have required financial management skills and knowledge (Atkinson et al. 2005). It is also important to underline that the incentives of officials and politicians will substantially influence service delivery outcomes (Channa, 2015; Luo, 2010). The existence of technical and information support from the central level is another important precondition (Winkler, 2007).

Moreover, if different regions have different financial capacities education decentralization could lead to increased inequalities (Atkinson et al, 2005). This can

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create disparities in spending and educational outcomes (Winkler, 2007). Local governments in poorer regions might not be capable of undertaking new fiscal burden if central resources are reduced as a result of decentralization.

- *An unsolved theoretical debate*

When it comes to different education decentralization effects and their influence channels in education provision, theoretical arguments leave the room open for debate. Proponents of decentralization put forward its capacity to better adjust education provision to local needs in terms of resource allocation and broader education organization while at the same time strengthening accountability mechanisms as well as competition between education providers, which should lead to improved performance. The opponents underline the risk of generating reduced economies of scale, increased inconsistencies among different administrative levels, inequalities, elite capture, reduced efficiency and effectiveness in the absence of institutional capacities of the sub-national levels. The core of the theoretical debate seems to be rooted in two opposing hypotheses: the functional potential and better incentives of local governments to adapt education provision to local needs on one end, and doubts related to their capacity and willingness to bring the expected benefits of education decentralization on the other.

There are some complementary insights on the posited effects of fiscal decentralization in the delivery of public goods that could bring additional arguments relevant to education sector as well. Firstly, fiscal decentralization is expected to improve efficiency through the 'voting with one's feet' hypothesis: 'It encourages competition across local governments to improve public services; voters can use the performance of neighboring governments to make inferences about the competence or benevolence of their own local politicians' (Sow and Razafimahefa, 2015:4). In this setting, local governments produce bundles of local public goods and individuals reveal their preferences for those goods by moving to those jurisdictions that correspond their preferences. This encourages local governments to tailor the services accordingly so as not to lose tax revenues (Rodríguez-Pose et al., 2007). Competition among local governments might promote lower tax rates and the efficient production of public goods under limited financial resources (Szarowská, 2014). Assuming that citizens can enter and leave competing jurisdictions freely and without costs, decentralization is believed in this way to offer a functional equivalent to market competition (Rodríguez-Pose et al., 2007).

In addition, 'the efficient level of output of a "local" public good (i.e., that for which the sum of residents' marginal benefits equals marginal cost) is likely to vary across jurisdictions as a result of both differences in preferences and cost differentials' (Oates, 1999, 1121-22). In this context, local governments are expected to better tailor outputs of such goods to the particular preferences of their jurisdictions.

Moreover, another argument emphasizes that decentralization might influence growth through the effect it has on the allocation of resources across expenditure categories. Decentralization is expected to shift resources from current to capital expenditures (Rodríguez-Pose et al., 2007). Fiscal decentralization might increase efficiency as 'the

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costs of producing certain public goods may rise disproportionately with size, due to the increasing costs of information processing and the disadvantages associated with large centralized bureaucracies' (Rodríguez-Pose et al., 2007:8).

Other analyses point that decentralization may contribute to reduce interregional disparities because of higher transparency and by bringing more efficiency and equalization across jurisdictions (Martínez-Vázquez et al., 2015). Decentralization may also lead to a decrease in lobbying by interest groups (that may distort policy choice and increase waste of public funds). However, others argue that this might not necessarily be the case as in certain settings local governments are more susceptible to be captured by lobbies (Barankay and Lockwood, 2006).

In developing countries fiscal decentralization might not lead to gains in allocative efficiency through increased providers' competition as citizens may be too poor to 'vote with their feet' (Rodríguez-Pose et al., 2007). Actually, 'household mobility across local jurisdictions, like in the United States, hardly exists elsewhere' (Martinez-Vazquez, 2011:3). High moving costs and other aspects that influence people's decisions regarding their living location have led many authors to question whether this 'voting with your feet' mechanism is likely to occur in practice (Rodríguez-Pose et al., 2007).

Furthermore, the higher expenditure allocation to capital goods under decentralization can also be challenged: 'If accountability is not broadly anchored in a local democratic process, but instead is based on rent-seeking political behavior, local governments would be tempted to allocate higher decentralized expenditure to non-productive expenditure items (such as wages goods and services, instead of capital expenditure). This can hinder efficiency, economic growth, and overall macroeconomic performance' (Sow and Razafimahefa, 2015: 4).

Decentralization may cause a reduction of the influence of poorer areas over the allocation of financial resources and transfers across the country (Martínez-Vázquez et al., 2015). In addition, 'the existence of local public goods externalities that go beyond the jurisdiction of local governments, combined with a low coordination effort among them, compromises the efficiency of service delivery under the decentralized regime' (Madeira, 2007:2). If central government is able to adapt the provision of public services to the different jurisdictions' needs, the expected gains from fiscal decentralization can be considerably lower than expected (Martinez-Vazquez, 2011).

Another very important argument that questions the potential gains of decentralization is well summarized by Rodríguez-Pose et al. (2007: 7):

> At the most fundamental level, the validity of the assumption that inter-jurisdictional preferences differ substantially, and that these differences are the main or most important source of regional variation to which government policy should be adjusted, has been questioned. Especially in the case of developing countries, the most relevant issue may not be "to reveal the fine differences in preferences between jurisdictions but to satisfy basic needs, which are – at least in principle – quite well known" (Prud'homme 1995: 208). In addition, it has been argued that, where preferences do vary substantially, subnational governments

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may not necessarily be better at uncovering these preferences (Prud'homme 1995). Although government officials in small communities may have a better knowledge of local preferences, for instance through talking to the locals and using the services themselves, this advantage is likely to decrease rapidly as the geographical scale of the jurisdiction increases.

It is also argued that, particularly in developing countries, years of highly centralized fiscal systems created a key problem related to the lack of effective local fiscal institutions (Rodríguez-Pose et al., 2007).

Given the diverse opinions on the impact of decentralization, it seems that the results of decentralization will depend on local conditions, in particular on comparative intensity of distortions in the incentive structure at different tiers of government (Freinkman and Plekhanov, 2009).

- *Broad and sector-specific fiscal decentralization*

For the purpose of this research, we find important to make a clear distinction between broad and sector-specific fiscal decentralization. We will refer to *broad fiscal decentralization* as the decentralization of revenues to sub-national governments that are in charge of providing public goods that will not necessarily include education. In order words, broad fiscal decentralization may or may not be connected to the decentralization of financial resources targeting the education system. A body of studies adopts this approach and base their analysis on total sub-national revenues or expenditures on public goods and state that sub-national investments in education depend on allocative decisions made by sub-national authorities across different sectors. In this case, the link between fiscal decentralization and educational outcomes is indirect (Díaz-Serrano and Rogríguez-Pose, 2014; Falch and Fischer, 2008; Luo and Chen, 2010).

Other studies adopt what we will call *sector-specific fiscal decentralization approach* that refers to decentralization of resources or fiscal competences that are reverted in a specific sector, in our case education. These studies are built based on sub-national expenditures in education and their effects on educational outcomes are more direct than in the *broad fiscal decentralization approach*. In *sector-specific fiscal decentralization approach* allocative decisions of sub-national authorities refer to decisions within the educational sector and not across different sectors as in the previous approach.

The present research is interested in enquiring on the effects of *sector-specific fiscal decentralization* on educational outcomes. However, even if *broad fiscal decentralization* does not match the object of this study, we acknowledge it as a relevant alternative hypothesis of improvement of education delivery. We also note that, possibly due to data availability and lack of conceptual clarity, the effects of broad fiscal decentralization on education policies seem to have been addressed more by researchers than the effects of decentralization of financial resources within the education sector. Consequently, our literature review tries to account for the evidence available regarding this alternative hypothesis.

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As it will be developed in the next chapter, results obtained by studies adopting these two different approaches do not lead to clear conclusions. Our literature review aims to contribute to systematize part of the evidence available in this sense.

- *Approach to decentralization of educational financing adopted in this study*

The education decentralization definition adopted in this study acknowledges its diverse facets, including its pedagogical and financial features. It departs from the widely accepted assumption that within educational systems decision-making power is not evenly distributed across policy areas.

We believe education decentralization to be a complex phenomenon that can be meaningfully represented by a finite number of dimensions. We also assume that albeit the documented heterogeneity of institutional arrangements across and within countries, it is possible – or methodologically valid – to define dimensions in function of a few number of variables that purposefully reveal features of that complex object that are relevant for our working hypothesis. The analytical framework presented in chapter 3 presents our operational definition of education decentralization. This definition encompasses the distribution of decision power on the setting of standards, implementation and oversight over different issues of educational policy, ranging from curriculum and physical structures to personnel management and organization of instruction. Given our interest on the effects of decentralization of educational financing, our definition tries to disentangle the financial and pedagogical dimensions of education decentralization. Before that, however, in the next chapter we analyze the evidence provided by a diverse pool of researchers who have enquired on the effects of decentralization on educational efficiency, effectiveness and impact on inequalities.

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Chapter 2. A survey on the effects of fiscal decentralization on the education system

This chapter presents the findings of an extensive (non-exhaustive) literature review of empirical studies that intend to measure and assess the effects of broad and sector-specific fiscal decentralization on education spending, effectiveness, regional inequalities and efficiency. The literature review was based on a *corpus* of 21 research empirical studies from different countries developed in recent years (from 2007 up to nowadays), which were selected out of approximately 70 studies identified in successive waves of bibliographic search carried out in different moments of the development of this study. The criteria used to select the studies to be included in this review aimed at identifying research work that offered quantitative empirical evidence on the effects of broad and sector-specific fiscal decentralization on education outcomes.

The purpose of this chapter is to systematize the evidence found in those research works and to answer the following questions:

- What is the available evidence of the effects of education financing decentralization on the overall education expenditure level and in primary and secondary education?
- What is the available evidence of the effects of education financing decentralization on student's learning outcomes?
- What is the available evidence on the effects of education financing decentralization on educational equity?
- What is the available evidence on the effects of decentralization of education financing on the technical efficiency of education expenditures?
- What is the available evidence of the effects of decentralization of education financing on the efficient distribution of resources at subnational level?

2.1. A survey on the effects of fiscal decentralization on education spending

In general, studies linking decentralization and spending look at total public spending, which does not account for the differences on spending among sectors (Busemeyer 2007). In particular, the effect of decentralization on spending levels in education is an empirical question that has not been studied in depth. Busemeyer (2007), Luo and Chen (2010) and Costa-Font (2010) address the question of whether decentralization affects educational expenditure. Although these authors focus on education spending, they obtain different results depending on how they operationalize fiscal decentralization: as the subnational government's own tax revenue (Busemeyer 2007); as the expenditure per person made by subnational regions (Luo and Chen 2010) or just evaluating if a state is fully politically

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or fiscally entitled to welfare (Costa-Font 2010). Freinkman and Plekhanov (2009), in turn, do not look directly at education expenditures. Instead, they test the relationship between fiscal decentralization and other educational inputs. In addition, while Busemeyer (2007) and Luo and Chen (2010) look at broad fiscal decentralization, Freinkman and Plekhanov (2009) address both broad and sector-specific fiscal decentralization and Costa-Font (2010) looks at wider decentralization processes, beyond its fiscal realm. (Table 1)

Busemeyer (2007) studies the impact of broad fiscal decentralization on a variety of spending sectors, including education. He studies 21 OECD countries during the period 1980 to 2001, and includes expenditures on primary and secondary education, as well as on higher education. Busemeyer addresses the criticism raised by Stegarescu (2005), who shows that measures based on budgetary shares do not appropriately capture decision-making structures and the extent of autonomy of subcentral government upon the allocation of their expenditure and revenue. Busemeyer's specific measure of fiscal decentralization is the subnational government's own tax revenue (as a share of general government revenue), in which the subnational unit can at least set the tax rate or the tax base autonomously and does not have to share the revenue obtained. The author shows that fiscal decentralization has a positive impact on education expenditures: a change of one standard deviation in fiscal decentralization increases the overall public spending in education in 27%, the public spending on primary and secondary education in 18%, and the public spending on tertiary education in 28%. He interprets this finding as evidence of local competition following the logic of a "race to the top", because education spending is – to a varying degree – delegated to lower levels of government and the positive coefficient shows that the provision of regional public goods is greater in countries with higher degrees of fiscal decentralization. The impact of fiscal decentralization on higher education spending is even greater than the impact on total education spending, whereas the impact on primary and secondary education spending is smaller.

Luo and Chen (2010) also test how broad fiscal decentralization affects public education spending in prefectural regions in China during 1996-2007, by using a panel data regression model. Authors show that fiscal decentralization significantly reduces public education provision. The greater fiscal expenditure authorities local governments have, the more local government officials are inclined to allocate fiscal expenditure to areas like infrastructure, but not education and other public services. Therefore, the expenditure allocated to education decreases. Fiscal decentralization significantly reduces public education expenditure-to-total expenditure ratio and public education expenditure-to-GDP ratio. If the degree of fiscal decentralization increases 1 percent, public education expenditure-to-total expenditure ratio decreases 0.301 percent, public education expenditure-to-GDP ratio decreases 0.021 percent, and public education expenditure per student decreases 3.758 yuan.

Costa-Font (2010) also analyses the impact decentralization has on both educational spending levels and education inequalities. The author draws upon the evidence from Spain to establish whether broad fiscal and political devolution has increased regional inequalities in welfare activity (operationalized as per capita expenditure) in the three key

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areas of social policy responsibility that have been decentralized: education, health care, and long-term care. The author shows that regional governments that had political responsibilities devolved spent 20-25% more than average on health care, whilst fiscal decentralization was not associated with health expenditure. As regards the education sector, the results were comparable with those for health but the coefficients of significant variables were quite different. The effect of political decentralization was half of that for health care: regional governments that had political responsibilities spent 10-15% more than average in education. The effect of fiscal decentralization was not statistically significant either.

Freinkman and Plekhanov (2009) test the relationship between both broad and sectorial fiscal decentralization and the quality of public services in the Russian regions during the first half of the 2000´s, considering both educational inputs and educational outcomes. Their analysis suggests that broad fiscal decentralization has no significant effect on the key inputs into secondary education, such as schools, computers, availability of pre-schooling and second shift. The measure of decentralization of education spending is statistically significant at the 10 per cent level in some specifications, but the estimated magnitude of the impact is very small. The measures of fiscal decentralization are not statistically significant and the magnitude of coefficients is low: a 10 per cent increase in the share of municipal own revenue in total municipal spending is associated with a 0.2 students more per each teacher, or 11 per cent of one standard deviation of the class size variable. Freinkman and Plekhanov (2009) also find that fiscal decentralization has a significant positive effect on average examination results, controlling for key observable inputs and regional government spending on education. The authors consider that the fact that fiscal decentralization has a positive impact on education outcomes, but not through typically benchmarked inputs and processes, would be consistent with the accountability and incentives argument in favor of decentralization.

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Table 2.1: effects of decentralization on education spending and inputs.

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Busemeyer 2007	To study the impact of fiscal decentralization on a variety of spending types, including education.	Types of spending: a) Total public education spending, b) Spending on primary and secondary education, c) Spending on tertiary education. All spending data is defined in percentages of GDP.	Fiscal decentralization: subnational government's own tax revenue (as a share of general government revenue), in which the subnational unit can at least set the tax rate or the tax base autonomously and does not have to share the revenue obtained.	21 OECD countries.	1980 to 2001.	Pooled time series analysis, using panel corrected standard error.	When spending decisions are located closer to the local level, fiscal decentralization has a positive impact on spending. When spending decisions are taken at higher levels of government, fiscal decentralization can have a negative impact on spending. Fiscal decentralization is significantly and positively associated with education spending.	The impact of a change of one standard deviation in fiscal decentralization increases the overall public spending in education in 27%, the public spending on primary and secondary education in 18%, and the public spending on tertiary education in 28%.
Costa-Font 2010	To establish whether devolution has increased regional inequalities in welfare activity.	Regional inequalities: Expenditure per capita in education, health and long term care.	Transfers on political and fiscal responsibilities: dichotomous variable measuring whether each region state is fully politically or fiscally entitled to welfare responsibilities.	Spain.	1998-2005	OLS estimates and panel-data estimates	The results indicate a clear downward trend in the development of regional inequalities in welfare activity. Whilst this trend is marked in education, in health the effect is less accentuated and in long-term care it is erratic.	Regional governments that had political responsibilities spent 10-15% more than average in education. The effect of fiscal decentralization was not significant either. Political decentralization accounted for 22% of regional disparities in education, but fiscal decentralization was not significant.

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Freinkman and Plekhanov 2009	To test the relationship between fiscal decentralization and the quality of public services.	a) Education inputs: schools, teachers, or computers in education. b) Education outcomes: results of the standardized final examinations in mathematics and language.	a) Fiscal decentralization: share of municipal spending financed by own municipal revenue. b) Education expenditure decentralization: regional expenditure on education per student in PPP.	Russia	First half of 2000´s.	Cross-regional study, based on Panel estimators.	Fiscal decentralization has no significant effect on the key inputs into secondary education, such as schools, computers, or availability of pre-schooling, but has a significant positive effect on average examination results.	The measure of decentralization of education spending is statistically significant at the 10 per cent level in some specifications, but the estimated magnitude of the impact is very small. The measures of fiscal decentralization are not statistically significant and the magnitude of coefficients is low: a 10 per cent increase in the share of municipal own revenue in total municipal spending is associated with a 0.2 students more per each teacher, or 11 per cent of one standard deviation of the class size variable. A 10-percentage point increase in the share of municipalities' own revenues is associated with an improvement in exam performance of approximately 30 per cent of one standard deviation of the class size variable
Luo and Chen 2010	To test how fiscal decentralization affect public education provision.	a) Public education expenditure-to-GDP ratio b) Public education expenditure-to-total government expenditure ratio c) Public education expenditure per student	Fiscal decentralization: prefectural expenditure per person/consolidated expenditure per person.	Prefectural regions in China, 3980 observations.	1996-2007	Panel data regression model.	Fiscal decentralization significantly reduces public education provision.	If the degree of financial decentralization increases 1 percent, public education expenditure-to-total expenditure ratio decreases 0.301 percent, public education expenditure-to-GDP ratio decreases 0.021 percent, and public education expenditure per student decreases 3.758 yuan.

2.2. A survey on the effects of fiscal decentralization on educational effectiveness

We now turn to the empirical research reviewed on the impact of decentralization on education effectiveness. It is worth noting that the different definitions of effectiveness and decentralization adopted by the authors limit the comparability of the studies reviewed. Still, there is some convergence suggesting that decentralization has a positive impact on educational policy outcomes, under some specific circumstances.

Although decentralization is predicted to impact on educational outcomes, the link between decentralization and education is under researched (Diaz-Serrano and Meix-Llop 2012, 10). One of the problems of this research field is that it is very difficult to measure the quality and the effectiveness in the provision of education services (Diaz-Serrano and Meix-Llop 2012). The ways in which authors define and measure decentralization or educational outcomes are not homogeneous.

In the reviewed literature, some authors focus on the effect of broad fiscal decentralization on educational effectiveness. That is the decentralization of revenues to sub-central governments who are then in charge of providing public goods, which may or may not include education. Others authors focus specifically on the decentralization of resources or fiscal competences that are reverted in education.

As regards those authors that emphasize the impact of broad fiscal decentralization on educational effectiveness, we can mention the articles of Diaz-Serrano and Meix-Llop (2012); Falch and Fischer (2008); and Freinkman and Plekhanov (2009). (Table 2)

Diaz-Serrano and Meix-Llop (2012) analyze the role played by fiscal and political decentralization on academic performance in 22 OECD countries. They find that fiscal decentralization exerts a positive effect on all outcomes (mathematics, science and reading skills), but the statistical significance of the estimated coefficient varies according to the different model specifications adopted by the authors. Subnational current expenditure exerts a statistically significant positive effect in all subjects of study. However, subnational capital expenditure reports this positive effect only for math scores, and is non-statistically significant for sciences and reading skills. Analogously, subnational revenue also exerts a significant positive effect on all students' outcomes.

Falch and Fischer (2008) examine the relationship between school quality and the decentralization of public sector spending among OECD countries as of 1990, during 1980-2000. They test two hypothesis: a) overall public sector spending decentralization is beneficial to student performance; and b) decentralization impacts test scores through an effect on expenditure levels for compulsory education. The analysis shows that decentralization of government spending is conducive to better student performance, but its significance and strength varies according to model specifications. The simple correlation between decentralization of public spending and test scores shows that the relationship is weakly positive and significant at 10 percent level. When fixed effects are taken into account, an increase in decentralization of public spending by 10 percentage points increases student test scores by 0.8 standard deviations. The effect does not appear to be mediated through levels of decentralization in educational spending. Student

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performance is not affected by GDP, population size, or educational attainment in the adult population.

Freinkman and Plekhanov (2009) test the relationship between fiscal decentralization and the quality of public services in Russian regions during the first half of the 2000´s. Their analysis suggests that fiscal decentralization has no significant effect on the key inputs into secondary education, such as schools, computers, or availability of pre-schooling, but has a significant positive effect on average examination results, controlling for key observable inputs and regional government spending on education. The broad revenue measure of fiscal decentralization is robustly positively associated with exam performance though: a 10 percentage point increase in the share of municipalities' own revenues is associated with an improvement in exam performance of approximately 30 per cent of one standard deviation. Decentralization also has a positive impact on the quality of municipal utilities provision. The authors interpret both effects as the result of strengthened fiscal incentives rather than to superior productive efficiency of municipal governments.

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Table 2. 2: review on the effects of broad fiscal decentralization on education effectiveness

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Diaz-Serrano and Meix-Llop 2012.	To determine the role played by fiscal and political decentralization on academic performance.	Academic performance: academic results on math, science or reading areas, belonging to PISA studies (2000, 2003, 2006 and 2009).	a) Political decentralization: indexes taken from Hooghe*et al.* (2008), Regional Authority Index. b) Fiscal decentralization: ratio between subnational and national expenditures or revenues (Government Finance Statistics of the International Monetary Fund).	22 countries.	2000-2009	Pooled linear model.	Fiscal decentralization exerts a positive effect on all outcomes (mathematics, science and reading skills). Political decentralization exerts a statistically significant effect only for math scores. Students' performance in mathematics is more sensitive to more decentralized educational policies than other subjects as sciences or reading skills.	-
Falch and Fischer 2008	To examine the relationship between school quality and public sector spending decentralization.	National average scores in Math and Natural Sciences obtained in SIMS and SISS (1980-1991), TIMSS (1994-1999) and PISA (2000)	Fiscal decentralization: the percentage of sub-national government spending in general government spending, calculated by the World Bank up to 1999.	OECD Members as of 1990	1980-2000	Panel fixed effects.	Government spending decentralization is conducive to student performance, but significance and strength of the relation varies according to model specification.	The simple correlation between spending decentralization and test score shows that the relationship is weakly positive and only significant at 10 percent level. When fixed effects are taken into account, an increase in spending decentralization by 10 percentage points increases student test scores by 0.8 standard deviations.
Freinkman and Plekhanov 2009	To test the relationship between fiscal decentralization and the quality of public services.	Education inputs: number of schools, teachers, or computers in education. Education outcomes: results of the standardized final examinations in mathematics and language.	Fiscal decentralization: share of municipal spending financed by own municipal revenue.	Russia	First half of 2000´s.	Cross-regional study, based on Panel estimators.	Fiscal decentralization has no significant effect on the key inputs into secondary education, such as schools, computers, or availability of pre-schooling, but has a significant positive effect on examination results. Results are consistent with the accountability and incentives argument in favor of decentralization and question the hypothesis that student improvement is related to educational inputs.	A 10-percentage point increase in the share of municipalities' own revenues is associated with an improvement in exam performance of approximately 30 per cent of one standard deviation.

Reviewed articles related to authors that focus specifically on the decentralization of resources or fiscal competences that are invested in education are: Blöchlinger (2013); Galiani and Schargrodsky (2002); Barankay and Lockwood (2006); Escardibul and Helmy (2015); Channa (2015); and Carr-Hill et al. (2015). (Table 3)

Blöchlinger (2013) evaluates the impact of both broad fiscal decentralization and education decentralization on educational outcomes in OECD countries. The author finds no robust positive correlation between broad fiscal decentralization and educational outcomes as measured by international student assessments. Statistical significance is only achieved when the Education at a Glance decentralization indicator is considered. A 10% point increase in education decentralization improves PISA results by four points, corresponding to an average improvement by around four positions in the PISA country ranking. Traditional decentralization indicators (spending, revenue and tax decentralization as well as the sub-central education spending share) are, in general, statistically insignificant.

Galiani and Schargrodsky (2002) evaluate the effect of the decentralization of secondary schools on education quality in Argentina between 1994 and 1998. They suggest that, on average, decentralization improved the learning achievements of public school students. Authors estimate that on average, test scores of students attending public schools improved by 1.2 standard deviations as a result of the decentralization process. However, they also find that the higher the provincial fiscal deficits, the smaller the positive impact of decentralization. The effect of decentralization on test scores is positive when schools are transferred to fiscally ordered provinces, but becomes negative when provinces run on sustained fiscal imbalance. Their results suggest that decentralization is deleterious when services are transferred to low-quality local governments running large deficits.

Barankay and Lockwood (2006) evaluate the association between expenditure decentralization and the productive efficiency of government using a data set of Swiss cantons over the period 1982-2000. They measure productive efficiency considering the number of students who obtain the university entrance level qualification as a share of 19-year old population (*Maturité rate*). Authors find that, after controlling for other input variables, the degree of decentralization is positively related to educational attainment. If decentralization increases by ten percentage points it leads to a 3.5% higher share of 19 year olds obtaining the Maturité. They also find evidence that expenditure decentralization is more beneficial when local governments have fiscal surplus.

Escardibul and Helmy (2015) examine the effects of decentralization and school autonomy on the quality of education in Tunisia and Jordan in 2009. The authors show that complete or partial decentralization in school budget formulation and establishing student assessment policies is positively associated with student achievement in mathematics in Tunisia. In turn, decentralization in personnel decisions has a positive effect on student achievement in both mathematics and reading literacy in Jordan. Also in this country, decentralizing the task of hiring and firing teachers has a positive effect on mathematics test scores.

Regarding school autonomy variables, Escardibul and Helmy (2015) find that autonomy management has no significant effect on student attainment in either of the two countries, except for a minor negative impact in Jordan. Results on ownership reveal that publicly operated schools perform significantly better in Tunisia in both mathematics and reading literacy. However, the type of school operation has no effect on achievement in Jordan. Private funding in all types of schools leads to a rise in students' test scores in both countries.

In relation to competition, the presence of one or more schools competing in the same area has no significant impact on student achievement, with the exception of a slight positive effect on mathematics in Jordan.

Concerning the accountability variables examined, Escardibul and Helmy (2015) show that comparing students' assessments to district/national performance or other schools, as well as parental pressure on schools play an important positive role in Tunisia and Jordan. However, schools that post achievement data publicly do not lead to distinctive student test scores, except for a slight negative impact where scores marginally decrease in reading literacy in Jordan.

Channa (2015) examines the empirical relationship between decentralization and educational quality, measured through PISA scores of 2012. The author focuses on the cases of Mexico, Indonesia and Kenya. The three countries are similar in that each one of them has achieved a satisfactory level of primary enrolment, yet has continued to struggle with poor levels of educational quality. They are dissimilar in almost all other respects: they represent different geographies, differing levels of income, and varying models of education decentralization. In Mexico, the School Based Management type reform adopted was the *Programa Escuela de Calidad* (Quality Schools Program) or PEC intervention, which was implemented in 2001. The PEC intervention empowered school management and parents to jointly develop a five-year quality improvement plan for a school. In Indonesia, the decentralization process started in 2001. The central authority continued to maintain control over setting and maintaining national competency standards, curriculums and education calendars, as well as over implementing evaluations. However, Indonesia's reform made provisions for sharing the human resource management responsibilities for teachers, schools were given the authority to manage operations such as planning and budgeting, and were mandated to form school committees of parents and prominent community members. In Kenya, the system had evolved into a mix of centralized and decentralized elements. Ad hoc amendments and approvals given had resulted in an inconsistency in the services that had been devolved to local bodies in different geographies, and redundancy between the local government and de-concentrated system persisted in many key functions. Moreover, financial allocations to local bodies were dictated by political decisions rather than a transparent formula, further adding to the opacity of decision-making.

In Mexico both performance in mathematics and equity in educational opportunities improved compared to previous years. In Indonesia, quality of education remains low. Besides inadequate facilities, there are serious issues related to poor teacher attendance and corruption in the country´s bureaucracy.

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Channa stresses that although decentralization has the potential to enhance quality, different decentralization approaches can result in dramatically different quality outcomes. In Kenya, an experimental trial does suggest that school-based management reforms have the potential to improve educational quality in the country, but results are not conclusive. The author highlights certain prerequisites that promote educational quality: community participation, capacity building and training, a continued role for the Centre, and time and experience. There are, however, instances when even the presence of these conditions has not resulted in better quality – this suggests that there may be additional factors that are relevant (Channa 2015, 26).

Carr-Hill et al. (2015) conducted a mixed-methods systematic review of research studies that evaluate the impact of school-based decision-making on educational outcomes in low and middle-income countries. The authors find that devolving decision-making to the level of the school appears to improve students' dropout and repetition rates in certain contexts. Effects on test-scores are more robust, being positive and significant in the aggregate, particularly in middle-income countries. While pooled effects on teacher attendance are not significant overall, there is some evidence that these effects are stronger in contexts of high decentralization and of low income. School-based decision-making reforms appear to be less effective in disadvantaged communities, particularly if parents and community members have low levels of education and low status relative to school personnel. Devolution also appears to be ineffective when communities do not choose to actively participate in the decision-making processes. Small schools, however, may find school-based decision-making interventions to be effective, particularly if community members opt to establish a collaborative, rather than an adversarial, relationship with the teachers (Carr-Hill et al., 2015, 128).

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Table 2.3: review on the effects of educational decentralization on education effectiveness

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Barankay& Lockwood 2006	To evaluate this the association between expenditure decentralization and the student's achievements.	Student achievement: Maturité rate- number of students who obtain the university entrance level qualification as a share of19-year old population.	a) Fiscal decentralization in education: expenditure decentralization in education counties: expenditure in education as a share of total expenditure in education at each canton. b) Competence of a government: size of the budgetary surplus.	26 Swiss Cantons	1982-2000	Panel estimations.	Decentralization is positively related to educational attainment. Expenditure decentralization is more beneficial when local governments are more competent –that is, when governments have fiscal surplus-.	If decentralization increases by ten percentage points, it leads to a 3.5% higher share of 19 year olds obtaining the Maturité.
Blöchlinger 2013	To evaluate the impact of decentralization is on educational outcomes.	PISA results.	a) Traditional fiscal decentralization indicators; b) Institutional education decentralization indicator; c) Education decentralization indicator.[1]	OECD Countries	2009	Unbalanced panels with time fixed effects.	Strong positive relationship between decentralization and educational outcomes, although only for the Education at a Glance decentralization indicator. Traditional decentralization indicators (spending, revenue and tax decentralization as well as the sub-central education spending share) are, in general, insignificant.	A 10% point increase in education decentralization improves PISA results by four points, corresponding to an average improvement by around four positions in the PISA country ranking.

Source	Research question /objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Carr-Hill et al 2015	What is the impact of school-based decision-making on educational outcomes in low- and middle-income countries ?What are the barriers to (and enablers of) effective models of school-based decision-making?	Educational outcomes.	School-based decision making.	-	Since 1990	Literature review based on a mixed-methods search strategy.	Devolving decision-making to the level of the school appears to have a negative effect on drop-out and on repetition.	-
Channa 2015	Examine the empirical relationship between education decentralization and education quality.	Educational quality: PISA results 2012.	Education decentralization content and school-based management content: if designs encourage accountability, if they are designed with the local context in mind, if they build capacity as well as foster key stakeholder buy-in-.	Mexico, Indonesia and Kenya.	Since 2000´s.	Literature review.	Although decentralization has the potential to enhance quality, different decentralization approaches can result in different quality outcomes.	Mexico: empowered school management and parents participation led to an improvement of both performance in mathematics and equity in educational opportunities compared to previous years. Indonesia: decentralization involved sharing the management of human resources management; schools were given the authority to manage operations (e.g. planning and budgeting) and were mandated to f school committees of parents and prominent community members. However, quality of education remains low. Besides inadequate facilities, there are serious issues related to poor teacher attendance bureaucracy's corruption. Kenya: the system had evolved into a mix of centralized and decentralized elements, with inconsistencies in the services that had been devolved to local bodies, and redundancy between local governments. An experimental trial does suggest that school-based management reforms have the potential to improve educational quality in the country, but results are not conclusive.

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Escardibul and Helmy 2015	To examine the effects of decentralization and school autonomy on the quality of education.	Educational quality: PISA results 2009.	a) Autonomy Management; b) Ownership and Funding; c) Competition; d) Accountability.[2]	Tunisia and Jordan	2009	Hierarchical Linear Model.	Tunisia: Complete or partial decentralization in school budget formulation and establishing student assessment policies is positively associated with student achievement in mathematics. Jordan: decentralization in personnel decisions has a positive effect on student achievement in both mathematics and reading literacy as well as the task of hiring and firing teachers on mathematics test scores.	
Galiani and Schargrodsky 2002	To evaluate the effect of the decentralization of secondary schools on education quality.	Difference between average test score over all students that attend the last year of public schools in each province and year and average test score over all students that attend the last year of private schools in each province and year.	Secondary school decentralization: Proportion of years that on average students of the last year of secondary public school in each province and year spent in national school.	Argentina	1994-1998	Two-way fixed effect error component model.	Decentralization improved the performance of public school students in test scores. The higher the provincial fiscal deficits are, the smaller the positive impact of decentralization is.	Test outcomes of public schools improved 1.2 standard deviations of its distribution as a result of the decentralization process. Effect of school decentralization on test outcomes is null for a fiscal deficit in terms of gross product of approximately 10 percent.

1: Variables are operationalized as follows: a) Traditional fiscal decentralization indicators: spending decentralization (the ratio of sub-central to general government spending); revenue decentralization (the ratio of sub-central own revenue to general government revenue); tax revenue decentralization (the ratio of sub-central tax revenue to general government tax revenue); tax autonomy (the ratio of taxes over which SCGs have some base or rate-setting autonomy to general Government tax revenue), taken from the OECD Fiscal Decentralization database; b) Institutional education decentralization indicator: level of government a wide array of education policy decisions are taken (OECD); c) Education decentralization indicator: the share of sub-central education spending to general government education spending (COFOG).

2: Variables are operationalized as follows: a) Autonomy Management: 1) Whether regional or local education authorities have complete or shared sizeable responsibility versus national educational authority in selected tasks (OECD); and 2) Whether principals, teachers or school governing board have considerable responsibility for selected tasks (OECD); b) Ownership and Funding: Type of school (public/private) and school's source of funding (private funding higher than 20% of total resources); c) Competition: Whether the school has one or more schools competing for students (OECD); d) Accountability: Whether assessments of students are used as a comparison to district/national performance or as a comparison to other schools (OECD) and parental pressure on schools.

2.3. A survey on the effects of fiscal decentralization on regional inequalities

Does fiscal decentralization lead to a lowering or rising of educational disparities? According to Beramendi (2007, quoted in Rodríguez-Pose and Ezcurra 2009, 4), this question has either been fundamentally overlooked by the literature or too easily dismissed on the basis that decentralized political structures not only lead to smaller governments, but also to a less-developed welfare state, and, consequently, higher levels of inequality. The prevailing view is that the transfer of powers and resources to subnational tiers of government disproportionately benefits those regions with a greater capacity to really fulfill allocative and productive efficiency (Cheshire and Gordon 1996, quoted in Rodríguez-Pose and Ezcurra 2009, 9). However, it does not seem possible to anticipate the net direct effect of fiscal decentralization on these variables (Sepulveda and Martinez-Vazquez 2011, 326).

Our review identified four studies that address, from very different perspectives, the relation between decentralization and regional inequalities (Table 4).

Rodríguez-Pose and Ezcurra (2009) investigate the link between political and fiscal decentralization and income interregional inequalities, measured as a population-weighed coefficient of variation of GDP per capita across regions. Their study covers 26 countries – 17 developed and 9 developing – between 1990 and 2006. They look both at broad and sector-specific fiscal decentralization, by separately analyzing subnational expenditures on economic affairs, health, education and social protection.

