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Public Spending Efficiency:  
Institutional Indicators in  
Primary and Secondary  
Education

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**PUBLIC SPENDING EFFICIENCY: INSTITUTIONAL INDICATORS IN PRIMARY AND  
SECONDARY EDUCATION**

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by  
**Frédéric Gonand, Isabelle Joumard and Robert Price**

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## ABSTRACT/RESUMÉ

### Public spending efficiency: institutional indicators in primary and secondary education

This paper presents composite indicators of the institutional and policy characteristics of educational systems, collated from the questionnaire responses of 26 Member countries. These indicators provide an overview of the institutional framework in the primary and secondary education sector and are constructed so as to be used for the analysis of international differences in spending efficiency. The key features of the institutional setting in the non-tertiary education sector are grouped under three headings: *i*) the ability to prioritise and allocate resources efficiently (through decentralisation and mechanisms matching resources to specific needs); *ii*) the efficiency in managing spending at the local level (through outcome-focused policies and managerial autonomy), and *iii*) the efficiency in service provision (through benchmarking and user choice). For each country, an intermediate indicator is computed for each of these six institutional properties. Composite indicators then combine the six intermediate indicators of spending efficiency into a single, aggregate measure. Results are presented and some of their implications are discussed. Overall, the characteristics of the institutional framework in the non-tertiary public education sector seem to be very favourable, compared to OECD average, in the United Kingdom, Australia, Norway, Denmark and the Netherlands, whereas results are less favourable for the Czech Republic, Greece, Luxembourg, Japan, Turkey, Hungary, Belgium (French speaking community), Switzerland and Austria.

*JEL Classification:* H11, H77, H83, I20, I28.

*Keywords:* Public spending efficiency, Public education, Institutional indicators, Decentralisation, Benchmarking, User choice, Outcome-focused public policies, Managerial autonomy in the public sector.

\* \* \* \* \*

### Efficacité de la dépense publique : indicateurs institutionnels dans le secteur de l'éducation primaire et secondaire

Ce document de travail présente sous forme d'indicateurs quantitatifs les réponses de 26 pays membres de l'OCDE à un questionnaire portant sur l'organisation institutionnelle du secteur public de l'éducation primaire et secondaire. Les indicateurs fournissent une vue d'ensemble des caractéristiques institutionnelles susceptibles de contribuer aux différences d'efficacité de la dépense publique entre les pays dans le secteur éducatif. Les caractéristiques institutionnelles prises en compte sont regroupées autour de trois dimensions : *i*) la capacité à allouer efficacement les ressources consacrées à l'éducation publique (décentralisation, prise en compte de besoins spécifiques), *ii*) l'efficacité de la gestion au niveau local (fixations d'objectifs, autonomie des écoles), et *iii*) l'efficacité de la fourniture de service éducatif au niveau local grâce à des mécanismes de marché (évaluation des performances, rôle du choix de l'utilisateur). Pour chaque pays, un indicateur intermédiaire est calculé pour chacune de ces six caractéristiques institutionnelles. Un indicateur composite est alors construit qui fournit une mesure synthétique de la qualité des institutions du secteur public de l'éducation au regard de leur capacité à renforcer l'efficacité de la dépense publique. Les résultats montrent en particulier que les institutions éducatives sont relativement favorables à l'efficacité de la dépense publique au Royaume-Uni, en Australie, en Norvège, au Danemark et aux Pays-Bas ; et relativement défavorables en République Tchèque, en Grèce, au Luxembourg, au Japon, en Turquie, en Hongrie, en Belgique (communauté francophone), en Suisse et en Autriche.

*Classification JEL :* H11, H77, H83, I20, I28.

*Mots clés :* Efficacité de la dépense publique, Education nationale, Indicateurs institutionnels, Décentralisation, Evaluation des performances, Choix de l'utilisateur, Management par objectif.

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## PUBLIC SPENDING EFFICIENCY: INSTITUTIONAL INDICATORS IN PRIMARY AND SECONDARY EDUCATION

Frédéric Gonand, Isabelle Joumard and Robert Price <sup>1</sup>

### 1. Introduction

1. This paper presents composite indicators of the institutional and policy characteristics of primary and secondary education systems, collated from the questionnaire responses of 26 OECD member countries. It is a companion paper of Sutherland *et al.* (2007), which presents indicators measuring the technical and cost efficiency of public spending in the same education sector, which accounts for 9% of total public expenditures in OECD countries on average and 3.8% of their GDP. OECD analysis, undertaken largely in the context of *OECD Economic Surveys*, suggests that well-designed institutional and policy settings can result in higher public sector efficiency. The indicators described here are based on the institutional characteristics which have been identified as most important in that respect, and are designed to be used in subsequent analysis accounting for international differences in efficiency.

2. The paper is structured as follows. In section 2, the conceptual basis of the composite institutional indicators is described in terms of the key properties which *a priori* may help to determine the efficiency of public service provision. Section 3 explains how the indicators are computed. Section 4 presents the results obtained, discusses the associated rankings of countries according to the various dimensions of spending efficiency.

### 2. Conceptual basis for the institutional indicators

3. The conceptual basis for describing and classifying the institutional determinants of public sector efficiency has been set out in a recent synthesis paper, summarising the experiences of OECD member countries,<sup>2</sup> and subsequent work relating to fiscal relations between levels of government.<sup>3</sup> Broadly, the efficiency-determining characteristics can be grouped under three headings: *i*) the ability to prioritise and

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1. The authors are members of the Economics Department of the OECD. This paper is a revised version of a document prepared for a workshop of the Working Party No. 1 of the OECD Economic Policy Committee held in October 2006. The authors are indebted to participants to this meeting, to the Delegates of the member countries to the Education Committee, and also to Michael Feiner, Jørgen Elmeskov, Douglas Sutherland, Chantal Nicq, Stéphanie Guichard, Anne-Marie Brook, Bénédicte Larre, Joaquim Oliveira Martins and other colleagues for their useful comments. They are grateful to Veronica Humi, Sandra Raymond and Paula Simonin for secretarial assistance. The opinions expressed in this paper are those of the authors and are not necessarily shared by the OECD.

2. Joumard I., P.M. Kongsrud, Y-S. Nam and R. Price (2003).

3. Sutherland, Price and Joumard (2005) ; Joumard and Kongsrud (2003).

allocate resources efficiently (*efficiency in resource allocation*); ii) efficiency in managing spending once priorities have been set (*efficiency in budget management*), and iii) efficiency in service provision (*market efficiency*). The main characteristics of these headings are defined as follows:

- **Efficiency in resource allocation:** In making the budget process responsive to priorities, much of the emphasis of recent public sector reform in OECD countries has been on imposing a hard budget constraint, via a medium-term budget planning focus, accounting transparency and the imposition of fiscal rules. These macro-institutional characteristics will obviously help determine the allocation of resources to individual programmes such as education and may well affect cross-country cost-efficiency comparisons. Allowing for the importance of a centrally imposed budget constraint, at the programme level the two most important indicators of an ability to allocate resources efficiently have been defined as follows:<sup>4</sup>
  - The degree of *decentralisation* of responsibilities between central government and sub-national public authorities is taken as improving efficiency in the allocation of public spending resources insofar as educational needs may differ from one geographical area to another and resources should be matched to them. However, decentralisation may become counterproductive and reduce efficiency if it is poorly designed, resulting, for instance, in overlapping responsibilities between levels of government.
  - *Matching resources to specific needs* -- which may encompass mechanisms to support the disadvantaged -- may have a favourable impact on overall educational efficiency, notably by avoiding “cream-skimming” effects at the aggregate level. Such mechanisms may be required in order to make up for the tendency of education systems to under-provide services for less able pupils.
- **Efficiency in budget management:** Under the heading of efficiency in budget management, two crucial efficiency enhancing characteristics may be identified:
  - The extent to which policy is *outcome-focused* allows clear objectives to be set for public institutions involved in education, especially if backed by associated evaluation, reward and/or sanction systems.
  - The degree of *managerial autonomy*, especially at the school level, based on flexibility of job status, wage setting and budget allocation and disciplined by liberalised outsourcing, where possible may also make for greater efficiency in the use of resources.
- **Market efficiency:** Productive efficiency is presumed to be related to the degree of competitive pressure in service provision, which involves the presence of market signals:
  - *Benchmarking* may improve service provision by identifying best practices and inefficiencies.
  - Allowing for *user choice* among alternative providers of educational services may be one of the most effective means of giving market signals a role in enhancing the effectiveness of public spending in education. This may strengthen competitive pressures and results in services which respond better to citizens’ needs -- provided that spending follows the user.

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4. These two intermediate indicators of efficiency in resource allocation do not directly measure the strength of the budget constraint, but a higher degree of decentralisation is assumed to translate into a higher degree of financial responsibility for local decision makers, provided that decentralisation is accurately designed and avoids, for instance, overlaps of responsibilities.

4. Figure 1 displays the framework of efficiency categories, intermediate indicators and low-level indicators which arises from the conceptual breakdown. The method by which intermediate and composite indicators are compiled from this schematic structure is further elaborated in the next section.

**[Figure 1. Main institutional and policy factors potentially affecting public spending efficiency in the education sector]**

5. The indicators describe the institutional framework in the public education sector as resulting from current regulations. Their construction assumes that the institutions described in the answers to the questionnaire are implemented and working in practice according to regulatory prescriptions. While this assumption may be optimistic in some cases, relaxing it would bring about even more serious methodological problems, related with the measure of the degree of implementation of recent reforms. In this context, the interpretation of the indicators should remain cautious. For instance, the favorable bias in the indicators might be significant for Portugal. The recent OECD Country survey for Portugal indeed highlighted that the full implementation of recent reforms (increasing the autonomy of the schools or favoring benchmarking) remains an important challenge in this country (Guichard and Larre, 2006). In all countries, the indicators have to be interpreted as describing the education system when the implementation of current reforms is completed.

6. The institutional indicators are computed at the national level and do not account for possible heterogeneity among sub-national authorities. This point applies especially to federal countries and brings about some specific issues discussed in Box 1.

**Box 1. Federal countries and institutional indicators computed at the national level**

The institutional indicators presented in this document are computed at the national level. Accordingly, they do not account for heterogeneity among sub-national authorities.

In the case of federal countries, the indicators implicitly average features among different sub-national authorities, thus delivering a potentially distorted picture of the institutional framework in the public education sector. For instance, if one State/province scores low in "outcome-focused policy" and high in "managerial autonomy" while another State/province is efficient for the first item but inefficient for the second, then both States/provinces are relatively inefficient in budget management because "outcome-focused policy" and "managerial autonomy" are complementary features of the education sector (see below). However, the value of an aggregate institutional indicator computed at the national level will be average, overestimating the efficiency of the public education sector of the federal country.

In the specific case of Belgium, institutional indicators have been computed at the sub-national level of the three linguistic communities (Flemish, French speaking and German speaking). Educational systems are almost completely different between these communities and the degree of heterogeneity of educational institutions between them can reasonably be considered as far higher than in any other OECD country. Indicators computed for Belgium at the national level would have been almost meaningless. Moreover, institutional indicators for the Belgian linguistic communities can be compared with efficiency indicators computed at the same level, because all data needed to compute performance indicators are available at the community level. Since the ultimate purpose of this exercise is to analyse the correlation of institutional indicators with efficiency measures, the availability of PISA data at the community level in Belgium justified building institutional indicators at the same level.

For all the other OECD countries, this paper presents institutional indicators computed at the national level, mainly because PISA data used to compute performance indexes are often not available at the sub-national levels. In this context, institutional indicators computed at sub-national levels would not have been compared to some efficiency indexes.

The problem associated with computing institutional indicators at the national level for federal countries should not be overestimated. Heterogeneity among different provinces of a federal country - not taken into account here - is probably much lower than heterogeneity between OECD countries - which is reflected in the indicators of this paper -, the more so as the number of sub-national authorities in a given country is high.



### 3. Compilation and design of the institutional indicators

#### 3.1 Computing the six intermediate indicators for each country

7. Questionnaire responses have been used to compute six intermediate indicators corresponding to the six institutional properties of the public education sector described in section 2. For each country, the indicators are computed as weighted means of some of the 21 “low-level” indicators, scaled from 0 to 10, with a higher score associated with a more desirable outcome.<sup>5</sup> Full details of the coding are given in Annex 2 (Tables A.1 and A.2).

8. Constructing an intermediate index requires an assessment of the relative importance ascribed to the different low-level indicators, which may vary both across countries, given different institutional settings, and over time. To help overcome the difficulties in assigning relative importance to individual aspects of institutional and policy efficiency in widely different budgetary frameworks, the approach adopted here is based on random weights, as applied in previous OECD studies constructing indicators of financial regulation, product market regulation and sub-central fiscal rules.<sup>6</sup> These do not assume any detailed knowledge of how the various institutional attributes interact, but they allow the identification of ranges of possible values for the intermediate index, depending on the different weightings assigned to the low-level indicators.

9. The first intermediate indicator with respect to efficiency in resource allocation deals with **decentralisation**, *i.e.*, the definition and sharing of responsibilities between the central government and local authorities (regional as well as local) in the public education sector. An excessively centralised framework would undoubtedly leave some local educational needs unanswered. On the other hand, decentralisation might also result in undue institutional complexity in some cases. The intermediate indicator of decentralisation is thus composed of four low-level indexes, which respectively assess the degree of localised decision-making; whether responsibilities are clearly defined between central and sub-central authorities; whether they are clearly defined among sub-central authorities, and whether responsibilities are allocated consistently between levels of government, avoiding jurisdictional overlaps.

10. The second intermediate indicator with respect to efficiency in resource allocation - “**matching resources to specific needs**” - measures the ability of the public education system to meet the demand for specific educational services and, especially, to avoid the under-provision of educational services to students with less favoured socio-economic background. This index is composed of three low-level

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5. The optimal score for all the low-level indicators computed in this paper is 10. In the case of LLI-1 “Degree of localized decision-making”, a theoretical case could nevertheless be made reasonably in favor of an optimal level below 10 since a completely decentralized institutional framework may not be optimal in the education sector. Empirically, however, this low-level indicator LLI-1 on decentralisation is computed using answers in the questionnaire about 17 educational functions (see Annex 3), all of which can (and should) be monitored at a sub-national level. Accordingly, a score of 10 is optimal even for LLI-1.

