

Chapter 1

Why look at school funding policies?

This report is concerned with school funding policies that can help countries achieve their educational goals and student learning objectives. This chapter sets the context for the subsequent analysis. First, it highlights the importance of well-designed school funding strategies for achieving quality, equity and efficiency objectives in schooling. Second, it explores major contextual developments shaping the funding of school education across different countries. Third, it explains how this report looks at school funding and the evidence base that it draws from. The annex to this chapter provides detailed definitions and discussion of the concepts of effectiveness, efficiency and equity that will be used throughout the report.

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

Why school funding policies are important

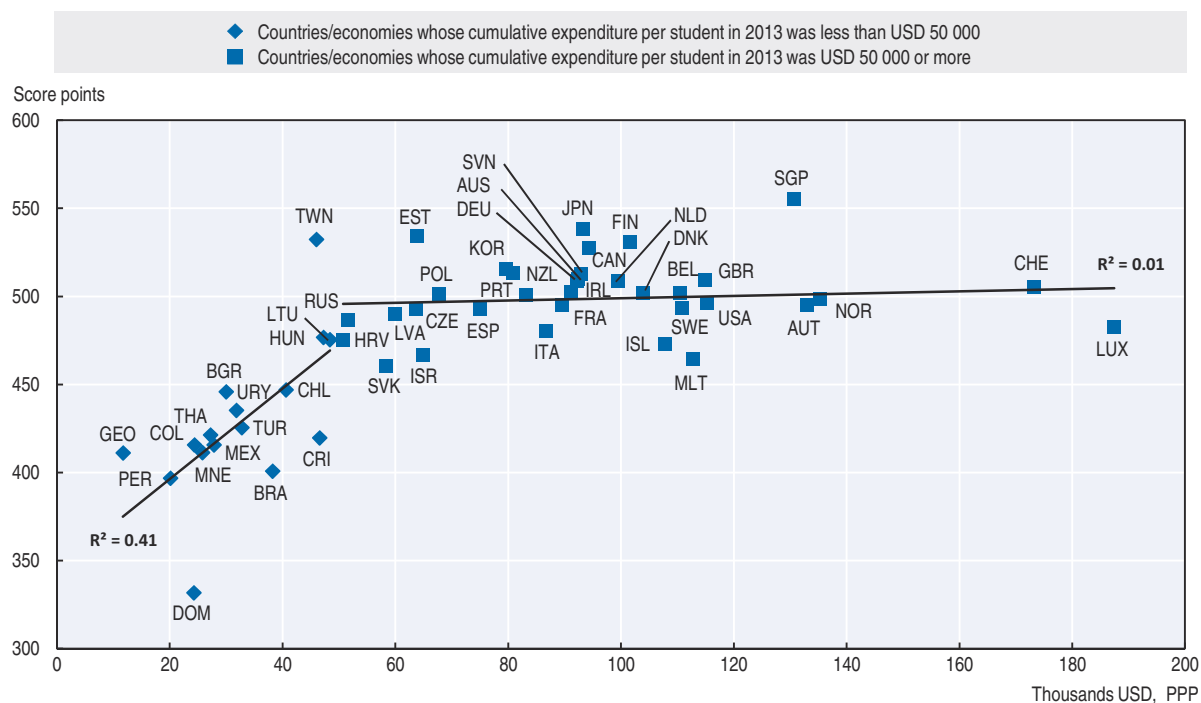
Directing school funding to where it matters

The overall level of school funding matters, but funding allocation strategies are at least as important. While the ability to provide quality education for all and to respond to new priorities depends on the availability of adequate funding for education, the mechanisms through which school funding is governed, distributed and monitored play a key role in ensuring that resources are directed to where they can make the most difference.

Previous OECD (2016a) work found that while larger education budgets are no guarantee of better student results, a minimum level of spending is necessary for ensuring good quality education provision. A school system that lacks quality teachers and school leaders, adequate infrastructure and textbooks will have more difficulties to promote quality education. At the same time, the overall level of school funding does not seem to be a key factor for the success of high-performing school systems (OECD, 2016a).

Indeed, Figure 1.1 shows that among the countries with lower overall levels of school funding (falling below a cumulative spending per student threshold of roughly USD 50 000 in purchasing power parity [PPP] terms), there is an observed positive correlation between cumulative spending per student and students' performance in the OECD Programme for

Figure 1.1. **Cumulative spending per student from age 6 to 15 and science performance, 2015**



Source: OECD (n.d.), PISA 2015 Database, www.oecd.org/pisa/data/2015database/, Tables I.2.3 and II.6.58.

International Student Assessment (PISA). Among the countries with higher overall levels of school funding, there is no observed relationship between cumulative spending per student and students' performance. This suggests that beyond a certain level of investment what matters more is not the aggregate level of expenditure, but rather the design of education policies, the mechanisms through which funds are allocated and how these determine where additional resources are channelled.

Even in countries where the overall level of funding for schools is comparatively high, there may be underinvestment in certain parts of the school system, which can result in serious educational inequalities, as resource challenges tend to concentrate in certain disadvantaged areas or schools (OECD, 2012a). Research in the United States has shown that finance reforms directed to guarantee an adequate provision of resources in low-income schools were crucial to reduce overall achievement gaps between high- and low-income school districts (Lafortune et al., 2016), increased the likelihood of high-school graduation and educational attainment for children from poor families, and diminished their socio-economic disadvantage in terms of earnings and income later in life (Kirabo Jackson et al., 2014).

Making the best use of limited resources

School systems have limited resources with which to pursue their objectives. As most school funding in OECD countries comes from public budgets, the best allocation of this funding among competing priorities is a relevant policy concern.

School education is costly and getting more so (Baumol, 2012; Wolff et al., 2014; Wolff, 2015). The long-term pattern of education spending largely reflects a continuous increase in the cost of human resources. Since public sector services and education in particular have limited ability to substitute human resources by less costly productive capital, such as machines, it is expected that the public costs of education will continue to rise (Baumol, 2012). Since long-run education expenditure has been increasing among OECD countries and education services have become relatively more expensive than other goods (De Witte and López-Torres, 2017), ensuring an efficient allocation of school funding is a key concern for OECD governments.