Their results reveal opposite trends between developed and developing countries. In the former, fiscal decentralization appears to contribute to the reduction of interregional inequalities, but its statistical significance is weak. Political decentralization does not seem to exert any impact. In developing countries, by contrast, the association between political decentralization and inequalities is negative, modest and significant at 5%. Broad fiscal decentralization, in turn, appears strongly associated with the rising of income inequalities. Fiscal decentralization of education expenditures shows a similar trend but (very strong) statistical significance is reached only for developing countries. Looking at fiscal decentralization of other sector expenditures, the authors observe that 'across the developed world variations in expenditure choices tend to be completely dissociated from the evolution of regional disparities' (Rodríguez-Pose and Ezcurra, 2009: 30), the only exception being subnational expenditures in health, which appears to contribute to reduce spatial inequalities both in developed and developing countries. In the latter set of countries, though, subnational expenditures on economic affairs, education and even social protection are significantly associated with increasing disparities. They conclude that:

> 'while high income countries, with limited internal disparities, a strong welfare state, and territorially progressive fiscal systems can expect that further decentralization will not harm their territorial cohesion (and, if anything, may increase it), low and medium income countries may have to tread more carefully as the potential positive effects of political decentralization on cohesion will be easily counter balanced by the unequal capacity of regions in the core and in the

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> periphery of these countries to make the most of decentralized resources, especially in the absence of well-established territorially progressive fiscal systems.' (Rodríguez-Pose and Ezcurra, 2009: 34-35)

Galiani, Gertler and Schargrodsky (2005) test the hypothesis that administrative decentralization of secondary schools increased inequality of educational outcomes in Argentina. At the same time, they add the impact of administrative capabilities in order to evaluate different effects of decentralization depending on provincial contexts. Administrative capability includes a proxy of broad fiscal decentralization, since they combine fiscal discipline and the Jones et al. index (2002). They find that on average, decentralization improved the performance of students on standardized Spanish and Mathematics tests. However, when they interact the effect of decentralization with measures of local administrative capabilities and population poverty, authors find that decentralization only had a positive effect on schools located in non-poor municipalities in well-managed provinces. Decentralization had no impact on schools in non-poor municipalities in poorly managed provinces, nor on schools located in poor municipalities in well-managed provinces. Test scores fell in schools located in poor municipalities and weakly managed provinces. After 5 years of decentralization, test scores improve about 7% in Math and 8% in Spanish in schools in well-administered provinces and non-poor localities; but diminished more than 14% in Math and more than 9% in Spanish in schools in badly administered provinces and poor municipalities. Thus, there is a trade-off between efficiency and equity associated to decentralization. Although "bringing decisions closer to the people" may be generally optimal, the advantages of decentralization dilute when provinces are weakly administered and people are extremely poor.

Akai, Sakata and Tanaka (2007) investigate whether decentralization of education finance from state to local governments in the United States leads to improved educational results in primary and secondary education, measured by students' average scores in math standardized exams and dropout rates. The authors define their independent variable as the "redistribution power of a State", which is calculated as the ratio of a coefficient of variation of education expenditure per pupil for public education service in each state to a coefficient of variation of state's own tax revenue per pupil for education service in each state. This indicator 'captures how the state government behaves in each state to decrease the disparity of education finance across school districts by redistributing resources in each state (the lower is the measure, the more effective is the state government to reduce the education finance inequality across districts)' (Akai et al., 2007: 18). They control for variation of average class sizes (pupil per teacher ratio), presence of the private sector (share of public school), and duration of compulsory schooling, median household income, ethnic composition of state's population (black rate) and a proxy of state's institutional capacity (perception of corruption).

Assuming that externalities on students learning are greater in elementary education than in high schools (or that marginal productivity of basic education is higher in comparison to secondary education), due to its emphasis on basic skills, the authors posit that the effect of decentralization of education finance should be larger in this latter stage of

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compulsory schooling. Their findings support this hypothesis. The estimated coefficient on education decentralization is statistically insignificant in all regressions for both mathematics scores at 4th and 8th grade. In secondary education, in turn, the results of Redistribution Power are positively signed and statistically significant in all regressions for SAT score and in some regressions for ACT score, leading the authors to interpret that the 'smaller degree of concernment to educational management of state government develops more educational performance in secondary school' (Akai et al., 2007: 25). Median household income exerts a positively and strongly significant determinant of states' average students' scores across all model specifications for both educational levels. Ethnical composition of population appears negatively associated with educational outcomes, but statistical significance is much stronger in secondary schools. States' corruption index is also negatively associated to students' average scores in mathematics, but statistical significance varies across model specifications, tending to be much higher in secondary, than in elementary education. Finally, the presence of the private sector appears as a relevant (and positive) determinant of students' achievements only in secondary education, which is consistent with the fact that the provision of elementary education is mostly covered by the public sector.

Authors' conclusions point to the need to 'consider the characteristics of schooling in each education level carefully when we decentralize education systems' (Akai et al., 2007: 29), since the positive effects of decentralization of education finance in secondary education might be outweighed by its negative effect in elementary schooling. Their study point out to the importance of some centralization of educational expenditure in educational levels with higher externalities, in order to counterbalance for the differing capacities of local governments to ensure optimum investment.

Finally, by considering the variation of per capita expenditure as a dependent variable, Costa Font (2010) finds that disparities in education expenditure across regions in Spain are related to political and fiscal devolution only to a small extent. While political decentralization accounted for 22% of regional disparities in per capita expenditures in education, fiscal decentralization was not significant at all. Differences in the patterns of regional disparities between the welfare services examined may be due to different forms of political agency and levels of political transparency (Costa-Font 2010, 447).

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Table 2.4: effects of fiscal decentralization on regional inequalities								
Source	**Research question/objective**	**Dependent variable**	**Independent variable**	**Countries /cases included**	**Period**	**Method**	**Results**	**Features of the effect**
Akai, Sakata and Tanaka 2007	What is the real effect of financial decentralization in two levels of school?	Student's performances in primary and secondary schools. a) Primary education: mathematics score at 4th and 8th on 1996 and 2000 years taken from National Assessment of Educational Progress. b) Secondary education: mathematical test scores in Scholastic Aptitude Test (SAT) from 1995 to 2000 taken from Digest of Education Statistics.	Redistribution Power: ratio of a coefficient of variation of education expenditure per pupil for public education service in each state to a coefficient of variation of own tax revenue per pupil for education service in each state.	49 American states.	1996-2000 (for primary schools); 1995-2000 (for secondary schools).	Both pooled data and panel models with one-way and two-way fixed effects.	Primary schools: Estimated coefficient on educational decentralization of Redistribution Power is statistically insignificant in all regressions for both mathematics scores at 4th and 8th grade. Secondary schools: results of Redistribution Power are positively signed and statistically significant in all regressions for SAT score.	A smaller degree of concernment to educational management of state government develops more educational performance in secondary school.
Galiani, Gertler and Schargrodsky 2005	To evaluate the impact of decentralization on educational outcomes.	Educational outcomes: Math and Spanish test scores.	a) Administrative decentralization of secondary schools (transference of national secondary schools to provinces): number of years a school has been under local administration in a certain year. b) Inequalities: classification of schools in four groups based on provincial government administrative capability (high fiscal deficit and budgetary institutions (Jones et al 2002) and binary indicator of poverty in municipality.	3,456 public schools in Argentina.	1994-1999	Non-experimental method.	On average, decentralization improved the performance of students on standardized Spanish and Mathematics tests. When interacting the effect of decentralization with measures of local administrative capabilities and population poverty, they find that decentralization only had a positive effect on schools located in non-poor municipalities in well-managed provinces. Decentralization had no impact on schools in non-poor municipalities in poorly managed provinces, nor on schools located in poor municipalities in well-managed provinces. But test scores actually fell in schools that were transferred in poor municipalities located in weakly managed provinces.	Test scores improve about 7% in Math and 8% in Spanish in schools in well-administered provinces and non-poor localities; but diminished more than 14% in Math and more than 9% in Spanish in schools in badly administered provinces and non-poor municipalities.

2 .4. A survey on the effects of fiscal decentralization on educational efficiency

- *Productive efficiency*

Several studies that purport to undertake an analysis of productive efficiency, actually look at what we define here as effectiveness by enquiring whether a certain level of inputs lead to a certain level of output. The analysis of productive efficiency, however, needs to go beyond this relationship and uncover the possibility of reaching the same level of output with less inputs or, alternatively, to reach a higher output level by using the same quantity of inputs. Technical efficiency is not directly observable – it is rather a quality that needs to be inferred from the comparison between cases with controlled variation of the quantity of inputs and outputs. These strict comparability requisites explain, as Grigoli (2014) points out, why measuring the efficiency of education spending has been a thorny challenge for researchers.

Studies focusing on the efficiency of education spending commonly use Data Envelopment Analysis (DEA) or Stochastic Frontier Analysis (SFA) to estimate efficiency scores, which are relative efficiency measures that are valid only for a given sample. Those estimates are highly sensitive to the analyst's choice on relevant inputs and outputs. Moreover, efficiency scores are descriptive by nature. To explain why some countries – or the corresponding unit of analysis – are more efficient than others (i.e. obtain higher efficiency scores), a second stage of analysis must be carried out, looking for the independent variables that would explain the variation in the scores estimated in the first place.

Our literature review tried to identify studies that, first, estimate efficiency scores based on education inputs and outputs and, then, investigate whether the distribution of these estimates of technical efficiency is associated to varying levels of decentralisation. We only found two papers meeting these criteria, the first by Coelho (2009) and the second by Sow and Razafimahefa (2015). Both studies use stochastic frontier models to estimate efficiency scores and measure education inputs based on sectorial spending. In Coelho, the latter is defined as the cumulative expenditure per student in primary and secondary education, whereas Sow and Razafimahefa look at total public expenditure on education as a share of GDP. The variables they chose to measure education output are quite different though. Coelho uses country averages of students' learning achievements in PISA. Sow and Razafimahefa, in turn, use net enrolment rates in secondary school to measure education output. Most importantly for our study, however, is to note that these studies also adopt totally different definitions of decentralisation: while Sow and Razafimahefa (2015) investigate the impact of broad fiscal decentralization on the technical efficiency of education expenditures, Coelho (2009) investigates the effects of education decentralization measured as the percentage of decisions made by local governments and schools on different areas of educational policy, using OECD's Education at a Glance database.

Sow and Razafimahefa (2015) investigate the impact of fiscal decentralization on the productive efficiency of public expenditures in health and education. Fiscal decentralization is measured as the share of subnational fiscal variables over general government fiscal variables. They analyse 64 countries, including advanced, emerging,

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and developing economies during 1990-2012. Their results highlight that expenditure decentralization seems to improve the efficiency of public service delivery in advanced economies but has a negative impact in emerging economies and developing countries. However, we note that their results seem to be robust only for health. They suggest that the relationship between fiscal decentralization and the efficiency of public service delivery is not linear, but U-shaped, and argue that a decentralization of expenditures need to exceed about 35.4 per cent for education to bring about improvements in efficiency. Still, their reported results suggest that this relationship is not statistically significant. The authors also purport that fiscal decentralization requires adequate political and institutional environments and their estimations suggest that corruption negatively affects the impacts of fiscal decentralization on the efficiency of public services. We observe, however, that the magnitude and significance of this effect could be biased due to the omission of relevant variables in all model specifications reported. We should stress that despite the authors' claims, in education, the magnitude and significance of the estimated effect of fiscal decentralization varies considerably across different model specifications, particularly for advanced economies. In contrast, in emerging and developing economies results seem to be slightly more robust and the estimated coefficient of fiscal decentralization is usually negative.

Coelho's (2009) analysis covers 18 OECD countries in 2000 and 2003. He investigates the effect of the organizational structure of primary and secondary education systems on the productive efficiency of education spending. Organisational structure is explored through two analytical components: the share of public/private providers in the system and the degree of decentralization of public providers, which is measured as the percentage of decisions taken at the "local" and "school" levels. The author finds that the share of public providers exerts a negative effect on efficiency, but when this is interacted with the decentralization variable, a positive effect on efficiency comes about.

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Table 2.5: effects of decentralization on productive efficiency of education expenditure.

Source	Researchquestion/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Sow and Razafimahefa 2015	To investigate the impact of fiscal decentralization on the productive efficiency of public service delivery in health and education.	Efficiency scores obtained using a stochastic frontier model. For education, efficiency scores are estimated from the regression of public expenditure in education on net enrolment rate in secondary education. For health, scores are estimated from the regression of public expenditure in health infant mortality rate.	Broad fiscal decentralization: subnational government's share of expenditure (revenue) over total general government expenditure.	64 countries, including advanced, emerging, and developing economies.	1990–2012	Stochastic frontier model and two-stage least square estimates using panel data.	Expenditure decentralization seems to improve the efficiency of public service delivery in advanced economies but has a negative impact in emerging economies and developing countries. Fiscal decentralization can improve the efficiency of public service delivery but only under specific institutional conditions.	Varies according to sector and group of countries. In education, the association is negative and significant for emerging and developing economies. Association becomes positive and significant for advanced economies when time dummies are included. Different effects among country groups is explained by non-linearity of the relation between Fiscal Decentralization and efficiency, suggesting that the positive effects depend on surpassing a minimum threshold of decentralization. However, when the sample is split according to this threshold, the coefficient is not significant for education. The effects change in magnitude and significance when revenue FD indicators are used alternatively.
Coelho 2009	To investigate the effect of the organizational structure of primary and secondary education systems on the productive efficiency of education expenditure.	Efficiency scores obtained using a stochastic frontier model. Efficiency scores are estimated from the regression of cumulative expenditure per student in primary and secondary education on country average students' achievements in PISA.	Organizational structure: a) The share of public/private providers in the system b) The degree of decentralization of public providers, measured as the percentage of decisions taken at the "local" and "school" levels.	18 OECD countries.	2000-2003.	Maximum likelihood estimation of a production function frontier and technical inefficiency effects using panel data.	The share of public providers is found to exert a negative effect on efficiency whereas the degree of decentralization of public providers exerts a positive effect on efficiency.	-

- *Allocative efficiency*

The global drive toward decentralization of powers and resources to subnational tiers of government has put the economic returns of local and regional autonomy under analysis. However, as Díaz Serrano and Rodríguez Pose (2014) mention, despite the increasing tendency to justify decentralization on economic grounds, the primary aim of transferring powers and resources to subnational tiers of government is to improve the delivery of public goods and services to individuals, by the creation of more legitimate tiers of government, closer to the people and, therefore, more responsive to their needs and wants. Hence, most research on the economic implications of decentralization skips an important step. Rather than concentrating on the changes in the scope and quality of the provision of public goods and services, they aim directly at the economic consequences derived from the change in the scale of the delivery of policies. The question of whether decentralization leads to a more efficient allocation of resources remains almost unaddressed. Empirical research on the hypothesized impact of decentralization on allocative efficiency has been handicapped by the complexity of generating standardized measurements of allocative efficiency across countries (Arze del Granado et al. 2005).

Four of the studies included in our literature review try to address the linkage between decentralization and the allocative efficiency of education expenditure. These are Díaz Serrano and Rodríguez Pose (2014), Arze del Granado et al. (2005), Faguet (2004) and Hasnain (2008). However, they look at allocative efficiency in different ways (Table 6). While Díaz Serrano and Rodríguez Pose focus on citizen's satisfaction in public services, Arze del Granado et al. measures the impact of decentralization on the composition of public expenditures as a first approximation to efficiency analysis. Faguet and Hasnain also adopt the latter approach and go further by asking how these changes in allocative patterns responds to societal needs. This indicates two alternative ways of assessing allocative efficiency: one focusing on the matching of individual citizens' preferences (Díaz Serrano and Rodríguez Pose, 2014) and another that puts communities' needs in the centre of the analysis (Faguet, 2004; Hasnain 2008).

Diaz Serrano and Rodriguez Pose (2014) analyse whether political and broad fiscal decentralization has an impact on citizen's satisfaction in public services, such as education and health. They estimate linear fixed-effects models based on data for 31 countries in Europe. Their dependent variable is the individuals' subjective assessment of the health and education system, and it is operationalized with indicators of satisfaction with the education and health systems collected by four waves of the European Social Survey (ESS, 2002-2008). Hooghe et al.'s (2008) Regional Authority Index (RAI) is used as their political decentralization index, which, following the index authors' recommendation, they disaggregate into two key variables: self-rule and shared-rule. The former depicts the authority exercised by local and regional governments over those who live in the region. The latter measures their influence on national politics and policy as a whole. Fiscal decentralization data is obtained from the International Monetary Fund's Government Finance Statistics and the authors include in their model averages of the past ten years subnational shares over total public revenue and expenditure for each wave of

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the ESS. They use both total and disaggregated current and capital expenditure data, as well as total and tax revenue. Their estimation indicates a positive and moderate statistically significant association between decentralization of current expenditures and citizens' satisfaction with education services, as well as a weak and positive association of the latter with the decentralization of total revenues. For health, statistical significance is achieved only for the decentralization of aggregate expenditures (positive and moderately significant). As regards political decentralization, both variables appear as highly significant for education (significance is a slightly lower for health), but coefficient signs vary depending on whether they consider the capacity of subnational governments to rule their own citizens (self-rule, positive), or their capacity to influence national politics and policy (shared-rule, negative). This result implies that citizens tend to be more satisfied with specific policies – in this case health and education – in countries with institutions that grant higher autonomy to regional authorities to rule on their own jurisdiction. By contrast, the greater the capacity of autonomous governments to affect and/or shape national politics and policy, the smaller the satisfaction of local citizens with the education and health systems. It should be noted that both in health and education, the average negative effect of shared rule largely outweighs the positive impact of self-rule, leading to a negative average net effect of political decentralization on citizens' satisfaction with both policy domains. Also importantly, the magnitude of significant coefficients for fiscal decentralization variables suggests that, in practice, the effect of decentralization of revenues or expenditures on citizens' perceptions is almost negligible.

Arze del Granado et al. (2005) offer an indirect test of the allocative efficiency effects of decentralization by examining the role of decentralization on the composition of public expenditures. They employ panel data for 45 developed and developing countries from 1973 to 2000. Their independent variable is fiscal decentralization, defined as the share of subnational government expenditures to general government expenditures. Their analytical framework is based on mainstream fiscal federalism's literature, which they adapt to develop propositions regarding the provision of what they call pure public goods (PPGs) and public-provided private goods (PPPGs) under centralized and decentralized arrangements. Their empirical analysis focuses in the proposition that the provision of PPPGs is increasing with decentralization. To test this hypothesis, they define health and education as publicly provided private goods and measure how much these two sectors together account for total public expenditures. In their model, this variable is run against their measures of fiscal decentralization. Their estimations wield positive and highly significant coefficients for fiscal decentralization in all models, leading the authors to predict an increase of 2.4 percentage points in the share of education and health and expenditures over total public expenditures when the level of decentralization increases from 0.26 (the mean value) to 0.36.

Faguet (2004) seeks to answer if decentralization increases the sensitivity of public investment decisions to local needs. His objective is to test whether the decentralization process changed the pattern of public sector investment in Bolivia and, if so, to find the determinants of that change. He compares patterns of public investment in Bolivia after and before decentralization took place, using ordinary least squares estimators. National investment patterns are considered for education, water & sanitation, water management,

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agriculture and urban development, health, transport, communication and industry and tourism. Decentralization is defined as the devolution by central government of specific functions, with all of the administrative, political and economic attributes that these entail, to local governments that are independent of the centre within a legally delimited geographic and functional domain[1]. Faguet adds a number of variables to help explain the institutional, civic and procedural determinants of decentralized investment decisions: Civil Institutions; Training & Capacity-Building; Private Sector; Information Technology and Project Planning. Results show that decentralization significantly changed national public investment patterns in education, water & sanitation, water management, agriculture and urban development after the 1994 reform. There is some evidence that it may have changed in health, transport, communication, industry and tourism as well. Furthermore, these changes are strongly and positively associated to objective local needs. Models for education are jointly significant at the 2 per cent level or higher. Under decentralization, investments grew more in localities with higher illiteracy rates, thus showing a progressive pattern. The author takes this as evidence of local governments being more sensitive to local needs than central government. Educational investment fell in municipalities with stronger presence of the private sector, a finding that is again robust across model specifications. His explanatory hypothesis for this effect is that private firms lobby for resources to flow to other sectors where they stand to profit more.

Hasnain (2008) studies the relationship between devolution, accountability, and service delivery in Pakistan. He examines how decentralization reforms[2] impacted on the degree

[1] According to Faguet (2004), the core of the decentralization reform of 1994 in Bolivia consisted of four points: 1. The share of all national tax revenues devolved from central government to the municipalities was raised from 10 per cent to 20 per cent; 2. Title to all local infrastructure related to health, education, culture, sports, local roads and irrigation was transferred to municipalities free of charge, along with the responsibility to administer, maintain and stock this with the necessary supplies, materials and equipment, as well as invest in new infrastructure; 3. Oversight Committees (Comités de Vigilancia) were established to oversee municipal spending of Popular Participation funds, and propose new projects. These are composed of representatives from local, grass-root groups within each municipality, and are legally distinct from municipal governments; and 4. One-hundred ninety-eight new municipalities were created, and existing ones were expanded to include suburbs and surrounding rural areas, to the point where the 311 municipalities exhaustively comprise the entire national territory.

[2] According to Hasnain (2008), devolution in Pakistan has significantly changed the provincial and sub-provincial government structure, with the main responsibility for the delivery of education, health, water and sanitation, roads and transport, and agriculture services devolved to local governments. Politically, the formerly de-concentrated provincial bureaucracy in the above-mentioned sectors has been placed under the authority of elected local governments. Fiscally, a fairly elaborate 'rule-based' resource transfer system between the province and local governments has been created in the shape of the Provincial Finance Commission Awards. These awards divide provincial resources, consisting of both federal transfers and provincial taxes (and in some cases non-tax revenues), into provincial retained and allocable amounts, the latter of which is transferred to local governments. Administratively, the formerly de-concentrated bureaucracy is now on paper answerable to the locally elected leadership. Dependent variables are accountability and expenditure priorities, which is measured by a) examining the sectorial composition of development expenditures as outlined in the Annual Development Plan; b) the average size and type of typical local development schemes; c) trends in non-salary recurrent expenditure to estimate the emphasis on operations and maintenance as opposed to new investments; and d) the relative size of provincial spending in the devolved sectors in a district.

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of accessibility of local policymakers and the level of competition in local elections, the expenditure patterns of local governments to gauge their sector priorities, and the extent to which local governments are focused on patronage or the provision of targeted benefits to a few individuals as opposed to providing public goods. The analysis is based on Annual Development Plans data for 2006/07 received from 33 of the 35 districts of Punjab. Three conclusions are drawn from the analysis. First, that the accessibility of policy-makers to citizens in Pakistan is unequivocally greater after devolution, and local government elections are, with some notable exceptions, as competitive as national and provincial elections. Second, local government sectorial priorities are heavily tilted towards the provision of physical infrastructure- specifically, roads, water and sanitation, and rural electrification -at the expense of education and health. Third, this sectorial prioritization is in part a dutiful response to the relatively greater citizen demands for physical infrastructure; in part a reflection of the local government structure whereby the district political leadership is accountable to an electoral college of directly elected union councillors whose constituency is the village and neighbourhood; and in part a reaction to provincial initiatives in education and health that have taken the political space away from local governments in the social sectors thereby encouraging them to focus more towards physical infrastructure. Education nominal recurrent expenditures has increased on average annually by 17% from 2002/03 to 2005/06. Given that salary increases have on average been in the range of 10% to 15% annually in these years, data suggests that non-salary expenditures have been broadly stagnant in nominal terms in education. By contrast, provincial recurrent expenditures in this sector have increased more sharply, growing annually by 48%.

Table 2.6 A : effects of decentralization on the allocative efficiency of education provision.

Source	Research question/objective	Dependent variable	Independent variable	Countries/cases included	Period	Method	Results	Features of the effect
Díaz Serrano and Rodriguez Pose 2015	To analyze whether decentralization – the granting of greater powers and resources to subnational tiers of government – has an impact on citizen's satisfaction in public services.	The individuals' subjective assessment of the health and education system, based on the European Social Survey. The perception of the provision of education and health by individuals is measured on an eleven-point Likert scale, with 0 being the lowest level of satisfaction and 10 the highest.	a) Political decentralization index: Hooghe et al.'s (2008) Regional Authority Index. Index is divided into Self Rule index and Share Rule index.b) Fiscal decentralization: ratio between subnational and national magnitudes. Data stem from the International Monetary Fund's Government Finance. Five indicators of fiscal decentralization: total expenditure, current expenditure, capital expenditure, total revenues, and tax revenues.	31 countries in Europe	2002, 2004, 2006, 2008.	Linear fixed-effects estimates models.	Results of analysis reveal that the perception of the state of education and health services is affected by the degree of decentralization, but is also sensible to the balance between political and fiscal decentralization in any given country.	Political decentralization: a) One point increase in Self Rule index improves satisfaction in public services in 0.3537.a) One point increase in Self Rule index improves satisfaction in public services in 0.3537.Fiscal decentralization: Subnational Current Expenditure improves satisfaction in public services in 0.0196.b)One point increase in Subnational Total Revenue Improves satisfaction in public services in 0.03
Arze del Granado et al. 2005	To test the allocative efficiency effects of decentralization.	Comp: the ratio of education and health expenditures to total public expenditures.	Fiscal decentralization: share of subnational government expenditures to general government expenditures.	45 developed and developingcountries.	1973-2000.	Panel data set.	The effect of fiscal decentralization is positive and highly statistically significant in all models.	The magnitude of decentralization marginal effect ranges from 0.24 to 0.38.An increase of 2.4 percentage points in the composition of expenditures variable when the level of decentralization increases from 0.26 (the mean value) to 0.36.

Table 2.6 B: effects of decentralization on the allocative efficiency of education provision.

Source	Research question/objective	Dependent variable	Independent variable	Countries/ cases included	Period	Method	Results	Features of the effect
Faguet 2004	Does decentralization increase the sensitivity of public investment decisions to local needs?	National investment patterns in education, water & sanitation, water management, agriculture and urban development, health, transport, communication and industry & tourism.	Decentralization: devolution by central government of specific functions, with all of the administrative, political and economic attributes, to local governments which are independent of the center within a legally delimited geographic and functional domain.	Bolivia.	Pre and post 1994.	OLS regressions.	Decentralization significantly changed national public investment patterns. Investment changed unambiguously in education, water & sanitation, water management, agriculture and urban development after the 1994 reform, and there is some evidence that it may have changed in health, transport, communication and industry & tourism as well. Furthermore, these changes are strongly and positively related to real local needs	The mean of national investment patterns in education changed in almost 1000%. The number of municipalities that received investment in education after the decentralization reform grew in more that 800%.
Hasnain 2008	To examine how decentralization reforms impacted on the degree of accessibility of local policymakers and the level of competition in local elections, the expenditure patterns of local governments to gauge their sector priorities, and the extent to which local governments are focused on patronage or the provision of targeted benefits to a few as opposed to providing public goods.	a)Accountability: Citizen's contacting with politicians and voter tornout in municipal council elections.b) Local government sectoral priorities: sectoral composition of development expenditures as outlined in the Annual Development Plan; the average size and type of typical local development schemes; trends in non-salary recurrent expenditure to estimate the emphasis on operations and maintenance as opposed to new investments; and the relative size of provincial spending in the devolved sectors in a district.	Decentralization reforms.	33 of the 35 districts of Punjab, Pakistan.	2006-2007.	Descriptive analysis.	Accessibility of policy-makers to citizens in Pakistan is unequivocally greater after devolution, and local government elections are, with some notable exceptions, as competitive as national and provincial elections. Local government sectoral priorities are heavily tilted towards the provision of physical infrastructure-specifically, roads, water and sanitation, and rural electrification -at the expense of education and health. Sectorial priorization is in part a response to the relatively greater citizen demands for physical infrastructure; in part a reflection of the local government structure whereby the district political leadership is accountable to an electoral college of directly elected union councilors whose constituency is the village and neighborhood; and in part, as elaborated in detail, a reaction to provincial initiatives in education and health that have taken the political space away from local governments in the social sectors thereby encouraging them to focus more towards physical infrastructure.	Education nominal recurrent expenditures has increased on average annually by 17% from 2002/03 to 2005/06. Given that salary increases have on average been in the range of 10% to 15% annually in these years, suggests that non-salary expenditures have been broadly stagnant in nominal terms in education. By contrast, provincial recurrent expenditures in this sector have increased more sharply, growing annually by 48%.

2.5 Conclusions of the literature review

To conclude this chapter, we summarize the evidence portrayed in the literature reviewed following the research questions presented at the beginning of the chapter.

- *What is the available evidence of the effects of education financing decentralization on the total education expenditure and in primary and secondary education?*

As regards the effects of decentralisation on education spending, the literature reviewed in this study is both scarce and inconclusive. While Busemeyer's (2007) cross-country analysis for OECD countries reveals an average positive and significant association between fiscal decentralisation and investment in education, his results do not converge with those found in Costa-Font's (2010) analysis of Spain. In the latter, evolution of per capita spending in education is found to be significantly and positively associated with political, but not fiscal devolution. Busemeyer's findings are not supported by evidence from non-OECD countries either. Luo and Chen's (2010) analysis of China reveals a negative and very strong association between fiscal decentralisation and educational investment measured in different ways. Freinkman and Plekhanov's (2009) study of the Russian case, in turn, reports no significant relationship between fiscal decentralisation and selected educational inputs, although the latter appear to be robustly determined, among other things, by educational expenditure per student. Wider administrative decentralisation appears, in the Russian case, as a moderately significant determinant of the provision of second shift, when sub-national expenditure in education and municipal's share of own revenues over total revenues are controlled for.

These pieces of evidence cannot be considered to be contradictory, because of methodological differences across the studies reviewed. It is however important to note that, with the exception of Luo and Chen (2010), the studies that address this question take into account the methodological concerns regarding the limitations of traditional fiscal decentralisation indicators. Busemeyer incorporates Stegarescu's (2005) criticism in his choice of the internationally comparable indicators of fiscal decentralisation used in his study. Costa Font (2010) adopts an indicator that also intends at capturing the institutional dimension of fiscal devolution, moving beyond indicators that measure sub-national's share of total expenditure. Freinkman and Plekhanov's definition of fiscal decentralisation focuses on the share of own revenues over municipal's total expenditure, which is also believed to provide a better account of sub-national allocative autonomy than other traditional indicators.

It must be noted that neither Busemeyer nor Luo and Chen include in their models variables that would account for the political or administrative dimensions of decentralisation, which are found to be better determinants of educational investment in Costa-Font and Freinkman and Plekhanov. This should raise concerns on the validity of their conclusions, which could be biased due to omitted variables.

Finally, we must emphasize that none of the studies reviewed focus on education-specific fiscal decentralisation, with the exception of Freinkman and Plekhanov (2009). The latter

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find a small and weak, but positive, association between education expenditure decentralisation and the provision of pre-schooling when administrative decentralisation is included in the analysis, but statistical significance vanishes when the latter controls are replaced by a broad fiscal decentralisation indicator.

We therefore conclude that our literature review fails to find robust evidence on the relation between decentralisation of educational financing and total investment in education. In other words, the literature covered does not provide any evidence supporting or rejecting the hypothesis that decentralisation in education effectively increases incentives for subnational governments to increase their investment efforts in the sector.

- *What is the available evidence of the effects of education financing decentralization on students' learning outcomes?*

Most studies covered in our literature review address the relation between decentralisation and educational policy outcomes. In some cases, authors present their work as proxy enquiries into the productive (Barankay and Lockwood, 2006; Freinkman and Plekhanov, 2009) and allocative efficiency of educational investment, but, for conceptual clarity, we prefer to classify them as effectiveness studies.

We identified three studies that investigate the relation between broad fiscal decentralisation and students' academic achievement in standardized tests: Diaz-Serrano and Meix-Llop (2012); Falch and Fischer (2008); and Freinkman and Plekhanov (2009).

Falch et al. (2008) and Díaz-Serrano et al. (2012) investigate similar groups of countries (OECD), although the former cover a longer time period. Díaz-Serrano et al. (2012), in turn, employ micro-data that allow them to control for variables ranging from student to the country level. The operational definitions of variables of interest to those studies are also similar and they use traditional fiscal decentralisation indicators to measure their relevant independent variable. Both tend to find a positive association between broad fiscal decentralisation and student achievement, although statistical significance is not reached under some model specifications or in all subject areas.

However, their results differ as regards the effect of educational spending on the sector's policy outcomes in the presence of fiscal decentralisation. The estimated coefficient of this variable does not reach statistical significance in Falch et al. (2008). Díaz-Serrano et al. (2012), in turn, find a statistically significant negative association between total educational expenditure and student achievement and a positive significant association in the case of teacher salaries. Could this result obtained in presence of broad fiscal decentralisation indicate an efficiency path?

Interestingly, when Falch et al. (2008) include OECD institutional education decentralisation index in their model, the estimated effect of fiscal decentralisation changes its sign and is no longer significant, nor is the education index. The OECD index does not obtain statistical significance on Freinkman's et al. (2009), nor does decentralisation of education expenditures or expenditure per capita. As we develop in Chapter 5, our own analysis suggests that these results could be influenced by potential

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endogeneity between broad and sector-specific fiscal decentralization as well as an endogenous relation between sector-specific fiscal decentralization and decentralization of decision power in education policy matters.

Mostly notably, Freinkman's analysis on the effects of fiscal decentralisation on the performance of Russian students seems to converge with those two cross-country studies. They find a positive and strong association between the share of own revenues over total municipal expenditure and students' test scores. Additionally to this effect, authors find a positive impact of administrative decentralisation. This leads us to believe that the actual causal mechanisms explaining these associations could eventually come to light once endogeneity problems are corrected.

A few other studies look specifically at the link between decentralisation in education and policy outcomes, which corresponds more directly to the objective of our study. These are the cases of Barankay and Lockwood (2006); Blöchlinger (2013); Escardibul and Helmy (2015) and Galiani and Schargrodsky (2002). The systematic literature review by Carr-Hill et al. (2015) and qualitative comparative cases studies made by Channa (2015) also provide additional evidence in this vein.

Blöchlinger's (2013) cross-country analysis resembles the already-mentioned works by Falch et al. (2008) and Díaz-Serrano et al. (2012). In contrast with them, however, in his analysis traditional measures of broad fiscal decentralization are not found to exert significant effect on national averages of students' performance in PISA. Institutional educational decentralization based on OECD's Education at a Glance, in turn, appears positively and significantly associated with students' achievements. Although this would seem to contradict Falch et al. results, such conclusion cannot be made, as Blöchlinger evaluates the effect of broad fiscal and institutional decentralization separately, which also inclines us to be believe that endogeneity problems are better addressed in the latter study. It must also be noted that Blöchlinger´s, indicators that measure decentralization of educational expenditures, based on IMF's COFOG's database, appear to be a better predictor of students' average performance than measures of broad fiscal decentralization. Still, his results are not robust across different model specifications and for all countries. The positive effect of decentralization in education on students' achievements is found to be statistically significant particularly for unitary countries.

The other three studies that look specifically at the link between decentralization in education and students' performance in standardized exams do so for specific countries. Conclusions reached by Galiani and Schardgrodsky (2002), in Argentina, and Barankay and Lockwood (2006), in Switzerland, are quite similar, despite the different way these authors operationalize their variables of interest. Indeed, Barankay and Lockwood (2006) is one of the very few studies that actually builds on previous empirical research, including Galiani and Schardgrodsky's, to develop their own analysis. In both cases, decentralization in education is found to positively affect students' performance, but this impact is mitigated or even outweighed in provinces (Argentina) or cantons (Switzerland) that fail to obtain fiscal balance. These authors take fiscal surplus or deficit as proxy measures of institutional capacity of sub-national governments and, consistently with theoretical predictions, their conclusions highlight institutional capacity as a necessary

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condition for decentralization in education to deliver benefits. They also confirm that the effects of decentralization in education tend to be accumulative in time, becoming clearer within a timeframe of approximately five years. Interestingly, these studies also find that the effect of decentralization is not dependent on subnational expenditure in education per student, but while Schardgrodsky find a negative and strongly significant relation between expenditure per student and average test scores, in the Swiss cantons this association is found to be small, positive and statistically weaker. This could be suggestive of the presence of different causal mechanisms in developing and developed countries.

Escardibul and Helmy's (2015) comparative cases studies for Jordan and Tunisia do not take the fiscal dimension of educational decentralization into account. Instead, they focus on the effects of school autonomy on students' performance. It is worth mentioning that the areas for which they try to measure school autonomy are very similar to the normative, executive and standard-setting competences included in our own analytical framework (see Chapter 3), although in our case we look beyond the school, to encompass the autonomy of central and sub-national governments. The affinity between their approach and ours also amounts to the dimensions through which the authors try to explain the effectiveness of decentralization policies in education, namely school funding sources, institutional arrangements leading to competition among schools and accountability mechanisms. Their conclusions highlight how different aspects of school autonomy might have different impact depending on the context. So, in the case of Tunisia, complete or partial autonomy of schools to decide on their own budget and establish student assessment policies seems to favor students' achievements in mathematics. In Jordan, in turn, decentralization to the school of decisions on personnel management is found to be associated with better students' performance. The differences are connected to the presence of different incentive mechanisms in each country, i.e. different accountability mechanisms. These results are generally convergent with Channa's (2015) qualitative comparative analysis of education decentralization processes in Mexico, Indonesia and Kenya, although she does not systematically observe the same set of variables to build her narrative account of the effects of education decentralization in those countries. Still, her argument is similar to the conclusions of the systematic literature review conducted by Carr-Hill et al. (2015). These authors corroborate that decentralization of decision-making power to school actors can, under certain circumstances, lead to improved efficiency of the educational system, mainly by reducing students' dropout and repetition rates. However, as Escardibul and Helmy's (2015) and Channa (2015) studies show, little is known up to date about which decisions should be decentralized under which conditions in order for decentralization to deliver on its promises. In Chapter 5, we argue that the database we build on decentralization modalities could pave the way for an in-depth exploration of how different decentralization arrangements could affect education policy effectiveness.

- *What is the available evidence on the effects of education financing decentralization on educational equity?*

The studies that, in our review, address the relation between decentralization and education inequalities do so from very different perspectives and for different countries. They converge to the extent that they fail to provide evidence supporting the hypothesis that decentralisation could be beneficial to educational equity, but only Galiani's et al. (2005) analysis of the Argentinean experience offers evidence on the deleterious effect of education decentralisation. Akai et al. (2007) and Costa-Font (2010) studies for the United States (the former) and Spain (the latter) provide an account of the limitations of fiscal decentralisation to cope with regional inequalities, respectively in terms of students' learning achievements and subnational investment in education.