6. Starting with low-level indicators, this technique uses 1000 sets of randomly generated weights to calculate 1000 intermediate indicators. The random weights are drawn from a uniform distribution between zero and one and then normalised so as to sum to one. This is equivalent to assuming complete uncertainty about the most appropriate value of each of the individual weights used to construct the intermediate indicator. Accordingly, the resulting distribution of intermediate indicators reflects the possible range of values given no *a priori* information on the most appropriate value for each of the weights. Confidence intervals and the probability of a given country achieving a given rank are calculated from these distributions. The confidence intervals are centered on the mean value of each country’s 1000 intermediate indicator values. Given that the weights are drawn from a uniform distribution between zero and one, the mean indicator values are asymptotically equivalent to indicators calculated using equal weights on each of the low-level indicators.

indicators. The first two are related to the ability of the educational system to take account of specific educational needs when financing schools and rewarding teachers. The remuneration issue may be all the more relevant where user choice increases the risk of social segmentation and “cream-skimming” (see below). A third factor widely recognised as enhancing the efficiency of public spending in education relates to the age at which the education system becomes selective, which should not be too low.<sup>7</sup>

11. The first intermediate indicator with respect to efficiency in budget management – the “**outcome-focused policy**” index - assesses the extent to which public education systems are based on results-focused management rather than on a narrower framework which emphasises conformity to legal and procedural rules. The index is composed of three low-level indicators applied to the public school sector, considering whether targets are clear, the associated reward and sanction systems are credible, and the coverage of the performance assessment mechanisms is sufficient.

12. The second intermediate indicator under the budget efficiency heading – “**managerial autonomy at the school level**” - assesses the degree of managerial autonomy in the public education sector, especially at the school level. A greater autonomy for school managers in their day-to-day operations is a necessary condition for a more outcome-focused framework to enhance strongly the efficiency of public spending. The index is composed of four low-level indicators, measuring the degrees of flexibility in managing human resources, wage-setting and budget allocation and teaching methods and the extent of outsourcing possibilities.

13. The first intermediate indicator of the market efficiency index deals with **benchmarking**, which can help identify both best practices and inefficiencies in schools and thus be an effective tool for increasing competitive pressures.<sup>8</sup> The intermediate indicator is composed of three low-level indicators, assessing the geographical and school coverage of benchmarking and measuring its quality.

14. The second intermediate indicator relating to market efficiency deals with **user choice**, *i.e.*, the possibility for pupils and/or their families to choose the school they prefer. Allowing families a choice among alternative schools can strengthen competitive pressures, trigger innovation and result in services which respond better to educational needs.<sup>9</sup> The user choice indicator is composed of four low-level indicators. The first two assess the possibilities of choosing among public schools and between public schools and private schools receiving public financial support. A third low-level indicator measures the extent to which user choice is limited by some general regulations concerning, for instance, the size of school buildings or the availability of public transport. A fourth low-level indicator deals with school admission policies and assesses their potential detrimental impact on effective user choice at the school level.

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7. Though challenged in some recent studies, empirical research tends to support the view that tracking programmes might harm disadvantaged children.

8. While the positive effect of benchmarking on school efficiency is, in principle at least, hardly doubtful, it might not appear immediately in the data. If poorly performing school systems resort more frequently to benchmarking, some endogeneity between efficiency and institutional indicators might emerge and, if so, would need to be controlled for.

9. The possible under-provision of educational services to low-skilled pupils (“cream-skimming”) can stem either from an inefficient resource allocation framework at the aggregate level or from specific admission policies at the school level which lessen the market efficiency of user choice. The intermediate indicator “matching resources to specific needs” deals with the first case (see above), whereas the “user choice” intermediate indicator is concerned with the second.

### ***3.2 Computing the composite indicators***

15. The composite indicators combine, for each country, the six intermediate indicators of spending efficiency in the public education sector into a single, aggregate measure. Sub-aggregate measures representing the three different types of efficiency (efficiency in resource allocation, efficiency in budget management and market efficiency), as described above, can be derived in the same way. By definition, the three efficiency types are all encapsulated in the composite indicator. As with intermediate indexes, random weights have been applied when computing composite indicators in order to identify the ranges of their possible values.

16. Computing the composite indicator and the scores for the three categories of efficiency (as shown in Annex 2, Table A.3) by simply averaging the values of the intermediate indexes would deliver a distorted picture of the educational system, by downplaying interactions among the institutional properties of the intermediate indicators. Accordingly, four types of complementarities between the intermediate indexes have been defined and taken into account in the composite indicators:

- A country ranking high in outcome-focused policy is considered as relatively less efficient if it ranks low in managerial autonomy at the school level and/or benchmarking. Setting targets is of a limited use as long as local managers are not responsible for meeting them and/or not informed of the performance of other schools. Accordingly, a strongly outcome-focused policy enhances spending efficiency to the extent that autonomy at the school level and/or benchmarking are well-developed.
- The favourable impact of managerial autonomy on efficiency is conditional on how much the education policy is outcome-focused.
- The effect on market efficiency of wider user choice among schools depends to some extent on the quality of benchmarking.
- The favourable impact of decentralising responsibilities on spending efficiency is also partially dependent on whether benchmarking on a national basis is available.

17. Two methods of computing composite indicators and scores for each category of efficiency have been developed which take account of such complementarities (see Annex 2 for more details). Both transform the values of the intermediate indexes so as to take account of complementarities and then average the transformed values to yield aggregate scores. In the “multiplicative aggregation” method, the transformed value of each intermediate index is computed as a geometric mean of the values of the indicators defined as being complementary. Though relatively intuitive, this method postulates an arbitrary degree of intensity of complementarities between intermediate indicators. In the second “exponential” aggregation method, the degree of complementarity can vary and the results can be assessed for their sensitivity to the amount of complementarity assumed.

## **4. Results**

### ***4.1 Rankings of countries according to six dimensions of spending efficiency in public schools***

18. Figure 2 shows the results obtained for the first component of spending efficiency in resource allocation, namely, the intermediate indicator for decentralisation. The left-hand side of Figure 2 shows the mean values of each intermediate indicator for each country and the range that contains 90% of the 1000 random weighted indices. The confidence intervals shown vertically can be interpreted as proxies for the degree of consistency, or dispersion, between the low-level indicators used to compute each intermediate

index.<sup>10</sup> The right-hand side of Figure 2 matches this measure of dispersion (along the vertical axis) to the mean value of the intermediate indicator (horizontal axis). For instance, a consistently decentralised system would in principle have a high value of the indicator and a low dispersion of the sub-indices.

19. As concerns decentralisation, the results depicted in Figure 2 suggest that there is strong and consistently designed decentralisation of responsibilities in primary and lower secondary education in Denmark and Finland. Centralisation in the public education sector is strong and/or decentralisation is less consistently designed in Slovakia, the Czech Republic, Portugal, Austria, Luxembourg, the Netherlands and France.

**[Figure 2. Efficiency in resource allocation: decentralisation]**

20. As seen in Figure 3, the ability of the educational system to match resources to specific educational needs, at the aggregate level, appears rather poor in Turkey, Austria, Luxembourg, Germany, Slovakia and Greece, whereas Portugal, France, New Zealand, Japan and Italy lie at the opposite side of the spectrum. The figure on the right hand side reveals -- particularly for Denmark, Finland, Greece, Iceland, Norway, Spain and the United Kingdom -- quite pronounced dispersion of sub-indices, suggesting that policies are generally not very consistent in matching resources to specific needs.

**[Figure 3. Efficiency in resource allocation: matching resources to specific needs]**

21. Figure 4 shows the results obtained for the first component of efficiency in budget management, *i.e.*, the intermediate indicator related to outcome-focused policy. Substantial differences appear among OECD countries in this area. Some member countries define very few objectives (Luxembourg, Denmark, Japan, Norway, Spain, Hungary, Switzerland) and even no objective at all in some cases (Italy, Iceland), while regulations in other countries favour strong outcome-focused management practices in the education sector (Slovakia, Mexico, Turkey, United States, United Kingdom, Sweden, the Netherlands). Where the use of outcome-focused policies is either strong or weak, policies tend to be relatively consistent. In intermediate cases, particularly in Belgium (the Flemish community), the Netherlands and New Zealand, the relatively high dispersion of sub-indices indicates that policies in this area may be less consistently designed. However, the results should be interpreted with some caution since the indicators make the implicit assumption that institutional practices are implemented as described, which may not always be the case (see section 2).

**[Figure 4. Efficiency in budget management: outcome-focused policy]**

22. A closer look at the low-level indicators (LLI) used to compute the “outcome-focused policy” index delivers an interesting stylized fact: where clear outcome targets (LLI-8) exist, consistent reward and/or sanction systems associated with educational results (LLI-9) are also often implemented. Figure 5 shows that both LLI seem to be positively correlated on average among OECD countries. Though this correlation needs to be interpreted with care since the value of one LLI may depend on many others factors, it appears to be reasonably significant. This stylised fact suggests that the implementation of outcome-focused policy in the educational sector has, on average, been relatively consistent: defining targets without setting a reward and/or sanction framework, or the other way round, would not strongly foster efficiency in public spending.

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10. To compute an intermediate indicator, low-level indexes are aggregated using a random weight technique (see above). Accordingly, a higher dispersion of low-level indexes results in a higher confidence interval for the intermediate indicator, which may be interpreted as a measure of the internal consistency of the institutions associated with an intermediate index.

**[Figure 5. Clarity of outcome targets vs credibility of reward/sanctions systems]**

23. As concerns the second component of efficiency of budget management – *i.e.*, managerial autonomy at the school level -, Figure 6 shows that all member countries allow public school managers some degree of autonomy. Policies in this area also tend to be reasonably consistent with little marked differences among countries (right hand panel). Countries such as the United Kingdom, Hungary, Slovakia, New Zealand, Norway, the Czech Republic, Australia, Canada and the United States rank relatively highly in this category, whereas the educational systems in Mexico, Luxembourg, Switzerland, Iceland, Greece, Germany, Turkey and France do not allow much room for autonomy at the school level. Interestingly, the amount of managerial autonomy allowed in Mexican schools is low and -- to a lesser extent -- this also applies in Turkey, leaving some room for improving the consistency of their otherwise strongly outcome-oriented educational systems. Likewise, there is some inconsistency in the budget management framework in Hungary and, to a lesser extent, the Czech Republic, because managerial autonomy is high while education policy remains poorly outcome-focused in both countries.

**[Figure 6. Efficiency in budget management: managerial autonomy at the school level]**

24. Looking at the LLIs used to compute the “managerial autonomy at the school level” index gives some more insight about the conditions for a policy fostering autonomy of school managers to be consistent. As shown in Figure 7, flexibility in the employment status of teachers in public schools (LLI-11), flexibility in setting their remuneration (LLI-12) and the degree to which schools can allocate their own budget and choose their teaching methods (LLI-13) are positively and significantly correlated among OECD countries. To some extent, this suggests that these three institutional characteristics are complementary.

**[Figure 7. Correlation between three dimensions of managerial autonomy at the school level]**

25. Figure 8 shows the results obtained for the first component of market efficiency in educational institutions, *i.e.*, benchmarking. A group of countries (Belgium, Switzerland, Austria, Finland, the Czech Republic, Mexico, Japan, Spain, Germany) is clearly less advanced in the implementation of benchmarking among schools, while Hungary, the United Kingdom, Iceland and the Netherlands appear to have gone furthest towards the general use of this practice.

**[Figure 8. Market efficiency: benchmarking]**

26. The questionnaire responses point to a negative relationship between the degree of localised decision-making and the quality of benchmarking of pupil performance at the national level (Figure 9).<sup>11</sup> This result suggests that the decentralisation of primary and lower-secondary education responsibilities to sub-national authorities have not been reinforced, on average, by common standards at the national level that would have allowed for an efficient benchmarking.

**[Figure 9. Quality of benchmarking of pupils’ performance at the national level vs degree of decentralisation]**

27. User choice is another powerful institutional tool fostering market efficiency in primary and lower-secondary schools. Results depicted in Figure 10 show that it is very developed and consistently applied in Belgium, the Netherlands and Spain - three member countries where private schools represent an important proportion of schools. User choice is strongly limited in Turkey, France, Greece, Austria,

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11. The composite indicators take account of the complementarity between the intermediate indicators related to decentralisation and benchmarking.

Mexico, Switzerland, Japan and Canada. In some countries, such as Italy, Germany and Switzerland, the comparatively high variance of sub-indices suggests that user choice policies are less consistently designed.

**[Figure 10. Market efficiency: user choice]**

28. Among OECD countries, improved conditions for user choice seem to have developed alongside schemes increasing the managerial autonomy at the school level. Figure 11 suggests that where pupils can enrol in any public school they wish and where money follows the user in financing public schools, more autonomy is also given to public school managers, especially for setting teachers' wages and deciding upon their own budget.

**[Figure 11. User choice among public schools vs schemes increasing the autonomy of school managers]**

#### **4.2 Overall assessments**

29. Figure 12 summarises country performance with respect to all six dimensions of spending efficiency in the public education sector, comparing the country-specific mean indicators to the OECD average and best practice. The scale is chosen so that the outer perimeter of the diagram represents the theoretical maximum score. No country can be found where national performance exceeds or equals OECD-wide scores for each of the six categories. Some countries exceed or equal the OECD average in five out of six institutional categories (United Kingdom, United States, Australia, Denmark, the Netherlands, Norway, Sweden). By contrast, Austria does not score better than the OECD average in any of the six institutional categories assessed here.

**[Figure 12. Intermediate indicators for each country]**

30. The composite indicators provide, for each country, with a single, aggregate measure of spending efficiency in the public education sector. As Figure 13 suggests, the two aggregation methods (see above) yield broadly similar rankings for member countries, but differences can be significant in some cases.