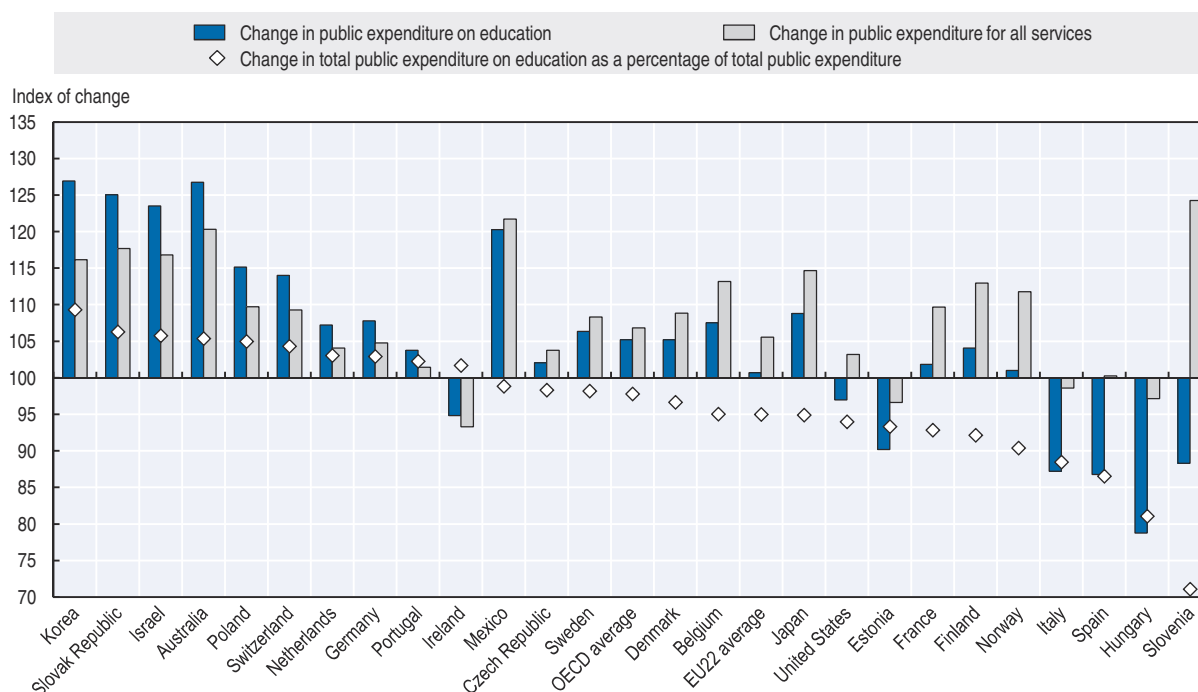
Policies aimed at reshaping the organisational structures and changing institutional habits in school systems are typically not easily accepted by public opinion and need to be carefully developed and implemented in collaboration with key stakeholder groups, such as social partners and parents. A recognition of the fact that the costs of education tend to increase in the long run helps to justify a focus on achieving greater efficiency by minimising expenditures that do not contribute to the quality and equity of education. Otherwise the pressure on resources and limited available funding could eventually crowd out the most talented human resources in the school sector. In order to build momentum for change and engage stakeholders in designing a more efficient provision of education, it is important not to focus merely on cost savings but to ensure that strategies to achieve greater efficiency in a school system go in line with a focus on improving quality and equity.

While the effective use of resources is a general aim of all public activity, in times of economic downturn, expectations for an efficient use of public resources are typically even stronger: the allocation of public resources is more scrutinised and political choices are increasingly based on efficiency arguments. Despite the long-term continuous increase in educational expenditures as a share of gross domestic product (GDP), public spending on education across the OECD has lagged behind the growth of GDP since 2010 (OECD, 2016b).

The recent pattern in education expenditures also reflects a prioritisation of public expenditures between education and other public services. Figure 1.2 shows this trend, although also including expenditure in tertiary education. In such contexts, governments willing to further invest in education may justify their choices based on reforms targeted to increase the external efficiency of school systems, that is to show how the costs of providing quality education translate into better social and economic outcomes (for detailed definitions of efficiency and equity, see Annex 1.A1).

Figure 1.2. **Change in public expenditure on education as a percentage of total public expenditure, 2008 and 2013**

Primary to tertiary education (2008 = 100, 2013 constant prices)



Source: OECD (2016b), *Education at a Glance 2016: OECD Indicators*, <http://dx.doi.org/10.1787/eag-2016-en>, Figure B4.2.

Looking at school funding from an educational perspective

Educational efficiency is typically conceptualised as the ability of fulfilling maximum educational potential at the lowest possible cost. In this context, improving the efficiency of a school or school system can be attained in two ways: either by maintaining identical levels of outcomes while lowering the amount of school funding, or by attaining better outcomes with the same level of funding (for a detailed discussion and definitions of efficiency see Annex 1.A1). However, as described in Box 1.1 there are limitations to efficiency analyses in the education sector. Recognising these limitations is important to frame the analysis provided in this report.

The purpose of this report is to look at the use of school funding from an educational perspective by taking into account the complexity of educational processes; the breadth and diversity of educational goals across OECD countries; the synergetic relationships between resources invested at different levels of a school system; the organisational and governance contexts of schooling in different countries; and the importance of social and

Box 1.1. **Limitations to efficiency analyses in education**

Annex 1.A1 provides a brief summary of the main methods used for quantifying effectiveness and efficiency in the use of school resources as well as their main advantages and drawbacks. Analyses of effectiveness and efficiency are sometimes used for school benchmarking, increased accountability, local and school capacity building, as well as for cross-country comparisons and peer learning among countries. However, quantitative analyses of educational efficiency are subject to several conceptual and measurement concerns and it is important to keep these limitations in mind when using such analyses as a source of expertise for educational policymaking. Due to the limitations explored below, the use of this type of studies generally provides an incomplete picture for policy. The use of qualitative and mixed-methods provides more room to take into account specific governance contexts.

Conceptual limitations

- It is not possible to have an absolute account of efficiency. In this sense, no abstract school or school system can be conceived as perfectly efficient. Absolute efficiency would imply knowing the limits of the educational process; however, it is both intuitively and empirically challenging to have a notion of these limits. These difficulties not only stem from the multiple inputs and objectives of the educational process, but mainly from the uncertainty underlying the educational process itself. Teaching and learning are complex rather than mechanical processes, which complicates the task of finding a single best way of guaranteeing efficiency. The mechanisms by which given combinations of resources are turned into desired outcomes are not clear and feed into one another, implying that no benchmark system can be established from these fundamental relations. Educational efficiency evaluations are thus always relative to an existing standard, either in the past or in other educational systems.
- For comparisons to be valid and the use of educational efficiency to be politically useful, the educational resources and outcomes must be considered in a sufficiently standardised way. The conditions of educational provision in the systems compared in the analysis must be sufficiently similar (Wolter, 2010). Identifying the context and main features of each school system is thus crucial for establishing both the main similarities and differences, helping to frame general recommendations. However, even if conditions are sufficiently comparable, the relative importance to different educational objectives may vary across countries. This means that the comparative work should mostly refer to the stated general educational goals set by the countries, and not to objectives discretionarily chosen during the analysis.
- Efficiency analyses, as defined in Annex 1.A1, are generally strictly focused on the quantitative relation between inputs and outcomes. Therefore, there is a risk that comparative analysis fails to capture the synergetic relations between school resources across the different levels of a school system. Such approaches might disregard the organisation and governance features of schools, local authorities and the school system as a whole. Beyond the right allocation of educational resources, designing adequate organisational structures is essential for fulfilling the potential of school systems with given financial resources.
- Efficiency analyses do not always adequately take social considerations into account. However, education officials are often more interested in the allocation of resources that is more efficient from a societal perspective, and guarantees a distribution of resources complying with a given degree of fairness. An excessive focus on allocations which are strictly efficient at the school and system level can lead to outcomes which are nevertheless

Box 1.1. Limitations to efficiency analyses in education (cont.)

insensitive to prevailing social and institutional arrangements. Therefore, it is important to account for decisive components of educational policy reality, including persistent institutional habits and unwillingness or resistance to change, but also the importance attributed by school systems to providing adequate educational opportunities to all students.