As it s shown in Akai et al. (2007), the direct engagement of local governments in the financing of education introduces disparities in the availability of resources across districts and the redistributive role played by state transfers to local governments does not appear to lead to significant improvements of primary students' achievements. Intergovernmental transfers do seem to have a positive effect on achievements of students in secondary education but, at this level, inter-state disparities in terms of wealth, ethnic diversity and presence of the private sector also become much stronger determinants of educational outcomes. This could be indicating a trend towards greater segregation within educational systems along levels of compulsory schooling that a decentralized financing scheme does not seem capable to prevent, despite the redistributive role of state governments. Liu (2006) adds to this argument by stressing the limited capacity of US federal transfers to compensate for inter-state disparities in terms of educational opportunities. The counterfactual hypothesis that both studies seem to hold is that a more centralized financing system would allow to better exploit the externalities that they assume as inherent to the development of basic skills during primary education, which could contribute to reduce inequalities. However, we must stress that neither of them put to this hypothesis to test in their respective analysis.

Indeed, this counterfactual argument seems to be at odds with the evidence provided by Costa-Font's analysis of Spain. The author shows that regional disparities in the financing of secondary and tertiary education in Spanish regions are not associated to fiscal devolution, but mainly to differences related to the demand and supply of educational services, as well as unobserved factors. Political devolution seems to explain interregional inequalities to a small extent, but fiscal devolution does not appear as a significant determinant. In other words, although fiscal decentralisation did not contribute to reduce regional inequalities, he does not find evidence of an opposite effect. Similarly to what other authors reviewed in this chapter, the political dimension of decentralisation seems to play a more important role than its fiscal component.

The relevance of the political dimension to explain the effects of decentralization on educational inequalities is corroborated in Galiani's et al. (2005) analysis of Argentina. Their study shows that institutions constraining provincial government's capacity to run on fiscal deficits contribute to harness educational investment towards better learning. However, they also show that the effectiveness of such institutions is dependent of the local level of economic development. The combination of weak provincial institutions and municipal poverty levels has led to the deterioration of educational quality in those

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localities, although students' non-poor municipalities within provinces with strong institutional environments were benefited by administrative decentralization of education. Thus, decentralization of secondary education in Argentina has contributed to widening the quality gap between rich and poor municipalities within provinces.

In short, the evidence provided by the literature included in our review is not conclusive on the effects of decentralisation of the financing of education on educational inequalities. The partial evidence available from Argentina supports the hypothesis that decentralization might be deleterious to educational equity. This is convergent with the findings of Rodríguez-Pose and Ezcurra (2009), who emphasize the detrimental effect of both broad and education-specific fiscal decentralization to the reduction of spatial inequalities in the developing world, largely offsetting the potential gains of political decentralization. Studies on the USA decentralized educational financing systems also pinpoint to the limitations of intergovernmental transfers to ensure improvement of students' achievements in primary education and alert for the risk of emerging segregation in secondary education that could be due to unexploited externalities in basic education. However, as the case of Spain suggests, this remains an area for further investigation. Future studies should take into account the political and institutional dimensions of decentralization when enquiring into the effects of its financial facet.

- *What is the available evidence on the effects of decentralization of education financing on the technical efficiency of education expenditures?*

As regards productive efficiency, the evidence gathered in our literature review is scarce and largely inconclusive, as research questions and operational definitions vary among the authors. We could only identify two studies that actually undertake an efficiency analysis in the way we define here. Several studies that Channa and Faguet (2012) classify in their literature review as focusing on technical efficiency of educational investment we included in our analysis as evidence regarding the link between decentralisation and policy effectiveness, but not productive efficiency. Coelho (2009) and Sow and Razafimahefa (2015) are the two works that address the relation between decentralization in education and productive efficiency in a vein that is relevant to our analysis.

Coelho (2009) finds that, in 18 OECD countries, in years 2000 and 2003, productive efficiency of primary and secondary education investment appears to be negatively associated with the share of public providers and positively associated with higher decentralisation of decision in education to local governments and schools. The author relies on OECD's institutional education decentralisation indicator to measure the latter. Alternatively, Sow and Razafimahefa (2015) investigate the effect of broad fiscal decentralisation on the technical efficiency of education expenditures. Their results suggest that the impact depends on the level of economic development of countries: while in advanced economies fiscal decentralisation seems to favour higher efficiency, the opposite effect prevails in emerging and developing economies. However, the authors fail to find robust results across different model specifications. Interestingly, the effects of fiscal decentralisation seem to be clearer when the efficiency of expenditures in health are analysed, suggesting that the impact of fiscal decentralisation might vary across

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sectors. Still, this finding should be object of further scrutiny, given the methodological handicaps of their selected indicator to measure fiscal decentralisation.

Unfortunately, the differences in their research designs of the two studies reviewed do not allow for comparison of their results. Still, they can be taken as cumulative evidence against the general claim that decentralisation in education unambiguously leads to higher efficiency of public educational expenditure. As we develop in Chapter 5, our own indicators of decentralisation in education could be used by future research aiming to corroborate and extend Coelho's (2009) findings.

As regards their methodological approach, we highlight a caveat of the stochastic frontier technique both studies choose to estimate efficiency scores. Indeed, both regression-based and non-parametric techniques to estimate efficiency scores have several limitations, as briefly described in Grigoli:

> 'Under DEA and other non-parametric techniques it is difficult to incorporate a large number of explanatory variables. Studies using these techniques have typically related public education spending, as a single input, to educational outcomes. This approach, however, neglects the effect of exogenous factors (such as the level of economic development) on educational outcomes. If these other factors also affect educational outcomes, a single input DEA will produce biased efficiency scores. Non-parametric techniques also assume there is no measurement error in the relationship between inputs and outputs. On the other hand, under SFA and other regression-based approaches it is possible to incorporate a larger number of inputs and to control for stochastic influences. In practice, however, it has been difficult to apply these approaches, because of the statistically insignificant relationship between spending (and other inputs) and outcomes.' (Grigoli, 2014, 2).

In response to these limitations, Grigoli (2014) develops a hybrid approach that helps to address the weaknesses of both DEA and SFA, providing a more refined measure of education spending efficiency. In our view, Grigoli's hybrid approach offers a better alternative to investigate the relation between decentralization and the technical efficiency of education expenditures, which should be explored in further research work.

- *What is the available evidence of the effects of decentralization of education financing on the efficient distribution of resources at subnational level?*

Our literature review failed to identify empirical studies addressing specifically the effects of decentralization of education financing on the allocative efficiency of education spending. This apparent gap may be due to lack of reliable data that would enable such analyses.

The study of allocative efficiency within education first requires knowing the distribution of education expenditures across at least one of the following dimensions: type of expenditure (capital and current expenditures, ideally discriminating expenditures on salaries in the latter), education level (pre-primary, primary, secondary, tertiary and post-

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tertiary education) and/or destination (direct expenditure on public education institutions, transfers to households, transfers to private entities, etc.). To assess the effects of decentralization of education financing on the allocative efficiency of investments on education, expenditure data must also be disaggregated by government levels. Additionally, time series are required to mitigate concerns on reversal causality. Up to date, internationally comparable data meeting these disaggregation requirements does not exist[3]. This could be one of the reasons why we were only able to identify studies that enquiry into the effects of broad fiscal decentralization, but not decentralization of education financing specifically.

Indeed, only two out of the four studies explicitly interested in the question of allocative efficiency actually go as far as investigating how it is affected by fiscal decentralization. Arze de Granado et al. (2005) fall short of such endeavour by showing how fiscal decentralization seems to induce changes in the composition of decentralized expenditures, but do not analyse whether these changes actually lead to any improvement of social welfare. Díaz-Serrano and Pose (2014) address the question whether fiscal and political decentralization is associated with higher citizens' satisfaction with health and education services, but do not investigate the causal mechanisms that would eventually explain this correlation. We address below the issue of political decentralization in their analysis, but stress here that given the almost negligible magnitude of their (highly statistically significant) estimated coefficient for fiscal decentralization, such a causal enquiry seems to be indeed out of order: decentralization of total expenditures would need to increase by 50 percentage points to raise citizens' satisfactions with education by one point in a 0-10 Likert scale. Faguet (2004) and Hasnain (2008), in turn, use data on expenditure distribution across different public services – as well as on other relevant variables – and ask whether decentralization promotes changes in resource allocation leading to higher social welfare.

Our review shows that the definition of a social welfare function is a matter open to debate. From an utilitarian perspective, welfare could be estimated based on individual citizens' satisfaction with service provision, which can be measured by specific surveys, such as the European Social Survey used in Díaz-Serrano and Pose (2014). This approach seems to come at odds with a rights-based perspective, which, in our opinion, should prevail in educational analysis. The latter perspective would focus on how different allocative decisions allow matching not citizens' individual preferences, but society's

[3] OECD's Education at Glance database is, to our knowledge, the most advanced source in this regard, providing mostly internally consistent disaggregated information on public education expenditures by ISCED levels and destination, from most OECD member and partner countries. Data disaggregated by government level, however, are available only for 2012. IMF's Government Finance Statistics database presents data by government functions (COFOG), but besides being incomplete for several countries and variables, is not suitable for direct cross-country comparisons, since countries may chose to report differently expenditures on social security at the central, state and local levels. This limitation is made explicit in GFS's manual (IMF, 2014:20-22), but this serious inconsistency problem seems to be largely ignored in the studies reviewed here, which use this data to base their analysis on both broad and sector-specific fiscal decentralization, but do not mention any data treatment to ensure cross-country comparability. Arze del Granado et al. (2005:10) is a rare exception in this regard.

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needs in terms of access to a universal human right. Faguet's (2004) and Hasnain's (2008) analyses of decentralization processes in Bolivia and Pakistan, respectively, seem to adopt this second approach, although in the latter case the author also addresses the question of how individual demands are processed through the political system, for instance, by means of patronage. As it becomes clear in the review of those studies, moving from an individual preference-matching to a rights-based approach leads analysts to stress the mediating role played by political systems in the enactment of legitimate (meaning welfare-enhancing) policy agendas, a concern that is actually present in Oates' (1972) original work on fiscal federalism and that is revamped by Arze del Granado et al. (2005).

The studies reviewed are hardly comparable, but it is possible to establish some dialogue among the partial evidence they provide and the questions they leave unattended. Arze del Granado's et al. (2005) findings suggest that fiscal decentralization is significantly associated with an increase in expenditures in health in education, which they consider to be publicly-provided private goods. It is important to note, however, that their analysis is silent about the origin of these incremental resources. It is not possible to ascertain, from their results, whether these positive effects derive from investments made by central or sub-national governments. We stress that it is not necessary to presume the presence of a homogeneous trend across all countries in this regard in order for this positive effect to take place.

Indeed, Hasnain's (2008) analysis of Pakistan shows how political, administrative and fiscal decentralization from provincial to local government in that country led both to a marked increase of recurrent expenditures on education at the provincial level and higher investments of local authorities in the development of physical infrastructure. Faguet's (2004) analysis of the Bolivian decentralization process seems to tell a similar story. The exponential increase that the author observes in the participation of local governments in public investment after decentralization precludes recurrent expenditures from the analysis. Still, we know from data from UNESCO's Institute of Statistics indicate that, in 2012, current expenditures amounted to 89% of total public expenditure on education in Bolivia and that 69% was destined to pay salaries. In that country, the recruitment and payment of teachers is not decentralized, but de-concentrated to departments and district officers appointed by the central government. The regulation of teacher career and education is also a national competence.

These pieces of evidence from Pakistan and Bolivia do not fit nicely in the general theoretical propositions developed by Arze del Granado et al., when, based on the traditional approach to fiscal federalism, they state that "pure public goods equilibrium quantity is increasing in the centralization level" (2005: 7). It could be argued, in their favour, that the kind of capital expenditures analysed in Hasnain and Faguet do not match the former authors' strict definition of pure public goods. In any case, it is also interesting to note that decentralization in those two countries seem to have fostered investments of local governments in areas which the theory usually purports that economies of scale would rather advise for more centralization. This invites for a revision of some of the assumptions upon which the literature on fiscal decentralization has been based. What are

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the actual economies of scale in the provision of education that would justify for central intervention? This seems to be a question calling for further empirical scrutiny. Another interesting feature of the Bolivian and Pakistan experiences is that decentralization in those countries did not seem to entail the substitution of higher for lower government levels, but rather a change in the complement role played by each stance. They also suggests that the assumption that in decentralized systems greater efficiency can be achieved due to competition of elected officials across and within government levels might neglect or even misinterpret the importance of actual coordination and cooperation in the crafting of educational policy.

Those experiences do not seem to provide any evidence either on the validity of assumption that "citizen's vote with their feet", but they do suggest that social welfare can be enhanced by political devolution. Both in Bolivia and in Pakistan, bringing the government closer to the people seems to have contributed to increasing state's response to citizen's needs, particularly in most disadvantaged areas. Is this interpretation convergent with Diaz-Serrano and Pose (2014) findings? Their results show that the positive association of "self-rule" with citizens' satisfaction is largely outweighed by the negative impact of "shared-rule", leading the authors to conclude that "citizens (…) seem to prefer their local governments to provide policies to them rather than to wield a greater influence on the provision of health and education services by national governments" (Diaz-Serrano and Pose, 2014: 21). In our opinion, such conclusions cannot be derived from their data. First and more importantly, as we have already mentioned, their analysis does not go beyond the calculation of a statistical correlation between variables, without any further evidence or even hypothesis on the underlying causal mechanisms explaining this association. Secondly, they measure the degree of association between two dimensions of regional authority and citizens' satisfactions with policy delivery, but make a statement on the relation between citizens' satisfaction and service providers; the latter hypothesis is not covered in their analysis by any means. What their data actually suggests is that institutions granting higher levels of regional autonomy over a territory's own jurisdiction are positively associated with citizens' satisfactions with education and health services, whereas institutions that grant regional governments with a higher influence over national policies are negatively associated with citizens' satisfaction. They also suggest that the hypothesized effect of the latter has a much higher magnitude than the former, leading to a negative net effect of regional autonomy on citizens' satisfactions. Even if we take this descriptive association as partial evidence favouring a hypothetical causal relation, this data seems to indicate that institutions giving greater power to regional governments tend to shape citizens' satisfactions in a negative direction. We could extrapolate this interpretation by saying that in more open political regimes, citizens are more willing to manifest their discontent with public policies. In this sense, Díaz-Serrano and Pose (2014) add nothing new to what we already know from extensive democratization studies and to what Durkheim's relative deprivation theorem anticipated in the early years of modern social science. The influence of political openness on citizens' perceptions and voice is only one of the reasons why citizens' opinions may not be the best barometer to measure social welfare. Still, it could be indicating that citizens

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do not want to vote with their feet, but rather want governors – central, regional or local – to be responsive to their needs.

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Chapter 3: Analytical framework and methodological strategy

This chapter presents the epistemological approach to our object of study – education decentralization with a specific emphasis on its financial dimension –, the analytical framework we develop to address it in our qualitative and quantitative analyses, as well as all the methodological decisions and assumptions that were taken throughout the research process. It also describes the criteria we employed to select the our country cases and the instruments and strategies used for data collection.

- *Epistemological approach*

Understanding the way effective and efficient allocation is made in educational systems requires identifying the actors that make expenditure decisions and the *lieu* they occupy in the system. Implementation of educational policy leads both directly and indirectly to expenditure decisions by actors in specific places of the system. The discretion these actors enjoy is usually constrained by regulatory frameworks, which we hold can be used as a tool to attain articulation of actions across the system in an effective and efficient way.

However, there is no single theory on the best distribution of competences over policy design and implementation. Decentralization in general, and financial decentralization in particular, have been said to foster effectiveness and efficiency but, as described in Chapter 2, studies available point to both positive and negative effects derived from decentralization. These pieces of evidence do not always refer to the same phenomenon though.

What is decentralization? Can we speak of an unambiguous relation between this term and policy effectiveness and efficiency? Can we also establish a relationship between decentralization and equity? The last two questions cannot be replied before clearly defining what decentralization means, highlighting its financial dimension.

We believe education decentralization to be a complex phenomenon that can be meaningfully represented by a finite number of dimensions. We also assume that albeit the documented heterogeneity of institutional arrangements across and within countries, it is possible – or methodologically valid – to define dimensions in function of a few number of variables that purposefully reveal features of that complex object that are relevant for our working hypothesis. This this does not imply, however, that the effects of the same exact policy will be the same in different contexts.

- *Dimensions of analysis, operational definitions, assumptions and working hypotheses.*

Our analysis focuses in four elements of educational systems: the distribution of executive competences leading to expenditure decisions, the generation and management of own resources, the management of financial transfers and the accountability mechanisms. It adapts and extends frameworks to assess fiscal decentralization systems, such as the one

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developed by Yilmaz *et al*. (2010). Table 1 presents the working hypotheses that can be derived from that framework[4], which we use as a reference when defining our own working hypothesis.

Table 3.1: Yilmaz's et al. (2010) framework to assess the efficiency of fiscal decentralization systems

Elements for the assessment of fiscal decentralization systems	**Working hypothesis and causal mechanisms**
Expenditure assignment	Subnational government autonomy to define expenditure priorities increases the system's efficiency, because local governments have better information on the citizens' preferences and local costs.
Own-resource revenue generation	Subnational government autonomy to raise taxes bases and rates increases the system's efficiency, because citizens "vote with their feet".
Inter-governmental transfer system	"A rule-based transfer system brings greater stability and predictability, and thereby promotes good planning and efficient service delivery effort." (p. 4) An indirect effect is also purported through expenditure assignment: "restrictions on the use of funds transferred to the local governments also diminish the ability of the local governments to respond to the preferences of the citizens. The conditional grants also allow the departmental ministries or departments to maintain control over the local governments."
Accountability	The existence of specific mechanisms of public and social accountability ensures an efficient and effective use of fiscal discretion by subnational governments. The availability and disposition of citizens and higher officials to hold subnational governments accountable for their discretion is assured when governmental structures set standards and clear rules of accounting, design mechanisms to observe and monitor fiscal functions, make the intergovernmental transfers conditional on predefined performance measures, make information accessible to the public, and promote public involvement in budgetary decisions.

Source: own elaboration based on Yilmaz *et al.* (2010).

- *Executive competences, executive autonomy and our decentralization index*

[4] Yilmaz *et al.* include "borrowing capacity" as an additional element of their analytical framework. They consider that local governments should be allowed to borrow with restrictions and strict accountability and go further by holding that "the option of local defaults and bail-outs by the central government creates a moral hazard problem for the local governments and result in inefficiency and overspending at the local level" (2010, 5). We acknowledge that borrowing capacity is an important element of fiscal discretion and empirical studies have found it to be a statistically significant predictor of allocative efficiency in decentralized educational systems (see for instance, our review of Galiani and Schargrodsky, 2002 and Barankay and Lockwood, 2006 in Chapter 2). Notwithstanding, our analysis does not incorporate this dimension due to our failure to identify reliable and systematized qualitative data for a meaningful number of countries. It remains as a relevant area of research for future investigation.

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As regards decisions on the **assignment of expenditures**, we initially focus on six items that we consider to be related to three specific functions in the development of educational policy and that we intentionally chose to represent different types of expenditure, as reflected in Table 2.

Table 3.2: Assignment of expenditures related to specific functions in education policy		
Executive competences directly linked to expenditure assignment decisions	**Function**	**Type of expenditure**
Construction, rental or acquisition of school infrastructure	Development of physical structures	Capital
Acquisition of school equipment		Capital goods
Recruitment of teachers	Personnel management	Recurrent expenditures in remuneration
Payment of teacher salaries		
Provision of in-service teacher training programmes	Improvement of educational quality	Other recurrent expenditures
Definition of school budgets		

We identify the actors mandated with the authoritative competence to decide on each of those items and the place these actors occupy in the educational system. We try to establish the level of autonomy these actors enjoy to make their decisions by looking at the existence of standards, norms and guidelines that are supposed to delimitate the universe of legitimate choices and the place where they are defined. Similarly, we consider that actors' autonomy is further constrained by the presence and place of mechanisms intended at overseeing the effective implementation of policy components. This leads us to map standard-setting and oversight competences within each function and adopt assumptions on how these affect the level of autonomy actors mandated with executive competences have when making expenditure assignment decisions. Table 3 presents the authoritative competences considered in our analysis[5].

Table 3.3: Level of authority for expenditure assignment			
Function	**Standard-setting competences**	**Executive competences**	**Oversight competences**
Development of physical structures	Definition of quality standards for school infrastructure	Construction, rental or acquisition of school infrastructure	Inspection of school facilities (including authorization for functioning)
		Acquisition of school equipment	
Personnel management	Definition of requirements for the exercise of the teaching profession.	Recruitment of teachers	Evaluation of teachers

[5] The operational definitions presented here have a methodological purpose. In many cases the negotiation process behind certain of these decisions is more complex than what the table reflects. Our study fails to grasp these differences in the actual performance of formal institutions.

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	Definition of teachers' statute	Payment of teacher salaries	
Improvement of educational quality	Definition of standards for teacher in-service training	Provision of in-service teacher training programmes	Evaluation of implementation of school plans[6].
	Definition of quality standards for school development[7]	Definition of school budgets	

Our assumptions on how the distribution of standard-setting and oversight competences affects the autonomy of actors invested with executive competences focus on the vertical division of regulatory powers (Table 4).

Table 3.4: Autonomy of actors according to vertical division or regulatory powers

			Position of executive competence in relation to standard-setting	
			Below	Same level
			Decentralization of policy implementation.	Concentration of policy design and implementation.
Position of executive competence in relation to oversight	Below	Vertical oversight	Decentralization of policy implementation.	Concentration of policy design and implementation with vertical oversight.
	Same level	Horizontal oversight	Decentralization of policy implementation with horizontal oversight.	Concentration of policy implementation.

As regards the levels of the system, we distinguish from top to bottom among central government, sub-central government and schools. In cases where standards are set and oversight is done by actors operating at the same level of the system as actors invested with the executive competence, we assume that executive autonomy is higher than in cases where actors responsible for policy implementation have to abide to standards set at higher levels of government and are subject to their oversight. We also assume that the vertical division between executive and oversight competences places a stronger constraint on actors' autonomy than the division between standard-setting and executive competences. This assumption is in line with mainstream principal-agent theorem that purports that in the absence of principal's oversight, the agent faces less incentive to comply with contractual norms. So, if the agent is not object of vertical oversight by the principal, we assume she has higher autonomy to decide on policy implementation than in scenarios where her performance is oversaw by actors at higher levels of government.

[6] A school plan is defined here as a financial and pedagogical commitment of schools. It provides a systematic basis for the changes to be made in order to improve school's quality and includes the main objectives of the school development as well as achievement targets. It may also include a description of school's vision, strengths, and evaluation processes.

[7] Quality standards for schools development refer to a range of programmes and goals that aim at improving the quality of teaching and learning process.

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Thus, in a continuous gradient ranging from zero to full executive autonomy, we hold that the four ideal-type categories of regulatory modalities presented in Table 4 would be placed in the middle zone between the extremes and in the following order:

1. Low executive autonomy: Decentralization of policy implementation
2. Moderate-low executive autonomy: Concentration of policy design and implementation with vertical oversight
3. Moderate-high executive autonomy: Decentralization of policy implementation with horizontal oversight
4. High executive autonomy: Concentration of policy implementation

It should be noted that our theory-based ranking does not account for eventual differences in the horizontal distribution of regulatory competencies. Indeed, there might be cases where strong division of powers between legislative, executive and oversight bodies operating at the same level of government provide the executive agent with comparable or even lower autonomy than in cases of vertical distribution of competencies. This relation between horizontal and vertical distribution of regulatory competencies and its effect on executive autonomy need to be explored in the future. Our present analysis focuses only on the vertical dimension[8].

By looking at the spatial distribution of executive competences and the executive autonomy granted to actors invested with the authority to assign expenditures, we are able to develop a measure of decentralization for each function and country case.

The intention of this measure is, in the first place, to spot the degree in which sub-central government levels and schools participate in the execution of educational policy. In this respect, we use a similar measure to OECD's: the proportion represented by sub-central government levels and/or schools among the agents of execution of policy implementation in the three referred functions.

Building on OECD's approach, that measure was enriched by its combination with a scale that aims at accounting for the concentration of competences in a specific non-central agent, as an indicator of its executive autonomy. Thus, executive competences suppose a higher value of the index when combined with standard-setting or oversight competences. As we have pointed out, we assume that the exercise of oversight competences implies greater executive autonomy than the exercise of standard-setting competences, and therefore an executive competence combined with oversight competences supposes a higher value of the index than an executive competence combined with standard-setting

[8] An additional caveat of our analysis is that only in a few cases the distribution of competencies observed empirically corresponds to one of the four ideal types. Frequently, agents at different levels of the systems are given complementary powers in the definition of standards, execution and oversight of policy implementation. Despite these variations, it is possible – and valid both from the epistemological and methodological points of view – to strip out for each case some the main features of its regulatory arrangements and classify it, at least tentatively, as similar to one of the four ideal types. In so doing, we move from objective observation towards subjective interpretation and increase the margin for potential specification and measurement errors. To cope with this limitation, we systematically report whenever a case does not "fit" in our ideal types, make explicit the divergences and justify our classification choice, leaving it open to the scrutiny and revision of other researchers the amelioration of our work.

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competences. The concentration of executive, standard-setting and oversight competences in a sub-central agent (namely, sub-central government or schools) supposes the highest possible value for that agent.

In a second step, the values respectively assigned to sub-central government and schools were combined in a single measure of educational decentralization for countries where execution competences are distributed among, at least, these two agents. This measure assigns a greater weight to schools' than to sub-central government's executive autonomy, in order to reflect the 'plus of decentralization' implied in the devolution of competences to schools *vis-à-vis* a situation in which sub-central governments are in charge.

Table 5 presents the values and weights we used to calculate the decentralization index in the present study.

Table 3.5. Values and weights we used to calculate the decentralization index in the present study.

		Concentration of competences weight			Type of agent weight	
Execution competencies	**Score**	E + O + S	E + O	E + S	Sub-central gvt.	Schools
No participation	**0**					
Shared participation with both other agents	**0,3**	1,3	1,2	1,1	2	3
Shared participation with another agent	**0,5**	1,3	1,2	1,1	2	3
Exclusive participation	**1**	1,3	1,2	1,1	2	3

A first assessment of the effectiveness and efficiency of decisions related to the assignment of expenditures can be made by looking separately at each of the five items that we define as representative of three functions performed by the educational systems. However, we are also interested in exploring the possibilities of a more comprehensive approach, where those items and functions are not understood as being independent from each other, but potentially intertwined. In a similar vein, we also decide to include in our framework two other functions that do not lead to expenditure assignments in a direct, straightforward way but that we hold to be important mediators of the financial investment made in education to promote learning: the management of the curriculum and the organization of instruction. Table 6 presents the standard-setting, executive and oversight authoritative competences included in our operational definitions of these two functions. As for the other functions, we assume that the executive autonomy of agents mandated with executive competences vary according to the relative position of agents invested with standard-setting and oversight competences and a decentralization index for those functions is calculated using identical values and weights.

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Table 3.6: Oversight authoritative competences for curriculum and organization of instruction			
Function	**Standard-setting competences**	**Executive competences**	**Oversight competences**
Curriculum management	Definition of official curriculum[9]	Select textbooks	Evaluation of students' learning achievements (extra school)
Organization of instruction	Definition of pupil-teacher ratio.	Admit students[10]	External evaluation of schools
	Definition of time of instruction	Choose teaching method	

The incorporation of these two functions to our analytical framework provides us with a more encompassing picture of the main decisions that craft basic education policies, including both those that directly lead to the assignment of expenditures and those that are expected to have an indirect impact. It enables to explore the interactions between these functions and ask for the existence of complementarities and a-complementarities among them and the way they are decentralized. It offers the opportunity to test empirically whether "pedagogical" decisions affect "expenditure" decisions and vice-versa. By answering to those questions, we investigate the virtues and pitfalls of building an aggregate index of decentralization of educational systems, which could have extensive use in future research.

The procedure leading to the building of such an aggregate index involved the computation of the simple average between indexes for items belonging to the same function. Similarly, averages for each type of function (pedagogical, financial) were computed. Finally, general EAI was computed as the average between the two resulting indexes.

Not least importantly, our definitions of functions and the procedures we adopt to measure decentralization enable the construction of an index that resembles in several aspects the one calculated by the OECD in its *Education at a Glance* reports (Box 1 Section 3). This offers the possibility for comparing the leverage of these both measures to address the relation between decentralization and policy effectiveness, efficiency and equity.

Box 3.1: OECD's Education at a Glance "Decentralization Index" and our definition of functions.

[9] We accept that official curriculum might be "tight" or "light", and that this difference may entail very different levels of autonomy in the actual development of the curriculum. Our data is not sensitive to these differences, though, which require working of different information sources than those we employ in the present analysis.

[10] This competence refers to the authority of setting rules and making final decisions regarding students' admission and transfers to schools.

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Education at a Glance's database (OECD, 2012[11]) aggregates information around four domains of decision making, namely:

- Planning and structures
- Personnel management
- Organization of instruction
- Quality improvement

For each domain, OECD calculates the share of decisions that are taken by the central, state, provincial/regional, sub-regional, local and school levels. For decisions taken at the school level, the dataset includes information on whether decisions are made by school actors in full autonomy, after consultation or within frameworks defined at higher levels of the system.

We adapted those categories to designate five *functions* that entail the enactment of educational policy and posit – as a testable assumption – that decisions made in relation to each function impact differently on decisions made at other spheres, affecting allocative efficiency.

Planning and structures encompass two broad spheres of regulation, one more closely related to the *macro organization of the curriculum* and a second that refers to the *physical structure* of educational systems. Decisions on the first have a direct impact in defining the demand for education, particularly by establishing compulsory education and learning accreditation systems. This alters the level of educational supply meeting policy goals. Educational supply itself is also potentially modified by curriculum decisions, encompassing definitions on educational contents, programmes of study, organization of grades and subjects. Those definitions imply different combinations of educational inputs required for service delivery and, consequently, different structures of costs. The actual impact of decisions made in this sub-sphere depend, then, to the extent they are followed by decisions made as regards physical structure as well as the other spheres of personnel and resource management and organization of instruction. Decisions on those areas, on their turn, can eventually be made independently from what is defined at the curriculum policy, since the implementation of the curriculum is more difficult to observe than the allocation of material and human resources.

Personnel management refers to decisions on the recruitment of teaching and non-teaching professionals, the definition of their salaries and some aspects of their careers

[11] OECD's *Education at a Glance* possibly represents one of the pioneer efforts to build comparable measures of educational decentralization for a large group of countries. The 2012 edition includes the most recent dataset available on the levels where decisions are made within national education systems, focusing on lower secondary education. We initially planned to build on OECD's data and methodology. However, some difficulties encountered led us to create our own dataset, which unfortunately is inspired but not compatible with theirs. One concern shared by our team referred to the comparability of results among countries, since *Education at a Glance*'s data for this theme is obtained from surveys to participating countries, but responding procedures are not homogeneous across cases. We also failed to obtain the questionnaires used in 2011 and the operational definitions of each domain. Nonetheless, it kept being a reference for the design of our framework and the following analysis.

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related to remuneration. Decision authority in this sphere implies power to influence the quantity and price of teachers incorporated to the system. By affecting the relative price of one main input of educational technology, decisions on personnel management constrain the array of viable alternatives in the *organization of instruction*. Decisions on this latter refer to admission, grouping, daily assessment and supervision of students, definition of instruction time and selection of teaching methods[12]. Theoretically, curriculum policy would define an array of legitimate decisions in the organization of instruction, whereas decisions on personnel management would reduce the number of alternatives to some viable decision possibilities. However, to the extent that compliance to curriculum policy is more difficult to ensure than compliance to personnel management, we expect decisions on the organization of instruction to be less constrained by curricular concerns than by personnel issues. The effect on the system's efficiency, in this case, would vary alongside the productivity differentials of the educational technologies chosen and these choices are dependent on the relative cost of teachers.

Our definition of *Quality improvement* is similar to OECD's definition of *Resource management* and refers to the "allocation and use of resources for teaching staff, non-teaching staff, capital and operating expenditure, professional development of principals and teachers" (OECD, 2012, 510). We include in this category recurrent expenditures aimed at increasing the overall productivity of human and capital factors allocated to education, both through compensation for factor depreciation and through acquisition of complement goods. Decisions in this sphere should be dependent on previous decisions over teacher recruitment and remuneration as well as over the development of physical structures. Often, they can be translated in the development of specific programmes aimed at improving the quality of educational service delivery, including the decentralization to the school level on the choice of bundles of goods and services in the framework of school development plans. The reach and scope of each programme are expected to condition their impact at the systemic level.

- *Allocative autonomy*

Having explored the dimension of executive competences for the assignation of expenditures, own analysis approaches the issue of generation and transfer of resources. In both cases, our analysis focuses on resources destined to cover expenditure assignments and the corresponding expenditure types included in the previous dimensions.

As regards own resources, we identify the authoritative competences granted by legislation to agents invested with executive competences to generate those funds. By

[12] OECD's definition of this domain also includes "the choice of textbooks and other didactical resources". However, in our study we take the choice of textbook as an indicator of executive competence in the sphere of the macro organization of the curriculum.

focusing on authoritative competences, our data do not indicate whether executive agents effectively generate own resources[13].

Indeed, our data are silent about the magnitude of own-generated resources as regards the total expenditure made by each executive agent. The extent to which executive agents effectively recur to this funding alternative is outside the scope of our analysis. It is widely accepted that the effective exercise of this power might be related, among other things, to the institutional capacity of executive agents and the level of economic activity within each relevant jurisdiction. However, up to date, data for addressing these issues for a medium-sized group of countries are not available.

We assume that the authoritative competence to generate own resources increases the autonomy of executive agents, leading to the working hypothesis that higher autonomy promotes policy effectiveness and efficiency.

While leaving the validation of this hypothesis to empirical scrutiny, we anticipate some concerns that may arise from analysis. The definition of "own-resources" points to different funding mechanisms according to the levels of the system taken into consideration. In the case of central and sub-central governments, it refers to fiscal resources, i.e. those that are collected by governmental agencies through taxing systems[14]. In the case of schools, in turn, it refers to financial resources that can be mobilized at the school level through the payment of fees, voluntary contributions and profit activities. It is thus important to stress that even if higher autonomy of schools to generate own resources is found to lead to greater effectiveness and efficiency, it can potentially represent a threat to promotion of fee-free basic education as a universal human right. Moreover, autonomy to generate own resources among actors with different resource generation capacities – be it schools or subnational governments – can also contribute to the emergence and consolidation of inequalities, which could lead to a deterioration of the system's equity.

In reference to transfers of fiscal resources, our analysis covers both transfers made among levels of government and those that are made to schools. We start by identifying for each actor invested with executive competences the presence of transfers destined to cover the specific expenditure items included in our operational definitions. Following the literature in the field, we assume that the actor's autonomy to allocate transfer resources varies according to the modality transfers are made. We therefore posit the following relation between transfer modalities and the allocative autonomy of executive agents:

Allocative autonomy of executive agent over transfer resources	**Assignation of grant**	**Definition of grant amount**	**Purpose of grant**

[13] On the other hand, in some of the cases that were analysed in the scope of this research, it could be observed that although executive agents have the authoritative competence to generate own-resources, this funding does not compose their educational expenditures, according to the available information. For methodological purpose, we interpret that in those cases the authoritative competence to raise own revenues does not affect the agent's autonomy to decide on educational expenditures.

[14] This definition excludes resources obtained from external sources, which should be linked to the dimension of Autonomy to borrow, which is ignored in the current analysis.

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Low	Discretionary	Arbitrary	Earmarked
Moderate		Based on needs assessment	Block grant
	Automatic		
High		Formula-based	Lump sum

It should be noted that although the literature converges to highlight all these three features – assignation mechanism, definition of grant amount and purpose of grant – affect the agent's autonomy to spend, we find no similar consensus on their accumulative effect. We overcome this limitation by assuming that they behave additively and derive the aggregate effect as the average of the effects expected from the observation of the individual characteristics.

By setting a score for each category in each feature and computing the average of these scores for every function (capital expenditure, teachers' wages, other recurrent expenditures) and agent (sub-central governments, schools), we construct a 'Transfers Allocation Autonomy Index' (AAI).

A further complication to the previously mentioned relates to the insufficiency of our data sources to provide information on all three characteristics of the transfers analysed. Therefore, whenever information is missing for one feature, we estimate the aggregate effect of transfers over the agents' autonomy based only on the remaining two. No estimation is made for cases where data is missing for two or more features

As a result, we tentatively classify transfers related to each system's function according to their presumed effect on the allocative autonomy of executive agents using the following ordinal categories:

1. Low
2. Moderate
3. High

Table 7 presents the values we assigned to each modality of assignation mechanism, definition of grant amount and purpose of grant in order to compute these categorical variables in the case of sub-central governments. As transfers to schools cannot adopt all the categories available for sub-central governments (schools, for instance, cannot receive lump sum transfers), table 8 presents the values assigned for those cases of schools.

Table 3.7. Values assigned to categorical variables related to transfer modalities and computation of Allocative Autonomy Index. Sub-central governments.

