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# Explaining the Development of Private Education: the Effect of Public Expenditure on Education

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**Explaining the Development of Private Education: the Effect of Public Expenditure on Education**

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**Abstract**

There is considerable cross-country variability in the distribution of pupils between public and private education. Whereas in some countries most children attend private schools, other countries have barely developed an educational offer that provides an alternative to public education. Drawing on available macroeconomic data, we test how public spending on education impacts the distribution of pupils enrolled in private institutions. Using disaggregated data on primary and secondary education in a large number of countries and over a long period, we analyse the differences in the public-private mix of educational systems. Cross-sectional and dynamic panel analyses show that the share of enrolments in private education at primary and secondary levels is strongly impacted by the level of public expenditure on education.

**Key words:** Education, public expenditure, private education

**JEL Classification:** I21, H52, L33

**Original version:** English

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## 1. Introduction

Private institutions provide schooling for a considerable proportion of children in the world, but situations vary greatly across countries. In some countries, most pupils attend private educational institutions whereas in others private education provision is almost non-existent. Yet, the factors determining how educational services are distributed between the private and public sectors in the different countries are still largely unknown. In this study, we analyse how the relative weight of the private education sector has developed in countries and highlight the impact of public spending on education to explain this evolution.

Since Friedman (1955), the place of private education and its effect on the equity and efficiency of education provision has sparked a major debate that has given rise to a huge corpus of academic literature (Hoxby, 2003; Jeynes, 2014; Belfield and Levin, 2015). In fact, the development of private education has raised a number of concerns particularly as regards social stratification and the reproduction of inequalities (Kremer and Sarychev, 2000; Meuret, Broccolichi and Duru-Bellat, 2001; Bisin and Verdier, 2010; Mounmé and Saudemont, 2015). Yet, some hopes have also been expressed that the private schools could enable households' educational demands to be better met and the efficiency of education services to be improved (Patrinos, 2000; Walberg, 2007; Patrinos and Sosale, 2007; Pritchett and Viarengo, 2015). Given the effect of private provision on the overall education offer and its distribution across the population, it is crucial to take the development of private education into consideration when crafting education policies. In reality, although private education is a key player in many countries, it is often sidelined by states, particularly in developing countries. Yet, in just over ten years, the notion of public-private partnerships for education has changed this state of play and attempts are being made to create closer links between private education operators and state authorities (Patrinos and Sosale, 2007; d'Aiglepierre, 2013). The Sustainable Development Goals (SDGs) and the 2015 World Education Forum in Incheon (Republic of Korea) explicitly recognise the importance of non-state actors in reaching the educational objectives the states set themselves. As households see their possible educational choices broaden out, these new issues appear increasingly crucial for education systems.

Although the academic literature has largely investigated the effects of private education, the question of what determines its development is still a little studied subject, particularly at the macroeconomic level. Despite the growing importance of the question, there is still a lack of empirical data on the determinants of the distribution of pupils between public and private education worldwide. In this study, we attempt to fill this gap using the latest available macroeconomic databases with a large number of countries, disaggregating primary and secondary levels, and focusing specifically on the role of public spending on education.

The rest of this study is organised as follows: Section 2 presents the conceptual framework along with a definition of private education, the factors of demand and supply of private education, the possible determinants of how countries behave with respect to the distributions of their pupils between public and private education, a literature review of the topic and a description of the available data. Section 3 describes the state of play in private education and public spending on education at global level. An econometric analysis is then performed in Section 4 using dynamic

panel and cross-sectional regressions. The conclusion in Section 5 explains the empirical results and infers what implications these could have for education policies.

## 2. Conceptual framework

### 2.1. Defining the boundaries of private education

In this study, we focus on the behaviour of countries regarding the distribution of pupils between the public and private institutions in their education systems in order to test to what extent public education expenditure is an influencing factor. But first, we need to identify the line separating private and public education. The private sector has varying degrees of involvement and responsibility in education, but here it is understood to include any individual or association independent of the state, thus comprising private entrepreneurs, as well as religious institutions and all forms of social groupings organised at local, national or even international level (Mounmé and Saudemont, 2015).

Private educational institutions thus form a very heterogeneous category when it comes to their purpose and resources, as well as the extent to which they are associated with the state (d'Aiglepierre, 2013). As regards the ownership, management and financing of an educational institution, many combinations of public and private inputs can coexist. The boundary between public and private education may not always be clear-cut. For the purposes of this paper and in line with UNESCO's definition, private educational institutions refer to "institutions that are not managed by a public authority, but controlled and managed, whether for profit or not, by a private body" (UNESCO, 2009, p. 256). An institution is therefore classed as private if it is directly controlled and managed by an authority or body that is independent of the state, regardless of whether its source of funding is public or private.

In the history of nations, religious institutions were often the first to found schools, sometimes centuries before the state set up public educational institutions. Today, private denominational schools still frequently represent a substantial share of a country's private education sector (Wodon, 2014). More recently, private secular institutions have also been set up on a for-profit basis or targeting ethnic or linguistic minorities. Depending on the subject being addressed, these private educational institutions may thus be classified according to their clientele, the degree of state control or support, or the extent to which they are officially recognised (Kitaev, 1999). Private institutions can also be differentiated depending on whether their purpose is based on profit, religion or identity. While the different types of private education should be kept in mind, note that an institution may belong to several categories at once (e.g., religious and for-profit). Unfortunately, however, it is impossible to distinguish between the different categories of private education at a macroeconomic level (cf. below Sub-section 2.5).

## 2.2. Factors affecting private education supply and demand

Explanations for the development of private schooling within an education system can be split into factors relating to the demand for private education and its supply (James, 1987; James, 1992; d'Aiglepierre, 2013).

On the demand side, two explanations can be advanced: an excess demand for education and a demand for differentiation. Given that public education is financed through taxes on all households whereas private education is generally in the main financed directly by those who have opted for private schooling, this often means that private education is more expensive for parents than public education. As a result, households need a very good reason to choose private education over public education. The demand for private education can thus be seen as the response of households faced with a public system that fails to meet their expectations.