31. Examining the aggregate indicators (Figure 13), the institutional framework emerges as most favourable *a priori* in the United Kingdom, the Netherlands and Sweden, whichever method is used to compute the composite indicator. Australia and the United States also rank relatively high compared to the OECD average. The institutional framework in primary and lower-secondary education is assessed as less favourable in Austria, Switzerland, Luxembourg, Japan, Germany and Mexico. The rankings does not appear to be very sensitive to the weighting system (unless, to some extent, for Belgium [the Flemish community] and Turkey). As noted above, the confidence intervals of the composite indicator give an indication of the overall consistency within national educational frameworks, insofar as a consistent set of institutions would have a small confidence interval. Figure 13 suggests that some significant room remains for improving institutional consistency in the education sectors of Iceland, Italy, Hungary and Denmark.

**[Figure 13. Composite indicators]**

32. Evidently, the aggregate classification needs to be interpreted in the light of the components. Using the conceptual framework where institutional characteristics are grouped under three efficiency types, it is possible to assess the performance of a country compared with the OECD average and define accordingly where most room remains for improving the educational framework. Figure 14 suggests that situations are very heterogeneous in this respect across OECD member countries. However, some features emerge and a few tentative country groupings might be defined:

- In a first group of countries including the United Kingdom, Australia, Norway, Denmark and the Netherlands, the characteristics of the institutional framework seem to be very favourable, compared to OECD average, with respect to market efficiency (*i.e.* benchmarking and user choice) and to either resource allocation efficiency or budget management efficiency. For these countries, performance in any efficiency type is never lower than the OECD average.
- In another group of countries which includes the United States, New Zealand, Iceland and Portugal (with some caveat for the latter, see section 2.), the institutional setting in primary and lower-secondary education remains globally favourable to spending efficiency, albeit national performance can be lower than the OECD average in one specific efficiency type, or higher in only one area out of the three considered in this paper.
- The overall picture is mixed for France, Slovakia, Italy, Canada, Belgium (Flemish community), Finland, Spain and Mexico, where the institutional characteristics of the public education sector either do not stand out as more (or less) favourable in any of the three dimensions of spending efficiency, or where outperformance in one category is offset by a lower score in another one. Germany, which was identified as relatively unfavourably placed by the composite indicator, belongs to this group.
- Results are less favourable for the Czech Republic, Greece, Luxembourg, Japan, Turkey, Hungary, Belgium (French speaking community), Switzerland and Austria. Among these countries, Austria, Switzerland, Japan, Luxembourg and the Czech Republic also ranked relatively low with respect to the composite index. This group includes several countries which are low in market efficiency (Austria, Switzerland, Japan and the Czech Republic), while efficiency of resource allocation is a potential problem in Austria, Greece, Luxembourg, Hungary and Turkey. The institutional framework is assessed as being relatively unfavourable in respect of both market efficiency and budget management in Switzerland, and unfavourable in respect of all efficiency types in Austria.

**[Figure 14. Properties of the educational system as regards spending efficiency (relative to the OECD average)]**

**ANNEX 1. FIGURES**

1. Main institutional and policy factors potentially affecting public spending efficiency in the education sector
2. Efficiency in resource allocation: decentralisation
3. Efficiency in resource allocation: matching resources to specific needs
4. Efficiency in budget management: outcome-focused policy
5. Clarity of outcome targets *vs* credibility of reward/sanctions systems
6. Efficiency in budget management: managerial autonomy at the school level
7. Correlation between three dimensions of managerial autonomy at the school level
8. Market efficiency: benchmarking
9. Quality of benchmarking of pupils' performance at the national level *vs* degree of decentralisation
10. Market efficiency: user choice
11. User choice among public schools *vs* schemes increasing the autonomy of school managers
12. Intermediate indicators for each country
13. Composite indicators
14. Properties of the educational system as regards spending efficiency (relative to the OECD average)



Figure 1. Main institutional and policy factors potentially affecting public spending efficiency in the education sector

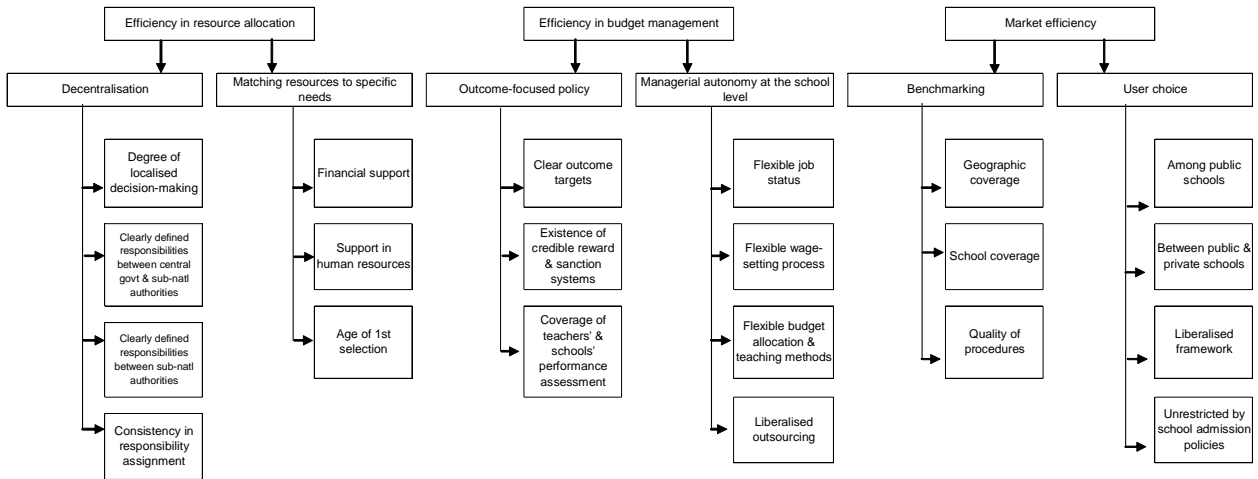


Figure 2. Efficiency in resource allocation: decentralisation

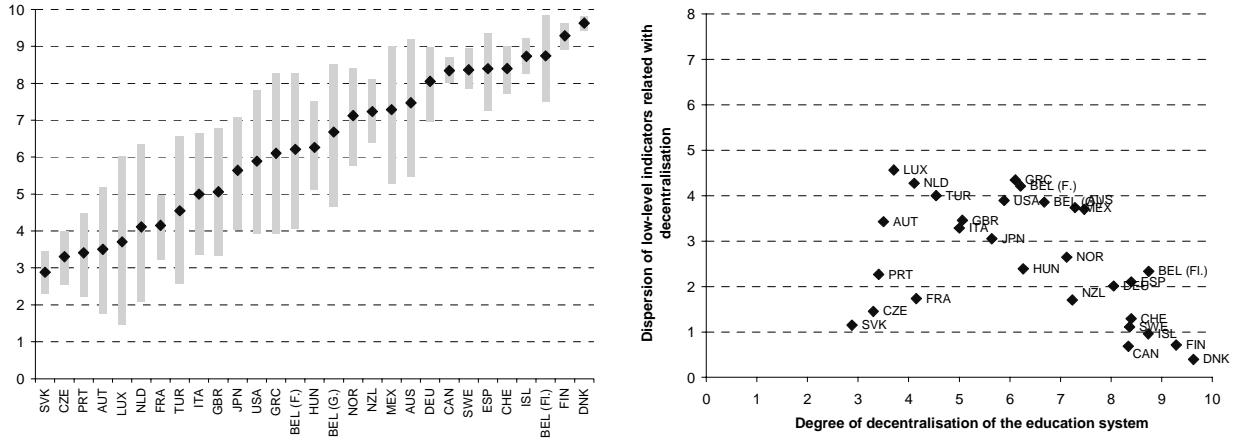
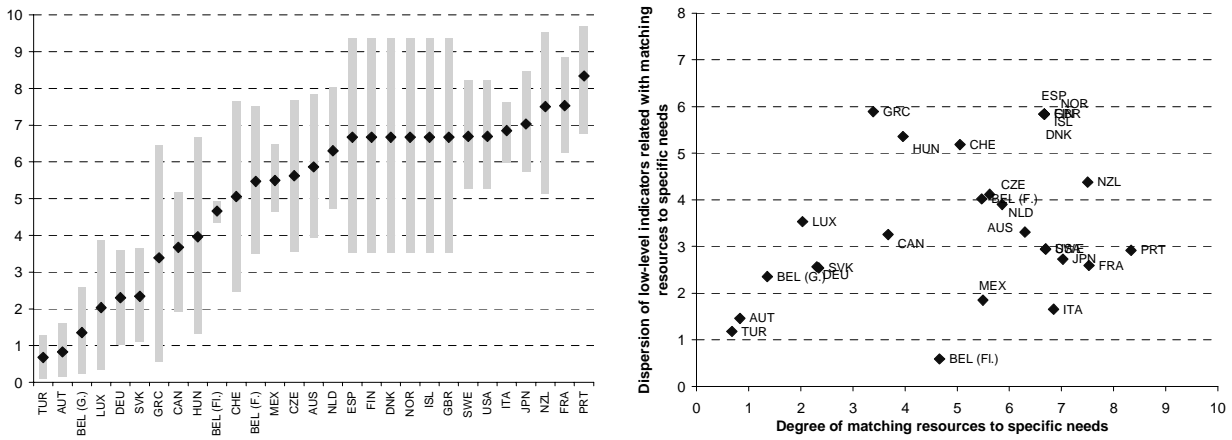
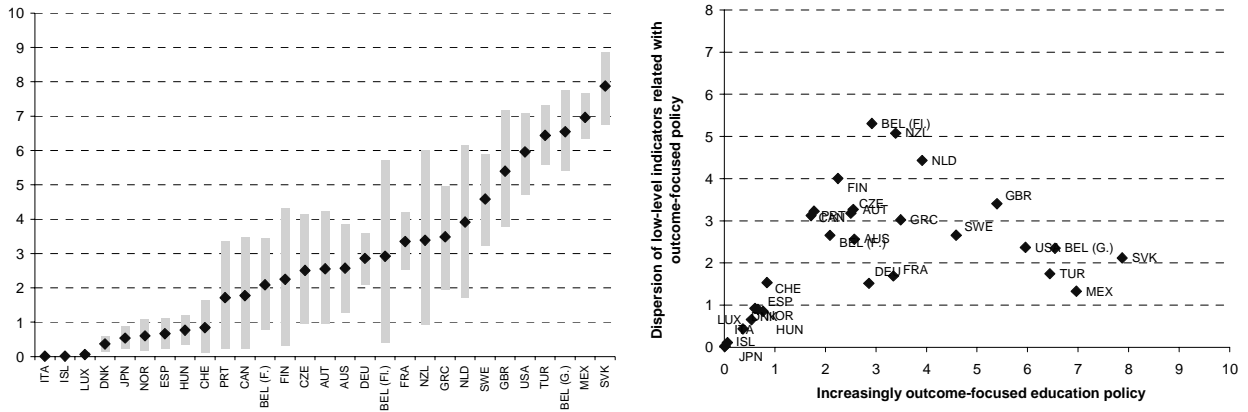


Figure 3. Efficiency in resource allocation: matching resources to specific needs



Note: The figure gives the average and the range that contains 90% of the 1000 random weighted indices.  
 Source: OECD Secretariat calculations based on questionnaire responses.

Figure 4. Efficiency in budget management: outcome-focused policy



Note: The figure gives the average and the range that contains 90% of the 1000 random weighted indices.  
 Source: OECD Secretariat calculations based on questionnaire responses.

Figure 5. Clarity of outcome targets vs credibility of reward/sanctions systems

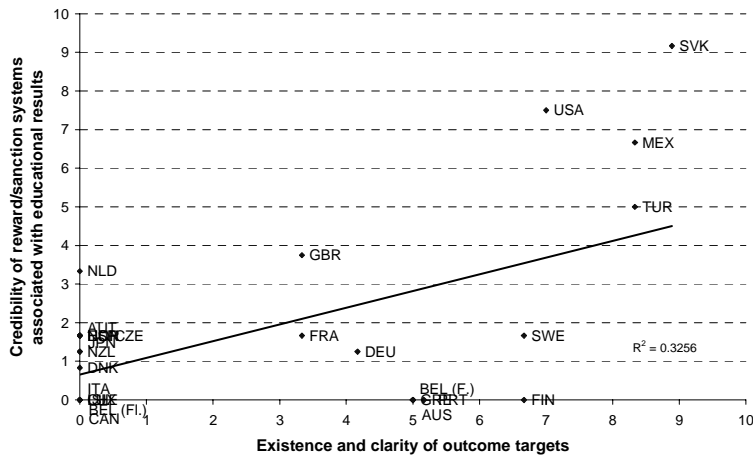
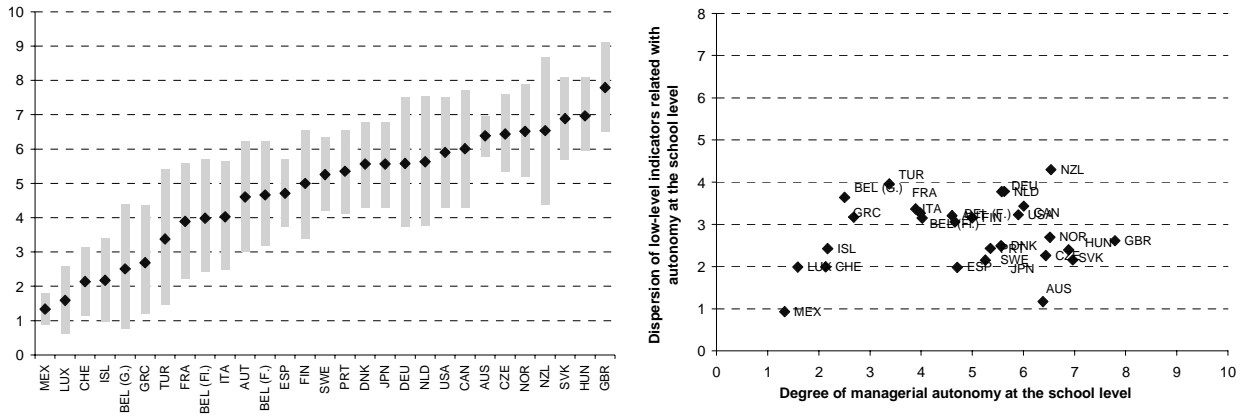


Figure 6. Efficiency in budget management: managerial autonomy at the school level



Note: The figure gives the average and the range that contains 90% of the 1000 random weighted indices.  
 Source: OECD Secretariat calculations based on questionnaire responses.