Assignation mechanism	Definition of grant amount	Purpose of grant	AAI	AA Category
Discretionary = 1	Arbitrary = 1	Earmarked = 1	1	Low
Discretionary = 1	Arbitrary = 1	Block grant = 2	1,3	Low
Discretionary = 1	Based on needs assessment = 2	Earmarked = 1	1,3	Low

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Discretionary = 1	Based on needs assessment = 2	Block grant = 2	1,7	Moderate
Automatic = 3	Based on needs assessment = 2	Block grant = 2	2,3	Moderate
Automatic = 3	Based on needs assessment = 2	Lump sum = 3	2,7	High
Automatic = 3	Formula based = 3	Block grant = 2	2,7	High
Automatic = 3	Formula based = 3	Lump sum = 3	3	High

Table 3.8. Values assigned to categorical variables related to transfer modalities and computation of Allocative Autonomy Index. Schools.

Assignation mechanism	Definition of grant amount	Purpose of grant	AAI	AA Category
Discretionary = 1	Arbitrary = 1	Earmarked = 1	1	Low
Discretionary = 1	Based on needs assessment = 2	Earmarked = 1	1,3	Low
Discretionary = 1	Arbitrary = 1	Block grant = 3	1,7	Moderate
Discretionary = 1	Based on needs assessment = 2	Block grant = 3	2	Moderate
Automatic = 3	Based on needs assessment = 2	Block grant = 3	2,7	High
Automatic = 3	Formula based = 3	Block grant = 3	3	High

Although for the mentioned reasons our classification exercise runs the risk of being inaccurate, we pursue consistency across cases in order to reduce potential measurement error. As in the case of generation of own resources, we remind that our categories are silent about the effective magnitude of transfers.

Following the literature reviewed in previous chapters, we hypothesize that the autonomy of executive agents to allocate transfer resources is positively related to policy effectiveness and allocative efficiency. Our framework also allows for testing the effect of autonomy to allocate transfer resources on the system's equity, where a positive relation would indicate the equalizing role of intergovernmental and school transfers.

- *Accountability*

Finally, our framework includes a dimension that, along Yilmaz *et al*. (2010), we name *Accountability*, and seeks to understand the scenario for agent's performance in the use of its autonomy (discretion). As already mentioned, these authors distinguish between accountability before governmental authorities (*public accountability*) and before citizens (*social accountability*).

As for public accountability, our analysis raises a conceptual distinction between *managerial and pedagogical assessments*, both mechanisms of accountability in terms of education matters, where the former is related to the transparency in the use of financial resources and, the latter, to the achievement of educational outcomes.

As stated by Santiago (2013), different instruments can be used as mechanisms of pedagogical assessments: student's assessments, teacher's appraisal, the appraisal of school leaders, the education system evaluation and the evaluation of schools. For methodological purpose, we focus on the latter, which represents the core of the inspectorate system within each country. We make this decision based on the assumption that school evaluation plays a key role in the accountability framework and can provide with considerable influence in the quality of education provision. This approach is common to other studies in the field, which state that 'school evaluation is increasingly considered as a potential lever of change that could assist with decision making, resource allocation and school improvement, especially as: further autonomy is given to individual schools, market forms of accountability gain in importance, and the school is increasingly recognised as the key agency within the education system for improving student learning' (Shewbridge, 2013: 384).

We acknowledge that pedagogical assessments through school evaluation could have different purposes and consequences. Regarding its purposes, we assume that school evaluation can focus on the monitoring of the teaching and learning process, as well as on the outcomes of schools' development. When the purpose is to monitor processes, this includes the evaluation of educational tasks, as well as the traditional inspectorate action targeting compliance of schools with laws and regulations. Alternatively, when the purpose is to focus in schools' outcomes, evaluations are based in specific indicators of students' performance. This second type of assessment could give some more autonomy to schools, as public accountability would not be a systematic process and could focus its work either on schools that are not performing up to expected standards, or in schools with good performance, to promote visibility of good practices. As for its consequences, we assume that the results that could come after a school evaluation, could lead either to disciplinary sanctions when infringements or bad performance are identified, or as well to specific rewards (to teachers, head teachers and schools) when good practices are recognized. The presence or absence of sanctions and/or rewards, could lead to stimulate or discourage good performance of schools.

However, the external inspectorate system is not the only instrument to evaluate school. Under the scope of our research, we also take note on the existence or absence of self-evaluations of schools. We assume these internal evaluations are a complement to external inspection as well as a mechanism to enrich the evaluation of school performance.

As for *social accountability*, our analysis assumes a conceptual distinction between parent's participation and involvement, and the publication of external and internal reports. In the first case, we assume that parent's participation in schools' councils and/or governing bodies, when this is a mandatory requirement, could stimulate community involvement in education matters that could lead to strengthen the social pressure to the education system. In the second case, if reports are of free access to community, this could provide important information to families, especially in contexts where parents can choose freely the school for their children. In addition, the publication of reports could also express a reinforcement of public accountability, when education competences are

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decentralized. In this sense, social accountability 'aims to foster transparency in the system by opening it up to public scrutiny' (Hooge, 2016, p.108). Table 9 summarizes the operational definition of accountability used in our study.

Table 3.9: Operational definition of accountability mechanisms used in this study

Public accountability					Social accountability	
Pedagogical assessment (external school evaluation)		Managerial assessment (external school evaluation)		Existence of self-evaluation of schools? Yes/ No	Parent's participation in school councils? Yes/ No	External/ internal evaluations are published? Yes/ No
Purpose of evaluation Monitoring/ Outcomes	Sanctions and awards as a consequence Yes/No	Purpose of evaluation Monitoring/ Outcomes	Sanctions and awards as a consequence Yes/No			

Following these conceptual definitions, a general framework to analyse accountability mechanisms can be found in Pritchett's (2015) thoughtful essay on educational systems in the light of the 2030 sustainable development goals agenda. Based on World Bank's World Development Report of 2004 and its "accountability triangle", Pritchett offers useful guidelines to detect consistencies and inconsistencies in the design of accountability systems, concerning the general objective of education. According to Pritchett, the coherence/ incoherence of an accountability system can be analysed by understanding the "relationship of accountability" among four elements (delegation, finance, information and motivation) and among four actors (citizens, the State, the organizational providers of schooling and teachers). His four-by-four diagnostic tool allows specifying the relevant principal-agent relations involved in the delivery of basic education, helping to map both public and social accountability for each specific context. The mapping of consistencies and inconsistencies opens the way for testing the relation between the design of accountability systems and the effectiveness of policy implementation, which brings the possibility to explore gaps that could be the cause of inefficiencies.

By incorporating his thesis and tools into our analytical framework, our analysis manages to give an account of how educational systems are embedded in the wider political system and how citizens are engaged in the management of educational service.

A working hypothesis that guides our analysis affirms that a different relationship of accountability will be observed, depending on the level of government responsible for each executive competence. This means that if the executive authority is located at the central level, the relationship of accountability will assume specific characteristics; different from those ones observed when the executive authority is in the level of the school. Therefore, a variation of scenarios for the agent to perform its competence will be displayed, and these variations could contribute to explain contrasts in terms of policy effectiveness and efficiency between education systems.

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➢ *Guiding questions of qualitative and quantitative analysis*

The purpose of this study is mostly descriptive and exploratory. We intend to provide a clear description of educational decentralization scenarios, based on a definition that, though operationally simple, allows encompassing a wide range of aspects of this complex phenomenon. We investigate the presence of commonalities across cases and the possibility of building empirically meaningful typologies. We explore alternatives for building functional synthetic indicators to be used in qualitative and quantitative analysis. We offer interpretations of qualitative data aiming to refine the working hypothesis included in our framework, highlight policy tools that are claimed to improve effectiveness, efficiency and equity and put forward a research agenda proposal.

Our qualitative analysis addresses the following specific questions:

- What are the main modalities of decentralization in financing primary and secondary education?
- What mechanisms are in place at the sub-national level to increase budget allocation to education?
- What mechanisms are in place to counter inequalities across sub-national levels? What conditions are associated with the transfers?

Our quantitative analysis, based on qualitative data, addresses the following question:

- Are different patterns of financial decentralization in education associated with different educational outcomes?

In the following section, we introduce and explain the criteria used and the process developed for case selection. In addition, we will present the data sources and tools for data collection.

➢ *Criteria used for case selection*

With the aim to contribute to the construction of an encompassing theory linking financial decentralization in education and policy outcomes, we decided to work with a medium-sized selection of country cases. By working with this quantity of cases, we wanted to obtain groups clearly different among themselves (between groups heterogeneity), but conformed by a sufficient number of relatively homogenous countries (within group homogeneity).

To overcome the difficulty of selecting our country cases prior to having empirical data on the variables included in our framework, we relied on proxy indicators that we considered that would offer the best information available on aspects relevant for our analysis. The proxy indicators we used were:

- Regional Authority Index (Hooghe*et al.*; 2016)
- Intergovernmental transfers as percentage of subnational revenues
- Adaptation of OECD's Education Decentralization Index

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Country scores of Regional Authority Index published by Hooghe *et al.* (2016) result from the aggregation of regional government tiers' scores, taking into consideration the presence of horizontal and vertical asymmetries as well as special autonomy statuses of regional governments within a country. They reflect the sum of authoritative decision-making power of regional governments within a certain territory. Authority is assessed in ten policy areas, that relate to two dimensions: regional governments' self-rule and shared rule. We purport that six out of the ten RAI components provide meaningful information for three elements of Fiscal Discretion as defined in the framework we adopted, with the caveat of not relating specifically to education, but all government areas. (Table 10)

Table 3.10: Comparison of analytical dimensions included in Yilmaz et al. (2010) framework and components of the Regional Autonomy Index

Fiscal Discretion	**RAI components that offer information on fiscal discretion elements**
Expenditure responsibilities	Policy scope Executive control
Revenue generation	Fiscal autonomy Fiscal control
Intergovernmental transfer systems	---
Local borrowing	Borrowing Autonomy Borrowing control

Source: author's elaboration based on Yilmaz et al. (2010) and Hooghe et al. (2016).

The remaining dimensions that make up for the RAI are loosely linked to the concept of fiscal discretion. We would rather consider them to measure more directly the concept of Political Autonomy of regional authorities in respect to central governments. Instead of being a caveat, we take this as an advantage of the RAI, to the extent that it captures differences in the overall organization of government structures, beyond fiscal policy. Conceptually, this implies assuming that fiscal policies are not designed and implemented in an institutional vacuum. Indeed, we hold that institutions framing fiscal behaviour are defined within the constraints of political arrangements, i.e. decisions related to the political organization of government structures take precedence over decisions on fiscal matters. So, by adopting the RAI as a proxy indicator for the selection of our cases, we also expect to grasp this political dimension in our analysis, which we frame mainly through the lenses of accountability mechanisms.

Table 3.11: Components of Regional Autonomy Index that do not directly fit into Yilmaz et al.'s (2010) framework

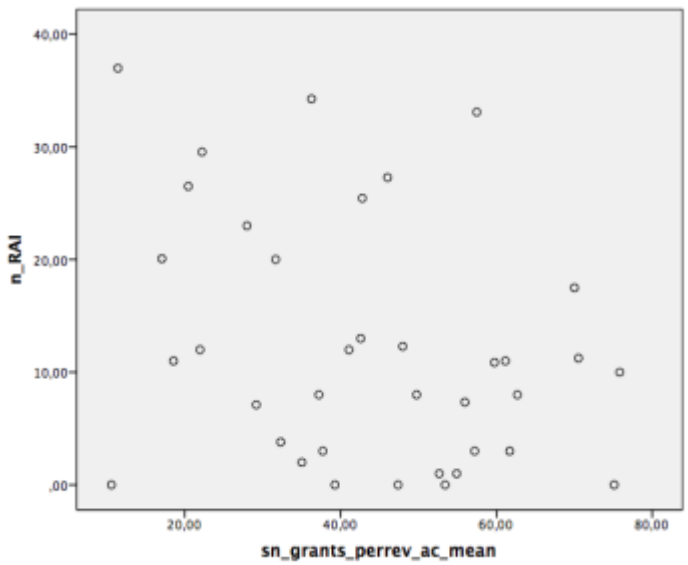
Political autonomy / Accountability	Institutional depth Law making
	Representation Constitutional reform

Source: author's elaboration based on Hooghe*et al*. (2016).

To overcome RAI's silence about governmental transfers, we include the share of intergovernmental transfers on sub-central government revenues as another criterion for case selection. This is an indicator of vertical imbalance frequently used in fiscal decentralization studies. Data was obtained from the World Bank's dataset on Fiscal Decentralization Indicators (2014). To mitigate yearly variations and compensate for missing data, we considered the average value for periods 2009-2011.

The following scatter plot shows the observed relation between the two indicators for the set of countries for which we have comparable information. We should stress that this representation does not incorporate any information on the quality of government grant systems, nor refers specifically to the educational sector. (Graph 1)

Graph 3.1: Countries according to Regional Authority Index (2010) and Share of Intergovernmental Transfers on Sub-central Government Revenues



Source: author's elaboration based on Hooghe et al. (2016) and World Bank (2014).

In order to encompass the specificity of institutional arrangements affecting education, we adapted OECD's education decentralization index and took it as the third and last criterion of our case selection. To construct our adapted indicator, we used data on the decisions taken at each level of government on public lower secondary education published in OECD's *Education at a Glance* (2012 round). To isolate the components we believe to be more closely associated with the financial dimension of education management, scores for each level of the system were calculated as the average scores of dimensions "Personnel management" and "Financial management"[15]. So the adapted indicator is expected to be a proxy of the incidence of each system's level in decisions on the allocation of financial resources. We then defined Sub-central government (SCG) as the sum of categories "State", "Provincial/Regional", "Subregional" and "Local". "Central" and "Schools" categories were kept as in the original database[16]. Finally, decentralization scores of Schools were subtracted from SCG scores, reflecting the linear distance of decentralization between these two levels. By incorporating the value of decision-making powers delegated to schools, this indicator distributes cases alongside a continuum reflecting different combinations of sub-central government and school decentralization in the two dimensions considered. This adapted indicator ranges from -100% to 100%, where the extreme negative value means pure school-decentralization and 100% pure SCG-decentralization. Zero equals identical decentralization levels to schools and subnational government agencies.

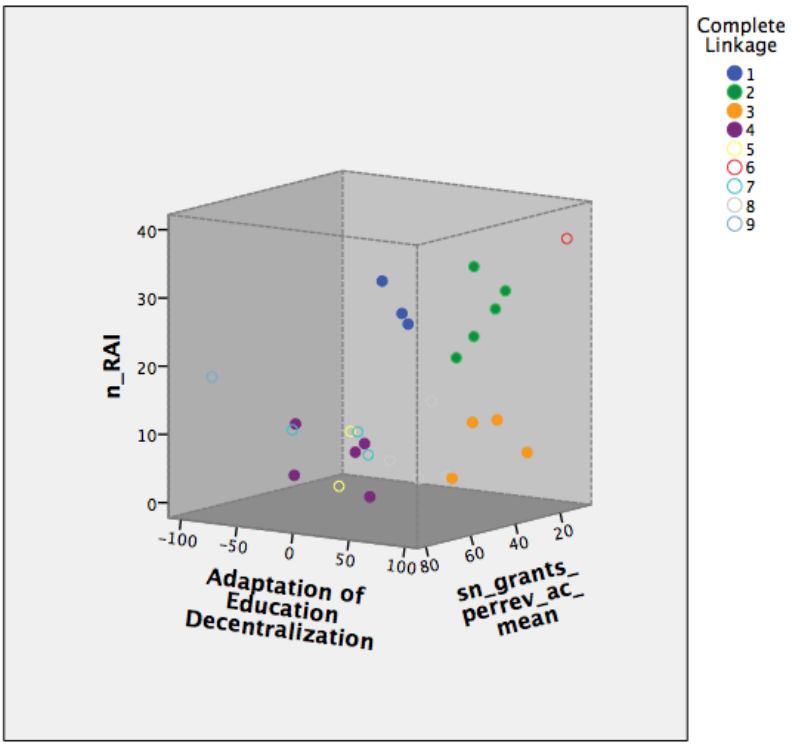
To obtain groups of cases that would simultaneously provide us with between-groups heterogeneity and within-group homogeneity, we proceeded to the clustering of cases according to these three proxy indicators. Graph 2 presents the results obtained. Hierarchical clustering was performed using complete-linkage (furthest neighbour) method and Euclidean distances. To avoid bias related to difference in scales, indicators were transformed into z-values.

We purposefully chose the solution of nine hierarchical clusters, at which point we were able to visually identify two mostly different country groups (2 and 4) and two additional groups that were similar to each group included in the first pair (1 and 3). Groups 5 to 9 were left out of our analysis, leaving us with seventeen country cases.

[15] I.e. dimensions "Organization of instruction" and "Planning and structures" are ignored in the selection of our cases.

[16] Education decentralisation scores for Belgium were calculated as the average score of French and Flemish Belgian regions. Likewise, United Kingdom's scores were calculated as the average of England's and Scotland's scores.

Graph 2: Tri-dimensional distribution of countries according to selected indicators and groups obtained through hierarchical clustering.



Source: author's elaboration based on Hooghe *et al.* (2016), World Bank (2014) and OECD (2012).

The dependence of our choice on data availability led to a selection conformed only by OECD countries, introducing bias to our analysis. This should be kept in mind in the moment of evaluating the conclusions. We do not correct for this caveat, but add five external cases for which cluster ownership was unknown by us *a priori*. We intentionally added three additional cases from Latin America (Brazil, Colombia and Mexico) and three from Africa (Kenya, Nigeria and South Africa). In our analysis, we evaluate how the cases in this subset relate to the others.

Table 12 presents cases included in each group and the descriptive statistics of the indicators used in the selection.

Table 3.12: Descriptive statistic of the indicators used in country selection, by country groups.

Group number	Countries	Indicator	Group Average	Group Standard Deviation	Group Minimum	Group Maximum
1	Australia	RAI	28,6	4,0	25,4	33,1

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	Belgium Italy	Share of Transfers on SCG revenues	48,8	7,7	42,8	57,5
		Adapted Ed. Decentralization	23,3	3,3	20,8	27,1
2	Austria France Spain Switzerland United States	RAI	26,7	5,6	20,0	34,3
		Share of Transfers on SCG revenues	27,7	6,6	20,5	36,3
		Adapted Ed. Decentralization	55,8	10,9	41,7	66,7
3	Chile Finland Japan Norway	RAI	8,8	4,6	3,0	13,0
		Share of Transfers on SCG revenues	37,6	6,0	29,2	42,6
		Adapted Ed. Decentralization	81,3	23,9	50,0	100,0
4	Denmark Hungary Ireland Luxembourg Poland	RAI	5,8	4,3	0,0	10,9
		Share of Transfers on SCG revenues	54,0	5,2	47,4	59,8
		Adapted Ed. Decentralization	-21,3	25,4	-52,1	0,0
Not assigned	Brazil Colombia Mexico Kenya Nigeria South Africa	RAI	--	--	--	--
		Share of Transfers on SCG revenues	--	--	--	--
		Adapted Ed. Decentralization	--	--	--	--

Source: author's own calculation based on Hooghe *et al.* (2016), World Bank (2014) and OECD (2012).

- *Data sources and tools for data collection*

Our analysis focuses on institutional variables for which we build data based mainly on the analysis of legislation. For all cases, constitutional texts provide information on the political and administrative organization of the country, authoritative competences of the government levels and, in several cases, the overall organization and regulation of educational service provision. For European OECD countries, further information on the functioning of the educational system and its financing mechanisms was obtained from Eurydice reports (European Union/EACEA/Eurydice, 2014, 2015a and 2015b), which

offer systematized and comparable information for many of the aspects relevant for our analysis. Information compiled in the Eurydice reports is prepared by national teams based on legislative norms and administrative records. For the other cases, and to fill eventual information gaps on the OECD European countries, we consulted national legislation directly. In all cases, bibliographic sources are used to support interpretation of normative frameworks and complete for some missing data.

The fact that our data sources are restricted to legislative texts and policy documents, our analysis by no means captures the incidence of informal institutions and/or practices that are actually carried out by agents within the framework of formal institutions. Still, we are convinced of the usefulness of an account on formal institutional arrangements – as the one we propose – to reach a comprehensive understanding causal mechanisms leading to policy outcomes.

Information gathered for each case was organized in a Country Profile. Processed data for each case was organized in Country Sheets and finally entered into a database.

To support interpretation of qualitative data and the refinement of working hypotheses, statistical comparable information was obtained from secondary sources and inserted into the database.

Guidelines for Country Profile, protocol for data processing and information sources are listed by country in separate Annex Documents, which also include the list of statistical indicators gathered from secondary sources.

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Chapter 4: Descriptive analysis of qualitative data

This chapter presents a descriptive analysis aimed at identifying most frequent modalities of education decentralization found in the 23 education systems included in this study. Following the analytical framework described in the previous chapter, all education systems were analysed through their formal and official legislations (mainly national constitutions and education acts), as well as through official web sites and on-line data bases, which offer information on education system, education financing and learning assessment. The research questions that guided the qualitative analysis of this chapter are the following ones:

- What are the main modalities of decentralization in financing primary and secondary (compulsory) education?
- What mechanisms are in place at the subnational level to increase budget allocation to education?
- What mechanisms are in place to counter inequalities across subnational levels?

The purpose of the analysis was to recognize, in each education system, how education responsibilities are distributed within the different levels of government (central, sub central and schools), and the institutional framework within each these responsibilities are performed, including those relative to funding and accountability mechanisms.

We first section present an overall description of the ways authoritative competences are distributed within the different levels of government across our selected countries in each sphere of education (physical structures, personnel management, quality improvement, curriculum and organization of instruction). Clear trends are underlined with the purpose of highlighting patterns concerning decentralization of authoritative competences in education systems.

A second section focuses on the financial sources that are expected to enable the exercise of those competences and the autonomy of each level of government (particularly sub central and schools) to allocate transfer resources. We also provide some examples of different mechanisms to increase budget allocation through intergovernmental transfers, as well as national strategies to counter inequalities across regions.

A third section describes the magnitude and relationship between own revenues and transfers in each education system, according to the distribution of executive competences.

The last and fourth section analyses public accountability mechanisms, focusing on external and internal school evaluation, and social accountability instruments, focusing on publication of external and internal evaluation reports and parents' participation in school matters. Although accountability is a wide and complex dimension, these specific instruments -selected for methodological purpose- were identified in all education systems to understand, from an exploratory and preliminary perspective, the particular scenarios in which different levels of government are required to perform their executive competences.

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The whole analysis is based on the qualitative data we produced from the country profiles prepared for this study. Throughout the text, we include frequency tables aimed at facilitating the visualization of the description we provide. Those interested in seeing the information relative to each country can consult the full dataset in the annex at the end of this chapter.

A. **Authoritative competences within the spheres of education**

As already described in the previous chapter, understanding the way in which decentralization of education financial resources performs in each country requires identifying the actors that make expenditure decisions in connection to the executive responsibilities they are mandated in an education system's institutional framework. Delegation of educational policy can be developed in different ways. Nevertheless, some clear trends can be identified across countries regarding the distribution of authoritative competences.

- *Physical structures: in most countries, the definition of quality standards for school infrastructure is a responsibility of central level, while oversight is a responsibility of either central or sub central governments. The executive competence of building schools usually falls at subnational governments. School equipment is most often acquired at sub central or school level, but the autonomy of decision makers is usually constrained by normative action and control of higher levels.*

In relation to the *physical structures*, in most countries central governments retain the competence to define quality standards for school infrastructure and sub-national governments are responsible for building school facilities. The responsibility for the acquisition of school equipment may fall at the sub-central or school levels, most commonly as an exclusive competence. On the other hand, oversight is most commonly an exclusive competence of either central or sub-central governments. In most cases, schools' autonomy to decide on the acquisition of equipment is constrained both by normative action and control of higher levels. This is similar regarding the building of schools. In Ireland, for example, Schools' Boards of Management are allowed to build schools. However, they need to follow standards and regulations settled at central level. Sub-central governments, in contrast, are less constrained by oversight from central authorities, but still, as schools, in most cases their executive autonomy is reduced by central governments' standards and oversight.

Table 4.1 : Distribution of authoritative competences by level of government in the sphere of physical structures

Level of government	Who defines quality standards for school infrastructure	Who builds schools	Who buys school equipment	Who inspects school facilities
Central government	**15**	0	0	**9**
Central and Sub central government	2	3	1	**5**
Sub central government	4	**16**	**10**	**8**
Central government and schools	0	1	1	0
Central and Sub central government and schools	0	1	2	0
Sub central government and schools	0	0	1	0
Schools	0	2	**8**	0
Missing information	2	0	0	1

- *Personnel management: in most countries, the definition of the requirements for teaching and teacher's statute is a responsibility of central level, while oversight competences are a responsibility of central or sub central governments. The payment of teachers is most often a competence of sub central governments, but recruitment of teachers is often shared among levels, representing an interesting incidence of school actors in decisions related to the conformation of the teacher's workforce*

As regards *personnel management*, we find a similar concentration of standard-setting competences at the central level. Most countries delegate in this level the competence to define the requirements for teaching and teachers' statutes. In some federal countries (Switzerland, Belgium and USA), however, neither requirements for teaching nor statutes are defined at central level. In some cases, only the latter is delegated in sub-national governments (federal countries Australia and Brazil, unitary countries Denmark and Japan). This could derive in coordination mechanisms between regions. For example, in Denmark the bodies involved in deciding conditions of service for teaching are the Local Government Denmark (assembly of all local councillors) together with the Danish Union of Teachers.

A clear trend across countries also emerges in relation to the payment of teachers, which is most often a competence of sub-central governments and only seldom of schools. Trends are less clear in reference to the recruitment of teachers. In this case, distribution of cases is quite balanced across the levels of the system, also representing an interesting incidence of school actors in decisions related to the conformation of teacher's workforce. Our data indicate that oversight competences are less centralized than normative prerogatives, requiring sub-central governments to play a more important role in the

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evaluation of teachers' performance. They also reveal that actors invested with executive competences usually enjoy greater autonomy to make decisions on personnel management than those responsible for the development of physical structures.

Table 4.2 : Distribution of authoritative competences by level of government in the sphere of personnel management

Level of government	Who defines requirements for the exercise of teaching profession	Who defines teachers' statute	Who recruits teachers	Who pays teacher salaries	Who evaluates teachers (extra school)
Central government	**18**	**12**	**6**	**6**	**8**
Central and Sub central government	1	3	2	1	2
Sub central government	3	**7**	**6**	**12**	**8**
Central government and schools	0	0	0	0	2
Central and Sub central government and schools	0	0	0	0	0
Sub central government and schools	0	0	4	0	0
Schools	0	0	**5**	2	0
Missinginformation / Notapplicable	1	1	0	2	3

- *Improvement of educational quality: standards in terms of teachers' in-service training and school development are most frequently settled at central level. Executive and oversight competences are generally shared between different levels. This is a distinctive feature of this policy function.*

Regarding *improvement of educational quality*, as in the functions analysed previously, the prerogative to define standards in terms of teachers' in-service training and school development is most often retained at the central level. In 25% of cases they are decentralized to the sub-central level, sometimes as a shared competence. Indeed, the sharing of responsibilities among all three levels is a distinctive feature of this policy function in respect to others, particularly concerning executive and oversight competences. Indeed, in seven countries schools are involved in the evaluation of school plans. These arrangements contribute to leveraging the autonomy of executive actors, who are engaged in standard-setting and oversight processes. At the same time, these arrangements require the presence of coordination mechanisms. This is the case of Belgium (Flemish Community), where the definition of school budgets is a responsibility of sub central and school level. Coordination mechanisms are present in this education system, particularly through the so-called Board of Go! This Board, dependent of the Flemish Ministry of Education and Training, acts conjointly with schools and school groups in deciding the allocation of resources.

Table 4.3: Distribution of authoritative competences by level of government in the sphere of quality improvement

Level of government	Who defines quality standards for teacher in-service training	Who defines quality standards for school development	Who designs in-service training programmes	Who defines school budgets	Who evaluates development of schools plans
Central government	**14**	**13**	**5**	3	**7**
Central and Sub central government	2	4	3	0	**4**
Sub central government	4	2	**6**	**7**	**4**
Central government and schools	1	0	2	4	1
Central and Sub central government and schools	0	0	2	0	2
Sub central government and schools	0	0	3	2	**4**
Schools	0	0	2	**6**	1
Missing in formation	2	4	0	1	0

- *Organization of instruction: Standards are defined at central, sub central or at school level, evidencing the engagement of schools in this issue. Oversight competences are most often a responsibility of central or sub central authorities. Admission of students is distributed among the different levels, while the choosing of teaching methods is generally an exclusive competence of schools.*

Incidence of central governments in the definition of standards is relatively lower as regards the *curriculum* and *organization of instruction*. In contrast to other functions, it is common to observe the engagement of schools in these issues. Teacher-students ratios are most commonly defined by central authorities, but in almost half of the cases this competence is decentralized either to sub-central governments or to schools, with a similar participation of both levels. Time of instruction is also defined exclusively by central governments in approximately half of the cases, but it is also very frequently set through the coordination of actors at lower levels. Among all the executive competences included in our analysis, the choice of teaching methods is the one that is most commonly an exclusive competence of schools. The admission of students, in turn, seems to follow the same unclear trends as the ones observed for the recruitment of teachers. As regards the oversight competences, external evaluation of schools, as will be described in this chapter's section on accountability, is most frequently either the exclusive or shared competence of central authorities, followed by sub-national agencies.

It is interesting to note that despite the engagement of schools in the definition of standards in this area, our data reveals that the autonomy enjoyed by school actors to perform the corresponding executive competences is more frequently constrained by

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other levels than what is observed in the three functions related to decentralization of financial resources.

Table 4.4 : Distribution of authoritative competences by level of government in the sphere of organization of instruction

Level of government	Who defines teacher/ students ratio	Who defines time of instruction	Who admit sstudents	Who chooses teaching methods	Who evaluates schools (extra school)
Central government	**11**	**11**	**4**	0	**10**
Central and Sub central government	0	3	0	0	**5**
Sub central government	**4**	2	**5**	0	**7**
Central government and schools	0	1	2	1	0
Central and Sub central government and schools	0	2	0	0	1
Sub central government and schools	1	2	2	0	0
Schools	**4**	1	**8**	**20**	0
Missing information / Not applicable	3	1	2	2	0

- *Curriculum: standards are commonly settled ad sub central or school level (which is engaged in this issues), but extra-school evaluation of students is most often a responsibility of central level. Selection of textbooks is a competence executed frequently by school actors.*

The clearest contrast with the latter appears in the sphere of curriculum. In only eight countries the definition of the curriculum is an exclusive competence of central authorities. Most commonly, this responsibility is shared with schools and/or sub-national authorities. The selection of textbooks is most frequently a prerogative of school actors, being the second executive competence included in our analysis where the participation of schools prevails over other levels. Indeed only in four cases this is an exclusive competence of either central (Mexico and Luxembourg) or sub-national authorities (Japan and Switzerland). The decentralization of curricular policy also follows a different trend from those observed in other areas in relation to the distribution of oversight competences. In more than half of the cases, the central government is the only level having the authority to evaluate students' achievements – excluding evaluations that are internal to schools. In another 30% of cases, this competence is shared with sub-national authorities. Similarly to what we observe regarding the organization of instruction, our data indicate that these arrangements provide a lower level of autonomy to actors invested

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with executive competences in comparison to functions involving the decentralization of decisions directly related to financial allotments.

Table 4.5 : Distribution of authoritative competences by level of government in the sphere of curriculum

Level of government	Who defines curriculum	Who selects books	Who evaluates students' achievements (extra school)
Central government	**8**	2	**13**
Central and Sub central government	2	0	**7**
Sub central government	2	2	3
Central government and schools	**4**	3	0
Central and Sub central government and schools	**6**	0	0
Sub central government and schools	1	1	0
Schools	0	**13**	0
Missing information	0	2	0

To sum up, although is not possible -concerning the scope of this study- to affirm the existence of different decentralization 'models', an overall description of the education systems allows to stress that decentralization of educational policy seems to follow trends and patterns within the spheres of education. Decentralization of executive competences most frequently go down to school actors in areas that do not involve financial expenditures directly, particularly in the spheres of curriculum, organization of instruction and in the competence of recruiting teachers. Meanwhile, in the other functions concerning personnel management, physical structures and quality improvement, executive competences are most commonly performed either by central level or delegated at sub central governments.

B. Financial sources to execute competences and autonomy to allocate resources

▪ *Physical structures: sub central governments rely on both own resources and intergovernmental transfers to undertake capital expenditures and frequently enjoy high autonomy to allocate resources. Schools are funded by government grants to execute capital expenditures, but usually have less autonomy than sub central levels.*

As regards funding sources for *physical structures*, sub-central governments rely both on their own resources and intergovernmental transfers to undertake capital expenditures

related to the development of physical structures. Austria and Hungary are the only two cases where these expenditures are supposed to be covered exclusively by sub-national revenues, while in Italy the opposite situation is observed. In almost all cases, sub-central governments enjoy high autonomy to allocate resources transferred by central authorities. Intergovernmental transfers are most commonly automatic, based on some kind of formula and made in the form of lump sums. Italy and Switzerland are exceptions in this sense, with earmarked transfers either based on needs assessments or set arbitrarily. At the school level, capital expenditures are supposed to be at least partially funded by government grants, with the exception of Kenya. School actors enjoy markedly lower autonomy to allocate those recourses, in comparison to sub-central governments, since most frequently these funds are earmarked. In almost all countries, the legislation invests schools actors with the authoritative competence to generate resources to cover for capital investment. Denmark and Norway are exceptions in this sense, since schools are not allowed to produce revenues for this purpose.

Table 4.6 : Funding sources meeting executive competences related to Physical structures (capital expenditures), by level of decentralization.

	Transfers			
Schools				
Own revenues	No	Yes	No exec. comp.	Total
No		2		2
Yes	1	7		8
No exec. comp.			11	11
Missing		2		2
Total	**1**	**11**	**11**	**23**
Sub national governments				
No		1		1
Yes	2	17		19
No exec. comp.			3	3
Missing				
Total	**2**	**18**	**3**	**23**
Central government				
No				
Yes	6			6
No exec. comp.			17	17
Missing				
Total	**6**		**17**	**23**

- *Personnel management: when sub central governments are responsible for paying teachers, this expenditure is funded by intergovernmental transfers and own resources.*

As regards *personnel management*, in all cases where sub-central governments are responsible for paying teachers' salaries, this expenditure can be funded both by

intergovernmental transfers and own-generated resources. The only exception is Austria, which is also the only case where the responsibility to pay teachers is shared with the central level. In Austria, the obligations of subnational governments related to teacher remuneration are totally met by earmarked transfers from the central level. Otherwise, sub-central governments enjoy high autonomy to allocate funds. The only two cases where payment of teachers is a competence of schools – Finland and Poland – salaries are totally funded through automatic block grants that school actors can allocate with a relatively high level of autonomy. Still on the funding of teacher salaries, another feature to be highlighted refers to the nature of intergovernmental transfers. In almost all cases where sub-central governments are responsible for the payment of teacher salaries, transfers from central governments that can be allocated to this kind of recurrent expenditure are automatic, formula-based and sub-central authorities receive those resources in the form of lump sums that can be spent in education as well as in other policy areas. In fact, most frequently, these are resources that, despite being collected by national authorities, belong to sub-central governments.

Table 4.7: Funding sources meeting executive competences related to Personnel management (current expenditures - teacher salaries), by level of decentralization.

		Transfers			
Schools					
Own revenues	No	Yes	No exec. comp.	Missing	Total
No		1			1
Yes					
No exec. comp.			19		19
Missing		1		2	3
Total		**2**	**19**	**2**	**23**
Sub national governments					
No		1			1
Yes		14			14
No exec. comp.			8		8
Missing					
Total		**15**	**8**		**23**
Central government					
No					
Yes	9				9
No exec. comp.			14		14
Missing					
Total	**9**		**14**		**23**

- *Improvement of educational quality: when the execution of competences is a responsibility of sub central governments, expenditures are funded by own resources or intergovernmental transfers, and sub central governments have autonomy to allocate resources. When schools are responsible for these expenditures, they rely as well on transfers and own resources, but allocative autonomy is lower.*

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In seven cases, sub-central governments have the authoritative competence to both invest in the development of in-service teacher training and define school budgets. In all those cases, these services can be funded both by own revenues and intergovernmental transfers through modalities that provide sub-national authorities with high levels of allocative autonomy. This funding modality is also observed in those two cases where sub-central governments are responsible for defining school budgets, but have no incidence on in-service teacher training (Poland and Finland). Chile and Norway, in turn, use earmarked transfers from central government to finance the provision of in-service teacher training at the subnational level. Lower levels of allocative autonomy are observed among those cases where the development of in-service training programmes is a competence of sub-central governments, but these do not interfere in the definition of school budgets. In those cases, transfer modalities vary among countries, but allocation is usually tied, at least partially, to decisions taken at the central level.

In six countries schools are involved both in the development of in-service teacher training and the definition of their own budget. Most frequently, school actors can rely both on own-generated resources and governmental transfers to fund these current expenditures. Brazil and Belgium are exceptions in this sense, relying only on public grants. Despite this difference, in all six countries for which data is available the amount of transfers is defined based on some kind of needs assessment and are most frequently earmarked. Consequently, school actors tend to have low allocative autonomy in the use of those resources. In another six countries, schools are engaged in the definition of their budgets, but have no executive autonomy regarding in-service training of teachers. In those cases, transfer amounts are also most frequently defined based on needs assessments and reach schools in the form of block grants. In the two countries where schools have the competence to provide in-service training, but are not involved in the definition of school budgets – Finland and Colombia – school actors seem to enjoy relatively higher levels of autonomy to allocate government transfers.