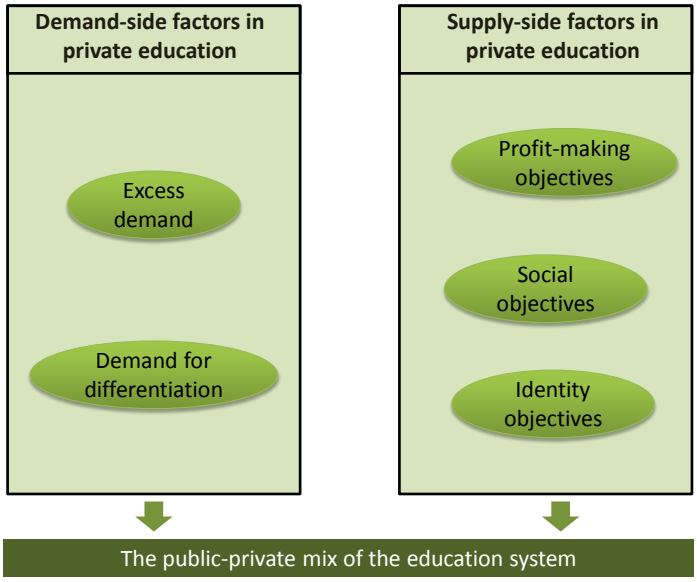
To begin with, there may not be enough available places in public schools, which thus creates excess demand. Thus, while households may prefer to enrol their children in public education, they are forced to turn to the private sector. In this case, public and private educational institutions can be considered perfect substitutes, with private education being the second-best solution. Demand for private education, however, may be the households' response to a public system that is unable to meet their educational preferences, which thus creates a demand for differentiation. Certainly, one of the main comparative advantages of private education is that it can provide households with a wide variety of specific offers and thus adapt itself to different types of educational preferences. In this context, public and private education are considered imperfect substitutes. The low quality of the public education also determines the demand for private education. A decrease in either the quality or number of places available in the public sector thus stands as a plausible explanation for a rise in the demand for private education (Nishimura and Yamano, 2013). In some cases, many private institutions have emerged in areas that are the most disadvantaged in terms of public education (Tooley, 1999; Tooley and Dixon, 2005). Failure to gain places at public schools (due to a limited number of places) or their poor reputation for quality or safety are also reasons regularly put forward to explain the success of the private sector. A specific fringe of private education has also been created to provide a second chance to pupils who have fallen foul of the shortcomings of public education (Langouet and Leger, 2000).

On the supply side, three explanations can be given corresponding to the identity-oriented, social or profit-making objectives of private education providers. Concerning identity-related objectives, a private education sector may develop to cater for minorities with specific educational preferences (Gemmeo and Osman, 1984), which may encompass ethnic, linguistic or religious considerations, types of pedagogy or even profit-making objectives. Choosing the type of schooling given to children may be a way of preserving the cohesion of values within a given group vis-à-vis the rest of the population (Cohen-Zada, 2006). Some minorities may thus place their children in private institutions alongside other children with the same background, avoiding public institutions in which the rest of the population is represented. In some contexts, institutions with a social mandate have been set up by local communities, NGOs and philanthropic organisations. In this case, the objective is to meet urgent social demands and needs, especially in areas overlooked by public services. A number of private institutions have

thus been created by local communities, parents or NGOs to complement the public education offer or mitigate its shortcomings. On the other hand, for-profit educational institutions are small businesses aimed at generating financial returns. In this case, private education can be seen as a market in which actors meet a solvent educational demand unfulfilled by public education. Beyond the specific administrative constraints imposed by states on the opening and management of educational institutions, the private for-profit education market operates much like other types of commercial markets.

To sum up, the public-private composition of educational systems can be explained by five causes acting simultaneously: excess demand, the demand for differentiation, profit-making, and the social and identity-based objectives of private education provision.

*Figure 1. Factors explaining private education development*




Source: d'Aiglepierre (2013).

### 2.3. What determines the mix of a country's private and public education

The provision of public education seems to have a clear influence on the growth of a demand for private education. Inadequate quantity and quality in public education may explain excess demand as well as the demand for differentiation. Reliable indicators on these aspects of public education are, however, somewhat difficult to find at the macroeconomic level.

Quantitatively, some countries, particularly in sub-Saharan Africa, still have inadequate education coverage rates. Countries in which the state leaves a sizeable number of its children outside the public education system may thus have a larger private offer, especially due to the increase in private schools with a social mission, such as community schools created by parents in some countries. The level of public spending on education could then be strongly linked to the state's capacity to include all its children in the public education system. The level of public education expenditure per pupil is also a possible indicator of the quality of public education provision. A

country that spends more money on each pupil's schooling may be able to provide better public education and thus have a smaller share of private education. Yet, while public spending is likely to impact private education through the quantity and quality of public education provision, a reverse causality is possible. The level of enrolment in private institutions may impact a country's willingness to support public schools (Goldhaber, 1999). Countries in which a large proportion of children are schooled privately may be less likely to want to finance public education, and this may have a detrimental impact on the state budgets allocated to education. Although the correlation between the proportion of pupils in private education and public expenditure on education is negative, the direction of causality is not clear. Concerns about the effectiveness of public expenditure also need to addressed. The effectiveness of public education expenditure with regard to quality and quantity is not always verified (Gupta, Verhoeven and Tiongson, 2002; Estache, Gonzalez and Trujillo, 2007). Moreover, while we can assume that the bulk of public education expenditure goes on public education, it should be remembered that this spending may include public support for private education. Some countries directly or indirectly subsidise private education through material or financial support. This state backing for private education providers is obviously likely to drive their development.

The economic situation is another possible determinant of both the demand for private education and the supply of for-profit private education. Given that private education generally costs households more than public education, an increase in the population's average income could have a positive impact on the proportion of private education enrolments by bolstering the demand for the differentiation of education and by encouraging the growth of for-profit private education. On the other hand, as a country develops it is to be expected that the quantity and quality of public education provision will improve, thereby reducing excess demand. Ultimately, the linkage between incomes and the development of private education is ambiguous.

As regards the objectives based on identity and the use of private education by minorities as a means of protecting their own identities, countries with a high level of religious, ethnic, linguistic or income heterogeneity in their population may have a higher demand for private education. Religions specifically use children's schooling to reinforce the cohesion of their followers, attract new followers and pass on their moral values to the next generation. Denominational institutions are thus founded at least partly for reasons of identity. Christian churches were among the first to spread throughout the world via private educational institutions. In response, other religions also began to open their own institutions to maintain their influence (James and Rose-Ackerman, 1986). Competition between religions may be considered one of the determinants of the expansion of denominational institutions in the world (James, 1992). The proportion of denominational private education institutions may prove to be greater in countries with many independent religions competing to attract the faithful rather than in countries with only one major religion. A similar effect may also be true for objectives related to ethnic or linguistic identity. In the specific case of income heterogeneity, high-income households may also be tempted to indulge in private education that is of a higher quality than in the public sector. High-income households could also be tempted to curb public education provision by raising its prices and thus reducing access to public education for lower-income households.

Finally, the political environment may also prove to be a determinant of private education supply. Under some regimes, freedom of educational choice may be restricted or the state may set up

barriers to the entry of private providers onto the education market. In fact, unlike public education, the private sector at least partially escapes state control. In countries where a dominant group attempts to impose its values or language on the rest of the population, private education may be curtailed by the state. In some cases, where autocratic regimes have come to power, this has led to a ban on all forms of non-state education and the nationalisation of existing private institutions. Policies aimed at assimilating minorities, constructing a national identity or even ideological indoctrination may well serve as an argument for creating a public education monopoly (Lott, 1990). Democracy and civil liberties in the form of the right of association may have some impact on private education development. Similarly, the roots of legislative systems may have some influence. For instance, legal systems with socialist roots may be less conducive to the development of private education.