Figure 7. Correlation between three dimensions of managerial autonomy at the school level

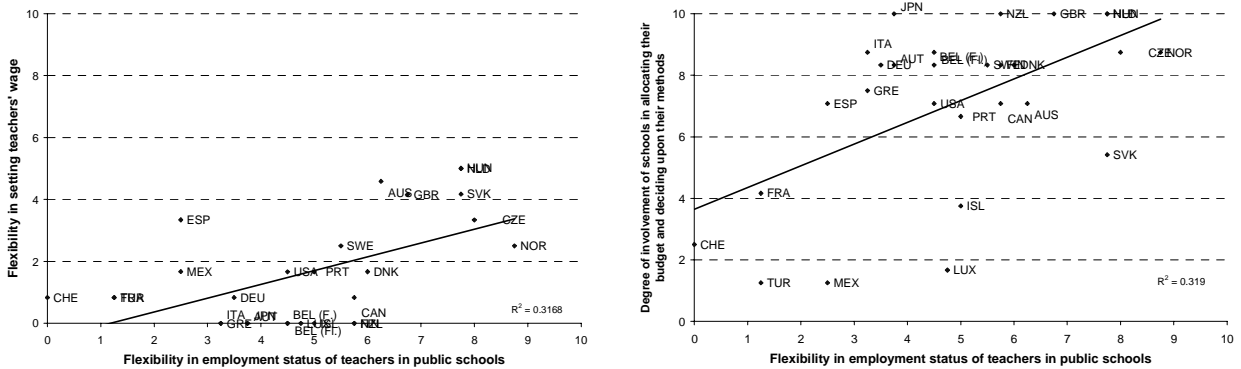
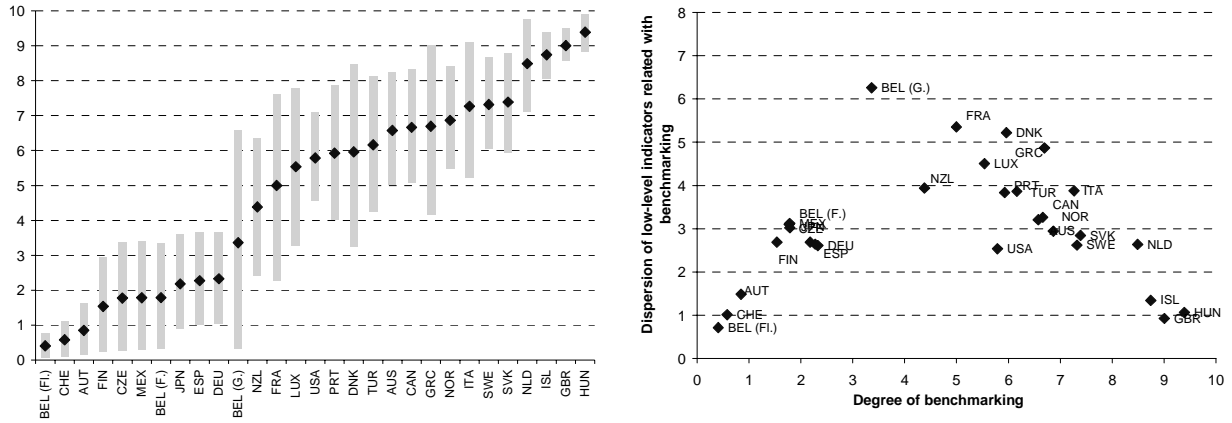


Figure 8. Market efficiency: benchmarking



Note: The figure gives the average and the range that contains 90% of the 1000 random weighted indices.  
 Source: OECD Secretariat calculations based on questionnaire responses.

Figure 9. Quality of benchmarking of pupils' performance at the national level vs degree of decentralisation

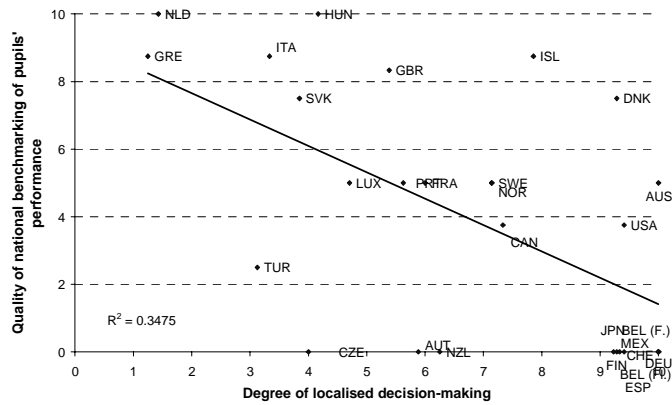
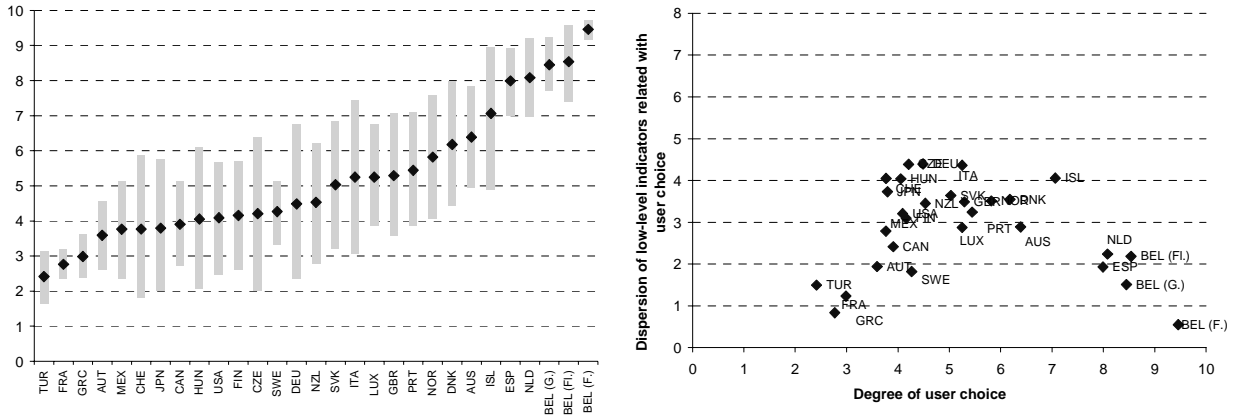


Figure 10. Market efficiency: user choice



Note: The figure gives the average and the range that contains 90% of the 1000 random weighted indices.  
 Source: OECD Secretariat calculations based on questionnaire responses.

Figure 11. User choice among public schools vs schemes increasing the autonomy of school managers

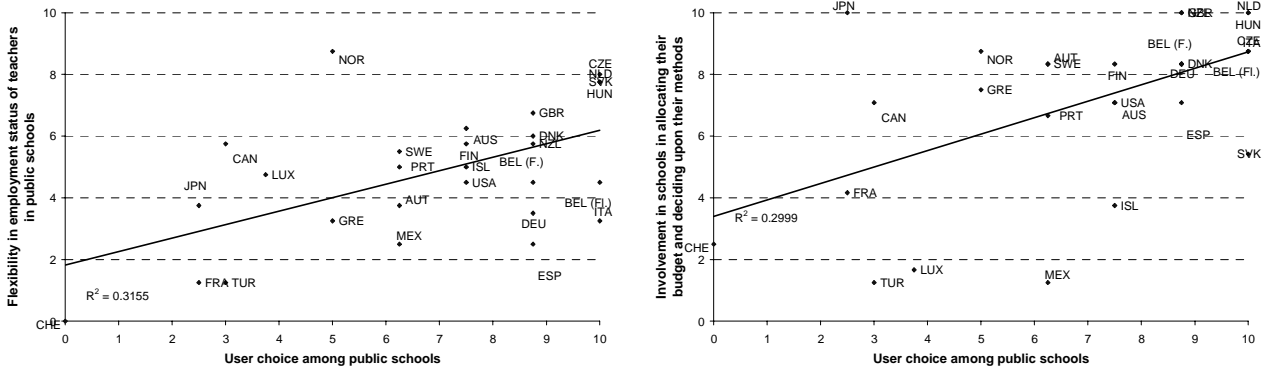
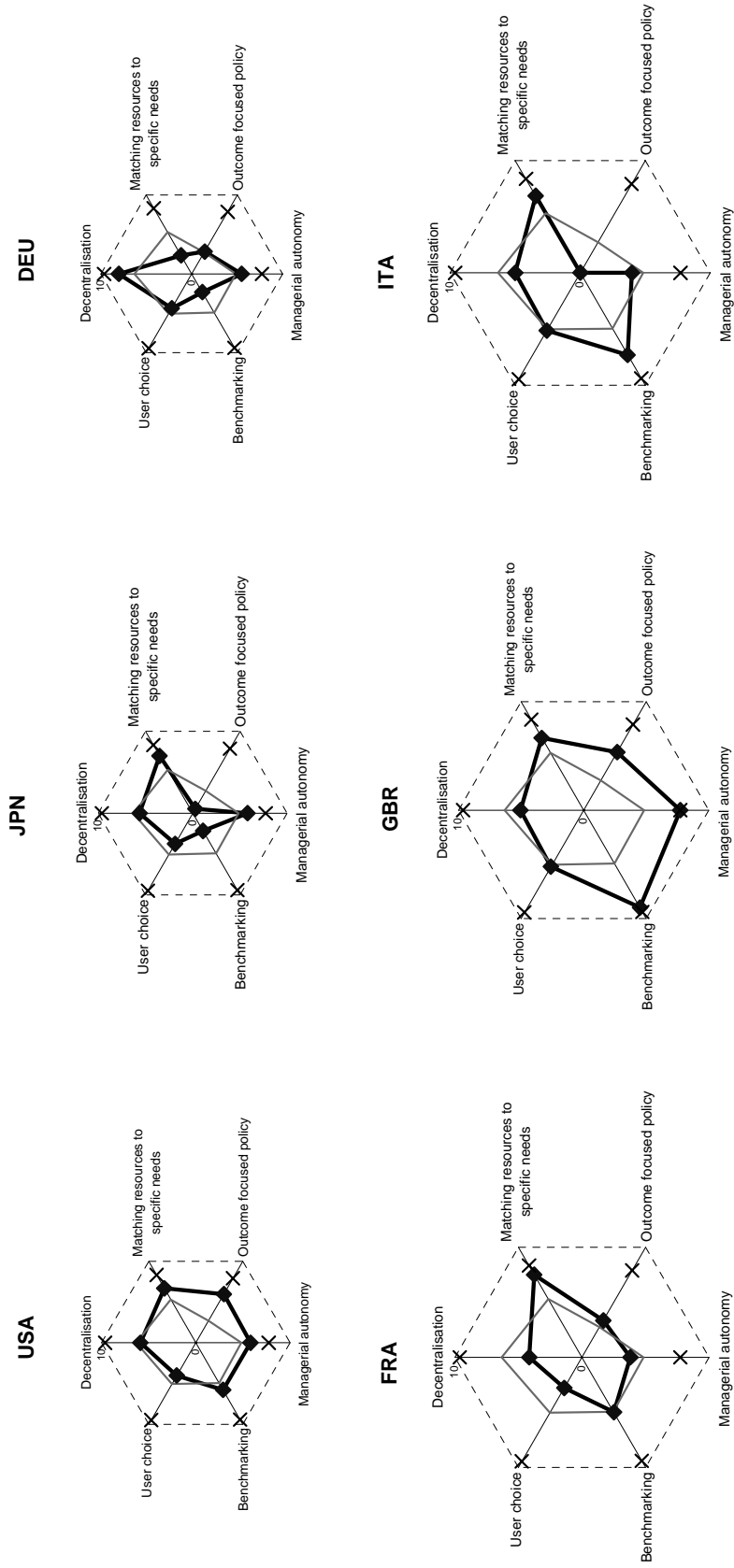
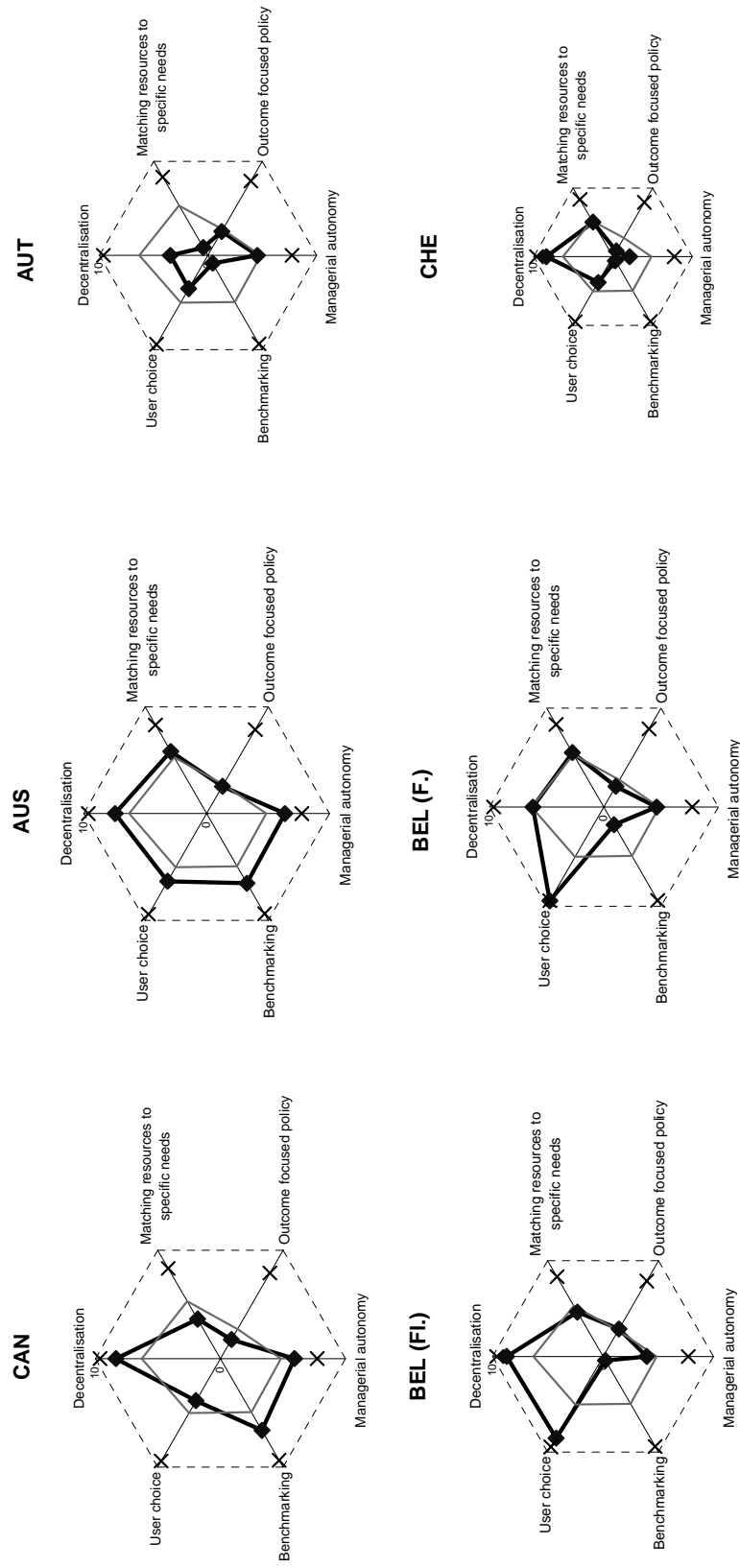


Figure 12. Intermediate indicators for each country



Note: the clear line stands for the OECD average. The crosses stand for OECD best practice for each intermediate indicator. The values of the intermediate indicators presented here are not transformed to take account of complementarities (see Annex 2).