Table 4.8: Funding sources meeting executive competences related to Quality improvement (current expenditures, excl. teacher salaries), by level of decentralization.

	Transfers				
Schools					
Own revenues	No	Yes	No exec. comp.	Missing	Total
No		5			5
Yes		9			9
No exec. comp.			8		8
Missing		1			1
Total		**15**	**8**		**23**
Sub national governments					
No		1			1
Yes		15			15
No exec. comp.			6		6
Missing				1	1

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Total		**16**	**6**	**1**	**23**
Central government					
No					
Yes	13				13
No exec. comp.			10		10
Missing					
Total	**13**		**10**		**23**

- *In some cases, intergovernmental transfers introduce a redistributive criteria aiming to equalizing funding*

In some cases, this intermediary role of central governments allow for the introduction of redistributive criteria aiming to equalizing funding according to public investment needs. Only in a few cases, though, the formulae that determine the amount of these transfers take into consideration redistributive criteria that are directly linked to education. Brazil and Colombia represent two exceptions to this general rule. In those countries, transfers to cover for teacher salaries take the form of block grants that must be allotted to education. In both cases, central authorities play a redistributive role explicitly aimed at reducing funding gaps among subnational governments (Box 4.1).

In short, we can remark the dominance of sub central governments in policy implementation regarding the three functions that involves financial sources. In contrast, schools have more presence regarding curriculum and organization of instruction. To fund expenditures within the three first functions (physical structures, personnel management and improvement of educational quality) sub central governments can allocate both own resources and transfers received by central level. In some cases, intergovernmental transfers are based on redistributive criteria that helps to reduce gaps between sub central regions. Most commonly, however, transfers are allocated automatically and as a lump sum that includes different policy areas. When executive competences are a responsibility of school levels, the trend evidences a lower allocative autonomy of schools compared to sub central governments. Restrictions on allocation decisions of transferred resources seem to work as a regulation tool that balances the delegation of higher autonomy to schools. In addition, schools' autonomy regarding implementation of curriculum and instruction (which doesn´t involve this financial regulation tool), as seen in the previous section, is constrained by oversight from higher levels of government.

Box 4.1: Ensuring resource allocation in decentralized systems through intergovernmental transfers

Three institutional arrangements: Colombia, Brazil and Poland

Several countries have developed different types of fiscal institutional arrangements in order to improve the distribution of resources. In Colombia, the fiscal system was established in 2001. It is called *Sistema General de Participación* (SGP) and it defines the amount of resources National Government transfers to subnational regions (Departments, Districts or Municipalities) destined to health, water, basic sanitation and education (Bonet, Pérez and Ayala 2014). Education is publicly funded and most of grants come from

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the National Government (up to 80%). Transfers are automatic and divided into two groups. First, Central Government earmarked transfers to Departments and Municipalities for covering teachers´ salaries. Second, Central Government transfers block grants to Departments and Municipalities in order to cover services, equipment, capital and capital goods. These funds are then transferred to schools. Each transfer is made on formula basis (number of students, geographic area, level of studies, etc.). Between 2002 and 2015, the amount of money transferred from Central Government to subnational regions increased more than 170% (Official Website of the National Planning Department of Colombia). In 2010, almost 4,8% of the national GDP was invested in education (Morduchowicz 2010). Although the quantity of transfers increased, the percentage of the GDP transferred to Departments and Municipalities has been going down, while local governments (those certified territorial entities that are allowed to provide educational services) have increased their participation in education funding (Bonet, Pérez and Ayala 2014, 17; OECD, 2016). At the same time, the Ministry of education has been contributing with technical assistance for local governments (*Entidades territoriales certificadas* –ETC) to reinforce their educational investments. However, some analysis show that the autonomy of local governments is not full yet and definitions of expenditures still are centralized (OECD, 2016; CEPP 2005, cited in Morduchowicz 2010, 21).

In Brazil, constitutional amendments from 1996 and 2006 determined that 20% state and municipal revenues coming from taxes defined in the constitution are automatically pooled at the level of states under "Funds for the Maintenance and Development of Basic Education" (FUNDEB). The FUNDEB establishes a mechanism that assigns resources according to enrolment rates and considers the differences among territories, grades, levels of education and teaching methods. It also establishes minimum expenditures per student and guarantees that almost 80% of non-university education costs are covered (Morduchowicz 2010: 17). The Union transfers resources to state funds until that minimum is reached in all territories. Federal contribution must be equivalent to at least 10% of the contributions from states and municipalities but must not exceed 30% of the funds. Pooled resources are distributed to the different government levels according to the number of students enrolled from pre-primary to secondary education in their respective public school networks. Municipal governments are entitled to receiving transfers in proportion to the number of students enrolled in pre-primary and fundamental education. State governments receive transfers for students enrolled in fundamental and secondary education. As established in the education law, states and municipalities that offer vacancies in lower quantity than their physical capacity are not entitled to receiving the share corresponding to the federal contribution to FUNDEB.

In Poland, the Act on Local Government (1990) assigned the *gminas* the responsibility for kindergartens and primary schools. Central level transfers are allocated in the form of lump sum to cover resources for a range of public services including education. Per capita (i.e. per student) funding was introduced as a more equitable and efficient way of financing *Gminas* for discharging their educational responsibilities than the previous input-based system. According to Levačić (2011: 240-241) two main messages emerge from the Polish experience. Per student funding is given a strong impetus by the decentralization of the administration of schools to democratically elected local governments. The main role of per student funding is to function as a fair procedural rule for allocating central government grants, which are relatively objective and less subject to political-bias and non-transparent manipulation than discretionary and individually negotiated allocations. The second message is that "while per student funding can provide a stimulus to internal efficiency, this is considerably blunted when, in the context of declining student numbers, efficiency is inconsistent with other social objectives, in particular preserving rural schools and placating a strong teachers' union. By itself per student funding is a relatively weak tool for promoting efficiency: to do this it has to be accompanied by other measures which will not materialize unless there is a political will to pursue the internal efficiency of the school system at the expense of other objectives favoured by specific political interests" (Levačić 2011: 241).

Mechanisms to counter inequalities across sub-national levels: the cases of Denmark and Chile.

In contexts of complex educational decentralization scenarios, some governments promote policies that claim to address equity across subnational levels. Denmark and Chile are two examples that develop funding mechanisms based on the needs of the regions and their educational performances.

In Denmark, the Ministry of Social Affairs and the Interior is in charge of financing Municipalities and Regions with state grants. In the Local Government Reform, in 2007, a new subsidy and equalization system was introduced according to which the distribution of the state grant to each local authority is based on population instead of tax base. The actual equalization is calculated based on the overall economic situation of each municipality, also called the net equalization method. The purpose of the equalization scheme is to even out the differences in the economic situation in the municipalities due to differences in tax base, composition of age groups and social structure. The effect of the equalization is that the municipalities can offer services at the same financial terms. The equalization method is calculated based on a municipality's estimated structural surplus or deficit, i.e. the difference between a municipality's estimated expenditure need and its tax revenue based on an average tax rate. This shows whether a local government is able to finance an estimated expenditure need by imposing taxes at an average tax rate. Part of the state grant is issued to finance equalization subsidies for municipalities with a high structural deficit. The remaining part is, as a rule, allocated to the municipalities by population. The annual state block grant is determined since the sum of the following elements: 1) the subsidy of the previous year; 2) adjustments according to the expected price and wage development; 3) adjustment according to an increase or decrease in local government expenditure (Official Website of Eurydice).

In Chile, the educational system became strongly decentralized during the 1980's. Schools are publicly funded, but also private schools receive subsidies. According to Morduchowicz (2010), because of the inequity of the system, in 2008 the Government sanctioned the Act on Preferential School Subsidy (*Ley de Subvención Escolar Preferencial*). The law modified the previous funding system, which was characterized by the transfer of per capita grants to schools (Weinstein and Villalobos 2015). This law introduced new values to flat per capita grants, according to the kind of school and the quantity of priority students. This category includes those students whose families are in a context of social and economic vulnerability. Besides, grant conditions include gradual improvement in the functioning of the educational unit (Weinstein and Villalobos 2015). This design promotes the improvement of schools that have higher shares of priority students, which is an advance over criticisms about the inequity of the system (Morduchowicz 2010, 36). Between 2008 and 2014, the Chilean State has multiplied the amount of money granted to schools by more than five times (Weinstein and Villalobos 2015).

Sources:

Bonet, Jaime; Pérez, Gerson and Ayala, Jhorland. 2014. *Contexto histórico y evolución del SGP en Colombia*. Documentos de Trabajo Sobre Economía Regional 205. Banco de la República.
Campbell, C., Carpentier, V. and Whitty, G. "Educational financing and improvement: conceptual issues and policy debates in the UK". In *ScheweizerischeZeitschriftfurBidungswissenschaften*, 2003, 25, 3: 455–480.
CEPP, 2005. *Programa: Evaluación de Sistemas Educativos*, Colombia. CEPP-Fundación Konrad Adenauer. Buenos Aires, 2005.
Levačić, Rosalind. 2011. "Per Capita Financing of General Education in Poland: A Case Stud"y. In *Reforming Education Finance in Transition Countries Six Case Studies in Per Capita Financing Systems*, Juan Diego Alonso and Alonso Sánchez, editors. Washington: World Bank.
Morduchowicz, Alejandro. 2010. *Asignación de recursos en sistemas educativos descentralizados de América Latina*. Buenos Aires: IIPE-UNESCO.
OECD (2016) *Education in Colombia*, Paris: OECD
Weinstein, José; and Carlos Villalobos. 2015. "Chile: la experiencia de la Subvención escolar preferencial (2008-2015)". Paperpresented at the *Seminario Regional de Programas de Subvención escolar en América Latina – Experiencia acumulada y transformaciones*, Tegucigalpa, 11-12 November.
Official Website of Eurydice.
Official Website of the National Planning Department of Colombia.

C. The magnitude and relationship between own revenues and transfers, according to the distribution of executive competences

As it has been stressed, our qualitative data is silent about the magnitude of own revenues and transfers at each level of the system, referring only to the authoritative competence to resort to these sources in order to fund their executive competencies. Interpretation of this data can be enriched through the triangulation with information on governmental expenditures in education by government levels. Unfortunately, this data is available only for OECD member and partner countries in year 2012 and it does not include direct expenditures by schools, whichever its source[17]. Still, it is useful to complement our descriptive analysis, as follows.

- *When central governments are responsible for paying teachers, educational expenditures made by central level are higher.*

As expected, the share of educational government expenditures made by central governments is substantially higher in countries where the payment of teachers is a responsibility of this level. Central government expenditures in these cases range between 70% of total government expenditures in education in France, to 84% in Ireland and Luxembourg. In Austria, where the payment of teachers is a shared competence of national and subnational governments, expenditures of the former account for 40% of total expenditures, with transfers to subnational governments responding for another 37%.

Table 4.9 : Distribution of expenditures in education by level of government and source. Countries where central government are responsible for payment of teachers.

Country	Central	Sub national		
		Total	Transfers	Own resources
France	70%	30%	0%	30%
Hungary[18]	30%	70%	34%	36%
Ireland	84%	16%	15%	1%
Italy	82%	18%	1%	18%
Kenya	…	…	…	…
Luxembourg	84%	16%	5%	11%
Austria	40%	60%	37%	23%

[17] For comments on other sources available and the virtues and limitations of OECD Education At a Glance data, see footnote 3 in Chapter 2.

[18] Data from Hungary is reported but cannot be analysed as it refers to a scenario that has been changed with the last Hungarian education reform. Up to 2013, Educational institutions were operated by municipalities. The new Public Education Act (2011) transformed the system and reduced the level of decentralization. In 2013 the government established a National School Maintenance Centre (Klebelsberg Institution Maintenance Centre) with 198 school district local units operating under its direct supervision. Since 2013 public education institutions are directly operated by the state through this Centre. OECD data on education expenditures used in our study refer to year 2012 (pre-reform), while our own qualitative data refers to the post-reform period.

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▪ *When subnational governments and schools are responsible for paying teachers, sub central own resources plays an important role within total educational expenditures.*

Intergovernmental transfers seem to play a very limited role in funding teacher salaries in countries where this falls under the competence of subnational authorities. In nine out of thirteen cases for which data is available, own revenues of subnational governments account for more than 77% of total expenditures. Chile, Colombia and Mexico are the exceptions, with subnational own revenues accounting for less than 25% of total education expenditure. In the case of Chile, transfers to subnational governments represent 38% of total expenditures and investment by the central government accounts for the remaining 57%. The latter possibly includes earmarked transfers that are made to public-subsidized private schools.

The two countries where schools undertake the payment of teacher salaries – Finland and Poland – show a contrasting trend. In Finland, revenues of sub-central governments account for 59% of total expenditures in education and transfers to these levels represent another 30%. In Poland, in turn, these shares are 95% and 1%, indicating the marginal contribution of intergovernmental transfers in funding this recurrent expenditure.

Table 4.10 : Distribution of expenditures in education by level of government and source. Countries where central government are not responsible for payment of teachers.

Country	Central	Sub national		
		Total	Transfers	Own resources
Chile	57%	43%	38%	5%
Colombia[19]	85%	15%	0%	15%
Norway	8%	92%	1%	91%
South Africa	…	…	…	…
Mexico	29%	72%	50%	22%
Spain	14%	86%	0%	85%
Belgium	24%	76%	-1%	77%
Brasil	10%	90%	7%	82%
Denmark	12%	88%	-7%	94%
Japan	2%	98%	15%	84%
Switzerland	-	100%	3%	96%
United States	1%	100%	11%	89%
Poland	4%	96%	1%	95%
Finland	11%	89%	31%	59%

[19] In the case of Colombia, expenditures from Central level include transfers made through the Colombian *Sistema General de Participación* (SGP): an intergovernmental transfer system to cover public services all over the country (see Box 4.1).

- *When subnational governments and schools are responsible for paying teachers, central governments are not involved in the development of physical structures and only in a minority of cases get directly involved in the implementation of teacher in-service education and school development plans. After controlling for exceptional cases, we find that the share of central government direct expenditures accounts, on average, for less than 12% in total public investment in education.*

The triangulation made with our qualitative data and the information available on public expenditures in education also allows us to have a preliminary assessment of the complementary role played by government levels that are not responsible for the payment of teacher salaries. It is interesting to note that in countries where subnational governments or schools are responsible for paying teachers, central governments do not have any executive competence related to the development of physical structures, the only exception being Mexico (shared competence with subnational governments to build schools).

In six cases (Brazil, Chile, Japan, Mexico, Norway and Poland) this government level finances, at least partially, the implementation of in-service teacher training programs and school development plans. The share of central government expenditures in those cases varies considerably but, with the exception of Chile (57%) and Mexico (29%), represents less than 10% of total public investment in the sector. In other eight cases, data on expenditures made by central governments suggests that this level spends in items that are not captured by our data. Consequently, we are unable to make any statement about the destination of these resources. We can only observe that the contribution of central governments to total public educational expenditures also varies considerably among cases. The highest share is found in Belgium, with 24% of educational expenditure directly made by national government in items that exclude the payment of teachers in the Flemish educational system. However, this figure must be interpreted cautiously, since data on education expenditure refer to the whole country and our qualitative data refer only to Belgian Flemish community. Spain, Denmark and Finland follow in the ranking, with 14%, 12% and 11%, respectively. However, in the Danish case, direct expenditures by the central government are substantially financed by intergovernmental transfers from lower tiers. Finally, in federal Switzerland and the United States of America, central governments' participation in education expenditure is largely marginal.

- *In countries where central governments are responsible for paying teachers, the share of subnational governments' expenditures in educational public expenditure never falls below 16%*

We can also look at the reverse situation, i.e. countries where subnational governments are not responsible for the remuneration of teachers. In this case, the complementary role of subnational governments and schools is more evident, both as regards the development of physical structures and quality improvement. In the six countries where teacher remuneration is an exclusive responsibility of national governments, the share of subnational governments in educational public expenditure never falls below 16%,

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amounting to 30% in France. On average, a third part of the expenditures done by sub central governments, in those cases, is financed through intergovernmental transfers. However, this situation varies significantly across countries. In one extreme, we find Ireland, where transfers from central government represent 94% of all expenditures made by sub-central authorities, in a clear contrast with the French case, with less than 1%.

To sum up, sections B and C provide information on the funding sources available to perform the executive competences. As pointed out through the analysed countries, the availability and magnitude of own revenues plays an important role in decentralization process. As it could be seen, own resources constitute a significant financial source to meet sub-central governments executive competences. Nevertheless, intergovernmental transfers from central level are, as well, a meaningful mechanism to ensure the allocation of resources. And, in fact, in a few countries, there are institutional arrangements aiming at attenuating inequalities among different regions concerning educational provision. However, we could observe education systems where sub-national governments have full autonomy to allocate transfer resources and others where this autonomy is restricted because transfers are earmarked to education. This highlights different decentralization modalities, which could impact differently on policy outcomes.

D. Accountability

As it was described in the previous chapter, specific mechanisms of public and social accountability can be employed to pursue efficient and effective performance of educational executive competences by the different levels of government. Nevertheless, these mechanisms can vary across the countries. The section that follows aims at identifying and discussing some of the consequences of these variations.

As already mentioned, public accountability involves pedagogical and managerial assessments. These assessments (particularly the pedagogical one) can be performed through different instruments: student's assessments, teacher's appraisal, the appraisal of school leaders, the education system evaluation and the evaluation of schools. For methodological purpose, we focus the external evaluation of schools. This means, generally, the inspectorate system, who according to our operational definitions frequently is the institutional actor in charge of performing the oversight competence in the sphere of organization of instruction

The first sub section (public accountability) focuses on external evaluation of schools and their modalities within the education systems, complementing this information with the existence (or not) of self-evaluation of schools. The second sub section identifies the presence of specific instruments of social accountability: parents' participation and publication of evaluation reports. The third sub section follows the working hypothesis positing that different relationships of accountability will be observed depending on the level of government responsible for each executive competence. Thus, the countries were classified according to at which level teachers are recruited. This exercise aims at helping to understand the variation of accountability mechanisms according to the level

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responsible of a specific executive competence. The selection of *recruiting teachers* was intentional, because it is an action that, in an indirect way, is associated with expenditures (personnel management). At the same time, as we have seen in the first section of this Chapter, it is a competence that may fall either at the central level, sub central or school level. In this last sub section, information on who evaluates teachers complements the previous one regarding external school evaluation (and in this sense, not always, these mechanisms of assessments are a responsibility of the same level of government). We remind that, according to our operational definitions, the evaluation of teachers (extra school), was classified as an oversight competence within the sphere of personnel management.

It is important to say that the interpretations and classifications developed for this section were based on secondary sources and contrasted with specific literature regarding education assessments (Eurydice, 2015; Santiago, 2013; Shewbridge, 2013; Smith, 2016 and Hooge, 2016). Nevertheless, the information provided through these sources has the limitation of not offering notions on the actual modalities of implementation of these mechanisms. Acknowledging this limitation, the following analysis has the intention to guide the development of working hypothesis for further research work.

a. Public accountability

- *Public accountability includes managerial assessments, usually carried out by parliament and audit committees*

As described in chapter 3, the mechanisms of *public accountability,* recognized in the education systems, include an array of different instruments that allow governments to monitor and evaluate the performance of education provision. Among these elements, the *managerial assessments* are, in general, linked with specific systems of budget scrutiny. In the education system revised in the scope of this study, when the executive competences are located at central level, these assessments are generally performed by the parliament, usually with the support of the Court of Audits, who monitors central government's fiscal functions. When the executive competences are located in lower levels of government or at the school level, parliament committees could be complemented with other mechanisms of fiscal accountability, as, for example, in Denmark, where subnational levels of government carry out independent and external audits for their budget executions.

- *Managerial assessments can differ from one country to another, depending on the existence or not of consequences after evaluations*

One of the elements that can differ among the education systems is the existence of sanctions and rewards as a consequence of management performance. This variation can be recognized even in countries with similar delegation of specific executive competences. In this sense, in some education systems managerial assessments could influence budgetary decisions, but in others this does not happen, revealing differences in the mechanisms of accountability. Looking, for example, at the responsibility of

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deciding on school's budget, we see that in four countries this is a competence shared between the central government and the level of the school (Luxembourg, Brazil, France and Kenya). However, only in the case of Luxembourg managerial accountability has consequences on budgetary decisions, which means that schools are held accountable before central level and their budgets are evaluated according to school managerial performance. A similar situation can be recognized when the competence of paying teacher's salaries is observed. Finland and Poland are the cases where this competence is delegated to schools. But only in Poland, managerial assessments are based on information on school's outcomes, which flows from subnational governments to central government, and could influence in budgetary decisions. Therefore, this type of evaluation can be an important tool to monitor and even constrain school's autonomy.

- *Another element of public accountability can be recognized in pedagogical assessment, throughout the external evaluation of schools. Usually it is carried out by the inspectorate system focusing in processes.*

Pedagogical assessment throughout the external evaluation of schools is another element that, in fact, embodies the core of public accountability within the education systems. It can be highlighted the existence of this mechanism of accountability in all the countries that were analysed under the scope of this research. Generally, it is performed by the inspectorate system and/or a specific public agency, and its purpose, through external evaluation of schools, is the monitoring of teaching and learning processes. In this sense, we observe a persistence of a traditional accountability mechanism that focuses in schools' compliance with laws and regulations, usually performed by inspectors that represent higher levels of government (central or subnational). External school evaluations normally include, apart from the monitoring of the implementation of national education policies within each school, evaluations of school's environment, leadership and administration.

- *In the majority of the countries, the external school evaluation is a responsibility of central level. Several countries where this is an exclusive responsibility of sub central level have federal regimes*

In the majority of the education systems revised (15 countries), external evaluations of schools are either a responsibility of central level or a shared competence between central and subnational levels of government. This situation is evidenced even in countries where executive competences are decentralized (for example in Poland, where teacher's payment is responsibility of schools themselves and the inspectorate system is developed by central level). When the external evaluation of schools is a responsibility of sub central governments exclusively, in almost all cases this coincides with countries where the executive competences of teacher's payment and building schools are a responsibility as well of subnational levels (Belgium, Brazil, Colombia, Japan, Switzerland and USA). As it can be observed, some of these countries have federal political systems. The exceptions are Japan and Colombia.

- *In some countries, there is no external evaluation through the inspectorate system*

Particularly, we observe in a few countries where executive competences are mostly decentralized that no external evaluation takes place through the inspectorate system (Norway, Finland and Luxembourg). This means that inspectors do not visit schools themselves, but base their inspections in other sources to monitor school performance. In Norway and Finland, for example, inspectors from central level focus their assessments on school providers (in both cases Municipalities), monitoring the effectiveness of communication processes between local authorities and school heads. A similar situation we identify in Denmark, as municipalities are also responsible for schools provision. However, in this country, municipalities are also in charge of inspecting schools and carrying out external evaluations, while the Agency for Quality and Supervision, from central level, is responsible for screening overall results of all schools.

- *Pedagogical assessments can differ from one country to another depending on the purpose they follow. The publication (or not) of external evaluation reports can differentiate accountability mechanisms*

As we can observe with this general description, even though the education systems share similarities regarding pedagogical assessments, the purpose of these evaluations can vary slightly from one education system to another. In this sense, the focus could not only be concentrated in monitoring the teaching and learning process.

Publication of external evaluation reports also constitutes a significant issue to differentiate accountability mechanisms among the countries. In countries with education system decentralized to the sub central level, external evaluations could provide comparable data between regions. In this sense, we observe that external evaluation reports are published in eleven countries. In five of them, external school evaluation is performed by subnational levels (Belgium, Brazil, Japan, Switzerland and USA). This group includes as well Australia and South Africa, where external evaluations are a shared responsibility between sub central and central governments. In all these countries a share of executive responsibilities fall to the subnational level and, for that reason, the availability of publicly external reports means a mechanism to strength pedagogical assessments, allowing comparing information among regions.

- *The existence (or not) of consequences after external evaluations can differentiate accountability mechanisms. When there are no consequences in terms of sanctions and rewards, external evaluations could lead, anyway, to some actions*

The existence of some consequences following external evaluations, could serve as a mechanism to differentiate pedagogical assessments among the education. In nine of the countries analysed, pedagogical assessments do not have a direct consequence for schools. Nevertheless, within those countries, in a group of them (France, Spain, Japan,

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USA, Australia and Switzerland), external evaluation of schools could lead to the implementation of follow-up actions, the elaboration of improvement plans according to specific recommendations and/or in additional training for teachers.

- *Alternatively, external evaluations could lead to disciplinary sanctions and/or reward schemes.*

In the rest of the countries, some kind of sanction and/or reward can follow the result of the evaluation. Disciplinary sanctions acts as a response to infringements and bad performance of schools in ten countries. Usually, disciplinary sanctions are a mechanism to penalize the not compliance of schools with central or subnational education policies. As for rewards, as a consequence of evaluations, only in a few countries (Hungary, Italy, Chile, Brazil, Colombia, Mexico and Ireland) some kind of award can be granted to teachers, head teachers or schools, when good performance is identified by external evaluations. Usually a financial bonus for teachers and head teachers is the instrument selected to implement these rewards. With a similar perspective, external evaluations could contribute to make visible good practices of specific school with good performance, as in the case of Poland, that implements this type of recognition to good school practices.

- *Countries where external evaluations have consequences evidence a mechanism of hard accountability and a scenario of extrinsic motivations for the agent to perform he's competence.*

The existence of consequences from pedagogical assessments is considered a form of *hard* accountability (and by the contrary, the inexistence of these consequences is considered a soft accountability), since they provide an extrinsic motivation for agents to improve their performance, as stated by Pritchett (2015). Nevertheless, the question whether such mechanisms of sanctions and rewards lead indeed to more efficient education systems should be left as a working hypothesis for further empirical investigation, as other studies have pointed out the limitations of such arrangements (Smith, 2016).

- *Self-evaluation of schools can be used as a complementary mechanism to collect information on teaching and learning performance, becoming another instrument for public accountability.*

Apart from external evaluations, in more than a half of the countries, schools develop self-evaluations. This type of internal evaluation is a practice carried out by schools themselves to evaluate the quality of the education they provide. Within the countries, the purpose of inclusion of self-evaluation at the level of the schools and whether they are then submitted to higher levels of government, present some variations. Self-evaluations of schools could represent a complementary accountability mechanism allowing central and sub central level to collect more information on teaching and learning performance from the level of the school. The cases of Australia and Belgium seem to evidence this

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strategy. In these countries, self-evaluations of schools provides a complementary instrument to evaluate teachers.

- *In a few countries, with no external evaluations, self-evaluations of schools represent the only stance to assess teaching and learning.*

In other cases, with no presence of external school evaluations (as in Finland, Norway or Luxembourg), self-evaluations of schools represent the only stance of teaching and learning assessment, and school providers have to report these outcomes to higher levels of government. Thus, self-evaluation outcomes flow from school to subnational and central government levels.

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Table 4.11: Mechanisms of public accountability

Country	Who evaluates schools (extra school)	Pedagogical assessment (external school evaluation)		Managerial assessment		Existence of self evaluation of schools? Yes/ No
		Purpose of evaluation Monitorig/ Outcomes	Sanctions and awards as consequences of public accountability Yes/No	Purpose of evaluation Monitorig/ Outcomes	Sanctions and awards as consequences of public accountability Yes/No	
Chile	Central government	Monitoring	Yes (disciplinary sanctions; awards to teachers	Monitoring and outcomes	Yes	Yes
France	Central government	Monitoring	No (follow-up actions)	Monitoring	No	Yes (but only in secondary schools)
Ireland	Central government	Outcomes	Yes (awards to schools)	Monitoring	Yes	Yes
Italy	Central government	Monitoring	Yes (awards to teachers)	Monitoring	Yes	Yes
Kenya	Central government	Monitoring	Yes (disciplinary sanctions)	Monitoring	No	Yes (but not a common practice)
Luxembourg	Central government	Inspectors do not visit schools	No	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes
Mexico	Central government	Monitoring and outcomes	Yes (awards to teachers)	Monitoring	No	Yes
Nigeria	Central government	Monitoring	Yes (disciplinary sanctions)	Monitoring	No	No
Norway	Central government	Inspectors do not visit schools	No	Monitoring	No	Yes
Poland	Central government	Monitoring	Yes (disciplinary sanctions; recognition to schools with good practices)	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes
Austria	Central and sub central government	Monitoring	Yes (disciplinary sanctions)	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes

Australia	Central and sub central government	Monitoring	No (follow-up actions; market-oriented pressure)	Monitoring	No	Yes (School principals evaluate teachers)
Denmark	Central and sub central government	Outcomes	Yes (disciplinary sanctions to municipalities)	Monitoring	No (sanctions to municipalities)	Yes (decision is left to Municipalities)
South Africa	Central and sub central government	Monitoring	Yes (disciplinary sanctions)	Monitoring and outcomes	Yes (can influence budgetary decisions)	No
Spain	Central and sub central government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	Yes
Belgium	sub central government	Monitoring and outcomes	Yes (disciplinary sanctions; market-oriented pressure)	Monitoring and outcomes	Yes	Yes (school principals evaluate teachers)
Brazil	sub central government	Monitoring	Yes (awards to teachers; awards to Head teachers)	Monitoring	Yes	No
Colombia	sub central government	Monitoring	Yes (disciplinary sanctions; awards to teachers; awards to Head teachers)	Monitoring	Yes	Yes
Japan	sub central government	Monitoring	No (follow-up actions)	Monitoring	No	Yes
Switzerland	sub central government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	No
United States	sub central government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	No
Finland	sub central government	Inspectors do not visit schools	No	Monitoring	No	Yes (school principals evaluate teachers)
Hungary	Central, sub central government and external experts at school level	Monitoring	Yes (disciplinary sanctions; awards to teachers)	Monitoring	No	Yes (with external experts)

b. Social accountability

- *Apart from differentiating public accountability mechanisms, the publication of reports represents an instrument of social accountability. In market-based education systems, reports are usually published.*

As we have already noted, the publication of reports is an instrument that could differentiate public accountability among the education systems. However, it represents, as well, a specific mechanism of *social accountability*, as it allows the citizens to have direct and easy access to region's and school's educational outcomes. This type of strong social accountability is present in a half of the countries.

In countries where families are free to choose where to enrol their children, external evaluations could also assure a mechanism to disseminate information on school's performance and provide the families with comparable data to decide which school to choose. Particularly in the cases of Belgium (Flemish community) and Australia, the publication of reports provides families with information on schools. We can observe a similar situation in Ireland, where external evaluation reports are also published. In these countries, the possibility to choose schools generates a market-like dynamic. In this sense, when reports are published, external evaluations produce some kind of pressure to schools to improve its performance and position inside a general school ranking.

- *Social accountability is usually enabled through parents' participation in schools' governing bodies*

Although in almost all the countries analysed we detect social accountability mechanisms, the form in which community is involved in the evaluation and monitoring of the teaching and learning process varies. Most frequently, community involvement derives from parent´s participation in school's governing bodies, which enables the community, through parent's representation, to influence in educational performance. This ensures social accountability in the form of parent's permanent participation inside schools. In most of the countries, community participation through the schools' governing bodies is mandatory, as in the United States, Chile, Kenya and South Africa. In addition, other ways of participation can be recognized in the involvement of parents either in the elaboration of the school plans (in the case of Luxembourg) or in the evaluation of teachers (in the case of Italy). The cases of France and Mexico can also be remarked, because in those countries parents are involved in different parent's associations, with representations at national, sub central and school level. Through their participation, parents can express and defend their common interest regarding their children's education, and perform some kind of social pressure to the education system.

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- *Self-evaluations of schools represents, as well, an instrument for social accountability when it provides educational community and stakeholders with broader information on school performance*

As for self-evaluations, they can represent, as well, a mechanism of *social accountability*, when reports are disseminated within the community. In some countries, internal evaluation reports provide the community with information in order to control and monitor school performance. However, this instrument could be enhanced, when this information also involves different stakeholders, as in the case of Denmark. In this country, a School Head is not only accountable before a higher level of government and before a school council with parents' representation, but also before stakeholders that participate as well in school councils. This type of social accountability, also called "multiple school accountability design" (Hooge, 2016) has the potential to leverage the use of self-evaluations to target quality improvement, involving community actors.

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Table 4.12: Mechanisms of social accountability

Country	Who evaluates schools (extra school)	Parent's participation is mandatory? Yes/ No	External internal evalutaion are published? Yes/ No
Chile	Central government	Yes (parent's participation in governing bodies)	Yes
France	Central government	Yes (parent's participation in education councils)	No
Ireland	Central government	Yes (parent's participation in governing bodies)	Yes
Italy	Central government	Yes (parent's participation in governing bodies; parent's participation in the evaluation of teachers)	No
Kenya	Central government	Yes (parent's participation in governing bodies)	No
Luxembourg	Central government	Yes (parent's participation in governing bodies; parent's participation in the elaboration of school plans)	No
Mexico	Central government	Yes (parent's participation in education councils)	Yes
Nigeria	Central government	Yes (parent's participation in education councils)	No
Norway	Central government	Yes (parent's participation in governing bodies)	No
Poland	Central government	Yes (parent's participation in governing bodies ; parent's participation in self-evaluations of schools)	Yes
Austria	Central and sub central government	No	Yes (self-evaluation reports distributed to parents)
Australia	Central and sub central government	Yes (parent's participation in education councils)	Yes
Denmark	Central and sub central government	Yes (parent's participation in governing bodies; parent's participation in self-evaluations of schools)	No
South Africa	Central and sub central government	Yes (parent's participation in governing bodies)	Yes
Spain	Central and sub central government	Yes (parent's participation in education councils)	Yes (self-evaluation reports distributed to parents)
Belgium	sub central government	Yes (parent's participation in education councils)	Yes
Brazil	sub central government	Yes (parent's participation in education councils)	Yes
Colombia	sub central government	Yes (parent's participation in self-evaluation of schools)	No
Japan	sub central government	Yes (parent's participation in governing bodies)	Yes
Switzerland	sub central government	No	Yes

United States	sub central government	Yes (parent's participation in governing bodies)	Yes
Finland	sub central government	No	No
Hungary	Central, sub central government and external experts at school level	Yes (parent's participation in education councils)	No

c. Accountability mechanisms according to the distribution of competences

- *When focusing on one specific competence (in this case, the competence of recruiting teachers) different mechanisms of accountability can be recognized.*

Along with what was already described, accountability mechanisms involve different instruments and strategies. The differences between the countries regarding the presence or absence of these elements could be associated to the modality of decentralization within each education system, concerning the different executive competences. An in-depth analysis of this relationship can be done when highlighting specifically one of the executive competences. We have chosen, to develop this analysis, to look in particular at the act of *recruiting teachers*, as it is a crucial competence in the provision of education; at the same time, our dataset indicates that it is a competence that countries can delegate at central, subnational or the school level. In this sense, and from an exploratory perspective, we ask ourselves if the difference in the level of government responsible for this executive competence is also related to specific mechanisms of accountability, and if these mechanisms set different incentives for the agent responsible to perform this action. Following this proposal, the countries have been grouped according to the level responsible of recruiting teachers (central, sub central or at school level – see Table 13).

- *When the recruitment of teachers is located at central level, the evaluation of teachers is also a responsibility of central government. Public accountability focuses on processes, but self-evaluation of schools provide a complementary tool to monitor performance. Parents' participation in school enables social accountability.*

In the first group, six countries locate the recruitment of teachers and, at the same time, the evaluation of teachers (extra school) as central level competences. Consequently, in this group executive agents have high autonomy. The purpose of pedagogical and managerial assessments is to monitor school performance (with the exceptions of Luxembourg and Austria, where managerial assessments can influence budgetary decisions). Different types of consequence can derive from pedagogical evaluation in this group. Different mechanisms of social accountability are also found in this group, particularly regarding parents' participation in school matters. This group evidences the presence of self-evaluation of schools as a complement tool to evaluate the quality of education provision.

- *With some few exceptions, when the recruitment of teachers is delegated to subnational level, teachers' evaluation is also delegated in that level of government. Public accountability focuses on processes, but reports are usually published, strengthening social accountability.*

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A second group is composed by eleven countries where the recruitment of teachers is a responsibility of the subnational level of government (with the exception of some countries, where this competence is shared either with the central level –Spain and Nigeria- or with the school level –Norway, South Africa and Colombia)[20]. In almost all the countries within this group, the evaluation of teachers (extra school) relies on the subnational level. Both executive and oversight competences are delegated to the sub central level, which enjoy high autonomy to perform this competence. Nevertheless, there are some exceptions. In the case of Chile and Mexico, the evaluation of teachers is done by the central level. In the case of Norway, teachers are only evaluated at the school level and there are no external evaluations of their performance.

In this group, the purpose of pedagogical and managerial assessment is the monitoring of schools' performance and different types of consequence can derive from the outcomes of these evaluations. We also observe the presence of different mechanisms of social accountability and self-evaluation of schools. In contrast with the first group, it can be highlighted the practice, within these countries, of publishing either external or internal evaluation reports, and therefore, the practice of exercising a stronger control over schools under the scope of each region. At stated by Smith (2016), publication of reports that could provide comparable data of schools is an accountability instrument that gives the necessary pressure to change educator behaviour and improve school practices. However, the benefits of these alterations for students are not entirely clear.