### 2.4 Review of the literature

To date, academic research on what determines the development of private education is still relatively limited. Existing theoretical models on households' choice of an educational institution category tend to sort pupils based on income, ability (Epple and Romano, 1998, 2002) or religion and ethnicity (Cohen-Zada and Justman, 2003, 2005). Wealthy households, those belonging to religious and ethnic majorities and those with the most intellectually able children are theoretically more inclined to choose private education. At an empirical level, the findings are not as clear-cut. Academic studies on how households behave when faced with different types of educational offers still largely deal with the United States, particularly following the "education voucher" and "magnet school" experiments that sparked lively debate and gave rise to an abundant literature (Patrinos, 2000; Hoxby, 2003; Walberg, 2007; Jeynes, 2014; Belfield and Levin, 2015). Microeconomic studies on what determines the choice between several types of educational institution show that this is influenced by both demand and supply factors (Long and Toma, 1988; Lankford and Wyckoff, 1992; Lankford, Lee and Wyckoff, 1995; Buddin, Cordes and Kirby, 1998; Cohen-Zada and Sander, 2007; Schneider *et al.*, 2012). On the supply side, specific aspects of the different educational alternatives, such as cost, geographical location, denomination, quality, and the characteristics of the other pupils also have some influence on households' choice.

However, these microeconomic studies focus mostly on demand, leaving a number of important supply-side questions unanswered. Gemello and Osman (1984) were among the first to address this issue using more aggregated data. The authors show that in California school districts, the proportion of five-to-eighteen-year-olds, income level, income distribution within the population, and some ethnic factors significantly impact private school enrolment rates at the primary and secondary level. The level of the state's per-pupil expenditure on public schools also appears to have a significantly negative impact on private education development. In their study on private education providers' choice of location in California school districts, Downes and Greenstein (1996) also show that the level of spending by public institutions has a negative effect on private education, while the percentage of Catholics and minorities in the population as well as a high population heterogeneity index have a positive impact. Downes and Greenstein (2002) find that private education providers are more likely to be located in districts with low levels of per-pupil

public expenditure. Again for California, Downes and Schoeman (1998) examine how financial reforms undertaken by public schools affect private school enrolment rates, and highlight the importance of heterogeneity of demand and specific effects in districts. The quality of public education and future expectations of this quality are also determinants. To study the relationship between public expenditure on education and private education enrolment rates, Goldhaber (1999) constructed an endogenous model. Based on a panel of New York State school districts, the model shows that while a decrease in public school expenditure results in an increase in private education enrolment rates, the reverse is not verified. However, these studies using aggregate data are of limited value as they focus on the highly specific context of the United States. Indeed, some factors that influence private education may only be relevant at the country level.

At the **macroeconomic level** regarding the choices countries make for the public-private mix of educational services, the reference article is that of E. James (1992). This study includes data collected by the author for the year 1980 for 50 countries including 38 developing countries, and shows that the proportion of enrolments in private primary and secondary schools is positively affected by religious heterogeneity and subsidies to private education, and negatively affected by public expenditure on education. Income levels and income inequality do not appear to have any effect. The quality of the data, the bias in the choice of countries and the low number of observations compared to the number of explanatory variables raises doubts as to the robustness of the results (de la Croix and Doekpe, 2009). Despite its shortcomings, James (1992) is still being referenced in the academic literature (Easterly and Levine, 1998; Hanushek, 2002; Angrist *et al.*, 2002; Boldrin and Montes, 2005; Prichett and Viarengo, 2015). Since James (1992), the lack of comparable data on private education has so far precluded any further empirical macroeconomic studies on differences in the public-private mix of education systems. Despite the importance of this question and the fact that several factors impacting private education development can only be discerned at a macroeconomic level, the situations regarding the public-private mix of countries' education systems is still inadequately studied.

### 2.5. Data

Macroeconomic data on education are mainly produced by the UNESCO Institute for Statistics (UIS). In this study, the variable that we attempt to explain is the percentage of pupils enrolled in private educational institutions at the country level. However, this percentage is only available for primary and secondary education, as there is currently insufficient information available for tertiary education. The distinction between the different categories of private education does not exist at the macroeconomic level; thus, pupils are either educated in private institutions or public institutions. We have data on the proportion of pupils enrolled in private institutions in primary and secondary education for an unbalanced sample of countries for the period 1970–2014.

To understand a country's level of public spending on education, per-pupil public education expenditure is used, measured as a percentage of GDP per capita and disaggregated for primary and secondary education. This is thus the ratio between total public expenditure for a given educational level and the total number of pupils enrolled at that level, be it in public or private education. This expenditure captures educational spending at various levels of state

administration for public education, as well as eventual public support for private education. At the international level, however, there are no data on public transfers to private education. The proportion of children actually enrolled in primary schooling is measured by the net enrolment rate (NER), which is the number of children of official primary school age (generally between 6 and 12 years old) who are enrolled in primary education, expressed as a percentage of the total corresponding population. The net rate of secondary enrolments is calculated in the same way. The economic environment is measured using average per capita income in purchasing power parity and in constant 2010 dollars (WDI, 2016). The socialist origin of countries' legislative systems is drawn from La Porta *et al.* (1999) and enables us to identify the influence exerted by communist regimes. This refers mainly to countries in the former Soviet bloc and countries strongly influenced by communism.

## 3. The global state of play in private education and public expenditure on education

### 3.1. The weight and development of private education

To assess the share of private education in the world, a per-country average is calculated for the recent period 1999–2014. All in all, we have data available on the percentage of enrolments in private education for 179 countries at the primary level and 178 for the secondary level. The results in Table 1 and Figure 2 give a picture of the geographical distribution of this share of private education.

*Table 1. Primary, secondary and tertiary level enrolments in private education as a percentage of total enrolments, averages 1999–2014*