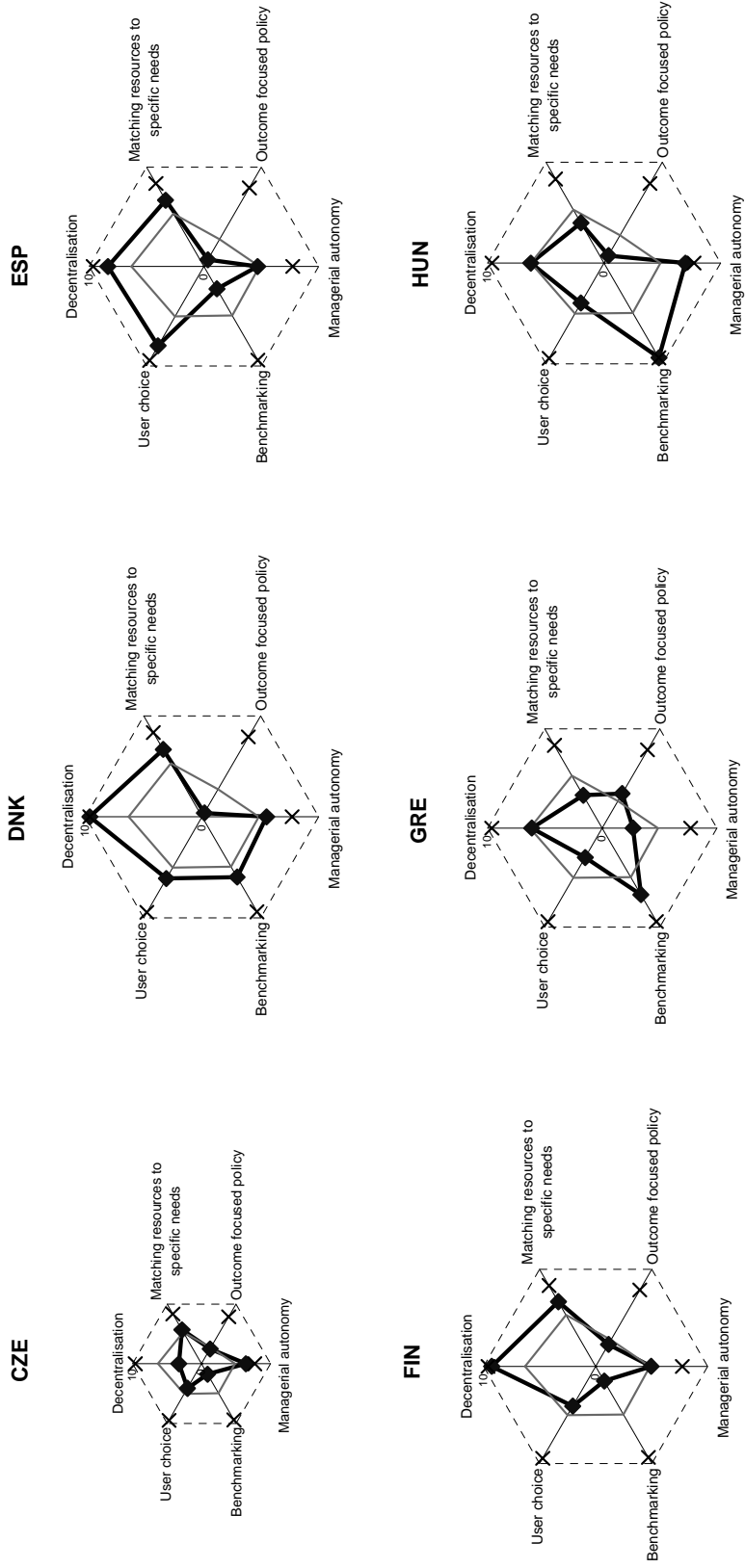
Figure 12. Intermediate indicators for each country (cont.)



Note: the clear line stands for the OECD average. The crosses stand for OECD best practice for each intermediate indicator. The values of the intermediate indicators presented here are not transformed to take account of complementarities (see Annex 2).

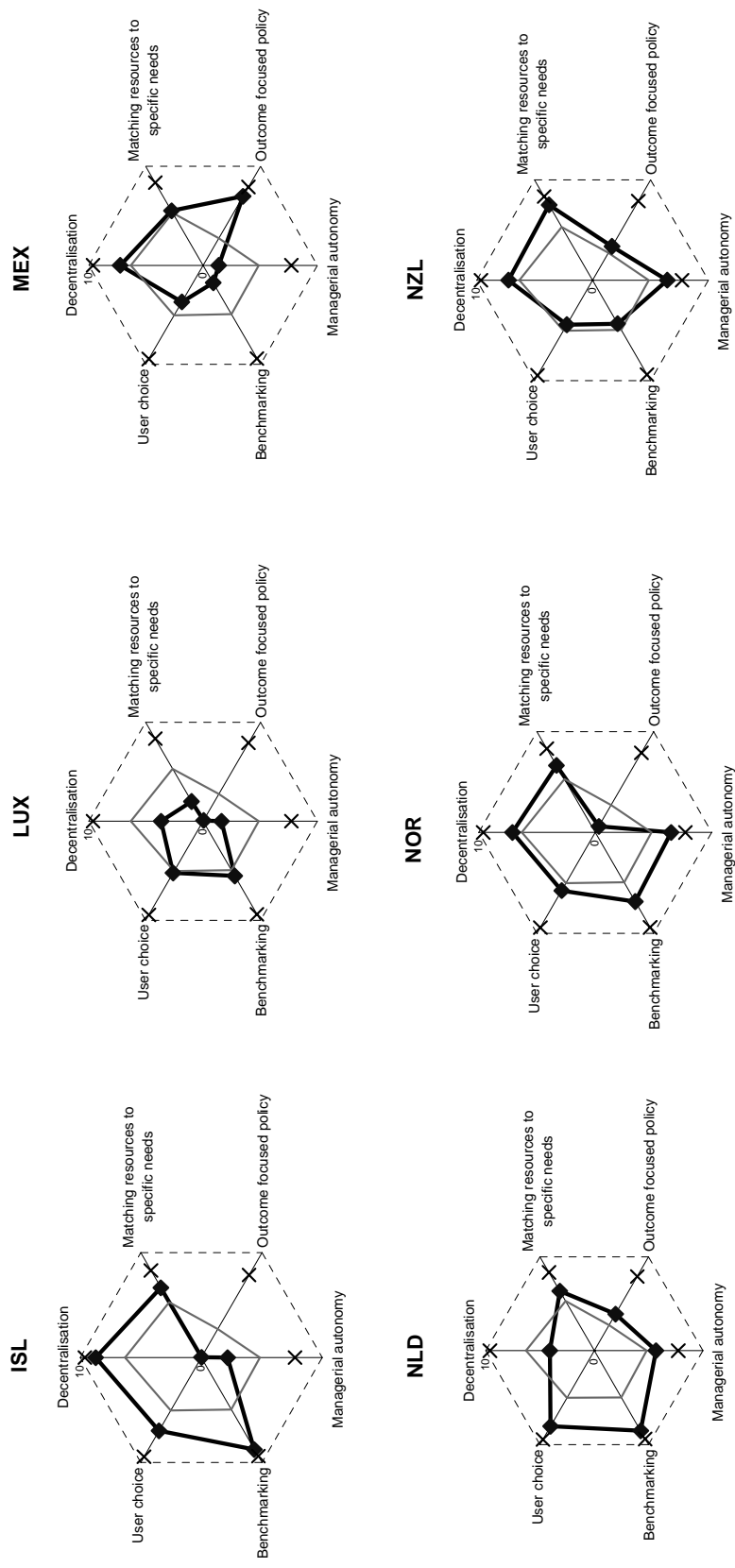


Figure 12. Intermediate indicators for each country (cont.)



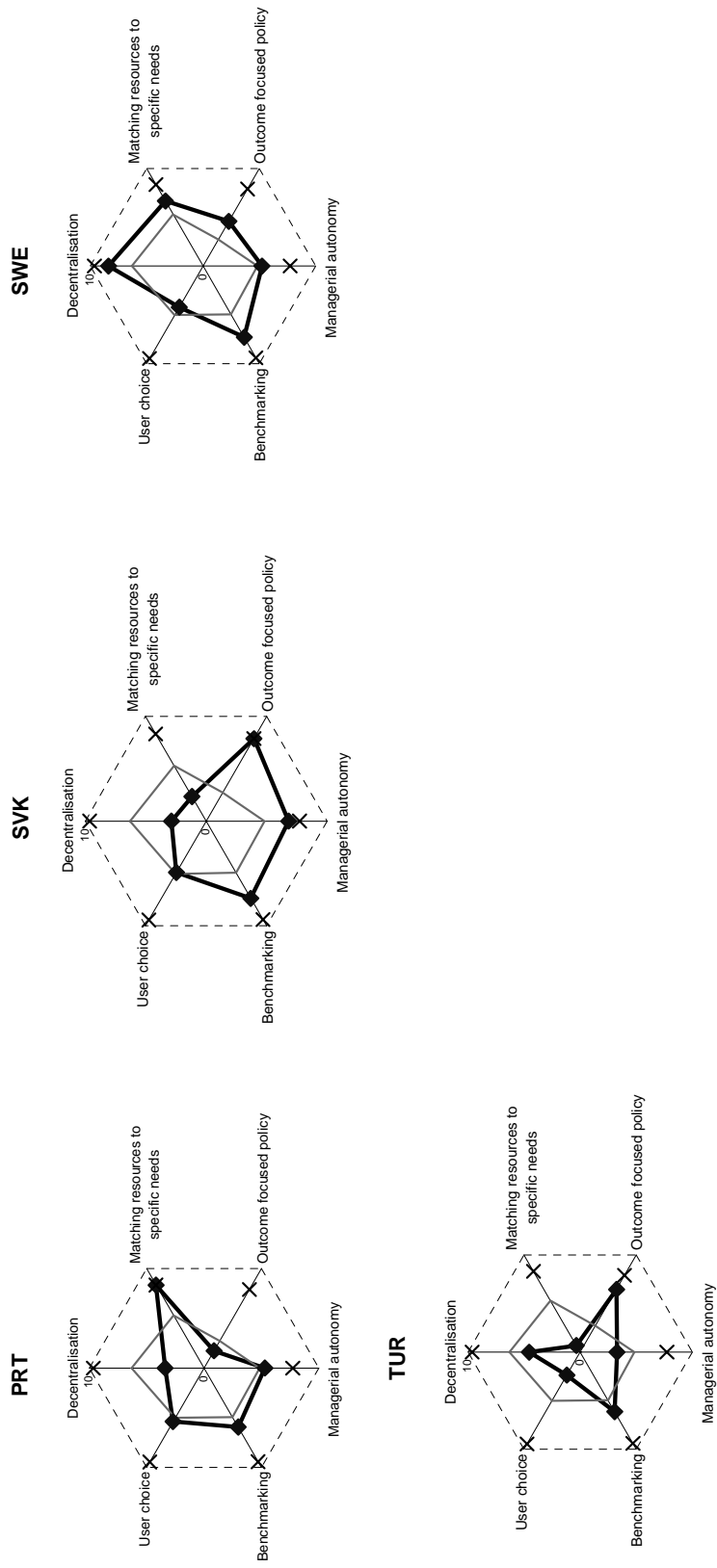
Note: the clear line stands for the OECD average. The crosses stand for OECD best practice for each intermediate indicator. The values of the intermediate indicators presented here are not transformed to take account of complementarities (see Annex 2).

Figure 12. Intermediate indicators for each country (cont.)



Note: the clear line stands for the OECD best practice for each intermediate indicator. The values of the intermediate indicators presented here are not transformed to take account of complementarities (see Annex 2).

Figure 12. Intermediate indicators for each country (cont.)



Note: the clear line stands for the OECD average. The crosses stand for OECD best practice for each intermediate indicator. The values of the intermediate indicators presented here are not transformed to take account of complementarities (see Annex 2).