Methodological limitations

- Despite consistent methodological improvements, efficiency evaluations are still particularly sensitive to the choice of the methods employed in the analyses. Therefore, the selection of the most suitable model for efficiency analyses needs to consider a number of criteria such as acceptability, applicability or understandability (Huguenin, 2015). Educational policies aimed at reforming resource allocation patterns should thus consider multiple approaches (Grosskopf et al., 2014).
- Efficiency is significantly influenced by factors which are not exclusively under the discretion of educational authorities, such as parental background, the acquired skills and characteristics of children when entering school or the average wealth of the citizens of a country, as measured by GDP per capita. Policies aimed at increasing efficiency in the use of school resources should thus take the importance of these factors into account.

Source: Grosskopf, S. et al. (2014), "Efficiency in education: Research and implications", *EdPolicyWork Working Papers Series*, <http://dx.doi.org/10.1093/aep/ppy007>; Huguenin, J.-M. (2015), "Data Envelopment Analysis and non-discretionary inputs: How to select the most suitable model using multi-criteria decision analysis", *Expert Systems with Applications*, <http://dx.doi.org/10.1016/j.eswa.2014.11.004>; Wolter, S.C. (2010), "Efficiency in education: 20 years of talk and no progress?", in S.M. Stoney (ed.), *Beyond Lisbon 2010: Perspectives from Research and Development for Education Policy in Europe*, National Foundation for Educational Research (NFER), Slough.

institutional arrangements in reform negotiation and change processes. Economic and financial perspectives will be considered in light of broader objectives for schooling and with a focus on the extent to which they promote quality, equity and desired long-term impacts of schooling.

Achieving efficiency and equity objectives together

Equity and efficiency are sometimes seen as competing goals as a focus on equity in education often entails higher investment for disadvantaged student groups and this additional funding may not proportionally translate into overall higher achievement at the aggregate level. This could lead to lower efficiency and thus a potential trade-off between the two objectives. However, the relationship between efficiency and equity is not that clear-cut, and education officials are not necessarily faced with a choice between the two goals.

Admitting that efficiency and equity can be complements to one another changes the focus in policy debates from a matter of political preference for one or the other objective towards seeking organisational design features that best favour synergies between equitable education, better results, and the best use of the available resources. If schools manage to support all students in achieving their full potential, an efficient school system can also be equitable at the same time (Wößmann, 2008).

As countries seek to enhance the performance of all students while also providing more equitable learning opportunities for different groups, there has been greater focus on ensuring that resources are directed to the areas where improvements in teaching and learning outcomes can best be achieved. Research has revealed a number of policy directions

which appear to support both equity and efficiency objectives and which, therefore, warrant attention from policy makers when considering where to invest resources. Some examples are explored below.

Supporting high quality early childhood education and care

Education is a self-reinforcing process, in which new knowledge and skills are attained building on a previous solid basis of both those factors. In other words, early cognitive and non-cognitive development makes it easier to acquire skills and knowledge later in life. Therefore, policies directed to providing better early childhood education and care (ECEC) have a multiplicative effect over an individual's life cycle. Research indicates that offering high quality early childhood education and care for all children increases student achievement in later stages of the schooling process and reduces the impact of socio-economic background on future academic performance (Cunha et al., 2006; Heckman, 2006; Schütz et al., 2008; Wößmann, 2008; Blankenau and Youderian, 2015). It also supports early social and emotional development, which has positive effects on the continued development of non-cognitive skills (Kautz et al., 2015).

Conversely, failing to provide the adequate level of resources to sustain high ECEC is likely to result in increased expenditure needs at later stages of the schooling process. Allocating funding to high quality ECEC, while targeting it particularly to disadvantaged children, is therefore a fundamental policy lever for attaining both efficiency and equity in education. However, as for all levels of education, not only the amount of funding is important, but more particularly the way in which these additional resources translate into high quality education and care. Ensuring adequate levels of funding should allow for recruiting, developing and supporting qualified staff to foster the development of children's cognition, socio-emotional capacities and attitudes towards learning.

Reducing educational failure

Educational failure, that is when students do not progress through the system as expected and exit with insufficient knowledge, skills and competencies, has a high cost for school systems and individuals, and is an important source of inefficiency in many OECD review countries. Students at risk of dropping out are often those with the lowest skills, and thus the least prepared for leaving the education system to enter the labour market. Failure to guarantee students a minimum level of skills and achievements before they leave the school system is an important challenge across OECD countries (OECD, 2012b).

Educational failure may be linked to the fact that some school systems allocate resources in a traditional pattern in which students who progress through to the end of secondary education are treated from a funding angle as requiring higher spending, while students who are struggling at the primary or lower secondary levels receive fewer resources. Despite the demonstrated importance of the early years of schooling, in several countries more school resources are still allocated to higher levels of education. There is a case to be made for seeking greater balance in funding across educational levels. A major reduction in under-achievement in primary school could help increase the flow of students into cognitively demanding secondary school programmes and reduce levels of dropout as well as unemployment on leaving school.

Addressing inadequate approaches to distributing students across schools and programmes can also help reducing educational failure and increase both equity and efficiency. Grouping students by ability may allow offering the optimal pace and level of

instruction to each group. But this needs to be weighed against the serious risks for equity and student motivation when labelling certain students as “low-ability” students and providing less stimulating academic environments to them, especially when this happens at a relatively early stage of schooling. There is evidence from different countries that the grouping of students is often biased with other criteria than student ability influencing the grouping process and students being ineffectively allocated to groups (Resh, 1998; Prenzel et al., 2005; Schofield, 2005; Strand, 2007). Several cross-country studies find that, after controlling for a range of other factors, early tracking of students into different programmes is associated with greater inequality of results across students, with no discernible effect on overall performance (Schütz et al., 2007; Hanushek and Wößmann, 2006; Meier and Schütz, 2007).

Another related practice raising challenges for equity and efficiency in some countries is year repetition in response to underperformance by individual students. A vast body of literature reports that the slight academic benefits of year repetition are short-lived, while it holds high individual and social costs (OECD, 2012b). The direct costs of year repetition for school systems are high as the retention of students in the system increases the number of enrolled students and thus the level of funding required, besides delaying entry to the labour market.

Investing in teacher quality

Attracting and retaining an adequate teaching workforce is a policy imperative. Teachers are the most important resource in schools and the quality and effectiveness of their teaching is essential for student learning (Rockoff, 2004; OECD, 2005). Investing insufficiently in the teaching workforce might generate ineffectiveness through the crowding out of the best and most qualified human resources. Spending reforms driven by reductions in teachers’ salaries, initial education and professional training may entail a loss of attractiveness of the profession and create challenges to quality, equity and efficiency in the long run.