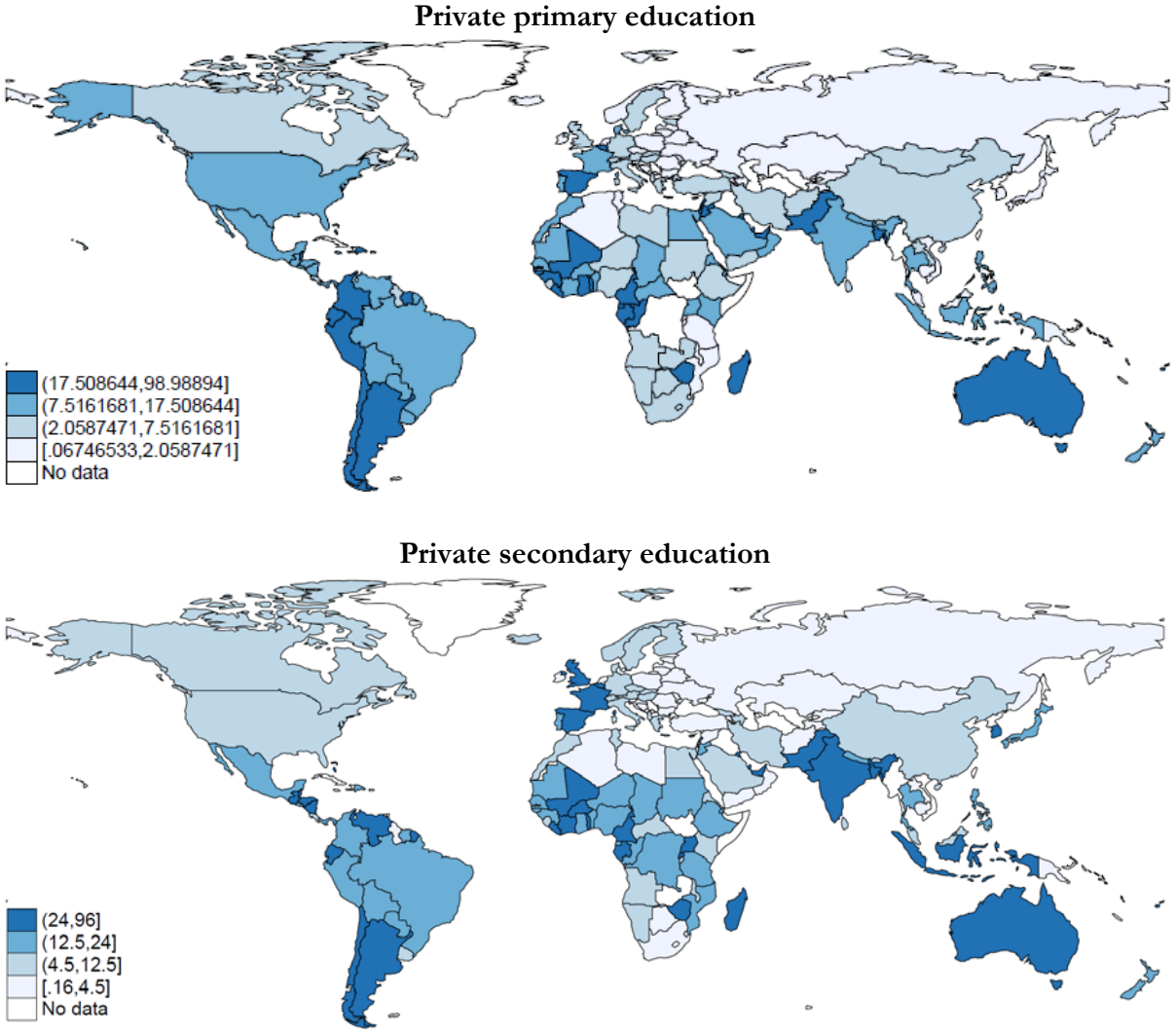
| Variable | Total | Income level | | | Region | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low income | Middle income | High income | Sub-Saharan Africa | Latin America | Asia | Western Europe and North America | Eastern Europe | Middle East and North Africa |
| % of primary level enrolments in private institutions | 14.74 | 15.45 | 13.02 | 17.15 | 13.95 | 23.76 | 17.15 | 10.10 | 1.864 | 20.27 |
| % of secondary level enrolments in private institutions | 18.01 | 23.71 | 17.31 | 16.19 | 20.53 | 24.29 | 25.20 | 13.96 | 3.369 | 15.42 |

Source: authors, based on UIS/UNESCO data (2015). Note: the country averages used here are not population-weighted. 2 3 4

Globally speaking, the world's countries have an average of 14.7% of primary pupils and 18% of secondary pupils in private education. While overall this represents a large proportion of pupils, the private sector seems more developed at the secondary level than at the primary level. Yet, these averages obscure a broad diversity of situations depending on the country. The weight of the private sector thus varies from 0.07% to 98.99% at the primary level and from 0.16% à 95.52% for the secondary. Although the correlation between the shares of primary and secondary private education is strong and significant, the linkage between the two is not perfect and some countries have a considerably more developed private sector at one level compared to the other (see Appendix, Table A1).

At primary level, high-income countries have a more developed private education sector than low-income countries. Conversely, for secondary education, low-income countries have higher private sector enrolment rates. As far as geographical distribution is concerned, private education is markedly less developed in Eastern European countries, whereas Latin America exhibits the highest growth of private education. Asia has substantially developed private secondary education while the Western Europe and North America region stands below global averages. Private primary education in sub-Saharan Africa is slightly lower than the global average, but a little higher at the secondary level.

*Figure 2. Primary and secondary enrolment in private education as a percentage of total enrolments, averages 1999–2014*




*Source: authors, based on UIS data (2016).*

To know how the share of private education has evolved over time, the annual per-country growth rate between the earliest and most recent data was calculated for the period 1999–2014. The results are reported in Table 2. On average, the share of enrolments in private education

increased over this period. At global level, the weight of the private sector rose by 0.27 percentage point for primary education and by 0.05 percentage point for secondary. For the share of private education to gain one percentage point compared to public education, an average of a little less than four years is necessary at primary level and almost 20 years at secondary. Once again, these averages obscure large disparities across countries, with a growth of between -4 points and +2,8 points for primary and -22 points and +3,9 points for secondary (see Appendix, Figure A1). The correlation between growth in the share of private primary education and that of private secondary education is relatively weak as some countries experienced growth at one educational level and a decline at the other (see Appendix, Table A1).

*Table 2. Average annual growth rate of the share of private sector enrolments, at primary and secondary levels, in percentage points, averages 1999–2014*

| Variable | Total | Income level | | | Region | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low income | Middle income | High income | Sub-Saharan Africa | Latin America | Asia | Western Europe and North America | Eastern Europe | Middle East and North Africa |
| Growth rate of % of primary level enrolments in private institutions | 0.266 | 0.323 | 0.228 | 0.298 | 0.386 | 0.156 | 0.292 | 0.0470 | 0.127 | 0.542 |
| Growth rate of % of secondary level enrolments in private institutions | 0.0516 | 0.0786 | -0.138 | 0.340 | 0.247 | -0.0721 | -0.557 | 0.258 | 0.202 | 0.395 |

Source: authors, based on UIS/UNESCO data (2015). Note: the country averages used here are not population-weighted.

Low-income countries experienced the highest growth rates in private primary education, whereas it was the high-income countries that saw the highest growth of private secondary education. Middle-income countries are below global average growth for private primary education and have seen their share of private secondary education decline. Geographically speaking, the highest growth of private education was in Africa and the Middle East. Asia exhibits an increase for private primary education but a decrease at the secondary level. The share of private education in Latin America has stagnated at the secondary level and slightly increased at the primary lavel. Western Europe and North America show a slight increase of private education at the primary level and a strong increase at secondary. Eastern Europe is above the global average increase for secondary education but falls below for primary education.

### 3.2. Funding levels and variations in public expenditure on education

Data on public education expenditure for the period 1999–2014 are only available for 147 countries at the primary level and 145 countries at the secondary level. Expressed as a percentage of GDP per capita, per-pupil public expenditure on primary and secondary education also varies greatly across countries. On average over the same period, the differences range from a 1.3% to 38.2% share of GDP per capita spent by the state for a primary school pupil compared to a range of 3.3% to 86% for a secondary school pupil.