Figure 13. Composite indicators

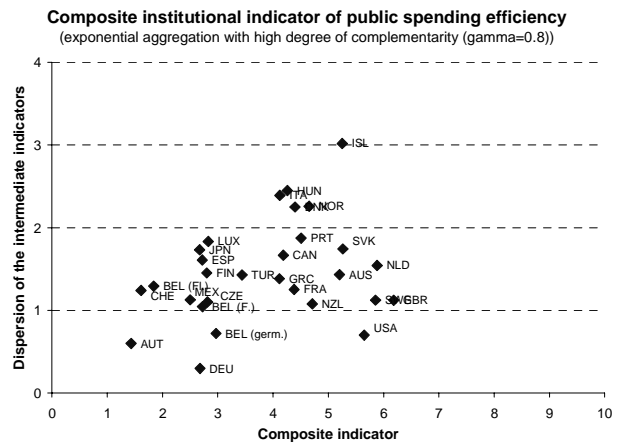
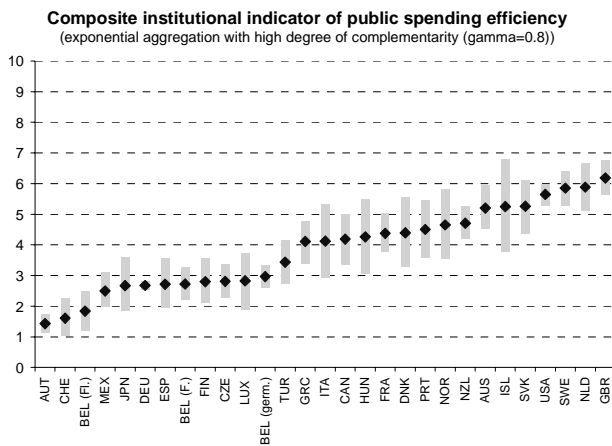
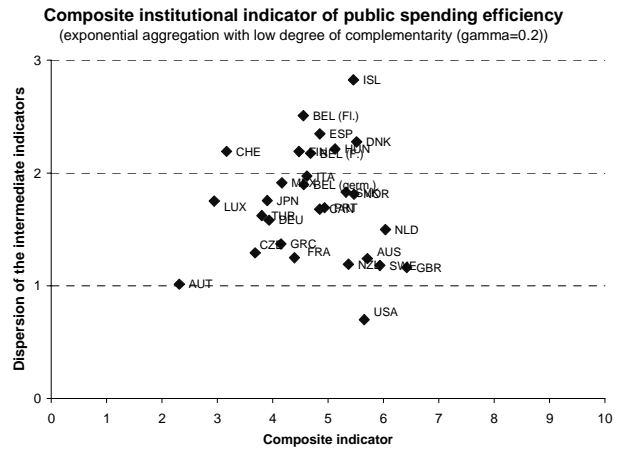
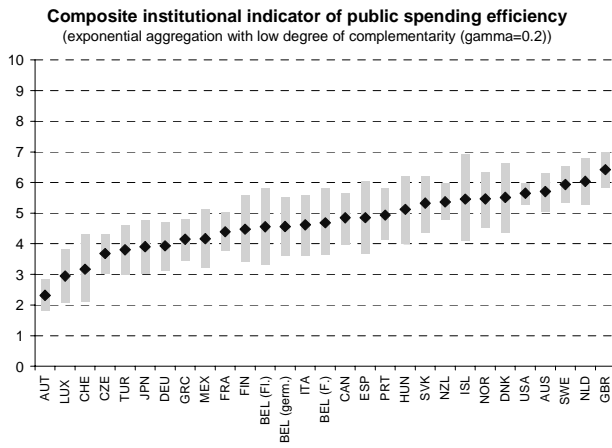
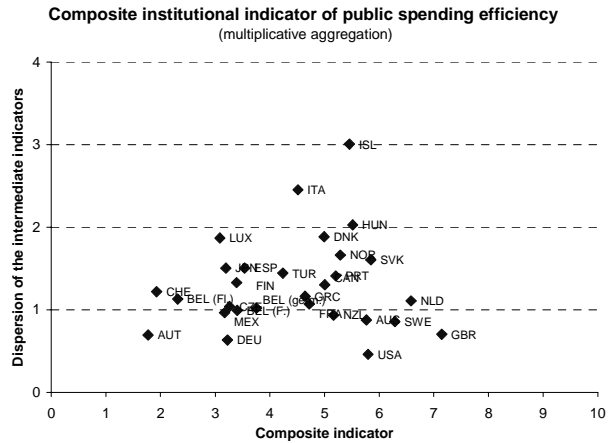
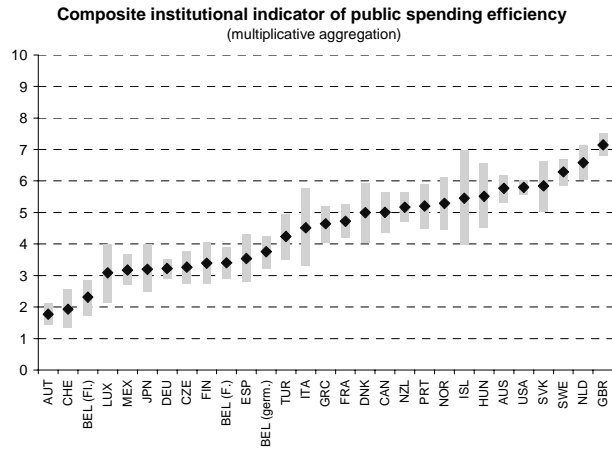
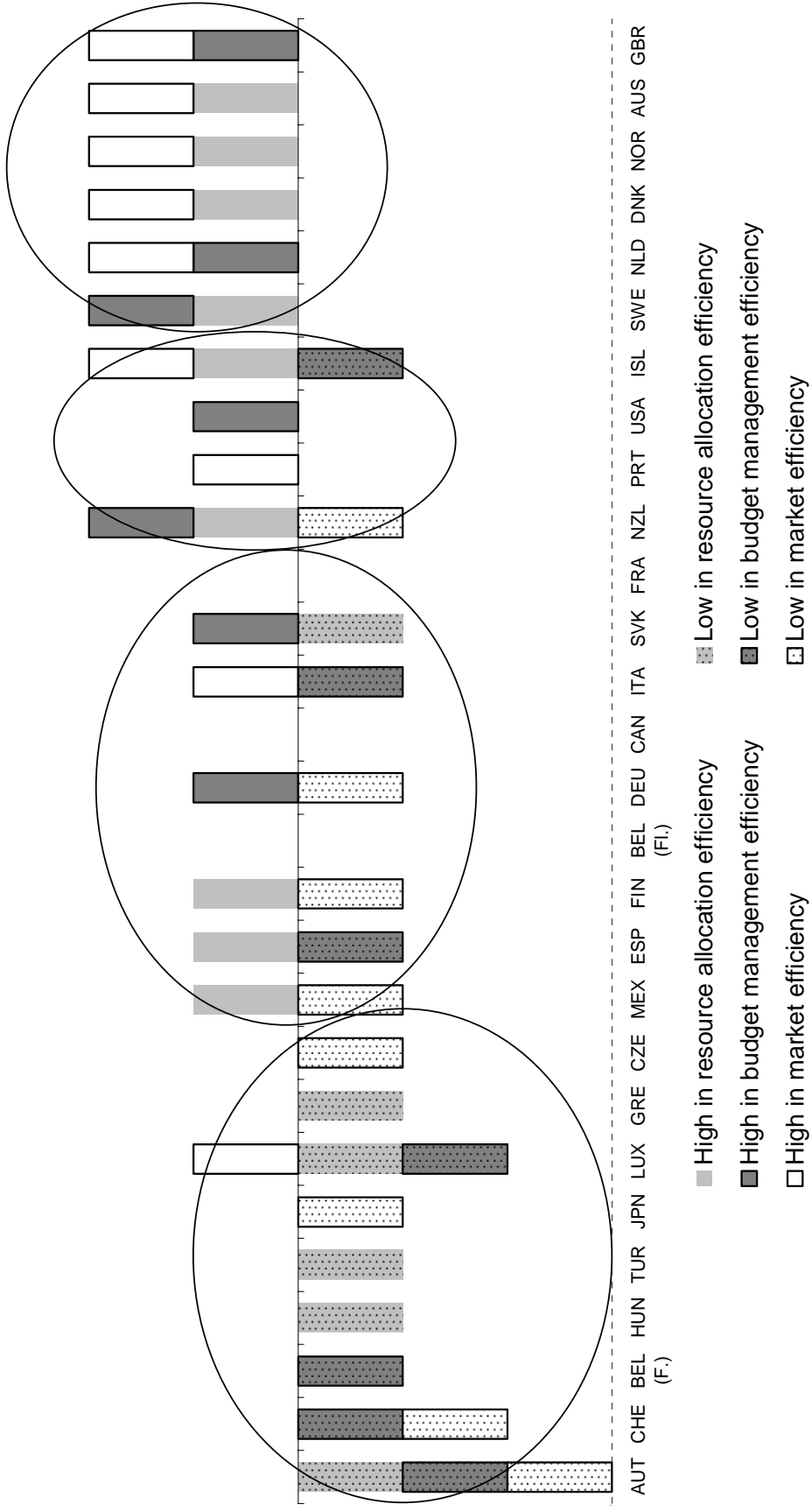


Figure 14. Properties of the educational system as regards spending efficiency (relative to the OECD average)



Note: For each country, a "high efficiency" score for one category of efficiency means that the two intermediate indicators associated with this efficiency type are both higher in this country than the OECD average, and a "low efficiency" score that the two intermediate indicators are both lower than the OECD average.

## ANNEX 2. CODING, DETAILED RESULTS AND METHODOLOGICAL ISSUES

## A. Coding and Results

Table A1. **Coding for composite indicators**  
 Institutional frameworks enhancing efficiency in public pre-primary, primary and lower-secondary education

## Coding for efficiency in resources allocation

| Low-level indicator                         | Weight   | Coding               |
|---|--|----------------------|
| <b>Decentralisation</b>                     |  |                      |
| <b>LLI-1</b>                                | <b>Degree of localised decision-making</b>   |                      |
|   | <i>(where D(i) stands for the number of education functions which regional and/or local institutions are involved in, and DD(i) for the number of education functions which central and regional and/or local institutions are involved in)</i>                | 10* D(i) / DD(i)     |
| <b>LLI-2</b>                                | <b>Clearly defined responsibilities between central government and sub-national authorities (i.e. no overlapping)</b>  |                      |
|   | <i>(where E(i) stands for the number of education functions which both regional or local institutions and central government are involved in)</i>  | 10 - 10* E(i) / D(i) |
| <b>LLI-3</b>                                | <b>Clearly defined responsibilities among and sub-national authorities (i.e. no overlapping)</b>   |                      |
|   | <i>(where F(i) stands for the number of education functions which both regional and local institutions are involved in)</i>  | 10 - 10* F(i) / D(i) |
| <b>LLI-4</b>                                | <b>Consistency in the sharing of responsibilities between levels of government</b>   |                      |
|   | <i>The institution mainly in charge of determining teachers' starting salaries and salary increases is the same as the institution mainly in charge of establishing the school overall budget envelope and deciding on budget allocation within the school</i> | +3.33                |
|   | <i>The institution mainly in charge of opening or closing schools is the same as the institution mainly in charge of paying teachers and/or supporting capital expenditures</i>  | +3.33                |
|   | <i>The institution in charge of financing new schools is the same as the institution in charge of financing the maintenance of existing schools</i>  | +3.33                |
| <b>Matching resources to specific needs</b> |  |                      |
| <b>LLI-5</b>                                | <b>Taking account of specific educational contexts in financing schools</b>  |                      |
|   | <i>Some financial adjustments are possible to take account for pupils' special needs - public schools as well as privately managed mainly publicly financed schools</i>  | 10                   |
|   | <i>Some financial adjustments are possible to take account for pupils' special needs - public schools only</i>   | 5                    |
|   | <i>No adjustment possible</i>  | 0                    |
| <b>LLI-6</b>                                | <b>Taking account of specific educational contexts in managing teachers</b>  |                      |
|   | <i>For each positive response in question 12ter</i>  | +2.5                 |
| <b>LLI-7</b>                                | <b>Age of first selection</b>  |                      |
|   | <i>(where F stands for the first age of selection in the education system if F&lt;=15, otherwise =10)</i>  | 10 - 2 * (15 - F)    |

Table A1. Coding for efficiency in budget management (cont'd)

| Low-level indicator  | Weight | Coding  |
|--|--------|---|
| <b>Outcome-focused policy</b>  |        |   |
| <b>LLI-8</b>   |        | <b>Clarity of outcome targets</b>   |
| Existence of results-focused targets   | 1/3    |   |
| <i>At least one result-focused target and at least one reward/sanction system</i>  |        | 10  |
| <i>No result-focused target, or targets but no reward/sanction</i>   |        | 0   |
| Correspondance 1 target - 1 institution  | 1/3    |   |
| <i>Each target applies to only one institution</i>   |        | 10  |
| <i>There are N(i) institutions in charge of T(i) targets (NB: in this computation, each cross in table 9 counts for an institution)</i>  |        | 10 * T(i) / N(i)  |
| <i>No result-focused target</i>  |        | 0   |
| Consistency of the institution to which targets are applied  | 1/3    |   |
| <i>Targets mostly apply to the institution(s) in charge of deciding about teaching methods, choosing textbooks, and selecting teachers for hire and setting necessary qualifications</i> |        | 10  |
| <i>Targets mostly apply to the institution(s) in charge of deciding about teaching methods, choosing textbooks, or selecting teachers for hire and setting necessary qualifications</i>  |        | 7.5   |
| <i>Targets mostly apply to institution(s) not mainly in charge of the 4 items above</i>  |        | 5   |
| <i>No result-focused target</i>  |        | 0   |
| <b>LLI-9</b>   |        | <b>Credibility of reward/sanction systems associated with educational results</b> |
| Existence of reward/sanction systems   | 1/3    |   |
| <i>A reward and sanction system exists</i>   |        | 10  |
| <i>The existing system features only sanctions or only rewards</i>   |        | 5   |
| <i>No sanction and no reward</i>   |        | 0   |
| Consistency of the institution to which reward/sanction systems apply  | 1/3    |   |
| <i>No institution with at least one reward/sanction system and no target (i.e. any institution that has at least one reward/sanction system also has a target accordingly)</i>           |        | 10  |
| <i>One institution with at least one reward/sanction system but no target</i>  |        | 5   |
| <i>Two or more institutions with at least one reward/sanction system but no target / No sanction and no reward system</i>  |        | 0   |
| Strength of the financial incentives for schools and/or teachers   | 1/3    |   |
| <i>There are financial incentive(s) for schools and/or teachers and...</i>   |        |   |
| ... <i>teachers' salaries can be adjusted for higher individual performance</i>  |        | +5  |
| ... <i>school financing takes account of the quality of educational output with...</i>   |        |   |
| ... <i>high performing schools receiving financial reward</i>  |        | +2.5  |
| ... <i>low performing schools being sanctioned</i>   |        | +2.5  |
| <i>None of the above</i>   |        | 0   |
| <b>LLI-10</b>  |        | <b>Coverage of teachers' and schools' performance assessment</b>                  |
| <i>Public and privately managed but mainly publicly funded schools</i>   |        | +5  |
| <i>Public schools only</i>   |        | +2.5  |
| <i>No assessment/inspection</i>  |        | 0   |
| <i>Teachers and/or schools assessments/inspections are made public</i>   |        | +2.5  |
| <i>(where Z(i) is the fraction of schools in country (i) declaring in the PISA questionnaire (2003) that observation of classes by inspectors were used to monitor teachers)</i>         |        | +2.5 * Z(i)   |