Teachers’ compensation levels play a role in determining who comes to the profession, who remains and for how long (OECD, 2005; Dolton and Marcenaro-Gutierrez, 2011). But not only the compensation levels are important, but working conditions in general, including recruitment, management, professional autonomy, collaboration and support. The OECD (2016d) report prepared for the 2016 International Summit on the Teaching Profession highlights the importance of effective and continuous teacher professional development and the policies underpinning it. Given the importance of teaching workforce policies for high quality schooling, a dedicated comparative thematic report will be prepared as part of the School Resources Review to analyse country policies for managing human resources in school education (OECD, forthcoming).

In this context, teacher-student ratios and class size are much debated topics in education policy. Strategies targeted at reducing class size are generally supported by arguments related to closer ties between teachers and students, increased time on task, and the potential to foster better learning environments with more individualised attention to students. The potential benefits of small classes need to be weighed against other potential investments such as the improvement of teacher education, professional development and employment conditions or more widespread use of assistant teachers and other professionals who can support qualified teachers. In other words, there may be a policy trade-off between investing in *more* human resources by maintaining small classes, and investing in *better* human resources and new approaches to teaching and learning (Dolton

and Marcenaro-Gutierrez, 2011; Bietenbeck et al., 2015). Given the high cost of class size reduction policies, these appear comparatively less efficient than other interventions to support student learning (Rivkin et al., 2005; Hattie, 2009; Hanushek, 2011).

Despite the existence of a polarised debate over the effects of class size on students' achievement (for a review, see for example Santiago, 2002), there is considerable consensus in the research literature that small classes have a strong positive effect on the learning of particular student groups such as those in the earlier years of education and from disadvantaged socio-economic backgrounds (Robinson and Wittebols, 1986; Mosteller, 1995; Krueger, 1999; Angrist and Lavy, 1999; Molnar et al., 2001 Lindahl, 2001; Björklund et al., 2005; Andersson, 2007; Chetty et al., 2011; Dynarski et al., 2011). This indicates that additional available teacher resources would be optimally allocated if they were targeted at those who are likely to benefit the most, i.e. disadvantaged groups and students in pre-primary and primary schools.

Matching the school offer to changing demand

Several OECD review countries face an important decline in the student population, especially in rural areas. This raises the unit cost of education in these areas, as the fixed costs for organising schools (e.g. buildings, materials, staff) do not decrease proportionally to the decline in student numbers. In countries with many small schools, underutilisation (i.e. large spaces and high staff numbers for few students) is very likely to occur. Small rural schools also often face difficulties in recruiting qualified teachers and may face shortages, high attrition rates and limited opportunities for teacher professional development (Ares Abalde, 2014). As the cost of maintaining small schools with sharply decreasing enrolment is high, if there is evidence of a loss of quality keeping these schools open may represent an expensive inefficiency for the school system.

Policies to maintain small rural schools are often related to broader rural development strategies, recognising the important role of schools for local communities. In addition, many countries aim to provide schooling for young children at a reasonable distance from home as the benefits from small schools appear highest for students at a young age (e.g. close relationships between students, teachers, families and communities). But at later stages of schooling, larger schools can provide a range of advantages for students which are likely to outweigh the burden and cost of transportation (e.g. a more diverse programme and course offer, more specialised teachers who are better connected to a professional community, a larger choice of extracurricular activities and greater possibilities to organise comprehensive schooling or full-day provision [for a review of the respective benefits and drawbacks related to maintaining or consolidating small schools, see Ares Abalde, 2014]).

When considering consolidation policies, attention to local contexts is essential. In some cases there are few possibilities to consolidate the organisation of the school offer due to geographic and demographic conditions. In other cases policies to provide incentives and support for schools to operate on a larger scale by merging or clustering providers can help address some of the challenges faced by small schools. However, policy makers need to ensure that consolidation agendas are not just driven by a focus on cost savings but linked to school improvement strategies. This requires developing a vision with local authorities, schools and parents and ensuring a strong focus on the quality and equity of educational opportunities provided in the consolidated schools or school clusters.

The respective needs of rural versus urban areas also need to be kept in mind. In countries with changing demographic patterns, the higher per-student cost in rural areas might direct resources away from other priorities, such as investing in urban schools which typically face their own set of equity challenges linked to greater student diversity and socio-economic disadvantage. Given the importance of matching the supply of schooling to changing demand across school systems, a dedicated comparative thematic report will be prepared as part of the School Resources Review to analyse country policies for organising the school offer (OECD, forthcoming).

Contextual developments shaping school funding policies

School funding policies do not take place in a vacuum but they are closely interlinked with wider developments in school governance contexts. In recent years, the organisation of OECD school systems has become increasingly complex and characterised by multi-level governance where the links between multiple actors operating at different levels are more fluid and open to negotiation (Burns and Köster, 2016). Although country contexts vary, in many countries there have been trends towards decentralisation across different levels of the school administration, enhanced school autonomy, and an increasing reliance on market-type mechanisms and incentive schemes. A large set of actors including regions, municipalities, different central and sub-central agencies, schools and private actors have gained responsibilities for managing budgets, recruiting staff and providing accountability information on the use of funding. In addition, key stakeholder groups such as school boards, parents associations, teacher unions and professional organisations and employers are recognised as important partners in school systems. These groups participate increasingly in negotiation and dialogue to influence the design of school funding mechanisms (Chapter 3) and in holding different actors accountable for the use of school funding (Chapter 5). The funding of school education has been affected by these broader governance trends and they influence the set of policy options available to countries. These contextual developments are briefly described in this section.

The decentralisation and devolution of education and other public services is expected to increase responsiveness to the demands of local communities, raise the potential for innovation, adapt financial and human resource management to local conditions and generate trust, commitment and professionalism. The arguments towards greater decentralisation and school autonomy are generally framed within the set of relations between schools and the environment in which these operate. These relations are of mutual influence: the context in which schools operate impacts on the level of resources available for their activities, and the schools themselves also contribute to shaping the communities in which they are integrated (Scheerens et al., 2011). More autonomous schools and local administrations have the potential to use the available resources more effectively as they are better able to adapt these to their local conditions and influence the operating environment (Scheerens, 2004).

On the other hand, governance arrangements that devolve responsibilities to a broad range of actors may raise concerns about the lack of systematic application of central directions, inconsistency of practices, ineffective or inequitable use of resources, and/or insufficient capacity for developing effective funding schemes at the local or school level. These concerns might be amplified by weak articulations between the different decision-making levels and limited collaboration between the actors involved. Excessively complex governance arrangements can lead to inefficient school funding structures if roles are

duplicated, responsibilities overlap, actors compete and resources flows through the system lack transparency (Chapter 2). The measure of success of fiscal decentralisation and school autonomy in funding decisions will be how these translate into enhanced learning environments and contribute to better teaching and learning outcomes by matching resources to where they are most needed.