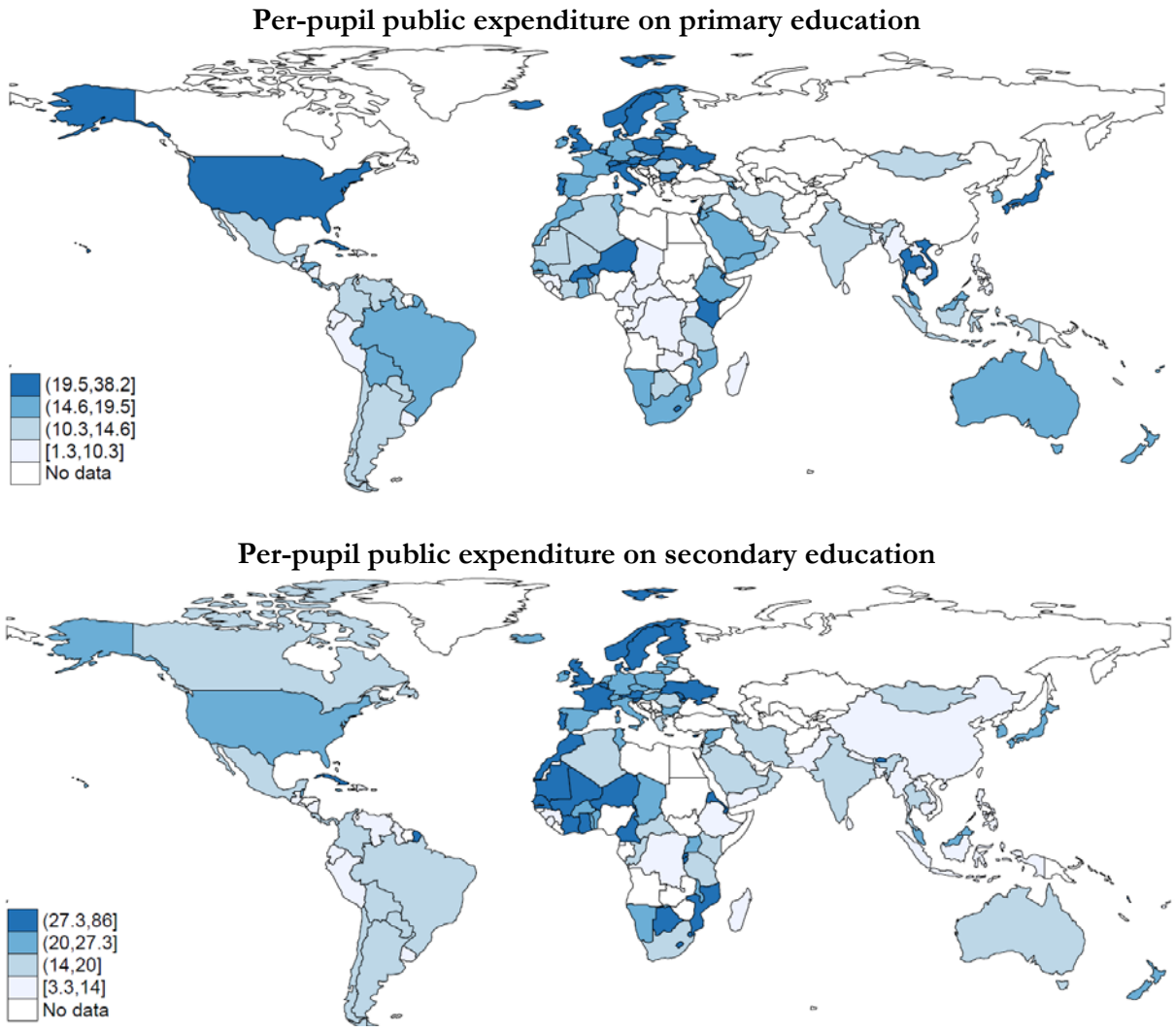
*Table 3. Per-pupil public expenditure on primary and secondary education as a % of GDP per capita, averages 1999–2014*

| Variable | Total | Income level | | | Region | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low income | Middle income | High income | Sub-Saharan Africa | Latin America | Asia | Western Europe and North America | Eastern Europe | Middle East and North Africa |
| Per-pupil public expenditure on primary education as % of GDP per capita | 14.96 | 11.54 | 14.73 | 17.13 | 12.36 | 13.34 | 13.29 | 19.44 | 20.88 | 15.89 |
| Per-pupil public expenditure on secondary education as % of GDP per capita | 21.00 | 22.98 | 20.10 | 21.19 | 26.23 | 15.16 | 16.47 | 24.59 | 22.86 | 19.76 |

Source: authors, based on UIS/UNESCO data (2015). Note: the country averages used here are not population-weighted.

Globally, states invest an average 15% of GDP per capita for a primary school pupil and 21% for a secondary school pupil. The unit cost for the state is thus 40% higher for a secondary pupil than for a primary pupil. At the primary level, high-income countries spend proportionally more on education than low-income countries. On the contrary, when it comes to secondary schooling, it is the low-income countries that spend most per pupil. Sub-Saharan African countries spend least on their pupils, while Asia is below world averages for spending on both primary and secondary education. Latin America is the region that spends the least per secondary pupil. Eastern Europe, Western Europe and North America are the regions where expenditure on education is the highest at both the primary and secondary levels. The countries in the Middle East and North Africa spend amounts comparable to world averages. The correlations between primary and secondary education expenditures are positive and significant, but the linkage between the two is far from perfect, and some countries spend substantially more on primary than on secondary schooling (see Appendix, Table A1)

*Figure 3. Per-pupil public expenditure on primary and secondary education as a % of GDP per capita*




*Source: authors, based on UIS data (2016).*

The annual growth rate of per-pupil public expenditure on education for each country is calculated between the earliest and latest available data for the period 1999–2014 (see Table 4). The results are reported in Table 4. On average, per-pupil expenditure as a share of GDP per capita has increased by 0.26 percentage point annually at the primary level, and by 0.09 percentage point at the secondary level. These annual growth rates vary between -2.7% and +4.2% for primary and -7% and +8.7% for secondary. The correlation between the growth of education expenditure as a share of GDP for primary education and that for secondary education is weak (see Appendix, Table A1).

*Table 4. Evolution of per-pupil public expenditure on primary and secondary education as a % of GDP per capita, 1999–2014*

| Variables | Total | Income level | | | Region | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low income | Middle income | High income | Sub-Saharan Africa | Latin America | Asia | Western Europe and North America | Eastern Europe | Middle East and North Africa |
| Annual growth rate of per-pupil public expenditure on primary education as % of GDP per capita | 0.264 | -0.101 | 0.268 | 0.442 | -0.144 | 0.410 | 0.266 | 0.400 | 0.744 | 0.279 |
| Annual growth rate of per-pupil public expenditure on secondary education as % of GDP per capita | 0.0919 | -0.833 | 0.164 | 0.388 | -0.964 | 0.414 | 0.505 | 0.282 | 0.438 | 0.350 |

Source: authors, based on UIS/UNESCO data (2015). Note: the country averages used here are not population-weighted.

The high-income countries exhibited the highest growth in the unit amount allocated by the state to primary- and secondary-level pupils, whereas the low-income countries experienced reductions in per-pupil public expenditure. The middle-income countries had growth levels close to the world average growth for primary education and slightly higher levels for secondary education. In terms of geography, it was in Eastern Europe, Western Europe, North America and Latin America that the funding allocated to primary school pupils experienced the highest growth (See Appendix, Figure A2). Asia and the Middle East and North Africa exhibit a growth close to the world average for primary education and considerably higher that the world average for secondary education. Africa, mainly due to its specific demographics, saw a fall in the share of expenditure on education both for primary and secondary.