- *When the recruitment of teachers is a responsibility of schools, the external evaluation of teachers is done from a higher level of government. However, to a larger extent, public accountability could be based in school outcomes, giving more autonomy to schools, as well as more incentives. Parents' participation and publication of reports are instruments to strengthen social accountability.*

In the third group, we can observe six education systems where the recruitment of teachers lies on schools, showing a decentralization of this policy implementation. Logically, the external evaluation of teachers is a responsibility in all cases of a higher level of government, either central or subnational. Within this group, the purpose of pedagogical and managerial assessment is the monitoring of schools' performance. However, in this group, and in contrast to the others, external evaluations are not only conducted to monitor in a systematic way all schools or a sample of them, but alternatively tend to focus on schools that are not performing according to the expected standards (particularly in the cases of Ireland and Denmark). At the same time, this group includes countries with no external evaluations. Therefore, the focus on processes is to some extent less present in the third group, which suggests that the scope of the school

[20] Nevertheless, in these countries, the relevant level of government for this executive competence is the subnational level. In the case of Finland, recruitment is also shared between the level of the school and the subnational government, but in this country, the relevant level is the school. Therefore, Finland is included in the third group.

autonomy is less constrained when education systems are more decentralized. However, hard accountability is more frequent when the executive competence of recruitment is decentralized to the school level, as sanctions and rewards are found to be more frequent within this group. In addition, with the exception of Finland, mechanisms of social accountability are always present, involving different instruments and practices. Thus, schools are extrinsically motivated to perform according to clear rules and knowing what would happen if the evaluation outcomes identify as good or bad performance.

To summarize, it can be stressed that public accountability mechanisms can differ across the countries according to the availability (or not) of specific instruments that could strengthen the scope of its control and monitoring. The publication of reports and the existence of self-evaluation of schools are two of these complementary instruments. In addition, social accountability is a method to assure the availability and disposition of citizens to hold the different levels of government accountable for their educational executive performance. The decentralization of educational competences seems to be connected to a certain extent, with some specific combination of such accountability mechanisms, which usually play a complementary and reinforcing role between them. In the analysed countries, particularly through the delegation of the act of recruiting teachers, we observed that when this competence is decentralized to the level of the school, all accountability mechanisms appear to be deployed at a greater extent and apparently in a complementary fashion.

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Table 4.13: Mechanisms of public and social accountability. Countries grouped by executive competence "recruit teachers".

Country	Who recruits teachers	Who evaluates teachers (extra school)	Public accountability					Social accountability	
			Pedagogical assessment (external school evaluation)		Managerial assessment (external school evaluation)		Existence of self evaluation of schools? Yes/ No	Parent's participation is mandatory? Yes/ No	External internal evalutaion are published? Yes/ No
			Purpose of evaluation Monitorig/ Outcomes	Sanctions and awards as consequences of public accountability Yes/No	Purpose of evaluation Monitorig/ Outcomes	Sanctions and awards as consequences of public accountability Yes/No			
Hungary	Central government	Central government and schools	Monitoring	Yes (disciplinary sanctions; awards to teachers)	Monitoring	No	Yes (with external experts)	Yes (parent's participation in education councils)	No
Luxembourg		Central government	Inspectors do not visit schools	No	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes	Yes (parent's participation in governing bodies; parent's participation in the elaboration of school plans)	No
Kenya		Central government	Monitoring	Yes (disciplinary sanctions)	Monitoring	No	Yes (but not a common practice)	Yes (parent's participation in governing bodies)	No

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France		Central government	Monitoring	No (follow-up actions)	Monitoring	No	Yes (but only in secondary schools)	Yes (parent's participation in education councils)	No
Italy		Central government	Monitoring	Yes (awards to teachers)	Monitoring	Yes	Yes	Yes (parent's participation in governing bodies; parent's participation in the evaluation of teachers)	No
Austria		Central and subnational government	Monitoring	Yes (disciplinary sanctions)	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes	No	Yes (self-evaluation reports distributed to parents)
Spain	Central and Subnational government	Subnational government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	Yes	Yes (parent's participation in education councils)	Yes (self-evaluation reports distributed to parents)
Nigeria		Central government	Monitoring	Yes (disciplinary sanctions)	Monitoring	No	No	Yes (parent's participation in education councils)	No

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Chile	Subnational government	Central government	Monitoring	Yes (disciplinary sanctions; awards to teachers	Monitoring and outcomes	Yes	Yes	Yes (parent's participation in governing bodies)	Yes
Japan		Missing information	Monitoring	No (follow-up actions)	Monitoring	No	Yes	Yes (parent's participation in governing bodies)	Yes
Brazil		Subnational government	Monitoring	Yes (awards to teachers; awards to Head teachers)	Monitoring	Yes	No	Yes (parent's participation in education councils)	Yes
United States		Subnational government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	No	Yes (parent's participation in governing bodies)	Yes
Mexico		Central government	Monitoring and outcomes	Yes (awards to teachers)	Monitoring	No	Yes	Yes (parent's participation in education councils)	Yes

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Australia		Subnational government	Monitoring	No (follow-up actions; market-oriented pressure)	Monitoring	No	Yes (School principals evaluate teachers)	Yes (parent's participation in education councils)	Yes
Norway	Subnational government and schools	_	Inspectors do not visit schools	No	Monitoring	No	Yes	Yes (parent's participation in governing bodies)	No
South Africa		Subnational government	Monitoring	Yes (disciplinary sanctions)	Monitoring and outcomes	Yes (can influence budgetary decisions)	No	Yes (parent's participation in governing bodies)	Yes
Colombia		Subnational government	Monitoring	Yes (disciplinary sanctions; awards to teachers; awards to Head teachers)	Monitoring	Yes	Yes	Yes (parent's participation in self-evaluation of schools)	No
Finland		_	Inspectors do not visit schools	No	Monitoring	No	Yes (school principals evaluate teachers)	No	No

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Ireland	Schools	Central government and schools	Outcomes	Yes (awards to schools)	Monitoring	Yes	Yes	Yes (parent's participation in governing bodies)	Yes
Belgium (Flemish Community)		Subnational government	Monitoring and outcomes	Yes (disciplinary sanctions; market-oriented pressure)	Monitoring and outcomes	Yes	Yes (school principals evaluate teachers)	Yes (parent's participation in education councils)	Yes
Switzerland		Subnational government	Monitoring	No (follow-up actions)	Monitoring	Yes (can influence budgetary decisions)	No	No	Yes
Denmark		Central government and schools	Outcomes	Yes (disciplinary sanctions to municipalities)	Monitoring (parliament and independent audit)	No (sanctions to municipalities)	Yes (decision is left to Municipalities)	Yes (parent's participation in governing bodies; parent's participation in self-evaluations of schools)	No
Poland		Central government	Monitoring	Yes (disciplinary sanctions; recognition to schools with good practices)	Monitoring and outcomes	Yes (can influence budgetary decisions)	Yes	Yes (parent's participation in governing bodies ; parent's participation in self-evaluations of schools)	Yes

Data Annex (Chapter 4)

Table 1: Distribution of standard-setting, executive and oversight competences and regulatory frameworks, by sphere of educational policy.

Legends:

- **Standard-setting, executive and oversight competences**
  - 1: Central government only
  - 2: Central and sub-central governments
  - 3: Sub-central governments only
  - 4: Central government and schools
  - 5: Central and sub-central governments and schools
  - 6: Sub-central governments and schools
  - 7: Schools only

- **Regulatory framework**
  - 1: Low executive autonomy (decentralization of policy implementation)
  - 2: Moderate-low executive autonomy (concentration of policy design and implementation with vertical oversight)
  - 3: Moderate-high executive autonomy (decentralization of policy implementation with horizontal oversight)
  - 4: High executive autonomy (concentration of policy implementation)

Table 2: Funding sources and transfer modalities, by executive level and spheres of educational policy.

Legends:

- **Own revenue and Transfers**
  - 0: No
  - 1: Yes

- **Grant assignation mechanism**
  - 1: Discretionary
  - 3: Automatic

- **Definition of grant amount**
  - 1: Arbitrary
  - 2: Based on needs-assessment
  - 3: Formula-based

- **Purpose of grant**
  - 1: Earmarked
  - 2: Block grant
  - 3: Lump sum

Table 3: Allocative autonomy of sub-central governments and schools over transfers by kinds of expenditure.

Legends:

- **Index of allocative autonomy over transfers**
  - 1.0 =< AAI =< 1.3: Low
  - 1.7 =< AAI =< 2.3: Moderate
  - 2.7 =< AAI =< 3.0: High

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Table 1: Distribution of standard-setting, executive and oversight competences and regulatory frameworks, by sphere of educational policy.

Country	Curriculum (F1)				Development of Physical Structures (F2)					
	Definition of official curriculum	Select textbooks	Evaluation of students' learning achievements (extra school)	Regulatory framework	Def. of quality standards for school infrastructure	Construction, rental or acquisition of school infrastructure	Acquisition of school equipment	Inspection of school facilities (incl. authorization for functioning)	Regulatory framework (E1)	Regulatory framework (E2)
Australia	2	-	2	1	3	3	3	3	4	4
Austria	1	7	1	1	1	2	3	2	3	1
Belgium	5	7	3	1	3	3	7	3	4	1
Brazil	5	7	2	1	2	3	3	2	4	4
Chile	4	4	1	2	1	3	3	1	1	1
Colombia	4	7	2	2	1	3	3	3	3	3
Denmark	5	7	2	2	1	3	7	1	1	1
Finland	5	7	1	1	1	7	7	-	1	1
France	1	7	1	1	1	3	5	1	1	1
Hungary	1	7	1	1	-	2	2	1	4	4
Ireland	4	7	1	1	1	7	7	1	1	1
Italy	6	7	1	1	-	3	7	1	1	1
Japan	1	3	2	3	1	3	3	3	3	3
Kenya	1	4	1	1	1	4	4	1	4	4
Luxembourg	4	1	1	4	1	3	3	1	1	1
Mexico	2	1	1	4	2	2	3	2	1	1
Norway	5	7	1	1	1	3	6	3	3	3
Poland	1	7	1	1	1	3	3	3	3	3
South Africa	1	4	2	1	1	3	7	2	3	1
Spain	5	7	2	1	1	3	7	2	3	1
Switzerland	3	3	3	4	3	3	7	3	4	1
United States	3	6	3	1	3	3	3	3	4	4

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Table 1 (continued): Distribution of standard-setting, executive and oversight competences and regulatory frameworks, by sphere of educational policy.

Country	Personnel management (F3)							Quality improvement (F4)						
	Def. of requirements to enter the teaching profession.	Definition of teachers' statute	Recruitment of teachers	Payment of teacher salaries	Evaluation of teachers	Regulatory framework (E1)	Regulatory framework (E2)	Def. of standards for teacher in-service training	Def. of quality standards for school development	Provision of in-service teacher training	Def. of school budgets	Evaluation of implementation of school plans	Regulatory framework (E1)	Regulatory framework (E2)
Australia	1	3	3	-	3	3	4	3	1	3	7	6	4	1
Austria	1	1	1	2	2	4	3	1	1	3	1	2	1	4
Belgium	3	3	7	3	3	1	4	3	-	6	6	3	4	1
Brazil	2	3	3	3	3	4	4	2	2	5	4	2	3	3
Chile	1	1	3	3	1	1	1	1	1	5	7	5	3	1
Colombia	1	1	6	3	3	3	3	1	2	6	3	6	3	4
Denmark	1	3	7	3	2	1	4	-	2	3	6	2	4	4
Finland	1	2	6	7	-	3	3	4	1	7	3	7	4	3
France	1	1	1	1	1	4	4	1	1	1	4	1	4	4
Hungary	-	1	1	1	4	4	4	1	-	1	1	1	4	4
Ireland	1	1	7	1	4	1	4	1	1	1	1	1	4	4
Italy	1	1	1	1	1	4	4	-	-	7	7	6	1	1
Japan	1	3	3	3	-	3	4	1	2	2	3	5	4	3
Kenya	1	1	1	1	1	4	4	1	1	1	4	1	4	4
Luxembourg	1	1	1	1	1	4	4	1	1	4	4	2	4	4
Mexico	1	2	3	3	1	1	1	1	1	2	7	1	4	1
Norway	1	1	6	3	-	3	3	2	1	2	7	7	2	1
Poland	1	1	7	7	1	1	1	1	1	1	3	1	4	1
South Africa	1	1	6	3	3	3	3	1	-	6	7	6	1	1
Spain	1	2	2	3	3	3	4	1	1	3	3	3	3	3
Switzerland	3	3	7	3	3	1	4	3	3	3	3	3	4	4
United States	3	3	3	3	3	4	4	3	3	3	3	3	4	4

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Table 1 (continued): Distribution of standard-setting, executive and oversight competences and regulatory frameworks, by sphere of educational policy.

Country	Organization of instruction (F5)						
	Definition of pupil-teacher ratio	Definition of time of instruction	Admit students	Choose teaching method	External evaluation of schools	Regulatory framework (E1)	Regulatory framework (E2)
Australia	3	1	7	7	2	1	1
Austria	1	1	7	7	2	1	1
Belgium	7	6	6	7	3	4	1
Brazil	3	2	3	7	3	4	1
Chile	-	1	7	7	1	1	1
Colombia	7	5	7	7	3	2	2
Denmark	1	5	3	7	2	3	2
Finland	7	4	3	7	3	3	3
France	-	1	1	7	1	4	1
Hungary	1	1	1	7	5	4	1
Ireland	1	1	4	7	1	1	1
Italy	6	6	7	7	1	1	1
Japan	1	1	-	7	3	3	1
Kenya	1	1	1	-	1	4	1
Luxembourg	7	1	6	4	1	2	1
Mexico	0	2	7	7	1	1	1
Norway	1	2	3	7	1	1	1
Poland	1	1	1	7	1	4	1
South Africa	1	1	4	7	2	1	1
Spain	1	7	7	7	2	1	2
Switzerland	3	3	7	7	3	1	1
United States	3	3	3	7	3	4	1

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Table 2: Funding sources and transfer modalities, by executive level and spheres of educational policy.

Country	Central governments			Sub-central governments				
	Physical Structures (F2) - Capital expenditures	Teacher management (F3) - Current expenditures	Quality improvement (F4) - Current expenditures	Physical Structures (F2) - Capital expenditures				
	Own revenue	Own revenue	Own revenue	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl
Australia	-	-	-	1	1	3	3	3
Austria	1	1	1	1	0	-	-	-
Belgium	-	-	-	1	1	3	3	3
Brazil	-	-	1	1	1	3	3	2
Chile	-	-	1	1	1	3	3	3
Colombia	-	-	-	1	1	3	3	2
Denmark	-	-	-	1	1	3	3	3
Finland	-	-	-	-	-	-	-	-
France	1	1	1	1	1	3	3	3
Hungary	1	1	1	1	0	-	-	-
Ireland	-	1	1	-	-	-	-	-
Italy	-	1	-	0	1	3	2	1
Japan	-	-	1	1	1	3	3	3
Kenya	1	1	1	-	-	-	-	-
Luxembourg	-	1	1	1	1	3	3	-
Mexico	1	-	1	1	1	3	3	1
Norway	-	-	1	1	1	3	3	3
Poland	-	-	1	1	1	3	3	3
South Africa	-	-	-	1	1	3	-	-
Spain	-	1	-	1	1	3	3	3
Switzerland	-	-	-	1	1	1	1	-
United States	-	-	-	1	1	3	3	3

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Table 2 (continued): Funding sources and transfer modalities, by executive level and spheres of educational policy.

Country	Sub-central governments Teacher management (F3) - Current expenditures					Sub-central governments Quality improvement (F4) - Current expenditures				
	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl
Australia	1	1	3	3	3	1	1	3	3	3
Austria	0	1	3	3	1	0	1	3	3	-
Belgium	1	1	3	3	3	1	1	3	3	3
Brazil	1	1	3	3	2	1	1	3	3	2
Chile	1	1	3	3	3	1	1	1	2	1
Colombia	1	1	3	3	2	1	1	3	3	2
Denmark	1	1	3	3	3	1	1	3	3	3
Finland	-	-	-	-	-	1	1	3	3	3
France	-	-	-	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-	-	-	-
Japan	1	1	3	3	3	1	1	3	3	3
Kenya	-	-	-	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-
Mexico	1	1	3	3	2	1	1	-	-	-
Norway	1	1	3	3	3	1	1	1	2	1
Poland	-	-	-	-	-	1	1	3	3	3
South Africa	1	1	3	-	-	1	1	3	-	-
Spain	1	1	3	3	3	1	1	3	3	3
Switzerland	1	1	3	-	3	1	1	3	-	3
United States	1	1	3	3	3	1	1	3	3	3

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Table 2 (continued): Funding sources and transfer modalities, by executive level and spheres of educational policy.

Country	Schools Physical Structures (F2) - Capital expenditures					Schools Teacher management (F3) - Current expenditures					Schools Quality improvement (F4) - Current expenditures				
	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl	Own revenue	Transfers	Grant assignation mechanism	Definition of grant amount	Purpose of grantl
Australia	-	-	-	-	-	-	-	-	-	-	1	1	3	3	2
Austria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	1	1	3	2	1	-	-	-	-	-	0	1	3	2	2
Brazil	-	-	-	-	-	-	-	-	-	-	0	1	1	2	1
Chile	-	-	-	-	-	-	-	-	-	-	1	1	1	2	1
Colombia	-	-	-	-	-	-	-	-	-	-	1	1	3	2	1
Denmark	0	1	1	2	1	-	-	-	-	-	0	1	1	2	2
Finland	-	1	3	-	2	-	1	3	-	2	-	1	3	-	2
France	1	1	1	2	1	-	-	-	-	-	1	1	1	2	-
Hungary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	1	1	3	3	1	-	-	-	-	-	-	-	-	-	-
Italy	1	1	3	2	1	-	-	-	-	-	1	1	3	2	1
Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kenya	1	0	-	-	-	-	-	-	-	-	1	1	3	2	1
Luxembourg	-	-	-	-	-	-	-	-	-	-	1	1	3	2	1
Mexico	-	-	-	-	-	-	-	-	-	-	0	1	1	2	1
Norway	0	1	-	-	2	-	-	-	-	-	0	1	-	-	2
Poland	-	-	-	-	-	0	1	3	2	2	-	-	-	-	-
South Africa	1	1	3	-	2	-	-	-	-	-	1	1	3	-	2
Spain	1	1	1	2	1	-	-	-	-	-	-	-	-	-	-
Switzerland	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-
United States	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Table 3: Index of allocative autonomy of sub-central governments and schools over transfers by kinds of expenditure.

Country	Sub-central governments			Schools		
	Physical structures (F2 - capital)	Teacher management (F3 - salaries)	Quality improvement (F4 - other current)	Physical structures (F2 - capital)	Teacher management (F3 - salaries)	Quality improvement (F4 - other current)
Australia	3,0	3,0	3,0	-	-	3,0
Austria	-	2,3	3,0	-	-	-
Belgium	3,0	3,0	3,0	2,0	-	2,7
Brazil	2,7	2,7	2,7	-	-	1,3
Chile	3,0	3,0	1,3	-	-	1,3
Colombia	2,7	2,7	2,7	-	-	2,0
Denmark	3,0	3,0	3,0	1,3	-	2,0
Finland	-	-	3,0	3,0	3,0	3,0
France	3,0	-	-	1,3	-	1,5
Hungary	-	-	-	-	-	-
Ireland	-	-	-	2,3	-	-
Italy	2,0	-	-	2,0	-	2,0
Japan	3,0	3,0	3,0	-	-	-
Kenya	-	-	-	-	-	2,0
Luxembourg	3,0	-	-	-	-	2,0
Mexico	2,3	2,7	-	-	-	1,3
Norway	3,0	3,0	1,3	3,0	-	3,0
Poland	3,0	-	3,0	-	2,7	-
South Africa	3,0	3,0	3,0	3,0	-	3,0
Spain	3,0	3,0	3,0	1,3	-	-
Switzerland	1,0	3,0	3,0	1,0	-	-
United States	3,0	3,0	3,0	-	-	-

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Chapter 5: Quantitative analysis of our qualitative data and potential uses of our measures of education decentralization

In this chapter, we address the following research question:

- Are different patterns of financial decentralization in education associated with different educational outcomes?

To do so, we resort to a quantitative exploratory analysis of our qualitative data. The sections of this chapter reproduce the successive stages of our exploratory exercise.

Following the procedures described in Chapter 3, we treated the categorical variables used in our qualitative analysis (Chapter 4) in order to transform them into numeric country indexes of decentralization of executive autonomy and indexes of autonomy to allocate transfer resources for sub central governments and schools. The decentralization index of executive autonomy can vary between zero – no decentralization – and 3.6 – maximum decentralization. The index of allocative autonomy over transfers varies between 1.0 (low autonomy) and 3.0 (high autonomy). Descriptive statistics of these three variables are reported in Table 1. Information for each country is reported in the Data Annex at the end of this chapter.

Table 5.1: Descriptive statistics – Decentralization index of executive autonomy (EAI) and allocative autonomy index over transfers (AAI) for schools and sub-central governments.

Indicator	Mean	Minimum	Maximum	Std. Deviation	N
Decentralization index of executive autonomy (EAI)	2,15	0,85	3,15	0,55	22
Allocative Autonomy Index - Schools	2,04	1,00	3,00	0,68	18
Allocative Autonomy Index - Sub-central gvts	2,77	2,00	3,00	0,31	19

We begin by analysing in greater detail how executive autonomy is decentralized across different items, functions and dimensions in order to identify patterns that could be indicative of potential complementarities and/or a-complementarities in the devolution of decision power in different spheres of educational policy. This also allows us to identify the potentialities and limitations of our dataset to carry out sound quantitative analysis.

In the second section, we ask whether we can identify, in our group of countries and using our data, any significant association between the decentralization of executive autonomy and education policy effectiveness. We use country averages of students' average scores in PISA as a proxy indicator of the latter.

Finally, we investigate whether the autonomy given to sub central governments and schools to allocate transfer resources appears associated with countries' performance in PISA.

A. Decentralization of executive autonomy: exploring potential complementarities and a-complementarities across policy spheres

As we explained in Chapter 3, our definition of education decentralization tries to account for the devolution of decision-making authority in five spheres of educational policy. Given our interest in knowing, specifically, the effects of financial decentralization, we looked at six executive competences related to three policy spheres that, according to our operational definitions, are directly associated with spending decisions: the development of physical structures, teacher management and quality improvement. However, we also hypothesize that the effects of financial decentralization could be linked to indirect effects of the decentralization of decision-making authority in areas that do not entail, in a direct fashion, the allocation of financial resources, leading us to incorporate to our analysis what we call the pedagogical spheres of curriculum development and organization of instruction.

The incorporation of these two functions to our analytical framework provides us with a more encompassing picture of the main decisions that craft basic education policies and enables to explore the interactions between these functions, asking for the existence of complementarities and a-complementarities among them and the way they are decentralized. It offers the opportunity to test empirically whether "pedagogical" decisions affect "expenditure" decisions and vice-versa. By answering to those questions, we investigate the virtues and pitfalls of building an aggregate index of decentralization of educational systems, which could have extensive use in future research.

As described in Chapter 3, the procedure leading to the building of such an aggregate index involved the computation of the simple average between indexes for items belonging to the same function. Similarly, averages for each type of function (pedagogical or financial) were computed. Finally, general EAI was computed as the average between the two resulting indexes.

In order to address the question on the potential complementarities among items of educational policy, among items, functions and types of functions, we analysed their correlation. Our analysis started by looking at EAI in its most disaggregated form, i.e. the index of executive autonomy for each one of the eight items (executive competences) included in our framework.

As can be seen from Table 2, the items that compound our "Development of physical structures" function (F2E1 and F2E2) are strongly correlated to each other. In contrast, there is only a mild correlation among the components of "Personnel management" (F3E1 and F3E2) and of "Organization of instruction" (F5E1 and F5E2), and no significant correlation at all among the components of "Improvement of educational quality" (F4E1 and F4E2).

In turn, institutional arrangements regarding "Construction, rental or acquisition of school infrastructure" (F2E1) show strong correlation with their equivalent as regards payment of teacher salaries (F3E2). As for the level of decentralization in the acquisition of school equipment (F2E2), it correlates with both decentralization in the recruitment of teachers (F3E1), payment of teacher salaries and provision of in-service teacher training

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programmes (F4E1). Decentralization in the payment of teacher salaries, in turn, correlates with decentralization in the definition of school budgets (F4E2). The degree of decentralization in the provision of in-service teacher training programmes appears to be mildly correlated with decentralization in both components of organization of instruction: admission of students (F5E1) and choice of teaching method (F5E2). Last but not least, institutional arrangements regarding the definition of school budgets shows strong correlation with their equivalent regarding the admission of students and mild correlation with decentralization of the choice of teaching methods.

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Table 5.2: Pearson's correlation coefficients among EAI components

		F1_EAI	F2E1_EAI	F2E2_EAI	F3E1_EAI	F3E2_EAI	F4E1_EAI	F4E2_EAI	F5E1_EAI	F5E2_EAI
F1_EAI	Pearson corr.	1	,188	,072	-,077	,086	,262	-,274	-,156	,478
	Sig.		,442	,770	,755	,725	,279	,256	,537	,039
	N	19	19	19	19	19	19	19	18	19
F2E1_EAI	Pearson corr.	,188	1	,522**	,365	,540**	,233	,129	-,080	,128
	Sig.	,442		**,018**	,114	**,017**	,324	,589	,744	,592
	N	19	20	20	20	19	20	20	19	20
F2E2_EAI	Pearson corr.	,072	,522	1	,503**	,451*	,473**	,210	,345	,189
	Sig.	,770	,018		**,024**	**,052**	**,035**	,374	,148	,426
	N	19	20	20	20	19	20	20	19	20
F3E1_EAI	Pearson corr.	-,077	,365	,503	1	,372	-,043	-,057	-,145	,123
	Sig.	,755	,114	,024		**,117**	,857	,812	,553	,604
	N	19	20	20	20	19	20	20	19	20
F3E2_EAI	Pearson corr.	,086	,540	,451	,372	1	,262	,403**	,294	,456
	Sig.	,725	,017	,052	,117		,278	**,087**	,236	,050
	N	19	19	19	19	19	19	19	18	19
F4E1_EAI	Pearson corr.	,262	,233	,473	-,043	,262	1	,298	,389*	,388*
	Sig.	,279	,324	,035	,857	,278		,202	**,100**	**,091**
	N	19	20	20	20	19	20	20	19	20
F4E2_EAI	Pearson corr.	-,274	,129	,210	-,057	,403	,298	1	,642**	,361
	Sig.	,256	,589	,374	,812	,087	,202		**,003**	**,118**
	N	19	20	20	20	19	20	20	19	20
F5E1_EAI	Pearson corr.	-,156	-,080	,345	-,145	,294	,389	,642	1	,355
	Sig.	,537	,744	,148	,553	,236	,100	,003		,136
	N	18	19	19	19	18	19	19	19	19
F5E2_EAI	Pearson corr.	,478	,128	,189	,123	,456	,388	,361	,355	1
	Sig.	,039	,592	,426	,604	,050	,091	,118	,136	
	N	19	20	20	20	19	20	20	19	20

The aggregation of components' indexes by function, by type of function and in general results in eight indexes. Given the correlation matrix among components and the procedure of aggregation, these aggregated indexes correlate to each other in the way shown in Table 3.

Namely, decentralization of curriculum management (F1) does not correlate with decentralization in any of the other functions. Decentralization regarding development of physical structures (F2), instead, correlates strongly with decentralization of personnel management (F3), while it correlates less strongly with decentralization of actions tending to the improvement of educational quality (F4). As for the latter, it strongly correlates with decentralization of the organization of instruction (F5).

The compound indexes that result from averaging decentralization indexes by type of function obviously correlate strongly with their components. Still, they also correlate more or less mildly with components other than their own. Thus, the decentralization index for pedagogical functions (EAIrest) correlates strongly with decentralization of curriculum management and decentralization of organization of instruction, but it also does, though mildly, with decentralization of improvement of educational quality. The decentralization index for financial functions (EAIF2thruF4) correlates strongly with the index for the three functions involved, but it also does with the index of decentralization of organization of instruction.

Finally, the general index correlates intensely with all its components, though it reflects the movement of decentralization of curriculum management to a lesser extent than it reflects the movement of the rest.

Table 5.3: Pearson's correlation coefficients among aggregated EAIs

		F1_EAI	F2_EAI	F3_EAI	F4_EAI	F5_EAI	EAIrest	EAIF2thruF4	EAI
F1_EAI	Pearson corr.	1	,146	,001	,009	,078	0,846***	,065	0,451*
	Sig.		,552	,995	,972	,752	,000	,793	,053
	N	19	19	19	19	19	19	19	19
F2_EAI	Pearson corr.	,146	1	0,644***	0,382*	,210	,239	0,85***	0,73***
	Sig.	,552		,002	,096	,375	,311	,000	,000
	N	19	20	20	20	20	20	20	20
F3_EAI	Pearson corr.	,001	0,644***	1	,203	,228	,136	0,770***	0,617***
	Sig.	,995	,002		,391	,333	,569	,000	,004
	N	19	20	20	20	20	20	20	20
F4_EAI	Pearson corr.	,009	0,382*	,203	1	0,656***	0,385*	0,713***	0,718***
	Sig.	,972	,096	,391		,002	,094	,000	,000
	N	19	20	20	20	20	20	20	20
F5_EAI	Pearson corr.	,078	,210	,228	0,656***	1	0,608***	0,491**	0,638***
	Sig.	,752	,375	,333	,002		,004	,028	,002
	N	19	20	20	20	20	20	20	20
EAIrest	Pearson corr.	0,846***	,239	,136	0,385*	0,608***	1	,335	0,709***
	Sig.	,000	,311	,569	,094	,004		,149	,000
	N	19	20	20	20	20	20	20	20
EAIF2thruF4	Pearson corr.	,065	0,850***	0,770***	0,713***	0,491**	,335	1	0,893***
	Sig.	,793	,000	,000	,000	,028	,149		,000
	N	19	20	20	20	20	20	20	20
EAI	Pearson corr.	0,451*	0,737***	0,617***	0,718***	0,638***	0,709***	0,893***	1
	Sig.	,053	,000	,004	,000	,002	,000	,000	
	N	19	20	20	20	20	20	20	20

Most importantly for our study, the correlations observed in our dataset indicate that the devolution of competences in two of the three spheres that make up our definition of financial decentralization – development of physical structures and personnel management – follows similar pattern across the countries included in our analysis. This pattern seems to be independent from the decentralization of decision-making in pedagogical spheres. This finding seems to encourage further research work where the financial and the pedagogical dimensions of education decentralization are treated as discernible objects of analysis.

On the other hand, the association found between the decentralization of expending authority in areas related to quality improvement and the organization of instruction could be indicative of potential complementarities among financial and pedagogical policy spheres, as we hypothesize. Following this hypothesis, our data would point to the need of further investigating the linkages between these areas. Why does the definition of school budgets appear to be associated with the decentralization of the authoritative competence to admit students? Is there a genuine connection between those areas or are we in front of spurious correlation? If this association indicates a genuine empirical phenomenon, how could it be affecting policy effectiveness, equity and efficiency?

We can also interpret these results as signalling a path towards the refinement of our operational definitions, particularly in relation to the items we considered to be representative of the spheres of quality improvement and organization of instruction. It is highly probable that alternative definitions would lead us to different results, which should be evaluated based on their descriptive and explanatory leverage. In the remaining sections of this chapter, we explore the potentialities and pitfalls of our data in this regard.

B. Exploratory analysis 1: education decentralization and policy effectiveness

In this section we use regression analysis to explore the association between our executive autonomy index (EAI), in its different levels of aggregation, and an indicator of policy effectiveness: country averages of students' average scores in PISA.

First, we need to understand the limitations of this exercise. We are working with a large sample of OECD countries (17 out of 34) with varied performance in PISA. They were selected on an intentional basis that pursued patterned variability across countries as regards broad fiscal decentralization (share of transfers over subnational own revenues around year 2010; World Bank, 2014), regional autonomy (RAI country score in year 2010; Hooghe et al., 2016) and education decentralization (adapted from OECD Education at a Glance, 2012). We added three cases from Latin American and three from Africa, resulting in an unsystematic inclusion of important regional economies.

The exploratory study on the relation between education decentralization, as we define it in Chapter 3, and education policy effectiveness we develop in this section is restricted to the group of OECD and Latin American countries. This results from our choice for the operational definition of our dependent variable. We use country averages of students' average scores in PISA in year 2012, and these are not available for our African cases. Moving beyond the criticism to the limited scope of this indicator – which we accept –

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we should also note that PISA results can be a biased indicator of education policy effectiveness (and efficiency) for countries with high dropout and repetition rates for students below the age of 15. Performance of countries with low net enrolment rates might also be overestimated by this indicator. Still, students' results in PISA is the most used proxy for effectiveness in the literature we reviewed.

Hungary was dropped from the analysis, since our qualitative and secondary quantitative data refer to different decentralization moments (post and pre reform, respectively). The difference in the periods in the remaining cases does not worry us: in several countries our review detected recent policy reforms of partial scope that we consider should not influence our analysis.

We must emphasize that the following exploratory enquiry aims at revealing an eventual association across our variables of interest, which by no means should be interpreted as evidence of a proved causal relationship. Indeed, both the theory and the empirical data available hold valid claims on the time effect of decentralization: results, if any, become clearer some years after policy reform. Our cross-sectional analysis does not include this time variable. We are simply looking at a photograph: in those countries, with their contemporaneous decentralization of executive autonomy within education systems, are there relevant strong associations between the latter and students' average performance in standardized exams?

Model specification

We look particularly at the association between PISA results and our executive autonomy variable, measured by our executive autonomy index (EAI) at its various levels of aggregation. The relevance of our analysis resides on the importance of discovering the strengths and limitations of our data, which we expect to be a good indicator of the institutional framework within each decision-making authority is decentralized in education systems. The literature has pinpointed the importance of accounting for the institutional dimension of decentralization processes, looking particularly at the autonomy actors are granted to make their decisions, including those with direct spending implications. Our data tries to grasp this hard-to-measure qualitative aspect of decentralization in a variety of policy spheres and to condense them into aggregate categories that distinguish between pedagogical and financial dimensions. We merge these two dimensions into an education decentralization index that informs on the average level of distribution of executive autonomy across the system.

We also include in our analysis a variable measuring sector-specific fiscal decentralization, namely the sub-central governments' share of total education expenditure, taken from OECD's Education at a Glance for year 2012. We use GDP per capita (PPP) to control for differences in economic development and also for its documented determinant role in explaining outcomes in standardized exams. We finally include the RAI as a control for differences in the authoritative competences of regional governments over policy areas other than education.

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We first ran ordinary least-square models including EAI in its different levels of aggregation and all controls. As expected, misspecification was evident in the four models. Problems of multiple collinearity, endogeneity and heteroscedasticity were addressed in the following way.

As regards collinearity, we have described that several of our more disaggregate executive autonomy indicators are highly and significantly correlated. This correlation has an interpretable meaning: some decisions in different spheres tend to be decentralized together, possibly as a strategy to promote more efficient work flows. However, incorporating two or more correlated variables in the same model leads to inefficient coefficient estimates and inflation of variation. We selected between models that allowed us to mitigate multiple collinearity to acceptable levels and improve the leverage. We did not carry out an exhaustive research of all possible models, but adopted two approaches. In the first, we compared models that included all significant variables in alternatives with different sets of control, but always including GDP per capita. In the second, we included or excluded our executive autonomy variables by blocks, as they referred to the pedagogical or financial dimension. We selected our preferred models resulting from each approach and compared them. The preferred models that resulted from the second approach were discarded due to severe collinearity problems, but allowed the development of a superior alternative for our preferred model including EAI in is most disaggregated form. It also contributed to formulate endogeneity hypotheses.

Throughout our exercise, our variable of regional autonomy was found to be insignificantly associated with PISA results. However, collinearity diagnostics helped to identify partial correlation between the former and our indicators of executive autonomy. These associations accept an empirical interpretation: in systems where regional autonomy is higher, decision making in the education sector could also be more decentralized. If this hypothesis is true, then the inclusion of RAI indicators in our models would entail endogeneity. A deeper look revealed that the correlation between RAI and our executive autonomy index in its different levels of aggregation derives from strong associations in two specific spheres: quality improvement and organization of instruction. We hold no hypothesis for why this association, if not spurious, is not observed in the other spheres, a question that could be addressed in the future. Still, we considered that the risk of endogeneity, the bias due to multicollinearity and the apparent low explanatory power of this variable were sufficient and justifiable criteria to exclude this control from our final estimations.

We took a similar decision regarding the variable for financial decentralization in education. Collinearity analysis uncovered a very strong association between this variable and the two components of the personnel management sphere. This association is empirically plausible since financial execution in education of subnational governments is expected to be higher in countries where the executive competence to recruit and pay teachers is more decentralized. So, to avoid endogeneity among the regressors, we evaluated models that included alternatively the financial decentralization and the block of our indicators of decentralization of financial executive autonomy. Models including the latter indicators performed better in terms of collinearity and goodness of fit in all

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cases we tested. So, none of our final estimations includes the share of sub-national expenditures over total education expenditures as explanatory variable.