Table A1. Coding for efficiency in budget management (cont'd)

| Low-level indicator   | Weight | Coding                                  |
|---|--------|---|
| <b>Managerial autonomy at the school level</b>  |        |   |
| <b>LLI-11 Flexibility in employment status of teachers in public schools</b>  |        |   |
| School involvement in managing human resources<br><i>For each item selected in question 7 a) to e)</i>  | 1/2    | +2                                      |
| Flexibility in the management of public schools teachers<br><i>(where E is a number of constraints in the employment status of public school personnel)</i>   | 1/2    | 10 - 2.5* E                             |
| <b>LLI-12 Flexibility in setting teachers' wage</b>   |        |   |
| Degree of involvement of schools in wage setting<br><i>Schools are not involved in setting teachers' wages</i><br><i>Schools are involved in setting teachers' wages but 2 (or more) others institutions are also involved</i><br><i>Schools are involved in setting teachers' wages but 1 other institution is also involved</i><br><i>Only schools are involved in setting teachers' wages</i>  | 1/2    | 0<br>3.33<br>6.67<br>10                 |
| Degree of flexibility in setting wages<br><i>Starting from a score of 5, add the following points if wages of public school teachers ...</i><br><i>... reflect the number of years of experience</i><br><i>... reflect academic credential</i><br><i>... reflect individual performance</i><br><i>... vary according to geographic areas</i><br><i>... vary according to subject areas</i>  | 1/2    | -2.5<br>-2.5<br>+1.67<br>+1.67<br>+1.67 |
| <b>LLI-13 Involvement of schools in allocating the budget within the school and deciding upon teaching methods</b>  |        |   |
| Degree of involvement of schools in budget allocation within the school<br><i>Schools are not involved in budget allocation within the school</i><br><i>Schools are involved in budget allocation within the school but 2 (or more) others institutions are also involved</i><br><i>Schools are involved in budget allocation within the school but 1 other institution is also involved</i><br><i>Only schools are involved in budget allocation within the school</i> | 1/2    | 0<br>3.33<br>6.67<br>10                 |
| Degree of involvement of schools in teaching methods<br><i>For each positive response in question 7 k) to n)</i>  | 1/2    | +2.5                                    |
| <b>LLI-14 Outsourcing possibilities</b>   |        |   |
| Coverage of legal restrictions to outsourcing<br><i>Legal restrictions apply to auxiliary and core education services</i><br><i>Legal restrictions apply to core education services only</i><br><i>(W stands for the compensation of all staff as a % of current PSE spending)</i><br><i>No legal restrictions to outsourcing auxiliary and core education services</i>   | 1/2    | 0<br>10 *(1-W/100)<br>10                |
| Degree of restriction to outsourcing<br><i>Legal restrictions apply to auxiliary and core education services outsourcing</i><br><i>Legal restrictions do not apply at least to outsourcing auxiliary services</i><br><i>(X stands for the number of constraints mentioned in question 16bis)</i><br><i>No legal restrictions to outsourcing auxiliary and core education services</i>   | 1/2    | 0<br>10 - 2X<br>10                      |



Table A1. Coding for market efficiency (cont'd)

| Low-level indicator   | Weight | Coding    |
|---|--------|-----------|
| <b>Benchmarking</b>   |        |           |
| <b>LLI-15</b>   |        |           |
| <b>Coverage of benchmarking of pupils' performance</b>  |        |           |
| <i>Geographic coverage</i>  |        |           |
| <i>National</i>   |        | 10        |
| <i>Regional</i>   |        | 6.66      |
| <i>No mandatory benchmarking or others</i>  |        | 0         |
| <b>LLI-16</b>   |        |           |
| <b>Quality of national benchmarking of pupils' performance</b>  |        |           |
| <i>Coverage by school category</i>  | 1/2    |           |
| <i>Public and all private schools</i>   |        | 10        |
| <i>Public schools and publicly-funded private schools</i>   |        | 6.66      |
| <i>Public schools only</i>  |        | 5         |
| <i>No mandatory benchmarking or others</i>  |        | 0         |
| <i>Publication of the results</i>   | 1/4    |           |
| <i>Pupils' results are adjusted and officially published</i>  |        | 10        |
| <i>Pupils' results are officially published but not adjusted</i>  |        | 5         |
| <i>Results are not officially published (or no compulsory national benchmarking)</i>  |        | 0         |
| <i>Independence of benchmarking vis-à-vis external influences</i>   | 1/4    |           |
| <i>Tests are designed and results assessed by independent auditors</i>  |        | 10        |
| <i>Others</i>   |        | 0         |
| <b>LLI-17</b>   |        |           |
| <b>Use of benchmarking at the school level</b>  |        |           |
| <i>Assessments of 15-year-old students are used to compare the school to district or national performance</i>               |        | +5 * X(i) |
| <i>(with X(i) referring to the fraction of schools of country (i) declaring so in the PISA school questionnaire (2003))</i> |        |           |
| <i>Assessments of 15-year-old students are used to compare the school with other schools</i>                                |        | +5 * Y(i) |
| <i>(with Y(i) referring to the fraction of schools of country (i) declaring so in the PISA school questionnaire (2003))</i> |        |           |

Table A1 (cont'd) Coding for market efficiency

| Low-level indicator  | Weight | Coding |
|--|--------|--------|
| <b>User choice</b>   |        |        |
| <b>LLI-18 User choice among public schools</b>   |        |        |
| General scope of the user choice among public schools  | 1/2    |        |
| <i>General right to enrol in any public school</i>   |        | 10     |
| <i>Derogation needed for enrolling in a public school outside a specified geographic area</i>  |        | 5      |
| <i>No choice</i>   |        | 0      |
| Strength of implementation of the "money follows the user" principle among public schools<br>(with C referring to the "capitation basis factor" as in question 11bis. The capitation basis factor stands for the degree of dependence of public funding to the number of pupils enrolled).                         | 1/2    | 10 * C |
| <b>LLI-19 User choice between public schools and publicly financed private schools</b>   |        |        |
| Weighted mean of the three items below multiplied by $-(2 \cdot Z(i) - 1)^2 + 1$ , where Z(i) refers to the percentage of students in public PSE schools   |        |        |
| Scope of the user choice between public schools and publicly financed private schools  | 1/3    |        |
| <i>Private schools can receive some funding from government</i>  |        | 10     |
| <i>Private schools can <b>not</b> receive any funding from government</i>  |        | 0      |
| Strength of implementation of the "money follows the user" principle between public and privately-managed schools<br>(with C referring to the "capitation basis factor" as in question 11bis. The capitation basis factor stands for the degree of dependence of public funding to the number of pupils enrolled). | 1/3    | 10 * C |
| Admission criteria imposed on publicly financed private schools  | 1/3    |        |
| <i>Private schools can receive funding from government provided that...</i>  |        |        |
| ... they do not select pupils  |        | +5     |
| ... they comply with other admission rules set by national authorities   |        | +2.5   |
| No restriction on admission rules  |        | 0      |
| ... they can not charge tuition fees   |        | +5     |
| ... they comply with other regulation on tuition fees  |        | +2.5   |
| No regulation on tuition fees  |        | 0      |
| <i>Private schools can <b>not</b> receive any funding from government</i>  |        | 0      |
| <b>LLI-20 Liberalised framework for user choice</b>  |        |        |
| For each positive response in question 18bis, starting from 10   |        | -2     |
| <b>LLI-21 User choice unrestricted by school admission policies</b>  |        |        |
| "Popular" public schools can turn away enrolment demands...  | 1/2    |        |
| ... upon their own admission policies  |        | 0      |
| ... upon other criteria  |        | 5      |
| ... none of the above (can not turn away enrolment demands)  |        | 10     |
| "Popular" publicly financed private schools can turn away enrolment demands...   | 1/2    |        |
| ... upon their own admission policies  |        | 0      |
| ... upon other criteria  |        | 5      |
| ... none of the above (can not turn away enrolment demands)  |        | 10     |

Table A.2. Low-level indicator scores

|        | USA  | JPN  | DEU  | FRA  | GBR  | ITA  | CAN  | AUS  | AUT | BEL<br>(Fl.) | BEL<br>(F.) | CHE  | CZE  | DNK  | ESP  | FIN  | GRE  | HUN  | ISL  | LUX  | MEX  | NLD  | NOR  | NZL  | PRT  | SVK  | SWE  | TUR  |     |
|--------|------|------|------|------|------|------|------|------|-----|--------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| LLI-1  | 9.4  | 9.3  | 10.0 | 6.0  | 5.4  | 3.3  | 7.3  | 10.0 | 5.9 | 10.0         | 10.0        | 10.0 | 4.0  | 9.3  | 9.3  | 9.2  | 1.3  | 4.2  | 7.9  | 4.7  | 9.4  | 1.4  | 7.1  | 6.3  | 5.6  | 3.8  | 7.1  | 3.1  |     |
| LLI-2  | 9.4  | 6.9  | 8.6  | 4.4  | 1.4  | 5.0  | 9.1  | 8.1  | 1.0 | 10.0         | 10.0        | 8.8  | 2.5  | 9.2  | 5.0  | 8.2  | 10.0 | 10.0 | 9.1  | 0.0  | 1.3  | 0.0  | 8.0  | 6.0  | 0.0  | 4.0  | 8.0  | 0.0  |     |
| LLI-3  | 3.1  | 4.6  | 8.6  | 4.4  | 10.0 | 10.0 | 8.6  | 10.0 | 7.0 | 10.0         | 3.1         | 8.1  | 5.0  | 10.0 | 10.0 | 10.0 | 10.0 | 6.0  | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 4.4  | 2.0  | 10.0 | 10.0 |     |
| LLI-4  | 1.6  | 1.7  | 5.0  | 1.7  | 3.3  | 1.7  | 8.3  | 1.7  | 0.0 | 4.9          | 1.7         | 6.7  | 1.7  | 10.0 | 9.2  | 9.7  | 3.3  | 5.0  | 8.0  | 0.0  | 8.3  | 5.0  | 3.3  | 6.7  | 3.5  | 1.7  | 8.3  | 5.0  |     |
| LLI-5  | 5.0  | 5.0  | 5.0  | 5.0  | 10.0 | 5.0  | 5.0  | 5.0  | 0.0 | 5.0          | 10.0        | 0.0  | 10.0 | 10.0 | 10.0 | 10.0 | 0.0  | 10.0 | 10.0 | 0.0  | 5.0  | 10.0 | 10.0 | 10.0 | 10.0 | 0.0  | 5.0  | 0.0  |     |
| LLI-6  | 5.0  | 6.0  | 2.0  | 7.5  | 0.0  | 7.5  | 0.0  | 2.5  | 2.5 | 5.0          | 2.5         | 5.0  | 5.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 7.5  | 5.0  | 0.0  | 2.5  | 5.0  | 5.0  | 5.0  | 0.0 |
| LLI-7  | 10.0 | 10.0 | 0.0  | 10.0 | 10.0 | 8.0  | 6.0  | 10.0 | 0.0 | 4.0          | 10.0        | 2.0  | 2.0  | 10.0 | 10.0 | 10.0 | 2.0  | 10.0 | 2.0  | 10.0 | 6.0  | 4.0  | 4.0  | 10.0 | 10.0 | 10.0 | 2.0  | 10.0 | 2.0 |
| LLI-8  | 7.0  | 0.0  | 4.2  | 3.3  | 3.3  | 0.0  | 0.0  | 5.0  | 0.0 | 5.0          | 0.0         | 0.0  | 0.0  | 0.0  | 0.0  | 6.7  | 5.0  | 0.0  | 0.0  | 0.0  | 8.3  | 0.0  | 0.0  | 0.0  | 0.0  | 5.2  | 8.9  | 6.7  | 8.3 |
| LLI-9  | 7.5  | 1.3  | 1.3  | 1.7  | 3.8  | 0.0  | 0.0  | 0.0  | 1.7 | 0.0          | 0.0         | 1.7  | 0.0  | 0.8  | 1.7  | 0.0  | 0.0  | 1.7  | 0.0  | 0.0  | 6.7  | 3.3  | 1.7  | 1.3  | 0.0  | 9.2  | 1.7  | 5.0  |     |
| LLI-10 | 3.4  | 0.4  | 3.1  | 5.0  | 9.0  | 0.0  | 5.3  | 2.7  | 5.9 | 8.6          | 1.3         | 2.5  | 5.8  | 0.3  | 0.4  | 0.1  | 5.4  | 0.6  | 0.0  | 0.2  | 5.9  | 8.3  | 0.2  | 8.8  | 0.0  | 5.6  | 5.4  | 6.0  |     |
| LLI-11 | 4.5  | 3.8  | 3.5  | 1.3  | 6.8  | 3.3  | 5.8  | 6.3  | 3.8 | 4.5          | 4.5         | 0.0  | 8.0  | 6.0  | 2.5  | 5.8  | 3.3  | 7.8  | 5.0  | 4.8  | 2.5  | 7.8  | 8.8  | 5.8  | 5.0  | 7.8  | 5.5  | 1.3  |     |
| LLI-12 | 1.7  | 0.0  | 0.8  | 0.8  | 4.2  | 0.0  | 0.8  | 4.6  | 0.0 | 0.0          | 0.0         | 0.8  | 3.3  | 1.7  | 3.3  | 0.0  | 0.0  | 5.0  | 0.0  | 0.0  | 1.7  | 5.0  | 2.5  | 0.0  | 1.7  | 4.2  | 2.5  | 0.8  |     |
| LLI-13 | 7.1  | 10.0 | 8.3  | 4.2  | 10.0 | 8.8  | 7.1  | 8.3  | 8.8 | 8.3          | 2.5         | 8.8  | 8.3  | 7.1  | 8.3  | 7.5  | 10.0 | 3.8  | 1.7  | 1.3  | 10.0 | 8.8  | 10.0 | 6.7  | 5.4  | 8.3  | 1.3  |      |     |
| LLI-14 | 10.0 | 9.4  | 9.3  | 9.0  | 10.0 | 3.9  | 10.0 | 7.5  | 6.1 | 2.6          | 5.6         | 5.0  | 5.6  | 6.1  | 5.8  | 5.7  | 0.0  | 5.1  | 0.0  | 0.0  | 0.0  | 0.0  | 6.0  | 10.0 | 7.8  | 10.0 | 4.6  | 9.8  |     |
| LLI-15 | 5.0  | 5.0  | 5.0  | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 0.0 | 5.0          | 0.0         | 0.0  | 0.0  | 10.0 | 5.0  | 0.0  | 10.0 | 10.0 | 10.0 | 10.0 | 0.0  | 10.0 | 10.0 | 5.0  | 10.0 | 10.0 | 10.0 | 10.0 |     |
| LLI-16 | 3.8  | 0.0  | 0.0  | 5.0  | 8.3  | 8.8  | 3.8  | 5.0  | 0.0 | 0.0          | 0.0         | 0.0  | 0.0  | 7.5  | 0.0  | 0.0  | 8.8  | 10.0 | 8.8  | 5.0  | 0.0  | 10.0 | 5.0  | 0.0  | 5.0  | 7.5  | 5.0  | 2.5  |     |
| LLI-17 | 8.5  | 1.5  | 1.9  | 0.0  | 8.7  | 3.1  | 6.2  | 4.7  | 2.5 | 1.2          | 0.3         | 1.7  | 5.3  | 0.4  | 1.8  | 4.6  | 1.4  | 8.2  | 7.5  | 1.6  | 5.3  | 5.5  | 5.5  | 8.0  | 2.8  | 4.7  | 6.9  | 5.9  |     |
| LLI-18 | 7.5  | 2.5  | 8.8  | 2.5  | 8.8  | 10.0 | 3.0  | 7.5  | 6.3 | 10.0         | 8.8         | 0.0  | 10.0 | 8.8  | 8.8  | 7.5  | 5.0  | 10.0 | 7.5  | 3.8  | 6.3  | 10.0 | 5.0  | 8.8  | 6.3  | 10.0 | 6.3  | 3.0  |     |
| LLI-19 | 0.0  | 0.0  | 0.8  | 4.2  | 1.6  | 0.0  | 2.0  | 5.4  | 1.4 | 9.1          | 9.1         | 0.0  | 0.4  | 3.2  | 8.2  | 0.3  | 2.3  | 1.8  | 0.4  | 2.1  | 0.0  | 7.2  | 0.5  | 0.5  | 2.8  | 1.2  | 1.6  | 0.0  |     |
| LLI-20 | 6.0  | 10.0 | 8.0  | 2.0  | 8.0  | 8.0  | 8.0  | 10.0 | 4.0 | 10.0         | 10.0        | 10.0 | 6.0  | 10.0 | 10.0 | 6.0  | 2.0  | 4.0  | 10.0 | 10.0 | 6.0  | 10.0 | 10.0 | 6.0  | 10.0 | 6.0  | 4.0  | 4.0  |     |
| LLI-21 | 2.5  | 2.5  | 0.0  | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  | 2.5 | 5.0          | 10.0        | 5.0  | 0.0  | 2.5  | 5.0  | 2.5  | 2.5  | 0.0  | 10.0 | 5.0  | 2.5  | 5.0  | 7.5  | 2.5  | 2.5  | 2.5  | 2.5  | 5.0  | 2.5 |