## 4. Econometric analysis

### 4.1. Cross-sectional regressions

Based on the averages for the whole period 1999–2014, multiple linear regression models can be represented. The estimated equation is expressed as follows:

$$Edu\ Privé_i = \alpha + \beta_1 X_i + \varepsilon_i, \quad (4.1)$$

where $Edu\ Privé_i$ denotes the share of enrolments in private education in country $i$, $X_i$ a vector including per-pupil expenditure (for primary or secondary) as a % of GDP per capita and the control variables and the error term, $\varepsilon_i$. We thus used the ordinary least squares (OLS) method to test the significance of the linkage between the share of private education and public expenditure on primary and secondary education.

*Table 5. Cross-sectional estimations of the share of enrolments in private primary institutions, OLS, average 1999–2014*

| Dependent variable: Percentage of enrolments in private primary institutions (%) | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Public expenditure per primary pupil as % of GDP per capita | -0.705*** | -0.868*** | -0.594*** | -0.735*** | -0.815*** |
| | (0.172) | (0.184) | (0.176) | (0.183) | (0.236) |
| ln GDP per capita (constant 2005 US dollars) (WDI Indicator) | | 2.541*** | | | 3.403** |
| | | (0.827) | | | (1.352) |
| Socialist origin of legal system | | | -12.031*** | | -8.833*** |
| | | | (1.906) | | (2.741) |
| NER-Primary | | | | 0.113 | -0.134 |
| | | | | (0.084) | (0.139) |
| _cons | 25.041*** | 7.034 | 25.062*** | 15.705** | 12.606+ |
| | (3.280) | (5.597) | (3.238) | (7.646) | (8.070) |
| Obs | 147.000 | 147.000 | 146.000 | 137.000 | 136.000 |
| R-squared | .0616019 | .111029 | .1152363 | .0638522 | .1580089 |

Source: UNESCO-UIS, La Porta *et al.* (1999). OLS estimations. Robust standard errors in parentheses. Time fixed effects.

*Table 6 Cross-sectional estimations of the share of enrolments in private secondary institutions, OLS, average 1999–2014*

| Dependent variable: Percentage of enrolments in private secondary institutions (%) | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Per-pupil public expenditure on secondary education as % of GDP per capita | -0.274** | -0.289** | -0.296** | -0.385*** | -0.362*** |
| | (0.120) | (0.123) | (0.115) | (0.136) | (0.127) |
| ln GDP per capita (constant 2005 US dollars) (WDI Indicator) | | -1.058 | | | -0.713 |
| | | (0.931) | | | (2.151) |
| Socialist origin of legal system (La Porta *et al.* 1999) | | | -18.506*** | | -19.880*** |
| | | | (1.888) | | (3.195) |
| NER-Secondary | | | | -0.084+ | -0.002 |
| | | | | (0.055) | (0.113) |
| _cons | 24.836*** | 33.706*** | 27.695*** | 33.453*** | 35.667*** |
| | (3.309) | (8.856) | (3.340) | (5.903) | (12.140) |
| Obs | 143.000 | 143.000 | 142.000 | 122.000 | 122.000 |
| R-squared | .0324998 | .0411356 | .1446899 | .0667295 | .166316 |

Source: UNESCO-UIS, La Porta *et al.* (1999). OLS estimations. Robust standard errors in parentheses. Time fixed effects.

Per-pupil public expenditure on education appears negatively and significantly correlated to the proportion of pupils enrolled in private institutions. This result holds for both primary and secondary levels and is validated even when controlled for a country's economic situation, access to education and the socialist origin of the legal system[‡]. Average income, like access to

[‡] This result remains robust even when a large number of other variables that could explain the growth of private education are included (results available from the authors upon request). The variables capturing the heterogeneity of population and religion in particular are not significant and do not modify our results.

education, does not seem to have a significant impact, whereas the socialist origin of the legal system significantly reduces the weight of private education.

The coefficients of determination ($R^2$) of our models vary between 0.03 and 0.17, signalling that while our variables do to some extent explain the variability of the level of private education in the countries, a large part of this variability is still unexplained. The analysis of the coefficients shows that an increase of one percentage point in per-pupil public expenditure on education reduces the share of private education by 0.59 to 0.87 percentage point at primary level and by 0.27 to 0.39 percentage point at secondary. The impact of this variable on our cross-sectional data is thus quite considerable. It is clear from the country averages that the countries spending most per pupil are also those in which private education is the least developed. While these simple models furnish the first clues, dynamic models need to be used to infer the causality between public expenditure on education and the distribution of pupils between the private and public sectors in the different countries' education systems.

### 4.2. Panel data regressions

To confirm our results, we use the time variations of our long-run series. As the socialist legal system has no time variability, we simply check the robustness of our results with respect to per-pupil public expenditure on education and control for changes in income and access to education. The dynamic estimation of the effect of our variables on private education enable us to integrate the individual unobserved heterogeneity specific to each country. Likewise, we are able to capture the time effects common to all of the countries. In addition, a degree of inertia needs to be included in the growth of private education, as changes in the proportion of enrolments in private institutions happen relatively slowly and the variables for public expenditure on education and for average income may take time to impact the share of private education. In fact, creating new institutions, opening new classes and a student's change of school all require at least one school year. To use maximum time variability, we use all the data for the period 1970–2014. The econometric analysis of our model is performed by estimating an equation expressed as follows:

$$Edu\ privé_{i\,t} = \alpha + \beta_1\ Edu\ privé_{i\,t-1} + \beta_2\ X_{i\,t-1} + \eta_i + \delta_t + \varepsilon_{i\,t}\ , \qquad (4.2)$$

where the share of private education in country *i* in *t+1* ($Edu\ privé_{i\,t}$) is explained by the share of private education for the previous year ($Edu\ privé_{i\,t-1}$) as well as by our explanatory variables in the period *t-1*. Fixed effects by country ($\eta_i$) and by year ($\delta_t$) are also included in the model in order to address the unobserved heterogeneity specific to the country and to the years. With this model, we use the generalised method of moments (GMM) – an estimation approach

whose advantage lies in the treatment of the problem of correlated individual effects and in the possibility of addressing the potential endogeneity of explanatory variables. In this framework, we consider the education expenditure, income and net enrolment rate (NER) as endogenous, and the time dummies as exogenous. We put no restriction on the number of lags and perform the estimations in two steps. The results of the test yield a sufficient confidence level for the validity of our instruments. The results are reported in Tables 7 and 8 and confirm the findings of our previous models.

*Table 7: Panel estimations of the share of enrolments in private primary institutions, annual panel, GMM approach, 1970–2014*

Dependent variable: Percentage of enrolments in primary education in private institutions (%)

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| % Primary private education(t-1) | 0.993*** | 0.983*** | 0.995*** | 0.991*** |
| | (0.010) | (0.008) | (0.008) | (0.007) |
| Expenditure per pupil (primary) (t-1) | -0.033** | -0.036** | -0.019+ | -0.032** |
| | (0.014) | (0.015) | (0.012) | (0.014) |
| L.NERPrimary | | -0.012+ | | -0.014+ |
| | | (0.008) | | (0.009) |
| ln GDP (t-1) | | | -0.019 | -0.016 |
| | | | (0.059) | (0.074) |
| _cons | -0.030 | 2.320*** | 0.000 | 2.766*** |
| | (0.651) | (0.860) | (.) | (0.990) |
| Obs | 935 | 709 | 905 | 701 |
| Number of countries | 139 | 119 | 136 | 118 |
| AR1-pvalue | .0102184 | .036805 | .0120225 | .0334762 |
| AR2-pvalue | .460132 | .6850881 | .4067593 | .5377478 |

Source: UNESCO-UIS, GMM estimations. Robust standard errors in parentheses. Time fixed effects.