As regards association between our decentralization variables and GDP per capita, the latter also shows a negative and very significant association with our indicators for the sphere of organization of instruction that results in a significant association with the more aggregate indicator of pedagogical decentralization. Here, we were inclined to reject the hypothesis of endogeneity for two reasons. First, we failed to find a convincing hypothesis for why admission of students – but not other decisions – would be more centralized in richer countries. This could, in any case, be addressed by other studies. Second, the high association between GDP per capita and the decentralization of the executive autonomy to choose teaching methods is a mathematical derivation of the very low variability, in our dataset, of the indicator that measures the former. Given the known significant influence of the level of economic development in PISA results, we kept this control throughout our model specifications and dropped from the analysis our indicators for decentralization of organization of instruction, thus mitigating multiple collinearity. It also led us to discard the models that included our decentralization index disaggregated into its financial and pedagogical dimensions (model D2).

We ended up with three models, for which we tested the validity of the assumptions used to obtain ordinary least square estimators. We ran Breusch-Pagan and Cameron-Trivedi's tests for homoscedastic error terms for the three models and results pointed to the presence of non-constant variance of the error terms obtained by ordinary least-square estimators in all our models. We used White-robust least square estimators to correct for heteroscedasticity. The alternative specification did not perform any better in heteroscedasticity tests. Due to time constraints we could not explore further improvements, but decided to report the results obtained with these limitations. As regards the normal distribution of the residuals, in model D3 we detect a high probability of violation of this assumption. Tests results and plot of the residuals are reported in the Annex to this chapter.

We must also advert that none of our preferred models pass the tests for under specification, suggesting that other explanatory variables should be added to the model. Indeed, our theoretical framework clearly states that other factors should be taken into account, such as the availability of resources and the autonomy to allocate them, the presence and functioning of accountability systems and the role played by informal institutions. In the absence of those factors, the results of our estimates should be taken with extreme caution, given the risks of bias due to omission of relevant explanatory variables.

Regression results

Table 4 reports the results obtained in our preferred estimations, using White-robust least squares. Detailed results for each model are included in the Annex. As expected, GDP per capita (in PPP) is positively and significantly associated with average results in PISA across all models. Association between the dependent variable and our decentralization

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indicators is also positive, with soft and varying levels of statistical significance depending on how we disaggregate EAI.

Table 5.4: Regression results.

Variable	D1_rob	D3_rob	D4_rob
EAI	38.5***		
GDPpcPPP	.00158***	.00158***	.00139***
F1_EAI		15.7**	13.1**
F3_EAI		18.6	
F3E1_EAI			14.8*
F4E1_EAI			10.3
_cons	336***	346***	354***
N	19	18	18
aic	189	181	181
bic	192	185	185
rank	3	4	5

legend: * p<.1; ** p<.05; *** p<.01

Notes: Dependent variable: countries' PISA average scores (OECD, 2012). Independent variables: Decentralization index of executive autonomy (EAI) and selected components (D1: most aggregate; D3: disaggregated by function; D4: disaggregated by executive competence). White-robust least-square estimators.

At its most aggregate level (D1), our education decentralization index shows a positive association with PISA country average results significant at 0,6% (D1_rob). When we disaggregate the indicator down to the level of policy spheres, the decentralization of executive autonomy on curriculum matters (F1) exhibits a positive association with students' performance, significant at 1,1%. The positive association obtained for decentralization of teacher management (F3) is significant at 10,2%. When we take EAI in its most disaggregated form, the decentralization of the executive autonomy to recruit teachers (F3E1) appears positively and significantly associated to our dependent variable, at 8,8%. Coefficients for the decentralization of the selection of textbooks (F1) and the design of in-service teacher training programmes (F4E1) are positive and significant at 4,2% and 16,4%, respectively.

We interpret these results in the following manner. Although our estimations are probably biased due to omission of relevant explanatory variables such as the autonomy to allocate transfers, accountability mechanisms and informal institutions and practices, our results

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encourage the inclusion of our indicators of decentralization of executive autonomy in further research interested in learning the effects of education decentralization on policy effectiveness and, by extension, efficiency and equity. Our data allow for disentangling the pedagogical and financial dimensions of education decentralization and assessing its effects separately. Our results suggest that both dimensions are independently relevant for explaining this phenomenon.

These results are convergent with the partial evidence available from studies that look at OECD countries. Our findings contribute to understand part of the confusion among researchers that find conflicting results when combining measures of institutional education decentralization and sector-specific decentralization in the same equation. Our data alert for the risk of endogeneity in such models and signal a promising path to overcome these specification problems. Particularly in this regard, we comment on some interesting findings from the analysis of the models we discarded due to multiple collinearity.

When comparing specification alternatives for model D4, under the second approach described, collinearity problems were best mitigated by dropping from the model all those variables related to the decentralization of executive competences in financial matters, while keeping those that measure pedagogical decentralization (curriculum and organization of instruction). In a clear contrast to the models that used more aggregate data, in this case we found that controlling for the share of subnational education expenditure increased the efficiency of the model, as well as for the level of economic development. So, only our controls for political autonomy were dropped. The goodness of fit of this model was slightly lower than the resulting from the one that minimizes multicollinearity with disregard to the theoretical grouping of our variables. We then decided to report the latter, which eliminated collinearity between our decentralization indexes for organization of instruction and GDP per capita. Still, it is interesting to note the convergence between the two models that seem to account for financial decentralization in two alternative ways: in the first, it is proxied by the decentralization of executive competences related to teacher management, in the second it is operationalized as sub-central governments' share of total expenditure in education. In both cases, our tests signal to the importance of simultaneously taking into consideration the pedagogical and financial dimension of decentralization in order to account for policy effectiveness. In the model that includes SCEat instead of our indexes of executive autonomy in the financial domain, executive autonomy over curriculum matters showed, again, a very significant positive association with PISA average results. Decentralization of education expenditures appeared positively associated to our dependent variable and close to being significant. We should recall, though, that the estimation of coefficients was inefficient due to the commented collinearity problem. Still, it could suggest that critics could be exaggerating when they claim that fiscal decentralization indexes do not capture the variation of the institutional settings where spending decisions are made. Our data finds that, in the countries we studied, those variables are closely associated, to the point of eventually being effective substitutes. But our exploratory study also suggests that fiscal decentralization only seems to be telling a part of the whole decentralization story and that, to achieve a comprehensive explanatory account of its effects on policy

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outcomes, it might be helpful to include information on the pedagogical dimension of education decentralization as a complement to information on expenditure decentralization. Our database could be a source in this regard.

C. Exploratory analysis 2: financial decentralization, allocative autonomy and policy effectiveness

Finally, we explore whether our indicators of allocative autonomy over transfer resources presents any significant association with the selected measure of policy effectiveness. The literature posits, on the one hand, that higher autonomy to use transfers allows actors to make superior allocative decisions, leading to improved results. On the other, it claims for the need of clear rules and solid institutions to prevent diversion of transfer resources by opportunistic agents. Our data allows us to approach this question by looking at the allocative autonomy that is granted to sub-central governments (AAIScl) and schools (AAISch), according to transfer modalities.

Model specification

Consistently with our operational definition, allocative autonomy, as we measure it, can only take place in combination with the decentralization of executive competences in matters directly related to expenditure decisions. So, our model includes the following independent variables: our aggregate financial component of EAI (EAIF2thruF4), our variable of interest (AAI for the sub-central and school level, alternatively), an interaction term between these two variables. We also include GDP per capita PPP as a control.

As in the previous exercise we observed that the share of sub-national governments' expenditures over total education expenditures could eventually be an effective substitute of EAIF2thruF4, we also run models where the former is used alternatively to our executive autonomy indicator.

As in any interactive model, in the alternatives we comment below collinearity is very high between each variable interacted and the interactive term that includes them, but no collinearity is detected when the interaction term is dropped. However, omitted-variable bias would arise without the interaction term. Acknowledging this limitation and due to time constraints to explore better alternatives, we ran the regression using ordinary least square estimators. After rejecting the homoscedasticity hypothesis, we decided to report results obtained from White-robust least square estimators. Still, we must note that test results included in the annex of this chapter indicate that estimations based on model V and VIII, upon which we base our interpretation, are biased due to presence of heteroscedasticity and non-normal distribution of the error terms, as well as to omission of relevant variables.

Results

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In order to help the interpretation of the dynamic observed, we report in table 5 the evolution of results for the sub-central and the school level, respectively, first as we run the regression without the allocative autonomy variable (Model I), then when we include it (Models II and IV) and, finally, taking into account the interactive effect (Models III and V).

Table 5.5: Regression results. Exploratory analysis of the interactive effect of decentralization of executive autonomy and allocative autonomy over transfers on PISA results.

Variable	I	II	III	IV	V
EAIF2thruF4	29.1*	29.1*	33.9	29.7	-11.8
GDPpcPPP	.0014**	.0014**	.0014**	.00141**	.00164***
AlAutI_Scd		.184	3.58		
EAIF2thru4~G			-1.68		
AlAutI_Sch				-1.64	-62.7**
EAIF2_4xAA~h					28.1***
_cons	371***	371***	361	372***	452***
N	19	19	19	19	19

legend: * p<.1; ** p<.05; *** p<.01

Notes: Dependent variable: countries' PISA average scores (OECD, 2012). White-robust least-square estimators in all models.

We can see that in both models that look at the allocative autonomy of sub-central governments (II and III) and that of schools (IV and V), the inclusion of the allocative autonomy variable alone (II and IV) does not affect considerably the results of regressions without them (I). In turn, the addition of the interaction term changes substantially the results in both cases. The most remarkable change is the total dissolution of the coefficients' significance of EAIF2thru4, as well as the change of its sign in the case of schools. In the latter case, coefficients estimated for the interaction term and our variable of allocative autonomy attain high statistical significance and present opposite signs.

Table 6 reports the estimations obtained from similar models replacing EAIF2thruF4 by SCEat. We observe that the inclusion of the interaction terms produces a similar destabilizing effect but, in contrast to the previous models, now it appears as statistically significant only in the model looking at the allocative autonomy of sub-central governments. It is interesting to observe that the coefficients for the allocative autonomy in models VIII and X adopt opposite signs than those we obtained in models III and V, respectively.

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Table 5.6: Regression results. Exploratory analysis of the interactive effect of decentralization of education expenditures and allocative autonomy over transfers on PISA results.

Variable	V	VII	VIII	IX	X
SCEat	29.5	32.6	-264	33.8	89.5
GDPpcPPP	.00134**	.00134**	.00146**	.00132*	.00127*
AlAutI_Sd		-4.51	-29.3**		
SCEatxAAISd			107*		
AlAutI_Sch				5.23	26.8
SCEatxAAISch					-27
_cons	414***	424***	487***	404***	360***
N	19	19	19	19	19

legend: * p<.1; ** p<.05; *** p<.01

Notes: Dependent variable: countries' PISA average scores (OECD, 2012). SCEat: sub-central governments' share over total education expenditures (authors' calculations based on OECD, 2012). White-robust least-square estimators in all models.

How do we interpret these results? Again, a cautionary note is mandatory. Although models with the interaction terms seem to offer superior specification alternatives than models that exclude them, they all still suffer from very high probability of being biased due to the omission of relevant variables. Coefficient estimators are probably inefficient and their statistical significance is surely affected by severe collinearity and heteroscedasticity. These are fragilities that should be addressed in future research work. Still, these preliminary results of our exploratory exercise allow us to ponder the two contending hypotheses mostly found in the literature.

Our results seem to fit within the widespread argument that decentralization should be accompanied by substantial devolution of autonomy to allocate resources in order to positively influence policy effectiveness. In model V, the posited effect of decentralization of executive competences with financial implications is only significant when it is combined with the autonomy to allocate transfer resources. The same result appears in model VIII when we replace our executive autonomy index by the indicator of sector-specific fiscal decentralization. A closer look at the conditional effect estimated in each model, however, reveals that those results are valid only for specific ranges of our variables of interest.

Red dots in Graphs 1 and 2 represent the effect of decentralization that is conditional to the presence of allocative autonomy over transfer resources, as estimated in models V and VIII, respectively. Blue and green dots represent upper- and bottom 95% confidence intervals.

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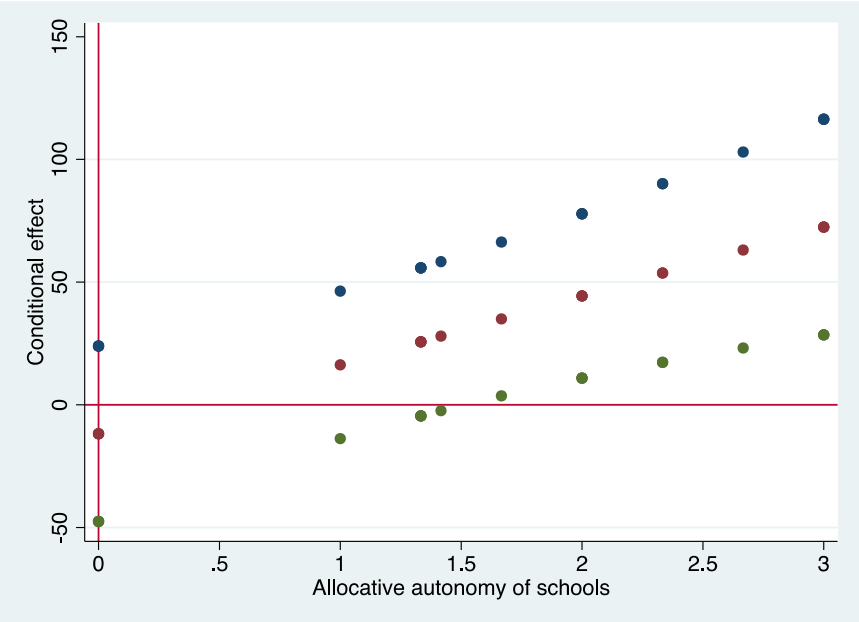
Graph 1: Estimated effect of decentralization of executive autonomy conditional to the allocative autonomy of schools over transfer resources.



As is can be seen from Graph 1, the conditional effect estimated in model V is statistically different from zero (and positive) for levels of allocative autonomy of schools higher than 1.5, i.e. moderate to high autonomy to allocate transfer resources. By taking the coefficients estimated in model V and making some calculations within the ranges of allocative autonomy of schools for each statistical significance is obtained, we can conclude that a positive and significant association of decentralization with country's average results in PISA is only observed in countries where the executive autonomy over matters with direct financial implications are moderately to highly decentralized (EAIF2thruF4>2.23) and, concomitantly, schools actors are given moderate to high allocative autonomy over transfer resources. In turn, countries that combine lower levels of decentralization of executive autonomy and moderate to high levels of allocative autonomy over transfers seem to obtain significantly lower results in PISA.

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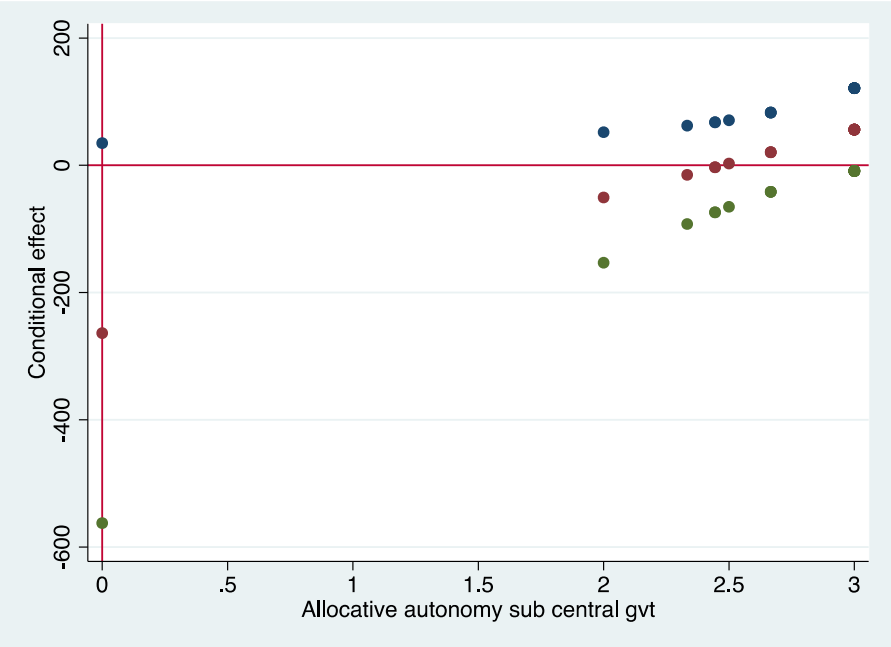
Graph 2: Estimated effect of decentralization of education expenditures conditional to the allocative autonomy of sub-central governments over transfer resources.



Graph 2 indicates that the conditional effect estimated in model VIII is not statistically different from zero for the range of valid values of allocative autonomy of sub-central governments over transfer resources. Consequently, the only significant association captured by our model is the direct and negative relationship between allocative autonomy and results in PISA. In other words, our exploratory exercise indicates that countries where sub-national governments are given lower autonomy to allocate transfer resources obtain significantly higher results in PISA. It also indicate that this association is not dependent on the level of decentralization of education expenditures.

For the reasons explained, these figures should not be taken more seriously than hints of a phenomenon that deserves further investigation. They are definitely inaccurate, despite the false impression of precision that such calculations could inspire. Indeed, we cannot rule out the hypothesis that they reflect hazardous algebraic associations plagued by biases due to miss specification of our empirical models and unknown measurement error in the construction of our variables. Scientific evidence should not be confounded with informed conjectures and our findings are possibly closer to the latter. Still, we can use them as tools for guiding us through a research agenda aimed at leveraging our comprehension of the complexities of education decentralization. In this sense, they can inspire the following working hypotheses:

- ✓ In countries with similar characteristics to those included in our study (OECD), the association between decentralization of executive autonomy over matters with direct financial implications and policy effectiveness is mediated by the autonomy

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that is given to actors invested with executive mandates to allocate transfers received from higher levels.

- ✓ The net effect of decentralization – defined as the combination of executive and allocative autonomy over transfers – tends to become positive as decentralization increases. Moderate to high levels of decentralization of executive autonomy over matters with direct financial implications seem to be necessary to achieve net positive effects.
- ✓ The effect of allocative autonomy over transfer resources seems to differ according to who receives those transfers. Moderate to high levels of allocative autonomy to school actors appear to be associated with higher policy effectiveness. In turn, allocative autonomy of sub-central governments over transfers from central governments seem to be negatively associated with policy performance.

The analytical framework developed for this study, as well as the research tools and dataset produced for the present study could, hopefully, be useful to researchers intending to advance such lines of enquiry.

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Data Annex – Chapter 5

Table 1: Decentralization index of executive autonomy, aggregate and components.

Country	**Decentralization index of executive autonomy** **(EAI)**	*EAI by dimension* Decentralization index of executive autonomy over areas with direct financial implications (EAIF2thruF4)	Decentralization index of executive autonomy over pedagogical areas with indirect financial implications (EAIrest)
Australia	2,70	2,60	3,00
Austria	1,94	1,23	3,00
Belgium	2,33	2,18	2,56
Brazil	2,29	1,89	2,90
Chile	1,84	1,91	1,75
Colombia	2,47	1,92	3,30
Denmark	2,67	2,40	3,08
Finland	3,15	3,25	3,00
France	1,59	0,98	2,50
Hungary	1,50	0,83	2,50
Ireland	2,15	2,00	2,38
Italy	2,50	2,17	3,00
Japan	2,35	2,12	2,70
Kenya	0,85	0,75	1,00
Luxembourg	1,11	1,17	1,02
Mexico	1,80	1,67	2,00
Norway	2,13	1,72	2,75
Poland	2,38	2,30	2,50
South Africa	1,87	2,11	1,50
Spain	2,60	2,28	3,08
Switzerland	2,76	2,73	2,80
United States	2,32	2,60	1,90

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Table 1 (continued): Decentralization index of executive autonomy, aggregate and components.

Country	Decentralization index of executive autonomy over curriculum (F1_EAI)	*EAI by policy sphere* Decentralization index of executive autonomy over development of physical structures (F2_EAI)	Decentralization index of executive autonomy over teacher management (F3_EAI)	Decentralization index of executive autonomy over quality improvement actions (F4_EAI)	Decentralization index of executive autonomy over organization of instruction (F5_EAI)
Australia	-	2,60	2,40	2,80	3,00
Austria	3,00	1,28	0,93	1,50	3,00
Belgium	3,00	2,80	2,80	0,95	2,11
Brazil	3,00	2,60	2,60	0,47	2,80
Chile	0,50	2,00	2,00	1,72	3,00
Colombia	3,30	2,40	1,63	1,73	3,30
Denmark	3,30	2,50	2,80	1,91	2,85
Finland	3,00	3,00	3,60	3,15	3,00
France	3,00	1,20	1,00	0,75	2,00
Hungary	3,00	0,50	1,00	1,00	2,00
Ireland	3,00	3,00	2,00	1,00	1,75
Italy	3,00	2,50	1,00	3,00	3,00
Japan	2,40	2,40	2,50	1,45	3,00
Kenya	1,00	0,50	1,00	0,75	1,00
Luxembourg	1,00	2,00	1,00	0,50	1,04
Mexico	1,00	1,25	2,00	1,75	3,00
Norway	3,00	1,63	1,63	1,90	2,50
Poland	3,00	2,40	3,00	1,50	2,00
South Africa	1,00	2,70	1,63	2,00	2,00
Spain	3,00	2,70	1,73	2,40	3,15
Switzerland	2,60	2,80	2,80	2,60	3,00
United States	1,00	2,60	2,60	2,60	2,80

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Table 1 (continued): Decentralization index of executive autonomy, aggregate and components.

Country	EAI by executive competence							
	EAI to build, rent or buy school infra-structure	EAI to acquire school equipment	EAI to recruit teachers	EAI to pay teachers	EAI to provide in-service teacher training	EAI to define school budget	EAI to admit students	EAI to choose teaching method
	F2E1_EAI	F2E2_EAI	F3E1_EAI	F3E2_EAI	F4E1_EAI	F4E2_EAI	F5E1_EAI	F5E2_EAI
Australia	2,60	2,60	2,40	-	2,60	3,00	3,00	3,00
Austria	0,55	2,00	1,00	0,85	2,00	1,00	3,00	3,00
Belgium	2,60	3,00	3,00	2,60	0,90	1,00	1,23	3,00
Brazil	2,60	2,60	2,60	2,60	0,44	0,50	2,60	3,00
Chile	2,00	2,00	2,00	2,00	0,44	3,00	3,00	3,00
Colombia	2,40	2,40	0,85	2,40	0,85	2,60	3,30	3,30
Denmark	2,00	3,00	3,00	2,60	2,60	1,23	2,40	3,30
Finland	3,00	3,00	3,60	3,60	3,90	2,40	2,40	3,60
France	2,00	0,40	1,00	1,00	1,00	0,50	1,00	3,00
Hungary	0,50	0,50	1,00	1,00	1,00	1,00	1,00	3,00
Ireland	3,00	3,00	3,00	1,00	1,00	1,00	0,50	3,00
Italy	2,00	3,00	1,00	1,00	3,00	3,00	3,00	3,00
Japan	2,40	2,40	2,40	2,60	0,50	2,40	-	3,00
Kenya	0,50	0,50	1,00	1,00	1,00	0,50	1,00	-
Luxembourg	2,00	2,00	1,00	1,00	0,50	0,50	1,08	1,00
Mexico	0,50	2,00	2,00	2,00	0,50	3,00	3,00	3,00
Norway	2,40	0,85	0,85	2,40	0,80	3,00	2,00	3,00
Poland	2,40	2,40	3,00	3,00	1,00	2,00	1,00	3,00
South Africa	2,40	3,00	0,85	2,40	1,00	3,00	1,00	3,00
Spain	2,40	3,00	0,85	2,60	2,40	2,40	3,00	3,30
Switzerland	2,60	3,00	3,00	2,60	2,60	2,60	3,00	3,00
United States	2,60	2,60	2,60	2,60	2,60	2,60	2,60	3,00

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Detailed Regression Results and Tests of violations of OLS assumptions

Model D1_rob

```
regress PISA_Av EAI GDPpcPPP, vce(robust)

Linear regression                               Number of obs =      19
                                                F(  2,    16) =   10.35
                                                Prob > F      =  0.0013
                                                R-squared     =  0.4782
                                                Root MSE      =   32.59

------------------------------------------------------------------------------
             |               Robust
      PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         EAI |   38.50266   12.29803     3.13   0.006      12.432    64.57332
   GDPpcPPP |   .0015789   .0004822     3.27   0.005     .0005567    .0026011
       _cons |   336.295   38.68349     8.69   0.000     254.2896    418.3003
------------------------------------------------------------------------------
```

Model D3_rob

```
regress PISA_Av F1_EAI F3_EAI GDPpcPPP, vce(robust)

Linear regression                               Number of obs =      18
                                                F(  3,    14) =   18.73
                                                Prob > F      =  0.0000
                                                R-squared     =  0.5097
                                                Root MSE      =   33.479

------------------------------------------------------------------------------
             |               Robust
      PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      F1_EAI |   15.70047   5.337838     2.94   0.011     4.251947    27.14899
      F3_EAI |   18.59643   10.61779     1.75   0.102    -4.176477    41.36933
   GDPpcPPP |   .0015767   .0004971     3.17   0.007     .0005106    .0026429
       _cons |   345.8082   27.67312    12.50   0.000     286.4553    405.1612
------------------------------------------------------------------------------
```

Model D4_rob

```
regress PISA_Av F1_EAI F3E1_EAI F4E1_EAI GDPpcPPP, vce(robust)

Linear regression                               Number of obs =      18
                                                F(  4,    13) =   15.17
                                                Prob > F      =  0.0001
                                                R-squared     =  0.5662
                                                Root MSE      =   32.68

------------------------------------------------------------------------------
             |               Robust
      PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      F1_EAI |   13.12699   5.810738     2.26   0.042     .5736576    25.68033
    F3E1_EAI |   14.75644   7.989205     1.85   0.088    -2.503189    32.01607
    F4E1_EAI |   10.25509   6.94922     1.48   0.164    -4.757785    25.26797
   GDPpcPPP |   .0013874   .0003727     3.72   0.003     .0005823    .0021926
       _cons |   353.635   24.34871    14.52   0.000     301.0328    406.2372
------------------------------------------------------------------------------
```


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Model V

```
regress PISA_Av EAIF2thruF4 AIAutI_Sch EAIF2_F4xAAI_Sch GDPpcPPP, vce(robust)

Linear regression                               Number of obs =     19
                                                F(  4,    14) =   4.29
                                                Prob > F      =  0.0179
                                                R-squared     =  0.5418
                                                Root MSE      =  32.649

------------------------------------------------------------------------------
             |               Robust
      PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
    EAIF2thruF4 |  -11.80034   18.23566    -0.65   0.528    -50.91194    27.31127
     AIAutI_Sch |  -62.72902   21.37201    -2.94   0.011    -108.5674   -16.89062
EAIF2_F4xAAI_Sch |   28.07668   8.77669     3.20   0.006     9.252549    46.9008
       GDPpcPPP |   .001636   .0005052     3.24   0.006     .0005524    .0027195
          _cons |   452.2521   40.2282     11.24   0.000     365.9712    538.533
------------------------------------------------------------------------------
```

Model VIII

```
regress PISA_Av SCEat AIAutI_Scl SCEatxAAA_Scl GDPpcPPP, vce(robust)

Linear regression                               Number of obs =     19
                                                F(  4,    14) =   2.91
                                                Prob > F      =  0.0602
                                                R-squared     =  0.5122
                                                Root MSE      =  33.687

------------------------------------------------------------------------------
             |               Robust
      PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
      SCEat |  -263.7862   152.3339    -1.73   0.105    -590.51    62.93758
   AIAutI_Scl |  -29.30801   13.27231    -2.21   0.044    -57.77428   -.8417442
SCEatxAAA_Scl |   106.615   53.5277     1.99   0.066    -8.190488    221.4205
    GDPpcPPP |   .0014599   .0005895     2.48   0.027     .0001956    .0027243
       _cons |   486.7769   33.82812    14.39   0.000     414.2228    559.3311
------------------------------------------------------------------------------
```

Tests for the normality of residuals

```
                    Skewness/Kurtosis tests for Normality
                                                   ------- joint ------
    Variable |   Obs   Pr(Skewness)   Pr(Kurtosis)  adj chi2(2)   Prob>chi2
-------------+------------------------------------------------------------
   resid_D1 |    19       0.8074        0.7819         0.14        0.9342
   resid_D3 |    18       0.2134        0.6475         1.98        0.3715
   resid_D4 |    18       0.8487        0.4165         0.74        0.6890
    resid_V |    19       0.2865        0.7597         1.36        0.5075
  resid_VIII |    19       0.6446        0.1961         2.12        0.3465


                  Shapiro-Wilk W test for normal data

    Variable |   Obs        W          V       z       Prob>z
-------------+--------------------------------------------------
   resid_D1 |    19      0.96108      0.888   -0.238   0.59391
   resid_D3 |    18      0.95704      0.944   -0.115   0.54572
```


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```
   resid_D4 |     18    0.98066      0.425   -1.713    0.95661
    resid_V |     19    0.93141      1.566    0.901    0.18386
 resid_VIII |     19    0.94677      1.215    0.391    0.34776


                  Shapiro-Francia W test for normal data

    Variable |   Obs        W         V         z       Prob>z
-------------+--------------------------------------------------
   resid_D1 |     19    0.96313      0.936   -0.118    0.54709
   resid_D3 |     18    0.95664      1.060    0.104    0.45840
   resid_D4 |     18    0.97267      0.668   -0.718    0.76357
    resid_V |     19    0.94419      1.417    0.622    0.26695
 resid_VIII |     19    0.96254      0.951   -0.090    0.53579
```

Tests for the homoscedasticity of residuals

Model D1_rob

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(5)      =     8.61
        Prob > chi2  =   0.1256

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |       8.61      5   0.1256
            Skewness |       2.53      2   0.2818
            Kurtosis |       0.12      1   0.7301
---------------------+-----------------------------
               Total |      11.26      8   0.1872
---------------------------------------------------
```

Model D3_rob

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(9)      =    12.99
        Prob > chi2  =   0.1632

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      12.99      9   0.1632
            Skewness |      10.50      3   0.0148
            Kurtosis |       0.05      1   0.8264
---------------------+-----------------------------
               Total |      23.53     13   0.0357
---------------------------------------------------
```

Model D4_rob

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(14)     =    17.66
        Prob > chi2  =   0.2228
```


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```
Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      17.66     14    0.2228
            Skewness |       3.86      4    0.4247
            Kurtosis |       0.05      1    0.8217
---------------------+-----------------------------
               Total |      21.57     19    0.3060
---------------------------------------------------
```

Model V

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(13)     =    17.07
        Prob > chi2  =    0.1961

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      17.07     13    0.1961
            Skewness |       4.92      4    0.2956
            Kurtosis |       0.65      1    0.4195
---------------------+-----------------------------
               Total |      22.64     18    0.2047
---------------------------------------------------
```

Model VIII

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(13)     =    17.35
        Prob > chi2  =    0.1838

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      17.35     13    0.1838
            Skewness |       0.86      4    0.9303
            Kurtosis |       1.88      1    0.1708
---------------------+-----------------------------
               Total |      20.08     18    0.3281
---------------------------------------------------
```

Tests for the adequacy of model specification

Model D1_rob

```
Ramsey RESET test using powers of the fitted values of PISA_Av
      Ho:  model has no omitted variables
                 F(3, 13) =      3.23
                 Prob > F =      0.0576


      Source |       SS       df       MS              Number of obs =      19
```

```
-------------+------------------------------           F(  2,    16) =   12.32
       Model |  19744.0185     2  9872.00923           Prob > F      =  0.0006
    Residual |  12823.6131    16  801.47582           R-squared     =  0.6062
-------------+------------------------------           Adj R-squared =  0.5570
       Total |  32567.6316    18  1809.31287           Root MSE      =  28.31

------------------------------------------------------------------------------
     PrSA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |    19.84406   8.264068     2.40   0.029     2.325021    37.3631
     _hatsq |   -.0196033   .0085938    -2.28   0.037    -.0378214   -.0013853
      _cons |   -4512.118   1981.112    -2.28   0.037    -8711.887   -312.3483
------------------------------------------------------------------------------
```

Model D3_rob

```
Ramsey RESET test using powers of the fitted values of PrSA_Av
       Ho:  model has no omitted variables
                  F(3, 11) =      7.28
                  Prob > F =      0.0058


      Source |       SS       df       MS              Number of obs =      18
-------------+------------------------------           F(  2,    15) =    9.85
       Model |  18166.5911     2  9083.29555           Prob > F      =  0.0019
    Residual |  13838.8117    15  922.587445           R-squared     =  0.5676
-------------+------------------------------           Adj R-squared =  0.5100
       Total |  32005.4028    17  1882.67075           Root MSE      =  30.374

------------------------------------------------------------------------------
     PrSA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |    10.78683   6.909517     1.56   0.139    -3.94046    25.51412
     _hatsq |   -.0102773   .0072515    -1.42   0.177    -.0257336    .0051789
      _cons |   -2320.042   1641.035    -1.41   0.178    -5817.825    1177.74
------------------------------------------------------------------------------
```

Model D4_rob

```
Ramsey RESET test using powers of the fitted values of PrSA_Av
       Ho:  model has no omitted variables
                  F(3, 10) =      5.66
                  Prob > F =      0.0157


      Source |       SS       df       MS              Number of obs =      18
-------------+------------------------------           F(  2,    15) =   13.39
       Model |  20516.6256     2  10258.3128           Prob > F      =  0.0005
    Residual |  11488.7771    15  765.918477           R-squared     =  0.6410
-------------+------------------------------           Adj R-squared =  0.5932
       Total |  32005.4028    17  1882.67075           Root MSE      =  27.675

------------------------------------------------------------------------------
     PrSA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |    11.14161   5.739053     1.94   0.071    -1.090887    23.37412
     _hatsq |   -.0106629   .0060301    -1.77   0.097    -.0235158    .0021901
      _cons |   -2400.032   1360.939    -1.76   0.098    -5300.805    500.7399
------------------------------------------------------------------------------
```

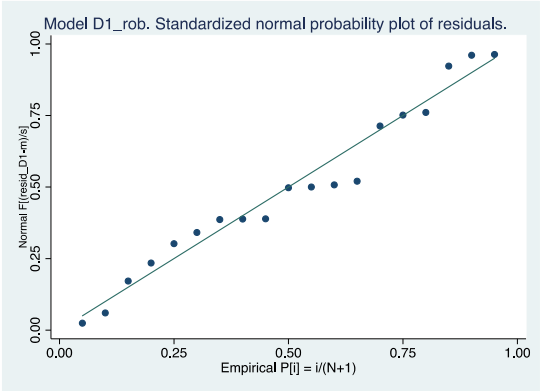
Model V

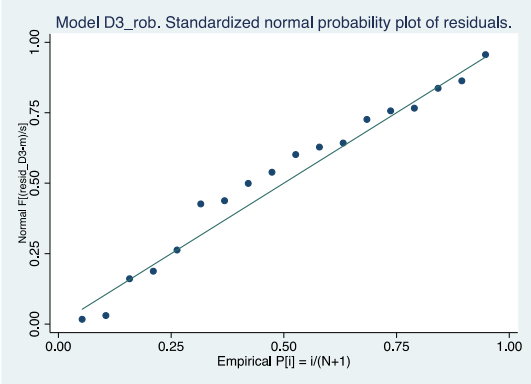
```
Ramsey RESET test using powers of the fitted values of PISA_Av
       Ho:  model has no omitted variables
                 F(3, 11) =      5.57
                 Prob > F =      0.0143

. linktest

      Source |       SS       df       MS              Number of obs =      19
-------------+------------------------------           F(  2,    16) =   22.71
       Model |  24083.9258     2  12041.9629            Prob > F      =  0.0000
    Residual |  8483.70583    16  530.231614            R-squared     =  0.7395
-------------+------------------------------           Adj R-squared =  0.7069
       Total |  32567.6316    18  1809.31287            Root MSE      =  23.027

------------------------------------------------------------------------------
     PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |   20.99814   5.740906     3.66   0.002     8.827961    33.16831
     _hatsq |  -.0207515   .0059544    -3.49   0.003    -.0333743   -.0081286
      _cons |  -4798.574   1379.482    -3.48   0.003    -7722.945   -1874.203
------------------------------------------------------------------------------
```

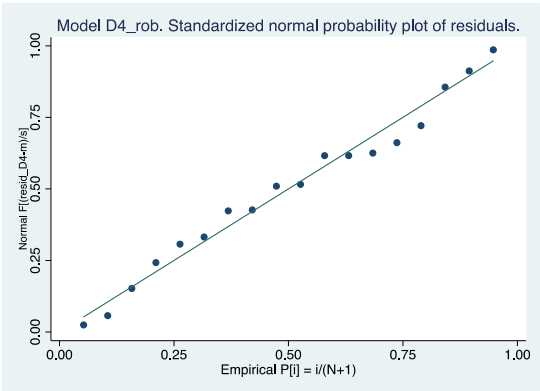
Model VIII

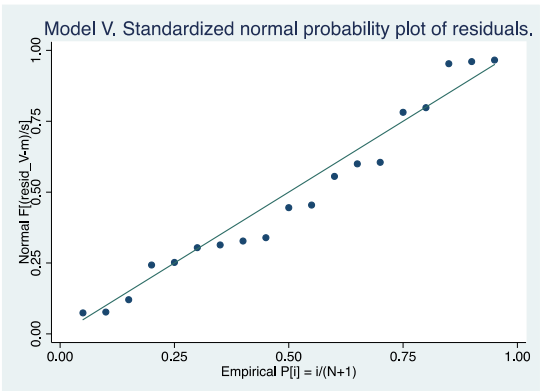
```
Ramsey RESET test using powers of the fitted values of PISA_Av
       Ho:  model has no omitted variables
                 F(3, 11) =     10.02
                 Prob > F =      0.0018