The above-mentioned governance trends have taken place across OECD countries to varying degrees over the past decades and it is important to keep in mind that countries have different points of departure regarding the level of decentralisation and devolution in their school systems (Burns and Köster, 2016). Federal countries such as Australia, Austria, Canada, Germany or the United States have a long history of decision-making powers being shared between central and state levels. Other countries such as Finland and the United Kingdom have strong traditions of decentralisation with the local level in charge of most schooling decisions. Yet another group of countries, such as Belgium and the Netherlands, have well-established practices of free school choice and a long tradition of publicly funding private schools (Burns and Köster, 2016). These institutional traditions have an important impact on school funding arrangements in each country and the range of policy options that are available in further developing school funding strategies.

It is also important to note that countries emphasise sub-central and school-based decision making to varying degrees and that decentralisation and school autonomy are not necessarily pursued as parallel strategies. For example, some countries where sub-central authorities have high levels of decision-making power (e.g. federal countries) may grant less autonomy to schools, whereas countries with high levels of school autonomy may retain a higher share of decision making at the central rather than at regional and local levels. OECD (2014) suggests that different driving factors may be behind the trends towards decentralisation and school autonomy: decentralisation of educational decision making to different levels of government might be more frequently part of broader public sector reform, whereas enhanced school autonomy might be prompted by more education-specific concerns about school management and performance.

In most countries, increased autonomy has been balanced by the strengthening of accountability requirements for local education authorities and schools. While further autonomy is given to the local level in many countries, other responsibilities are generally retained by central authorities (Levačič et al., 2000). These responsibilities are of a different kind, but still essential for ensuring efficient allocations of school resources. Strategic steering, standard setting, support and capacity development are all activities which are typically performed at a central level. This allows benefiting from positive externalities at the system level and addressing co-ordination problems across different levels of decision making. Nevertheless, these developments require the elaboration of more sophisticated school funding strategies, including in terms of designing allocation mechanisms that fit with school governance contexts (Chapter 3) and monitoring of the use of funds at the local and school level (Chapter 5).

Education services are usually framed within a set of public regulatory instruments, which means that funding is generally determined at a political level, rather than based on market incentives. However, some countries have introduced a range of market-type mechanisms in education, such as a free parental choice of schools, increased budgetary and management autonomy for school agents, greater emphasis on centrally determined objectives and the promotion of school competition through increased accountability and

benchmarking. The use of such mechanisms generally aims to provide incentive systems for different actors in school systems. However, country experience indicates that there are a broad range of challenges regarding the use of market mechanisms. These are related to the unintended consequences of high-stakes accountability (for an in-depth analysis, see OECD, 2013b), the limited ability of demand and supply in the school sector to adapt to changing situations, and equity concerns related to the unequal distribution of choice opportunities, with more affluent parents exercising choice more often (Blanchenay and Burns, 2016; see also Chapter 2).

How this report looks at the funding of school education

This report was prepared as part of a major OECD study on the effective use of school resources resulting in the publication series *OECD Reviews of School Resources*. This publication series will include thematic comparative reports on the different types of resources considered in the review including: i) the funding of school education (the present report); ii) the organisation of the school offer (forthcoming); and iii) the management of human resources in school education (forthcoming). Box 1.2 and Annex C provide more information on the main features of the OECD review.

Box 1.2. The OECD School Resources Review

The *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools* (also known as the *School Resources Review*) was launched in 2013. This review is conducted in collaboration with countries and under the guidance of the OECD Group of National Experts (GNE) on School Resources, comprising representatives from all participating countries, plus other OECD countries. The review is designed to respond to the strong interest in the effective use of school resources evident at national and international levels. It provides analysis and policy advice on the use of school resources to help governments achieve quality, efficiency and equity objectives in education. It focuses on primary and secondary school education, although links to other levels of education are also established where relevant.

Key issues for analysis

There are a broad range of resources used in school systems. This review concentrates mainly on three interlinked types of resources:

- **Financial resources** (e.g. expenditures on education, funding mechanisms, school budget).
- **Physical resources** (e.g. school size and location, school buildings, equipment).
- **Human resources** (e.g. teachers, school leaders, education administrators).

The overarching policy question is “What policies best ensure that school resources are effectively used to improve student outcomes?”. In considering policies to ensure that these resources are effectively used to improve student outcomes, the review focuses on four key issues for analysis: governance of resource use (how to govern, plan and implement resource use); resource distribution (how to distribute resources across levels, sectors and student groups); resource management (how to manage evaluate and follow up on resource use); and resource utilisation (how to utilise resources for different programmes and priorities).

Review objectives and methodology

The analysis developed by the project is designed to support the development of effective national education policy. In particular, the project proposes policy options that best ensure that school resources are effectively and equitably used to improve student outcomes.

Box 1.2. The OECD School Resources Review (cont.)

The project provides opportunities for exchanges of best practices, mutual learning, gathering and dissemination of information and evidence of what works. It is also expected that, through the wide public dissemination of its results, the project will inform national policy debates on school resource among the relevant stakeholders.

The project involves a reflection about the policy implications of the currently available evidence on resource use in schools in a wide range of national settings. Evidence analysed includes the relevant academic and policy papers published in peer-reviewed journals, detailed information provided by countries on their school resource use policies, and views and perspectives collected from a wide range of stakeholders in a variety of countries. The work is undertaken through a combination of desk-based analysis, country reviews and periodic meetings of the Group of National Experts (GNE) on School Resources to provide feedback on substantive documents and determine priorities for further analytical work. The work involves three major strands:

- **An analytical strand** to draw together evidence-based policy lessons from international data, research and analysis. The analytical strand uses several means – literature reviews, country background reports (CBRs) and data analyses – to analyse the factors that shape resource use in school systems. The CBRs use a common framework to facilitate comparative analysis and maximise the opportunities for countries to learn from each other.
- **A country review strand** to provide policy advice to individual countries tailored to the issues of interest in those countries, on the basis of the international evidence base, combined with evidence obtained by a team of experts visiting the country. For each country review, a team of up to five reviewers (including at least two OECD Secretariat members) analyses the CBR and subsequently undertakes an intensive case study visit of about eight days in length. Each study visit aims to provide the review team with a variety of perspectives on school resource policies and includes meetings with a wide variety of stakeholders. Country review reports are published in the series *OECD Reviews of School Resources*.
- **A synthesis strand** with the preparation of a series of thematic comparative reports. These blend analytical and review evidence and provide overall policy conclusions on specific themes.

Collaborations

The project is conducted in co-operation with a range of international organisations to reduce duplication and develop synergies. In particular, within a broader framework of collaboration, a partnership with the European Commission (EC) is established for this project. The support of the EC covers part of the participation costs of countries which are part of the European Union Erasmus+ programme and contributes to the preparation of the series of thematic comparative reports. In addition, the review of Kazakhstan was undertaken in co-operation with the World Bank. Other international agencies collaborating with the project include Eurydice, the Inter-American Development Bank (IDB), the Organising Bureau of European School Student Unions (OBESSU), the Standing International Conference of Inspectorates (SICI) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Social partners are also involved through the contribution of Trade Union Advisory Committee to the OECD (TUAC) and the Business and Industry Advisory Committee to the OECD (BIAC), which participated in the GNE as Permanent Observers.