*Table 8. Panel estimations of the share of enrolments in private secondary institutions, annual panel, GMM approach, 1970–2014*

Dependent variable: Percentage of enrolments in secondary education in private institutions (%)

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| % Secondary private education(t-1) | 0.964*** | 0.989*** | 0.985*** | 0.992*** |
| | (0.029) | (0.014) | (0.008) | (0.009) |
| Expenditure per pupil (secondary) (t-1) | 0.007 | 0.022 | -0.008 | 0.024 |
| | (0.033) | (0.032) | (0.012) | (0.036) |
| L.NERSecondary | | 0.013 | | -0.005 |
| | | (0.011) | | (0.018) |
| ln GDP (t-1) | | | 0.184** | 0.192 |
| | | | (0.087) | (0.238) |
| _cons | 0.401 | 0.000 | -1.181+ | -1.537+ |
| | (0.970) | (.) | (0.812) | (0.963) |
| Obs | 762 | 525 | 746 | 519 |
| Number of countries | 122 | 95 | 121 | 93 |
| AR1-pvalue | .0081193 | .0047702 | .0075838 | .0057101 |
| AR2-pvalue | .5245848 | .6898858 | .4904675 | .5206037 |

Source: UNESCO-UIS, GMM estimations. Robust standard errors in parentheses. Time fixed effects.

In the dynamic panel data model, public expenditure on education very significantly reduces the share of enrolments in private education, whereas average income and net access rate have no significant effects. However, the significance of unit costs for the state is only clearly confirmed for the primary level. The coefficient thus means that a decrease of one percentage point in public expenditure on education per primary school pupil will result in an increase of 0.033 percentage point for private education. These findings are robust when the sample is limited to low-income countries (see Table 9), as the coefficient of the impact of public expenditure on education is not significantly modified.

*Table 9. Panel estimations of the share of enrolments in private secondary institutions, annual panel, GMM approach, 1970–2014, low-income countries*

| Dependent variable: Percentage of enrolments in secondary education in private institutions (%) | |
|---|---|
| % Primary private education(t-1) | 0.997*** |
| | (0.011) |
| Expenditure per pupil (primary) (t-1) | -0.032** |
| | (0.015) |
| _cons | 0.000 |
| | (.) |
| R-squared | |
| Obs | 902 |
| Number of countries | 137 |
| AR1-pvalue | .0122128 |
| AR2-pvalue | .4597386 |

Source: UNESCO-UIS, GMM estimations. Robust standard errors in parenthesis. Time fixed effects.

## 5. Conclusion

This analysis of world statistics shows that the share of private education is far from negligible. On average, in the world's countries over the period 1999–2014, 14.7% of enrolments at primary level and 18% of those at secondary level are in private institutions. Since the late 1990s, it also appears that this share has tended to increase. The individual cases can be seen to vary a great deal. Some countries school almost all their pupils in institutions that are independent of the state, whereas in other countries the private education offer is almost inexistent. By developing a conceptual framework to explain what determines this distribution between public and private in the various countries, several channels can be identified. Regarding the demand for private education, what can be highlighted is excess demand and the demand for differentiation. In the first case, the demand for private education is driven by the inability of public education to provide school places for all children, while in the second case, it is its inability to meet all the educational preferences of households. In the private offer, the for-profit and identity-based objectives of private education operators appear to explain the emergence of private education. In this setting, a low level of per-pupil public expenditure is a factor likely to have a significant

impact on the distribution of pupils between the public and private sectors. Simple correlation and panel analyses involving a large number of countries over recent years have made it possible to evidence this impact of public education expenditure on the level of development of private education. This effect can be shown using cross-sectional and panel data and is greater for primary education than for secondary. These results are also robust when variables of average income in the population and access to education are included. The demand for differentiation and the quality of the public offer, rather than wealth and the availability of places in public institutions, are thus factors that can explain, at least in part, the development of private education.

The weight of the private sector is therefore to some extent a function of the funds that the state allocates to education. A country that finds itself obliged to cut back on education spending should expect to see a rise in the proportion of pupils attending private schools. Conversely, if its per-pupil public expenditure on education is stepped up, the public education sector can be expected to enrol a larger share of schoolchildren. On this count, some degree of substitutability clearly exists between public and private education. Education policies aimed at private sector education should also take account of the evolution of public provision and public funding for education. When budgets are cut and public spending on education decreases, public-private partnerships and greater supervision of private education operators should be foreseen to ensure that the increased share of private education is not to the detriment of quality or equity. Beyond the legal system of socialist origin, the economic environment and access to education do not appear to significantly impact the share of private education. More than a country's level of economic development, its public expenditure on education clearly explains the weight of the private sector. Despite the importance of the macroeconomic determinants mentioned so far, there exists a high individual heterogeneity across countries regarding the public-private mix of education worldwide. A country's history and its policies for private education are doubtless factors that exert a considerable influence – but these are difficult to grasp at the macroeconomic level.

With a larger sample of countries and more robust econometric methods, our results mostly corroborate the findings of James (1992). In further research on this subject, a number of points need to be addressed. The effect of different types of public support for private education would need to be analysed more precisely. Likewise, differences in the regulatory environment for private education could be explored in greater depth. The development of private tertiary education should also be investigated. For these questions, the key challenge is to ensure that enough comparable data are available at the international level. Given how important this question is for education systems, it should be possible to produce regular and reliable data on private education at the international level. Finally, drawing on the elements contributed by this study, there is a need for deeper macroeconomic analysis of how the public-private mix of education systems impact their outcomes in terms of access, quality and equity. Government

policy to stimulate or regulate private education ultimately depends on the answers to these questions.