      Source |       SS       df       MS              Number of obs =      19
-------------+------------------------------           F(  2,    16) =   38.32
       Model |  26942.8189     2  13471.4094            Prob > F      =  0.0000
    Residual |  5624.81269    16  351.550793            R-squared     =  0.8273
-------------+------------------------------           Adj R-squared =  0.8057
       Total |  32567.6316    18  1809.31287            Root MSE      =  18.75

------------------------------------------------------------------------------
     PISA_Av |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |   25.57395   4.550457     5.62   0.000     15.92741    35.22049
     _hatsq |  -.0255268   .0047245    -5.40   0.000    -.0355423   -.0155113
      _cons |  -5891.421   1092.661    -5.39   0.000    -8207.76   -3575.082
------------------------------------------------------------------------------
```

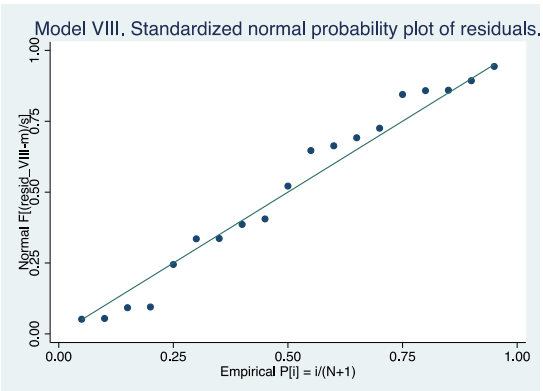
Standardized Normal Probability Plots of Residuals


Model D1_rob. Standardized normal probability plot of residuals.
Normal F[(resid_D1-m)/s]
Empirical P[i] = i/(N+1)
0.00
0.25
0.50
0.75
1.00


Model D3_rob. Standardized normal probability plot of residuals.
Normal F[(resid_D3-m)/s]
Empirical P[i] = i/(N+1)
0.00
0.25
0.50
0.75
1.00


Model D4_rob. Standardized normal probability plot of residuals.
Normal F[(resid_D4-m)/s]
Empirical P[i] = i/(N+1)
0.00
0.25
0.50
0.75
1.00


Model V. Standardized normal probability plot of residuals.
Normal F[(resid_V-m)/s]
Empirical P[i] = i/(N+1)
0.00
0.25
0.50
0.75
1.00


Model VIII. Standardized normal probability plot of residuals.
Normal F[(resid_VIII-m)/s]
Empirical P[i] = i/(N+1)
0.00
0.25
0.50
0.75
1.00

Conclusions

In the following pages, we wrap up the conclusions of our exploratory approach to the relation between education decentralization, in general, and decentralization of educational financing, in particular, and policy effectiveness, equity and efficiency. Our enquiry aimed at addressing the following research questions:

7. What are the main modalities of decentralization in financing primary and secondary education?
8. What is the available evidence of the effects of education financing decentralization on the overall education expenditure level and in primary and secondary education?
9. What is the available evidence of the effects of education financing decentralization on student's learning outcomes? Are different patterns of financial decentralization in education associated with different educational outcomes?
10. What is the available evidence on the effects of education financing decentralization on educational equity? What mechanisms are in place to counter inequalities across sub-national levels? What conditions are associated with the transfers?
11. What is the available evidence on the effects of decentralization of education financing on the technical efficiency of education expenditures?
12. What is the available evidence of the effects of decentralization of education financing on the efficient distribution of resources at sub-national level? What mechanisms are in place at the sub-national level to increase budget allocation to education?

Our research consisted of a literature review focusing on questions 2 to 6, and qualitative and quantitative analyses of qualitative data we produced for a set of 23 countries, based on constitutional texts and education legislation. Qualitative analysis aimed mainly at answering research question 1 and providing examples of ongoing policies related to questions 4 and 6. Our quantitative analysis also addressed question 1 and used our qualitative data to address the second part of research question 3. The partial conclusions of each component of our research are presented in Chapters 2, 4 and 5, respectively. In what follows we try to wrap these partial conclusions together.

One caution note is mandatory before we proceed, to understand the limitations of this exercise. We worked with a large sample of OECD countries (17 out of 34) with varied performance in PISA. They were selected on an intentional basis that pursued patterned variability across countries as regards broad fiscal decentralization (share of transfers over sub-national own revenues around year 2010; World Bank, 2014), regional autonomy (RAI country score in year 2010; Hooghe et al., 2016) and education decentralization (adapted from OECD Education at a Glance, 2012). We added three

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cases from Latin American (Brazil, Colombia and Mexico) and three from Africa (Kenya, Nigeria and South Africa), resulting in an unsystematic inclusion of important regional economies.

In our qualitative analysis (Chapter 4) and the first section of our quantitative exercise (Chapter 5, Section A), we worked with the full set of 23 countries. Our regression analyses (Chapter 5, Section B and C), in turn, was restricted to the group of OECD and Latin American cases, since the African countries do not participate in PISA. Hungary was also dropped from this analysis, because our qualitative and secondary quantitative data refer to different decentralization moments (post and pre reform, respectively).

We must emphasize that our quantitative exploratory enquiry aimed at revealing an eventual association across our variables of interest, which by no means should be interpreted as evidence of a proved causal relationship. Besides, and despite our best endeavours, there is a high probability that our estimations are biased due to omission of relevant variables and other problems of miss specification, as reported in Chapter 5. Therefore, the conclusions that result from this exercise should be taken as informed conjectures that we can use as tools for guiding us through future research.

As developed in Chapter 3, our operational definition of education decentralization encompassed three dimensions:

- *Decentralization of executive autonomy*: defined as the decentralization of decision-making authority on specific items of educational policy. It included both decisions with direct financial implications – such as development of physical structures, payment of teachers and definition of schools budgets – and decisions with indirect expenditure consequences – selection of textbooks, admission of students and selection of teaching methods. We identified at which level of the education system each of those decisions are taken, whether they are an exclusive or a shared competence of different levels and whether they are constrained by standards and/or oversight from actors at higher levels of the system.
- *Decentralization of allocative autonomy over transfers*: defined according to the modalities under which transfers are made from higher to lower levels of the system. We consider that transfers that are made on a discretional basis, whose amount is defined arbitrarily and resources are earmarked for specific purposes provide receivers with less autonomy to define on the allocation of those resources in comparison to automatic, formula-based and lump-sum transfers.
- *Accountability mechanisms*: we distinguished between public and social, as well as managerial and pedagogical accountability mechanisms and mapped the presence of specific accountability tools in each country, such as external evaluation of schools, mandatory parental participation in school boards, dissemination of evaluation results, etc.

Our qualitative analysis took into account these three dimensions. Our quantitative exploratory exercise, in turn, did not include information on the accountability

mechanisms, which we preferred to keep as a purely qualitative variable, given time constraints to carry out this analysis.

Our quantitative exercise in Chapter 5 indicates that decentralization of executive autonomy to implement educational policy, including financial allocations and pedagogical choices, seems to be significantly and positively associated with higher country's average performance of students in standardized exams.

It also suggests that this association might not be linear. The effect of decentralization could be dependent on the modalities of intergovernmental transfers to finance delegated functions. Transfer modalities that grant sub-central governments with higher autonomy to decide on the allocation of resources are found to be negatively associated with our policy effectiveness indicator. In turn, countries with moderate to high levels of decentralization of executive autonomy over decisions with direct financial implications and that, concomitantly, provide school actors with moderate to high levels of autonomy to decide on the allocation of transfers received achieve better results in PISA than their counterparts with lower levels of decentralization of executive autonomy.

Our qualitative analysis in Chapter 4 indicates that intergovernmental transfers to sub-national governments that are responsible for paying salaries are in several cases automatic transfers made within broader fiscal arrangements that cover other sectors beyond education. Such arrangements grant sub-national governments with high allocative autonomy. However, obligations of sub-central governments are usually met by own revenues: in nine out of thirteen cases, sub-national governments' own revenues of account for more than 77% of total expenditures. Chile, Colombia and Mexico are the exceptions, with subnational own revenues accounting for less than 25% of total education expenditure. The former two cases also show relatively low levels of decentralization of public education expenditures. The two countries where schools undertake the payment of teacher salaries – Finland and Poland – show a contrasting trend. In Finland, revenues of sub-central governments account for 59% of total expenditures in education and transfers to these levels represent another 30%. In Poland, in turn, these shares are 95% and 1%, indicating the marginal contribution of intergovernmental transfers in funding this recurrent expenditure.

It is interesting to note that in countries where subnational governments or schools are responsible for paying teachers, central governments do not have any executive competence related to the development of physical structures, the only exception being Mexico (shared competence with subnational governments to build schools). So, in those countries, the contribution of central governments to the development of physical structures is made through transfer of financial resources to lower tiers. In almost all cases, sub-central governments also enjoy high autonomy to allocate these resources, which are most commonly transferred automatically and in the form of lump sums calculated on the basis of some of formula. Italy and Switzerland are exceptions in this sense, with earmarked transfers either based on needs assessments or set arbitrarily. At the school level, capital expenditures are supposed to be at least partially funded by government grants (either from central or sub-central levels), with the exception of Kenya. School actors enjoy markedly lower autonomy to allocate those recourses, in

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comparison to sub-central governments, since most frequently these funds are earmarked. In almost all countries, the legislation invests schools actors with the authoritative competence to generate resources to cover for capital investment. Denmark and Norway are exceptions in this sense, since schools are not allowed to produce revenues for this purpose.

As regards the financial contribution of central governments to the development of quality improvement activities through transfers to lower tiers, in six cases (Brazil, Chile, Japan, Mexico, Norway and Poland) central governments finance, at least partially, the implementation of in-service teacher training programs and school development plans. The share of central government expenditures in those cases varies considerably but, with the exception of Chile (57%) and Mexico (29%), represents less than 10% of total public investment in the sector. In other eight cases, data on expenditures made by central governments suggests that this level spends in items that are not captured by our data. Consequently, we are unable to make any statement about the destination of these resources. But we observe that the contribution of central governments to total public educational expenditures also varies considerably among cases. The highest share is found in Belgium, with 24% of educational expenditure directly made by national government in items that exclude the payment of teachers in the Flemish educational system[21]. Spain, Denmark[22] and Finland follow in the ranking, with 14%, 12% and 11%, respectively. In federal Switzerland and the United States of America, in turn, central governments' participation in education expenditure is largely marginal.

In seven cases, sub-central governments have the authoritative competence to both invest in the development of in-service teacher training and define school budgets. In all those cases, these services can be funded both by own revenues and intergovernmental transfers through modalities that provide sub-national authorities with high levels of allocative autonomy. This funding modality is also observed in those two cases where sub-central governments are responsible for defining school budgets, but have no incidence on in-service teacher training (Poland and Finland). Chile and Norway, in turn, use earmarked transfers from central government to finance the provision of in-service teacher training at the subnational level. Lower levels of allocative autonomy are observed among those cases where the development of in-service training programmes is a competence of sub-central governments, but the latter do not interfere in the definition of school budgets. In those cases, transfer modalities vary among countries, but allocation is usually tied, at least partially, to decisions taken at the central level.

In six countries schools are involved both in the development of in-service teacher training and the definition of their own budget. Most frequently, school actors can rely both on own-generated resources and governmental transfers to fund these current expenditures. Brazil and Belgium are exceptions in this sense, relying only on public grants. Despite this difference, in all six countries for which data is available the amount

[21] This figure must be interpreted cautiously, since data on education expenditure refer to the whole country and our qualitative data refer only to Belgian Flemish community.

[22] In the Danish case, direct expenditures by the central government are substantially financed by intergovernmental transfers from lower tiers.

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of transfers is defined based on some kind of needs assessment and are most frequently earmarked. Consequently, school actors tend to have low allocative autonomy in the use of those resources. In another six countries, schools are engaged in the definition of their budgets, but have no executive autonomy regarding in-service training of teachers. In those cases, transfer amounts are also most frequently defined based on needs assessments and reach schools in the form of block grants. In the two countries where schools have the competence to provide in-service training, but are not involved in the definition of school budgets – Finland and Colombia – school actors seem to enjoy relatively higher levels of autonomy to allocate government transfers.

In short, does our study say that earmarking revenues and transfers to sub-national governments, while increasing the autonomy of schools to allocate grant resources could lead to improved policy effectiveness? We find this an interesting conjecture inspired by our exploratory exercise. But our answer to this question is a sound NO. In our exploratory exercise, we simply looked at an association of how education decentralization systems in some OECD and Latin American countries look today and the results they obtained in PISA 2012. This static picture could reflect both the causality argument underlying the first question and the reverse story: results in international examinations led to reforms in education financing mechanisms. The existence of other factors behind this association also needs to be object of further investigation. For illustration, we identified in Chapter 4 some country experiences with different funding modalities involving intergovernmental transfers earmarked to education. Closer looks of experiences such as Brazilian Maintenance Fund for Basic Education, Colombian General Participation System or the Polish per capita funding mechanism could contribute to understand their contexts of development and advance the causality questions just addressed.

We must also note that our exploratory exercise does not take into account differences in the dimension of intergovernmental transfers over education expenditures. Are qualitative differences detected in our regressions among transfers dependent on the size of the latter? We observed in our qualitative analysis that moderate levels of allocative autonomy seem to be a more frequent attribute of transfers destined to cover for the development of in-service teacher training and school development plans. But data also suggest that these resources may account for a marginal role in total education expenditures. Are these effective mechanisms to improve performance in PISA? Although tempting, it sounds counterintuitive and invites deeper scrutiny of these eventually efficient arrangements. Besides, our qualitative data is not able to capture the eventual effect of transfers destined to expenditures other than those covered in our operational definition of executive competences, although it does provide evidence of their existence.

Nonetheless, we highlight that our results seem to dialogue with the partial evidence found in our literature review. Since our exercise explored the relation between education decentralization and students' learning achievements in PISA, it corresponds more directly to the group of studies on the causes of education policy effectiveness.

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It converges with Falch et al. (2008) and Díaz-Serrano et al. (2012) analyses of OECD countries to the extent that these show a positive association between *broad* fiscal decentralization and students' achievement, although statistical significance is not reached in some model specifications or in all subject areas. The association we find for our sector-specific proxies of fiscal decentralization is also positive and with varying, generally low, levels of significance across model specifications. However, our exercise goes one step further by suggesting that the effects of decentralization of expenditures are conditioned to the autonomy given to allocate transfer resources. In this new scenario, we do not observe any significant association between sector-specific fiscal decentralization and performance in PISA. In contrast, allocative autonomy of sub-central governments over transfers seem to be negatively and significantly associated with policy performance. Further investigation is required in order to understand the potentialities and limitations of broad and sector-specific decentralization as mechanisms to leverage the effectiveness of education systems.

Our results also resemble Freikman and Plekhanov's (2009) analysis of the causal factors behind the provision of pre-schooling in Russian education systems, although the later is clearly a different indicator of policy effectiveness. They observe a positive and significant association between sector-specific fiscal decentralization, when controlling for other variables capturing institutional dimensions of decentralization. In our case, this positive effect is significant when conditioned to the modality of intergovernmental transfers in place, but deeper scrutiny reveals that statistical significance is restricted to values lacking empirical meaning. Despite these differences, coefficient estimators of institutional and fiscal variables behave similarly in both studies. This similarity is also found in the authors' analysis of the causal factors of students' performance in national standardized exams.

Convergence with Blöchlinger (2013) is patent, although he uses OECD's *Education at a Glance* education decentralization index to measure institutional decentralization. Despite using alternative measures, we both observe a positive association between education decentralization and country average students' achievements in PISA. However, our measure of decentralization of executive autonomy over decisions with direct financial implications shows a stronger association with performance in PISA than our variable for sector-specific decentralization. Blöchlinger, in contrast, finds IMF COFOG's data on decentralization of education expenditures to be a better predictor of country results than their education decentralization index. In our study, we commented on the apparent limitations of both data sources. Interestingly, in Blöchlinger, the positive effect of decentralization on students' achievements is found to be statistically significant particularly for unitary countries, but he does not develop a hypothesis to explain this association. The federal/unitary divide has not been a category of analysis in our qualitative exercise, but it enabled to find some recurrent accountability mechanisms within federal countries, suggesting that there may be decentralization modalities that are more frequent in this group of countries. A new look into our database could enlighten this debate.

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Finally, our exercise seems to converge with results obtained by Galiani and Schardgrodsky (2002) and Barankay and Lockwood (2006), for Argentina and Switzerland, respectively, despite differences in our units of analysis and the way our variables of interest are operationalized. We all observe that the effect of decentralization varies according to dimensions denoting the fiscal autonomy of sub-central governments. The mentioned studies focus on the institutional arrangements fostering fiscal balance of sub-national governments. In our case, we look at the autonomy given to allocate specific transfer resources. We all find that institutions constraining fiscal autonomy of sub-central governments could leverage the effects of decentralization of executive autonomy in education.

The overlap between the picture we see using our data and the stories told by the evidence available in the literature reviewed suggests that our analytical framework, operational definitions and database could be useful to revisit and expand those lines of enquiry. We expect our disaggregated information to enable studies interested in identifying in greater detail the mechanisms seeming to affect effectiveness in each context (Channa 2015), including accountability systems, as in Escardibul and Helmy (2015).

While keeping note of this convergence between our exploratory study and the literature, we remind that our exercise left unaddressed the effects of education decentralization on total public spending, its productive and allocative efficiency and equity. We recapitulate here the most important findings of our literature review in this regard.

We start by the literature exploring the effects of decentralization on regional inequality. The studies that, in our review, address the relation between decentralization and education inequalities do so from very different perspectives and for different countries. They converge to the extent that they fail to provide evidence supporting the hypothesis that decentralisation could be beneficial to educational equity, but only Galiani, Getler and Schardgrodsky's (2005) analysis of the Argentinean experience offers evidence of its deleterious effect. Akai et al. (2007) and Costa-Font (2010) studies for the United States (the former) and Spain (the latter) provide an account of the limitations of fiscal decentralisation to cope with regional inequalities, respectively in terms of students' learning achievements and subnational investment in education.

The partial evidence available from Argentina is convergent with the findings of Rodríguez-Pose and Ezcurra (2009), who emphasize the detrimental effect of both broad and education-specific fiscal decentralization to the reduction of spatial inequalities in the developing world, largely offsetting the potential gains of political decentralization. Studies on the USA decentralized educational financing system also pinpoint to the limitations of intergovernmental transfers to ensure improvement of students' achievements in primary education and alert for the risk of emerging segregation in secondary education that could be due to unexploited externalities in basic education. However, as the case of Spain suggests, this remains an area for further investigation. Experiences of countries using innovative financing arrangements aimed to equalizing educational funding throughout the national territory, such as those from Denmark and Chile mentioned in Chapter 4, could provide interesting insights to policy making. Our data could also contribute to continue exploring this research question. Future studies

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should take into account the political and institutional dimensions of decentralization when enquiring into the effects of its financial facet.

As regards the effects on education expenditures, none of the studies reviewed focus on education-specific fiscal decentralisation. So we failed to find robust evidence either supporting or rejecting the hypothesis that decentralisation in education effectively creates incentives for subnational governments to increase their investment efforts in the sector. Evidence on the effects of broad fiscal decentralization is also conflicting. While Busemeyer's (2007) cross-country analysis for OECD countries reveals an average positive and significant association between fiscal decentralisation and investment in education, his results do not converge with those found in Costa-Font's (2010) analysis of Spain. In the latter, evolution of per capita spending in education is found to be significantly and positively associated with political, but not fiscal devolution. Busemeyer's findings are not supported by evidence from non-OECD countries either. Luo and Chen's (2010) analysis of China reveals a negative and very strong association between fiscal decentralisation and educational investment measured in different ways. Freinkman and Plekhanov's (2009) study of the Russian case, in turn, reports no significant relationship between fiscal decentralisation and selected educational inputs, although the latter appear to be robustly determined, among other things, by educational expenditure per student.

Concerning the productive efficiency of education expenditure, the pieces of evidence we managed to identify are even scarcer. Coelho (2009) finds that, in 18 OECD countries, in years 2000 and 2003, productive efficiency of primary and secondary education investment appears to be negatively associated with the share of public providers and positively associated with higher decentralisation of decision in education to local governments and schools. The author relies on OECD's institutional education decentralisation indicator to measure the latter. Alternatively, Sow and Razafimahefa (2015) investigate the effect of broad fiscal decentralisation on the technical efficiency of education expenditures. Their results suggest that the impact depends on the level of economic development of countries: while in advanced economies fiscal decentralisation seems to favour higher efficiency, the opposite effect prevails in emerging and developing economies. However, the authors fail to find robust results across different model specifications. Unfortunately, the different research designs do not allow us to compare their results. Still, they can be taken as cumulative evidence against the general claim that decentralisation in education unambiguously leads to higher efficiency of public educational expenditure.

Our own indicators of decentralisation in education could be used by future research aiming to corroborate and extend Coelho's (2009) findings. As regards the approach both studies adopt to estimate efficiency of public expenditure in education, we ponder that Grigoli's (2014) hybrid approach offers a methodologically superior alternative, which should be explored in further research work. While our dataset is limited to a few countries and only one time observation, it could still be useful in the second stage of technical-efficiency analysis, after efficiency scores are obtained from estimations using panel information from other sources.

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Finally, we address the evidence found in the literature of the impact of education decentralization on the efficient distribution of resources at sub-national level. Our literature review failed to identify empirical studies addressing specifically the effects of decentralization of education financing on the allocative efficiency of education spending. This apparent gap may be due to lack of internationally comparable data meeting disaggregation requirements of this kind of analysis. This could be one of the reasons why we were only able to identify studies that enquiry into the effects of broad fiscal decentralization, but not decentralization of education financing specifically.

Indeed, only two out of the four studies explicitly interested in the question of allocative efficiency actually go as far as investigating how it is affected by fiscal decentralization (Faguet, 2004; Hasnain, 2008). Arze de Granado et al. (2005) fall short of such endeavour by showing how fiscal decentralization seems to induce changes in the composition of decentralized expenditures, but do not analyse whether these changes actually lead to any improvement of social welfare. Díaz-Serrano and Pose (2014) address the question whether fiscal and political decentralization is associated with higher citizens' satisfaction with health and education services, but do not investigate the causal mechanisms that would eventually explain this correlation.

Our review shows that the definition of a social welfare function is a matter open to debate. From an utilitarian perspective, welfare could be estimated based on individual citizens' satisfaction with service provision, which can be measured by specific surveys, such as the European Social Survey used in Díaz-Serrano and Pose (2014). This approach seems to come at odds with a rights-based perspective, which, in our opinion, should prevail in educational analysis. The latter perspective would focus on how different allocative decisions allow matching not citizens' individual preferences, but society's needs in terms of access to a universal human right. Faguet's (2004) and Hasnain's (2008) analyses of decentralization processes in Bolivia and Pakistan, respectively, seem to adopt this second approach, although in the latter case the author also addresses the question of how individual demands are processed through the political system, for instance, by means of patronage.

Pieces of evidence from Bolivia and Pakistan suggest that decentralization in those two countries seem to have fostered investments of local governments in areas that the theory usually advise for more centralization due to the presence of economies of scale. This invites for a revision of some of the assumptions upon which the literature on fiscal decentralization has been based. What are the actual economies of scale in the provision of education that would justify for central intervention? This is a question calling for further empirical scrutiny. Another interesting feature of the Bolivian and Pakistan experiences is that decentralization in those countries did not seem to entail the substitution of higher for lower government levels, but rather a change in the complement role played by each stance. They also suggests that the assumption that in decentralized systems greater efficiency can be achieved due to competition of elected officials across and within government levels might neglect or even misinterpret the importance of actual coordination and cooperation in the crafting of educational policy.

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Those experiences do not seem to provide any evidence either on the validity of assumption that "citizen's vote with their feet", but they do suggest that social welfare can be enhanced by political devolution. Both in Bolivia and in Pakistan, bringing the government closer to the people seems to have contributed to increasing state's response to citizen's needs, particularly in most disadvantaged areas. From a different angle, we reinterpret Diaz-Serrano and Pose (2014) results by noting that in political regimes where authoritative power is less concentrated, citizens are more willing to manifest their discontent with public policies. The influence of political openness on citizens' perceptions and voice is only one of the reasons why citizens' opinions may not be the best barometer to measure social welfare. Still, it could be indicating that citizens do not want to vote with their feet, but rather want governors – central, regional or local – to be responsive to their needs.

This brings us back to the need to learn, in greater detail, how accountability mechanisms work in different contexts. Our qualitative analysis suggests that accountability systems vary in a patterned way along the decentralization spectrum. While trends are not unambiguous, they seem to point to the more frequent presence of social accountability tools and harder public accountability arrangements in more decentralized systems. As we have seen, our exploratory exercise suggests a positive and significant association between the level of decentralization and policy effectiveness. We could then investigate whether differences among more decentralized systems regarding policy effectiveness are associated to more nuanced differences in accountability systems. Recent studies in this field have put into question the effectiveness of some of these arrangements, particularly those aiming to foster market-like incentives to improve school performance (Smith, 2016). Further investigation should be welcome.

In short, our study highlights that the availability of quantitative comparative studies on education decentralization, in general, and its financial dimension, in particular, seems to be incongruent with the relevance of this topic to the policy agenda. Such studies are scarce and knowledge accumulation severely limited by conceptual and methodological concerns.

The argument that this limitation is due to the inadequacy of quantitative methods to address this complex phenomenon should be revised, and further improvement of current research practices might be undertaken. Education decentralization is multidimensional, indeed. But it is feasible to leverage our comprehension of its dynamics through models that are simple enough to manipulate but, at the same time, not too simple so as to lose sight of the diversity of institutional arrangements through which decision-making and financial resources are decentralized. Data available to develop such models is limited up to date, but we ambitioned to demonstrate that it is possible to overcome this limitation efficiently. Knowledge accumulation would be enhanced if researchers ensure transparency of their methodological choices and the limitations of their own analyses.

We also find ground to assert that despite the diversity of institutional arrangements leading to decentralization and development contexts, comparative research involving larger sets of countries contribute to identify converging trends and signal working hypotheses that can be useful both to academics and policy makers. Such studies should

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be seen as complementary to in-depth case studies, where causal mechanisms might be easier to identify. A common conceptual framework, however, is necessary to enable this dialogue, as it has been underlined in this report.

Meanwhile, one general recommendation that social scientists should give to decision makers in this policy area probably is not to trust people claiming that by decentralizing, their education systems will work better. At the same time, they should not trust either those claiming that centralization will do it instead. Social scientists cannot foretell what will work and, unfortunately, we are still trying to map what has actually worked, what has not and why. Social science may not be able give a straightforward answers to these questions. But it must inform policy makers of the best evidence available, which in this case, seems to be limited.

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Bibliographic references

Akai, Nobuo, Sakata, Masayo, and Tanaka, Ryuichi. 2007. *Financial Decentralization and Educational Performance: Evidence form State-level Panel Data for the United States*. Berkeley: University of California.

Arze del Granado, Javier, Martinez-Vazquez, Jorge and McNab, Robert. 2005. *Fiscal decentralization and the functional composition of public expenditures.* No. paper0501. International Center for Public Policy, Andrew Young School of Policy Studies, Georgia State University.

Atkinson, Mary et al. 2005. *School funding: a review on existing models in European and OECD countries*. National Foundation for Educational Research. Berkshire, UK.

Barankay, Iwan and Lockwood, Ben 2006, *Decentralization and the Productive Efficiency of Government: Evidence from Swiss Cantons*, Discussion Paper No. 2477, The Institute for the Study of Labor.

Beramendi, Pablo. 2007. *Inequality and the territorial fragmentation of solidarity.* International Organization 61: 783-820.

Blöchliger, Hansjörg. 2013. Decentralization and Economic Growth- Part 1: How Fiscal Federalism Affects Long-Term Development. *OECD Working Papers on Fiscal Federalism* 14. OECD Publishing.

Busemeyer, Marius. 2007. The impact of fiscal decentralization on education and other types of spending. *MPIfG Discussion Paper 07/8*. Cologne: Max Planck Institute for the Study of Societies.

Carr-Hill, Roy, Rolleston, Caine, Pherali, Tejendra, Schendel, Rebecca, Peart, Edwina and Jones, Emma. 2015. *The effects of school-based decision making on educational outcomes in low and middle income contexts: a systematic review.* London: International Initiative for Impact Evaluation. London, UK: UCL Institute of Education.

Channa, Anila. 2015. *Decentralization and the Quality of Education.* Paper commissioned for the EFA Global Monitoring Report 2015, Education for All 2000-2015: achievements and challenges.

Channa, Anila and Faguet, Jean-Paul, 2012. *Decentralization of health and education in developing countries: a quality-adjusted review of the empirical literature*. Economic Organisation and Public Policy, discussion papers, EOPP 38. STICERD, London, UK.

Cheshire, Paul and Gordon, Ian. 1998. Territorial Competition: Some Lessons for Policy. *Annuals of Regional Science* 32: 321-346.

Coelho, Miguel Castro. 2009. *The Effect of Organisational Structure on Education. Efficiency: public-private provision and decentralisation* Institute of Local

Government Studies – School of Public policy – The University of Birmingham, Edgbaston, B15 2TT, United Kingdom.

Costa-Font, Joan. 2010. Does devolution lead to regional inequalities in welfare activity? *Environment and Planning C: Government and Policy* 28: 435-449.

Díaz-Serrano, Luis and Meix-Llop, Enric. 2012. Do Fiscal and Political Decentralization Raise Students' Performance? A Cross-Country Analysis. *IZA Discussion Paper* 6722.

Diaz-Serrano, Luis and Rodríguez-Pose, Andrés. 2014. Decentralization and the welfare state: What do citizens perceive? *Social Indicators Research* 120 (2): 411–435.

Escardibul, Josep and Helmy, Nehal. 2015. Decentralisation and School Autonomy Impact on the Quality of Education: The Case of Two MENA Countries. *IEB Working Paper* 33.

European Commission/EACEA/Eurydice. 2014. *Financing Schools in Europe: Mechanisms, Methods and Criteria in Public Funding . Eurydice Report.* Luxembourg: Publications Office of the European Union.

European Commission/EACEA/Eurydice. 2015a. *Assuring Quality in Education: Policies and Approaches to School Evaluation in Europe. Eurydice Report.* Luxembourg: Publications Office of the European Union.

European Commission/EACEA/Eurydice. 2015b. *Teachers' and School Heads' Salaries and Allowances in Europe. 2014/2015. Eurydice – Facts and Figures.* Luxembourg: Publications Office of the European Union.

Faguet, Jean-Paul. 2004. *Does decentralization increase responsiveness to local needs? Evidence from Bolivia.* London: LSE Research Online.

Falch, Torberg and Fischer, Justina. 2008. Public Sector Decentralization And School Performance: International Evidence. *Working Paper Series* 4. Norwegian University of Science and Technology.

Fiske E. B. 1996. *Decentralization of Education: Politics and Consensus.* Washington: The World Bank.

Freinkman, Lev and Plekhanov, Alexander. 2009. Fiscal decentralization and the quality of public services in Russian regions. *Working Paper No. 111*. European Bank for Reconstruction and Development.

Galiani, Sebastian and Schargrodsky, Ernesto. 2002. *School Decentralization and Education Quality: The Role of Fiscal Deficits.* Buenos Aires: Universidad de San Andres.

Galiani, Sebastián, Gertler, Paul and Schargrodsky, Ernesto. 2005. "School decentralization: Helping the good get better, but leaving the poor behind". *Journal of Public Economics* 92: 2106- 2120.

Grigoli, Franscesco. 2014 “A Hybrid Approach to Estimating the Efficiency of Public Spending on Education in Emerging and Developing Economies”. International Monetary Fund.

Hasnain, Zahid. 2008. Devolution, accountability, and service delivery: some insights from Pakistan. *World Bank Publications* 4610.

Heredia-Ortiz, E. 2007. ‘The Impact of Education Decentralization on Education Output: A Cross-Country Study’. Economics Dissertations, Georgia State University, US.

Heredia-Ortiz, Eunice. 2007. ‘The Impact of Education Decentralization on Education Output: A Cross-Country Study. ’ Dissertation, Georgia State University. Available at: http://scholarworks.gsu.edu/econ_diss/21

Hinsz, S.; Patel, M.; Meyers, C.; Dammert, A. 2006. ‘Effects of Decentralization on Primary Education: Phase I: a Survey of East Asia and the Pacific Islands’. UNICEF Regional Office for Asia and the Pacific.

Hooge, Edith. 2016. "Making multiple school accountability work". Burns, Tracey and Köster, Florian (Eds). *Governing education in a complex world*, Educational Research and Innovation, Paris: OECD publishing, pp. 93-112

Hooghe, Liesbet; Marks, Gary; Schakel, Arjan H.; Chapman, Chapman; Niedzwiecki, Sara; Shair-Rosenfield, Sarah. 2016. *Governance Below the State: Regional Authority in 81 Countries*. Oxford: OUP.

Hooghe, Lisbet, Marks, Gary and Schakel, Arjan. 2008. Regional Authority in 42 Democracies, 1950-2006. A Measure of Five Hypotheses. *Regional and Federal Studies* 18 (2-3): 111-302.

Liu, Goodwin. 2006. “Interstate inequality in educational opportunity”. New York University School of Law. NY.

Luo, Wei-qing and Chen, Shi. 2010. Fiscal Decentralization and Public Education Provision in China. *Canadian Social Science* 6 (4): 28-41.

Madeira, R. 2007. ‘The Effects of Decentralization on Schooling: Evidence from the Sao Paulo State’s Education Reform’. University of São Paulo.

Martinez-Vazquez, J. 2011. *The Impact of Fiscal Decentralization: Issues in Theory and Challenged in Practice.* Philippines: Asian Development Bank.

Martínez Vázquez et al. 2015. *The impact of fiscal decentralization: a survey*. Georgia State University and GEN, GEN, IEB and University of Vigo, Universitas Mercatorum (Italy) and GEN

Oates, W. E. 1999. ‘An Essay on Fiscal Federalism’. In: *Journal of Economic Literature, 37* (3), 1120-1149.

OECD. 2012. *Education at a Glance 2012: OECD Indicators*. Paris: OECD. http://dx.doi.org/10.1787/eag-2012-en

Pritchett, Lant. 2015. *Creating Educational Systems Coherent for Learning Outcomes: Making the Transition from Schooling to Learning*. Oxford: Centre for Global Development/Research on Improving Systems of Education. http://www.riseprogramme.org/sites/www.riseprogramme.org/files/RISE_WP-005_Pritchett.pdf

Rodríguez-Pose, A.; Tijmstra, S. A. R.; Bwire, A. 2007. 'Fiscal Decentralisation, Efficiency, and Growth'. Working papers series in Economics and Social Sciences, London School of Economics, UK.

Rodríguez-Pose, Andrés and Ezcurra, Roberto. 2009. Does decentralization matter for regional disparities? A cross-country analysis. *Serc Discussion Paper* 25.

Santiago, Paulo. 2013. "The focus on evaluation and assessment". OECD. *Synergies for better learning: an international perspective on evaluation and assessment*, Paris: OECD, pp. 29-34

Sepulveda, Cristián and Martinez-Vazquez, Jorge. 2011. The consequences of fiscal decentralization on poverty and income equality. *Environment and Planning C: Government and Policy* 29 (2): 321-343.

Shewbridge, Claire. 2013. "School evaluation: from compliancy to quality". OECD. *Synergies for better learning: an international perspective on evaluation and assessment*, Paris: OECD, pp. 383-484

Smith, William. 2016. "Exploring accountability: national testing policies and student achievment", Burns, Tracey and Köster, Florian (Eds) *Governing education in a complex world*, Educational Research and Innovation, Paris: OECD publishing, pp. 73-92

Sow, M.; Razafimahefa I. F. 2015. 'Fiscal Decentralization and the Efficiency of Public Service Delivery'. IMF Working Paper.

Stegarescu, Dan. 2005. Public Sector Decentralisation: Measurement Concepts and Recent International Trends. *Fiscal studies* 26 (3): 301-333.

Szarowská, I. 2014. 'Fiscal Decentralisation and Economic Development in Selected Unitary European Countries'. In: *European Financial and Accounting Journal, 9* (1), 22-40.

Winkler, D. R. 1989. 'Decentralization in Education: An Economic Perspective'. The World Bank Working Paper.

Winkler, D. R.; Yeo B. 2007. 'Identifying the Impact of Education Decentralization on the Quality of Education'. Paper written for EQUIP2.

Winkler, Donald; and Alec Gerschberg. 2003. "Education Decentralization in Africa: A Review of Recent Policy and Practice". In *Building State Capacity in Africa: New Approaches, Emerging Lessons*, edited by Brian Levy and SahrKpundeh. Washington D. C.: World Bank Institute.

Winkler, Donald. 1989. “Decentralization in Education: an Economic Perspective”. In *Policy Research Working Paper Series*. Washington D.C.: World Bank.

World Bank. 2014. *Decentralization Indicators*. Washington D.C: Intergovernmental Relations Thematic Group, Poverty Reduction and Economic Management Network, World Bank. Accessed on March 30th, 2016. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPUBLICSECTORANDGOVERNANCE/0,,contentMDK:23112839~pagePK:148956~piPK:216618~theSitePK:286305,00.html

Yilmaz, Serdar; Ghazia Aslam; and AsliGurkan. 2010. How-to Note: A Framework for the Assessment of Fiscal Decentralization Systems. *Social Development Notes* 123.

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