Aims of this report

This report on the funding of school education is the first in a series of thematic comparative reports. Figure 1.3 presents an overview of the main themes and guiding questions addressed by the report. It is intended to add value to the wide range of materials produced through the OECD review (Box 1.2) in the area of school funding by drawing out its key findings and policy messages. This report seeks to:

- Provide an international comparative analysis of funding policies in school education.
- Provide a stock-take of current school funding policies and practices in countries.
- Develop a comprehensive framework to guide the development of school funding policies.
- Propose policy options for the development of school funding policies in different contexts.
- Identify priorities for follow-up work.

Figure 1.3. **The funding of school education: Main themes and guiding questions for the report**



Country participation and sources of information

Eighteen school systems were actively engaged in the preparation of this report. These are referred to as the “OECD review countries” throughout the report. These 18 school systems cover a wide range of economic and social contexts, and among them they illustrate quite different approaches to school funding. This allows a comparative perspective on key policy issues. In addition, this report seeks to go beyond information collected from the 18 participating countries by considering cross-country data available from broader OECD and other data collections as well as the relevant international research literature.

Most of the OECD review countries took part in a collection of qualitative data on the main features of their school funding approaches and prepared a detailed background report, following a standard set of guidelines. In addition, ten of these school systems also opted for a detailed country review, undertaken by a review team consisting of members of the OECD Secretariat and external experts. Country reviews provide an independent analysis by the review team of identified strengths and challenges in the use of resources in these countries. In their analyses, the review teams have drawn on information gathered in interviews with a broad range of stakeholders, including social partners, during a main country review visit.

This report draws on four main sources of information:

- A range of literature reviews bringing together research findings on relevant issues from as many school systems as possible beyond the OECD review countries. These literature reviews include OECD working papers on budgeting and accounting in OECD education systems; the public funding of private schools; conceptualising and measuring efficiency and equity in the use of school resources; the funding of vocational education and training; the funding of special educational needs provision; and targeted funding schemes. Annex C provides an overview and links to published literature reviews.
- Seventeen responses to a qualitative data collection on national approaches to school funding provided by the following school systems: Austria, Belgium (Flemish Community), Belgium (French Community), Chile, the Czech Republic, Denmark, Estonia, Iceland, Israel, Kazakhstan, Lithuania, Portugal, the Slovak Republic, Slovenia, Spain, Sweden and Uruguay. The information collected is summarised in comparative tables included in the annexes to individual chapters of this report.
- Sixteen country background reports prepared by the following school systems: Austria, Belgium (Flemish Community), Belgium (French Community), Chile, the Czech Republic, Denmark, Estonia, Iceland, Kazakhstan, Lithuania, Luxembourg, the Slovak Republic, Slovenia, Spain, Sweden and Uruguay.
- Ten country review reports prepared by OECD-led review teams for the following school systems: Austria, Belgium (Flemish Community), Chile, the Czech Republic, Denmark, Estonia, Kazakhstan, Lithuania, the Slovak Republic and Uruguay.

This thematic synthesis report provides examples of country initiatives in funding school education (available also in specific boxes). These country examples do not constitute best practices or recommendations of a particular approach and have not necessarily been evaluated through a programme evaluation, but rather help to illustrate points made in the analysis and show different approaches. It should be noted that country-specific information given in this report with no associated source or reference is taken from country background reports and country review reports produced through the review. All documents produced through the review are available from www.oecd.org/education/schoolresourcesreview.htm.

The importance of context

When reading this report, it is important to keep in mind that the contexts within which school funding policy making operates can vary markedly across countries depending on their historical traditions, educational cultures and economic and social conditions. Policy initiatives that work well in one national context are not necessarily transferable. The review has attempted to be sensitive to this through an approach that analyses school funding policies in relation to the values, vision and organisation of school systems in different countries as well as the broader economic, social and political contexts in which they operate. It is important to note that not all policy directions apply equally across countries. In a number of cases the policy suggestions are already in place, while for other countries they may have less relevance because of different social, economic and educational structures and traditions. The implications also need to be treated cautiously because in some instances there is not a strong enough research base across a sufficient number of countries to be confident about successful implementation. Rather, the discussion attempts to distil potentially useful ideas and lessons from the experiences of countries that have been searching for better ways to govern, distribute and manage school funding.

The structure of this report

The report has five chapters. Following Chapter 1 which explains the importance of school funding, Chapters 2-5 are concerned with the key substantive issues involved in school funding policies: *Governing School Funding* (Chapter 2); *Distributing School Funding* (Chapter 3); *Planning the Use of School Funding* (Chapter 4); and *Evaluating the Use of School Funding* (Chapter 5). The chapters provide a description of school funding frameworks in countries; analyse strengths and weaknesses of different school funding approaches; and provide recommendations for the improvement of funding strategies.

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ANNEX 1.A1

Key terms and concepts

Effectiveness, efficiency and equity

In the economic literature, education is typically conceptualised as a process turning a given set of resources into a given set of outcomes. Schooling is thus the transformation of resources (e.g. students' and teachers' characteristics, classroom size, or schools' facilities) into individual (e.g. improved cognitive skills, successful integration in the labour market or individual wellbeing) and social outcomes (e.g. increased democratic participation, intergenerational mobility or social cohesion). This process is mediated by the institutional factors shaped by educational policy (e.g. decentralisation of school funding, higher school autonomy or benchmarking between schools) and broader national policies and governance structures.

Contextual factors also affect the success of the school system and the effectiveness of political reforms. The socio-economic background of students, the characteristics of the students' neighbourhood and peers and the location of schools all influence the capacity to make the most out of the available resources. Therefore, there has been a greater focus on ensuring that resources are directed to those areas where improvements in teaching and learning can best be achieved and where funding is most needed. In this context, devising funding strategies promoting an *effective, efficient and equitable* use of resources is of key importance.

Effectiveness

Educational effectiveness refers to the potential of a particular combination of school resources to provide desired outcomes. Effective schools or school systems are those able to adequately accomplish stated education objectives, producing the maximum possible outcomes by using available human and physical resources. Studies of educational effectiveness analyse whether specific resources have positive effects on different outcomes, and if so, how large these effects are (Lockheed and Hanushek, 1994). In contrast to studies of efficiency (see below), effectiveness analyses are not necessarily concerned with the cost of different resources, but rather with which minimum combination of resources provides a desired level of school quality or longer-term social and economic outcomes.

Effectiveness can be internal or external, depending on the nature of the outcomes being considered. Internal effectiveness analyses assess the extent to which the potential for providing quality education is being fulfilled to achieve outcomes that directly accrue to the education system such as student achievement or literacy and numeracy levels. Educational policies targeted at increasing internal effectiveness are dependent on an evaluation of

alternative uses of resources *within* the school system. External effectiveness, on the other hand, addresses how that educational potential is being fulfilled in terms of private and social financial outcomes. This type of analysis focuses on the ways in which particular combinations of non-financial resources, such as different teachers' characteristics or different educational curricula, influence longer-term outcomes in the labour market. However, external effectiveness evaluations are of little value to provide guidance to educational policy since the financial effort invested in providing the human and physical resources is not quantified. Hence, the concept is normally used as a first stage of a cost-benefit analysis (Lockheed and Hanushek, 1994).