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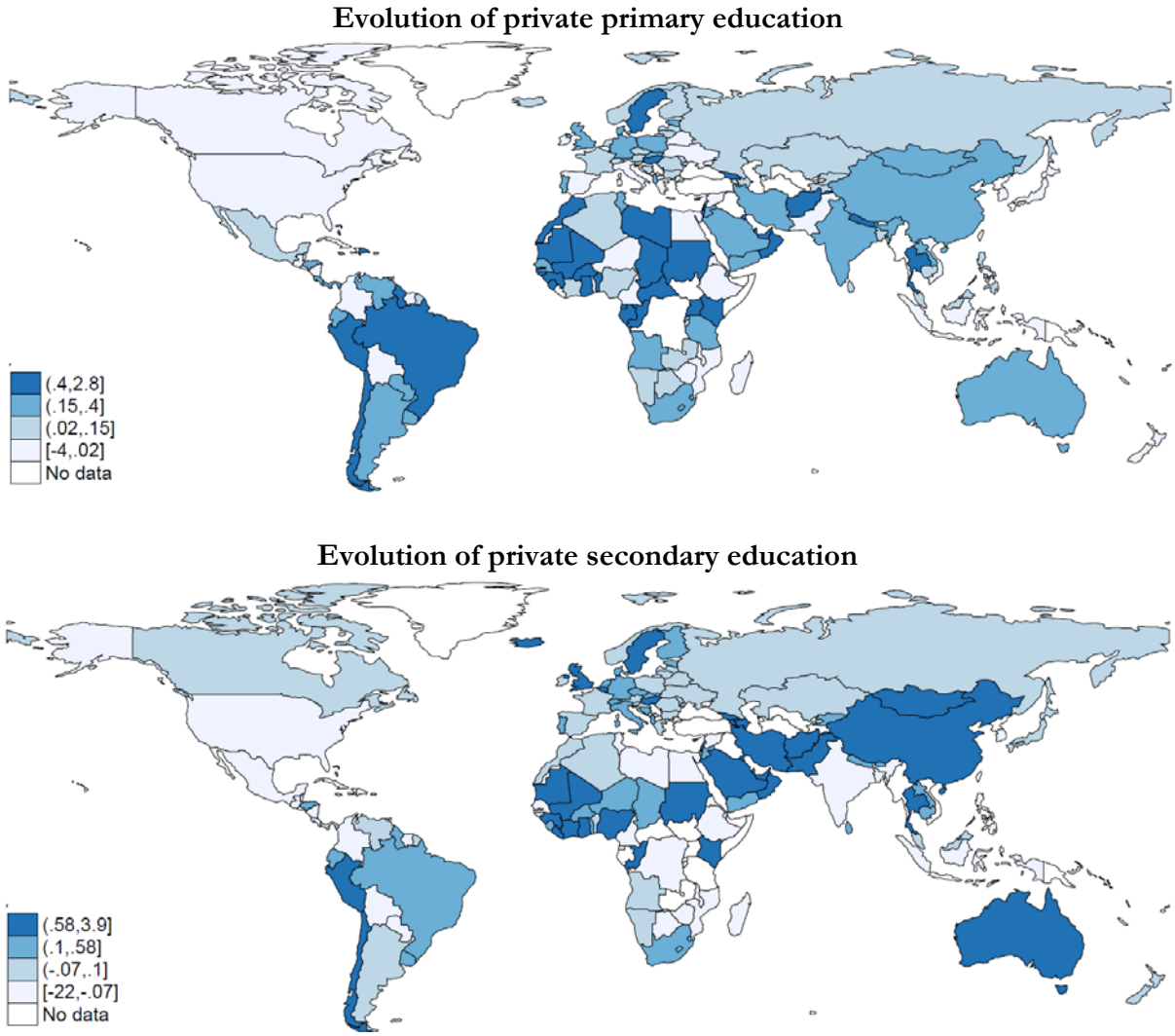
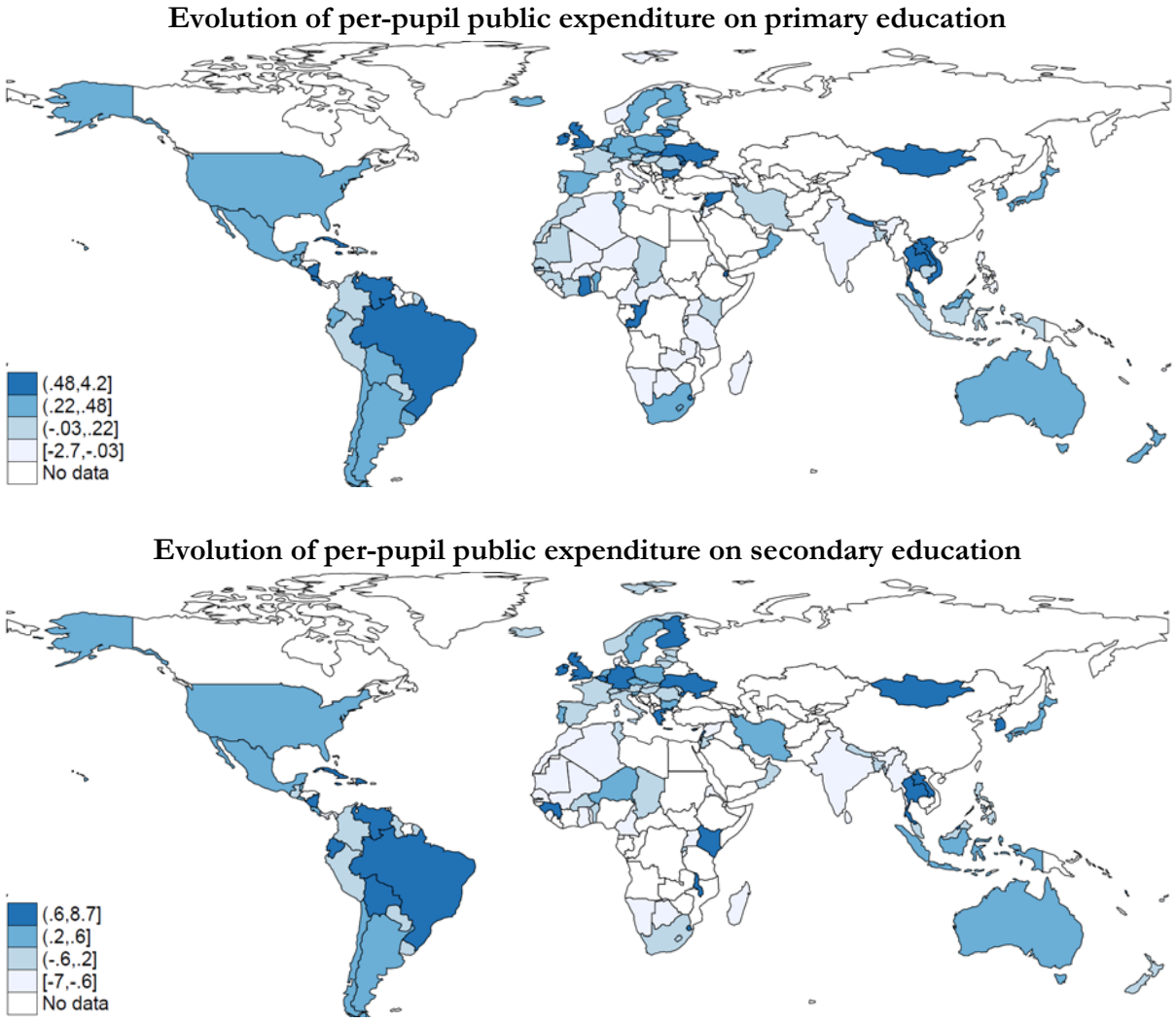
## Appendix

*Figure A1. Evolution of the shares of primary and secondary enrolments in private institutions, 1999–2014*




*Source: authors, based on UIS data (2016).*

*Figure A2. Evolution of per-pupil public expenditure on primary and secondary education as a % of GDP per capita*




*Source: authors, based on UIS data (2016).*

*Table A1: Correlations between primary and secondary education*

| Variables | Correlation |
|---|---|
| Correlation shares of private education at primary and secondary levels | 0.7447 |
| Correlation growth of private education at primary and secondary levels | 0.2476 |
| Correlation public expenditure per pupil in % of GDP at primary and secondary levels | 0.4965 |
| Correlation growth of public expenditure per pupil in % of GDP at primary and secondary levels | 0.4976 |

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