Improving internal or external effectiveness can be attained through two different approaches: either by maintaining identical levels of outcomes while lowering the intensity of resources in the system, or by attaining better outcomes with the same level of resources employed. The choice of the approach has important implications for policy makers and will depend on contextual factors. The best way for seeking more effective school systems is always dependent on the political, cultural and economic constraints faced by education officials. In times of economic growth, an orientation towards increasing student performance, with a controlled increase or constant allocation of school resources used may more easily earn political traction while in times of severe budget constraints the overuse of public resources becomes more salient and there is greater pressure for reallocation to other uses. In any case, even with favourable political and economic conditions, having a more effective school system overall means a better adequacy between school resources and educational outcomes – which does not mean that *more* resources necessarily lead to better results.

Efficiency

Educational efficiency, in turn, refers to the ability of fulfilling the maximum educational potential at *the lowest possible cost*. It thus adds a financial cost component to effectiveness analyses. This means that it does not only matter, for instance, how many teachers per student or computers per school an educational system needs in order to provide quality education, but rather how the intensity of those resources translates into financial investment needs weighs on budgetary decisions. Thus, in order to analyse efficiency, it is necessary to have information regarding the cost of human and physical resources.

From these definitions, it follows that a school system can be effective without being efficient, but cannot be efficient without being effective. From a political perspective, this implies that there is no logical support for seeking cost reducing policies based on an efficiency argument, if a neutral or positive impact on effectiveness is not guaranteed in the first place. Thus, a policy reform can only reveal itself truly efficient if, from its proceedings, internal and external effectiveness remain at least unchanged.

Efficiency can also be internal or external depending on the nature of the outcomes considered. Internal efficiency focuses on the relationship between financial resources and outcomes which directly accrue to the school system, like student achievement or literacy and numeracy levels. In the context of education policies, evaluations of internal efficiency are targeted at assessing how the available funds can be best allocated *within* the system. The use of these analyses can provide guidance on which school funding policies should be pursued. External efficiency, on the other hand, focuses on comparing the benefits from investing in the school system with the benefits from investing comparable amounts in alternative priorities. As a condition, the outcomes of the different priorities must be

comparable, which normally implies that these are measured as financial returns, normally in the labour market context. Thus, these evaluations help to understand how many funds should be allocated to or *from* the system. They also provide the justification for long-term trends in education expenditures by showcasing how the economic costs of providing quality education can continuously translate into improved social and economic outcomes. Analyses of external efficiency are beyond the scope of this report.

As in the case of effectiveness, efficiency improvements can be obtained either through an input or output perspective. School systems can become more efficient either by consuming less financial resources with no change in the outcomes, or by improving their outcomes with no change in the level of financial investment.

Equity

Educational equity is a broad and not easily definable concept. Studies of educational equity are concerned not only with issues internal to the school system, but typically also explore broader phenomena such as housing segregation, social discrimination and integration of immigrants and minorities (Levin, 2003).

The pursuit of equity in education usually takes into account three different possible strategies underpinning policymaking: seeking equal opportunities, equal treatment or equal results across students and schools (Castelli et al., 2012). Equity is not, in every circumstance, synonym of equality: it is open to the unequal treatment of those who come from different starting points. Striving for equal results across students with different characteristics allows for differences in funding that take into account the differential costs of providing similar educational experiences to different student groups. The different approaches also reveal a different relevance given to the phases of the educational process. While the concern with equal opportunities entails the provision of sufficiently differentiated levels of resources to ensure identical levels of quality, the focus on equity as an achievement equaliser turns the debate towards the best policies to ensure an even distribution of educational outcomes.

There are two main ways of operationalising equity in education: horizontally and vertically. While horizontal equity considers the overall provision of resources to each part of the school system, vertical equity justifies policy options targeted to ensure disadvantaged groups of students or schools have access to additional funds. As will be explained below, horizontal and vertical equity can be complementary goals. While horizontal equity is assessed by minimum variability in the distribution of resources for similar students, vertical equity focuses on providing differential funding for different student groups based on their needs. In order to minimise an apparent tension between these concepts, the analyses must be clearly identified and be correctly conditioned to the relevant factors for differentiation. The next sections will better address these concerns.

Horizontal equity

Horizontal equity is usually defined as the equal treatment of equals. It closely reflects the principle of equality in resource distribution, such that the same amount of school resources is allocated for similar types of provision. For the case of horizontal equity, the differences in educational opportunities are analysed within each subpopulation of students or schools to be targeted. It is, then, a useful concept when applied to intra-group equality, if the relevant subpopulations are well identified and separately analysed (Berne

and Stiefel, 1999). Horizontally equitable funding schemes are set such that there is a minimum dispersion of access to resources within the relevant subpopulations of students or groups of schools.

Vertical equity

Vertical equity is typically defined as the unequal treatment of unequals. In other words, students or schools with different characteristics should be given access to different levels of funding. These differences in funding reflect the additional costs of providing similar educational experiences across students with different characteristics. It is thus the concept that most closely reflects the principle of equal educational opportunity. At the student level, it implies that funding should be allocated according to the specific needs of each subpopulation of student, identified by its relevant characteristics. Previous analyses of PISA data indicate that the risk of low performance is significantly different and systematically increases for students with key identified characteristics (OECD, 2016c; OECD 2016e). These characteristics are normally those of family and cultural background, gender, ethnicity, immigrant status or specific special educational needs. At the school and regional levels the usual characteristics considered are related with the level of urbanisation of the municipality or region, its size and the capacity to raise additional revenues. Funding strategies for education must take this into account if equity across different groups of students is to be achieved. Vertically equitable funding schemes are set such that all students have an equal opportunity to achieve their full potential, independently of circumstances which are out of their direct control.

At first sight, the definitions of the concepts of vertical and horizontal equity may seem to imply a trade-off. Allocation of differential funding to comply with vertical equity objectives leads to overall variability in funding across regions and schools which could hinder horizontal equity. However, a clear conceptual distinction and assessment reveals no such concern, as horizontal equity can be pursued with no prejudice of vertical concerns. It is possible to both provide differential funding across subpopulations of students, while guaranteeing minimum variability of access to resources within those subpopulations. So, while a funding scheme can allocate additional funding for schools with a higher proportion of students from disadvantaged socio-economic backgrounds, horizontal equity can be attained by guaranteeing that such additional funding is identical for those groups of students or schools with similar characteristics.

Research in the area of educational economics has provided evidence supporting well designed and transparent *funding formulas* as the best way to combine horizontal and vertical equity, while incentivising the efficient use of school resources at the different levels of the system (Levačić, 2008). A funding formula is a set of agreed funding criteria which are impartially applied to each school, normally through a mathematical formula making the coefficients attached to each criterion explicit (Levačić et al., 2000; Fazekas, 2012). Through funding formulas, the equity and efficiency objectives are made explicit and the coefficients yield the potential to better address specific school priorities. Chapter 3 includes a more thorough discussion of funding formulas and other funding mechanisms used by the countries analysed in this report.

Measuring efficiency

Efficiency as a normative concept

Efficiency is different from productivity due to its normative nature. Productivity stands for the ratio between the outputs and inputs involved in a given production process.

Conceptualising the education process as production, a measure of productivity in this sense would be given by the simple ratio between educational outcomes, such as student achievement, and a measure of resources invested in that education process. On the other hand, technical efficiency measures attempt to capture the distance between the *observed* productivity and the productivity that would be *maximally attainable* given the same level of resources invested (input-oriented approach) or the same level of outputs (output-oriented approach). In the case of education, and taking an input-oriented approach at the school-level, the degree of technical inefficiency can be measured as the proportion of resources that could be saved for a given level of student achievement, if the school would be operating optimally. Therefore, technical efficiency is a normative concept since it presumes the existence of an optimal relation between the resources invested and the outcomes of that investment. The existence of this optimal point sets a benchmark for performance, as it is assumed that schools and school systems can seek to operate at this level.

When not only the quantity but also the prices of inputs are taken into account, there is also an optimal relation to be considered. In that case, the concept of allocative efficiency is taken into account. However, in the case of education, it is harder to obtain a reliable measure of allocative efficiency as the prices of relevant inputs in the education process are generally not available and are not separable from the price of other inputs. For instance, while specific teaching skills are shown to have higher impact on students' success than others, the pricing of those skills is not separable from the full cost of hiring a teacher. Furthermore, teachers' salaries are generally influenced by institutional factors that might be detached from the strict teaching and learning processes occurring at the classroom-level. The priorities for the organisation of the educational process are still relatively more influenced by discretionary budgetary decisions of school leaders and other educational officials combined with some influence of market mechanisms, rather than the strict reliance on the adjustment between input supply and demand. For international comparisons of allocative efficiency it adds the difficulty in having internationally comparable sets of financial resources. Differences in teachers' salaries across countries are strongly influenced by institutional differences in labour market legislation and the average labour productivity of each economy. These are factors external to school systems themselves, and should not contaminate evaluations of educational efficiency. Although these differences can be partially controlled for, a substantial part of the literature in efficiency measurement has thus been focusing on measuring technical efficiency instead of allocative efficiency. However, there is no divergence in qualitative conclusions as the former is a necessary condition for the latter. Policies conducive to the effective use of resources are necessary to promote an efficient use of resources.

Efficiency as a relative concept

The theoretical existence of a benchmark to which the observed productivity can be compared to immediately poses a practical question, namely that of knowing how to empirically determine this benchmark. Empirical studies assume that the potential to reach a given level of productivity can be inferred from the sample of observed productivities used in the comparative evaluation. Therefore, efficiency is seen as a relative concept. For instance, the potential of a specific school to reach given results can be inferred from the set of schools that have an identical intensiveness of resources. Schools that have better results using the same amount of resources as schools with lower results are said to be more technically efficient from an output-oriented perspective.

However, the ability to use school resources effectively also depends on contextual and institutional factors not directly related to school management or educational policy. Efficiency measures not taking these factors into account tend to capture the harshness of the conditions in which schools operate rather than the strict ability of school management to turn resources into results. The way inputs which are or not under the discretion of education officials are considered in the analyses is therefore fundamental, as different approaches change the efficiency estimates.

Efficiency as a measurable concept

Efficiency measurement studies can be a useful tool in diagnosing where efficiency problems might be occurring and where resources might be used more effectively. Box 1.A1.1 provides a brief summary of the main methods used in efficiency measurement.

However, from a policy perspective, cautions should be taken when using efficiency measurement studies to change the allocation of school resources. The conclusions are mainly based on correlational evidence, not providing a clear direction of causality. School systems are characterised by complex behaviours of the agents involved, and the true causality relation is not easily discernible exclusively by measurement studies, at least with the research tools available today. Furthermore, the efficiency estimates are sensitive to factors at the discretion of the analyst: the choice of inputs and outputs to include in the analyses, the choice of factors which the analyses are conditioned to, the methods employed and the assumptions behind those methods. Studies that apply multiple approaches, with sensitivity and robustness analyses are more reliable for their empirical credibility. Mixed-methods approaches, including qualitative assessments can provide the greatest insights to policy (Grosskopf et al., 2014).

Box 1.A1.1. Main approaches to efficiency measurement in education

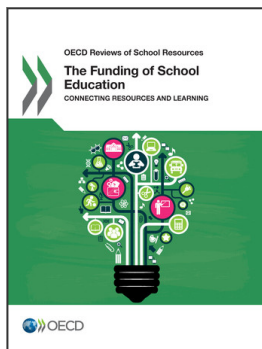
The literature in efficiency measurement can be divided in parametric and non-parametric methods. Parametric approaches assume that the process by which inputs are turned into outputs can be represented by a mathematical function. If the assumptions are correct then parametric methods are the best way to estimate the efficiency scores. Parametric methods are valuable due to their statistical properties. Confidence intervals can be easily constructed from the standard errors and the assumed functional form enables to easily quantify the marginal effect of given variables over efficiency estimates and their statistical significance. Furthermore, parametric methods can also be stochastic, meaning that the efficiency estimates can be separated from unexplained variation.

On the other hand, non-parametric techniques rely on a set of less stringent assumptions about the production process. The way by which inputs are turned into outputs is not assumed, meaning that the observed productivities are completely inferred from the data. This has some limitations. First, no standard significance tests and marginal effects can be directly computed. Second, non-parametric estimates are generally deterministic, meaning that these can be easily contaminated by unexplained variation in the data, making it more sensitive to measurement errors and outliers. However, recent developments in non-parametric methods have been able to overcome or at least limit most of these drawbacks, making them more robust. As such, different re-sampling methods have been bridging the gap between parametric and non-parametric literatures by incorporating statistical properties in the measurement process. These allow for more robust efficiency estimates.

Box 1.A1.1. Main approaches to efficiency measurement in education (cont.)

Non-parametric methods have been the most applied in educational efficiency measurement studies (De Witte and López-Torres, 2017). Two justifications for this relate to the nature of the educational process. First, the process by which educational inputs are turned into educational outcomes is generally unknown and difficult to translate in a mathematical function. Therefore, non-parametric methods, by not requiring a specific functional form, seem like a natural choice, as the relative importance of each input for the educational process is directly inferred from the data. Second, school systems and schools seek to fulfil multiple goals, and non-parametric methods more easily deal with multiple outputs than parametric ones.

Source: De Witte, K. and L. López-Torres (2017), "Efficiency in education: a review of literature and a way forward", *Journal of the Operational Research Society*, <http://dx.doi.org/10.1057/jors.2015.92>.



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