Note: For NZL, LLI-1 to 4 have been computed by assimilating schools as decentralised authorities.

Table A.3. Scores for intermediate indicators, efficiency categories and composite indicators

|   | USA | JPN | DEU | FRA | GBR | ITA | CAN | AUS | AUT | BEL<br>(Fl.) | BEL<br>(F.) | CHE | CZE | DNK | ESP | FIN | GRE | HUN | ISL | LUX | MEX | NLD | NOR | NZL | PRT | SVK | SWE | TUR | OECD<br>average | OECD<br>best<br>practice |  |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--------------------------|--|
| <b>Intermediate indicators 1/</b>   |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Decentralisation  | 5.9 | 5.6 | 8.0 | 4.1 | 5.0 | 5.0 | 8.3 | 7.4 | 3.5 | 8.7          | 6.2         | 8.4 | 3.3 | 9.6 | 8.4 | 9.3 | 6.1 | 6.3 | 8.7 | 3.7 | 7.2 | 4.1 | 7.1 | 7.2 | 3.4 | 2.9 | 8.4 | 4.5 | 6.3             | 9.6                      |  |
| Matching resources to specific needs                                      | 6.7 | 7.0 | 2.3 | 7.5 | 6.7 | 6.8 | 3.7 | 5.8 | 0.8 | 4.7          | 5.5         | 5.0 | 5.7 | 6.7 | 6.7 | 3.3 | 4.0 | 6.7 | 2.0 | 5.5 | 6.3 | 6.7 | 7.5 | 8.3 | 2.3 | 6.7 | 0.7 | 5.3 | 8.3             |                          |  |
| Outcome focused policy  | 6.0 | 0.5 | 2.9 | 3.3 | 5.4 | 0.0 | 1.8 | 2.6 | 2.5 | 2.9          | 2.1         | 0.8 | 2.5 | 0.4 | 0.7 | 2.3 | 3.5 | 0.8 | 0.0 | 0.1 | 7.0 | 3.9 | 0.6 | 3.4 | 1.7 | 7.9 | 4.6 | 6.4 | 2.7             | 7.9                      |  |
| Managerial autonomy   | 5.8 | 5.8 | 5.5 | 3.8 | 7.7 | 4.0 | 5.9 | 6.4 | 4.5 | 4.0          | 4.6         | 2.1 | 6.4 | 5.5 | 4.7 | 4.9 | 2.7 | 7.0 | 2.2 | 1.6 | 1.4 | 5.7 | 6.5 | 6.4 | 5.3 | 6.8 | 5.2 | 3.3 | 4.8             | 7.7                      |  |
| Benchmarking  | 5.8 | 2.2 | 2.3 | 5.0 | 9.0 | 7.3 | 6.6 | 6.6 | 0.8 | 0.4          | 1.8         | 0.6 | 1.8 | 6.0 | 2.3 | 1.5 | 6.7 | 9.4 | 8.7 | 5.5 | 1.8 | 8.5 | 6.8 | 4.3 | 5.9 | 7.4 | 7.3 | 6.1 | 4.9             | 9.4                      |  |
| User choice   | 4.0 | 3.8 | 4.4 | 2.8 | 5.2 | 5.1 | 3.9 | 6.4 | 3.5 | 8.5          | 9.5         | 3.8 | 4.1 | 6.1 | 8.0 | 4.1 | 3.0 | 4.0 | 7.0 | 5.2 | 3.7 | 8.0 | 5.8 | 4.4 | 5.4 | 4.9 | 4.2 | 2.4 | 5.0             | 9.5                      |  |
| <b>Efficiency types 2/</b>  |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| <i>with multiplicative aggregation</i>                                    |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 6.2 | 5.2 | 3.3 | 6.0 | 6.7 | 6.4 | 5.6 | 6.4 | 1.3 | 3.3          | 4.4         | 3.6 | 4.0 | 7.1 | 5.5 | 5.2 | 4.9 | 5.8 | 7.7 | 3.3 | 4.5 | 6.1 | 6.8 | 6.5 | 6.4 | 3.5 | 7.2 | 3.0 | 5.2             | 7.7                      |  |
| Efficiency in budget management   | 5.9 | 1.8 | 3.6 | 3.8 | 6.8 | 0.4 | 3.7 | 4.4 | 2.8 | 2.5          | 2.8         | 1.2 | 3.5 | 1.9 | 1.8 | 3.0 | 3.5 | 3.0 | 0.4 | 0.6 | 2.8 | 5.2 | 2.5 | 4.6 | 3.4 | 7.4 | 5.2 | 4.8 | 3.3             | 7.4                      |  |
| Market efficiency   | 5.3 | 2.5 | 2.7 | 4.4 | 7.9 | 6.7 | 5.9 | 6.5 | 1.3 | 1.1          | 2.9         | 1.0 | 2.2 | 6.0 | 3.2 | 2.0 | 5.6 | 7.7 | 8.3 | 5.5 | 2.2 | 8.4 | 6.6 | 4.4 | 5.8 | 6.7 | 6.4 | 5.0 | 4.8             | 8.4                      |  |
| <i>with exponential aggregation and low degree of complementarity 3/</i>  |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 6.2 | 6.1 | 4.9 | 5.8 | 5.9 | 5.9 | 5.8 | 6.5 | 1.9 | 6.4          | 5.6         | 6.4 | 4.3 | 7.9 | 7.3 | 7.7 | 4.7 | 5.1 | 7.7 | 2.8 | 6.1 | 5.2 | 6.8 | 7.1 | 5.9 | 2.6 | 7.3 | 2.6 | 5.7             | 7.9                      |  |
| Efficiency in budget management   | 5.8 | 2.9 | 3.8 | 3.5 | 6.3 | 1.7 | 3.6 | 4.2 | 3.1 | 3.0          | 3.0         | 1.2 | 4.1 | 2.7 | 2.4 | 3.2 | 2.9 | 3.6 | 0.9 | 0.6 | 3.9 | 4.6 | 3.3 | 4.6 | 3.3 | 7.2 | 4.8 | 4.6 | 3.5             | 7.2                      |  |
| Market efficiency   | 4.9 | 2.7 | 3.1 | 3.9 | 7.1 | 6.2 | 5.3 | 6.5 | 1.9 | 4.2          | 5.4         | 1.9 | 2.7 | 6.0 | 4.9 | 2.6 | 4.8 | 6.7 | 7.9 | 5.4 | 2.5 | 8.3 | 6.3 | 4.4 | 5.7 | 6.2 | 5.8 | 4.3 | 4.9             | 8.3                      |  |
| <i>with exponential aggregation and high degree of complementarity 4/</i> |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 6.2 | 4.8 | 2.6 | 5.8 | 5.9 | 5.9 | 5.4 | 6.4 | 1.1 | 2.8          | 3.9         | 3.0 | 3.9 | 6.6 | 4.7 | 4.3 | 4.7 | 5.1 | 7.7 | 2.8 | 3.9 | 5.2 | 6.8 | 6.2 | 5.9 | 2.6 | 7.2 | 2.6 | 4.8             | 7.7                      |  |
| Efficiency in budget management   | 5.8 | 0.8 | 2.9 | 3.4 | 5.6 | 0.3 | 2.0 | 2.8 | 2.1 | 2.1          | 2.2         | 1.0 | 2.5 | 0.6 | 0.9 | 2.3 | 2.8 | 1.0 | 0.2 | 0.3 | 1.6 | 4.1 | 0.9 | 3.6 | 2.0 | 7.0 | 4.7 | 3.5 | 2.5             | 7.0                      |  |
| Market efficiency   | 4.9 | 2.4 | 2.5 | 3.9 | 7.1 | 6.2 | 5.3 | 6.5 | 1.1 | 0.7          | 2.0         | 0.8 | 2.0 | 6.0 | 2.5 | 1.8 | 4.8 | 6.7 | 7.9 | 5.4 | 2.0 | 8.3 | 6.3 | 4.4 | 5.7 | 6.2 | 5.8 | 4.3 | 4.4             | 8.3                      |  |
| <b>Composite indicators</b>   |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| <i>with multiplicative aggregation</i>                                    |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 5.8 | 3.2 | 3.2 | 4.7 | 7.1 | 4.5 | 5.0 | 5.8 | 1.8 | 2.3          | 3.4         | 1.9 | 3.3 | 5.0 | 3.5 | 3.4 | 4.6 | 5.5 | 5.5 | 3.1 | 3.2 | 6.6 | 5.3 | 5.2 | 5.2 | 5.8 | 6.3 | 4.2 | 4.4             | 7.1                      |  |
| <i>with exponential aggregation and low degree of complementarity 3/</i>  |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 5.1 | 4.6 | 4.6 | 5.7 | 6.4 | 5.5 | 5.5 | 5.4 | 4.8 | 3.9          | 3.9         | 6.0 | 5.7 | 4.5 | 3.2 | 3.8 | 4.9 | 4.1 | 5.9 | 4.6 | 2.9 | 3.7 | 5.3 | 4.2 | 4.7 | 5.5 | 2.3 | 4.4 | 4.7             | 6.4                      |  |
| <i>with exponential aggregation and high degree of complementarity 4/</i> |     |     |     |     |     |     |     |     |     |              |             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                 |                          |  |
| Efficiency in resource allocation   | 5.6 | 2.7 | 2.7 | 4.4 | 6.2 | 4.1 | 4.2 | 5.2 | 1.4 | 1.8          | 2.7         | 1.6 | 2.8 | 4.4 | 2.7 | 2.8 | 4.1 | 4.3 | 5.3 | 2.8 | 2.5 | 5.9 | 4.7 | 4.7 | 4.5 | 5.3 | 5.9 | 3.4 | 3.9             | 6.2                      |  |

1/ Scores for intermediate indicators before transformation taking account of complementarities (see Annex 2).

2/ The score for each efficiency type is computed as a non-weighted average of its associated intermediate indicators after transformation of their values according to the methods detailed in Annex 2.

3/ The value of gamma is set at 0.2 (see Annex 2).

4/ The value of gamma is set at 0.8 (see Annex 2).

## B. Methodological Issues

33. This section details the methods developed to compute a composite indicator assessing the institutional setting in the public education sector as regards its overall ability to bolster spending efficiency. Simply averaging the values of the intermediate indexes to yield an overall indicator would neglect existing complementarities among the institutional properties of the education system assessed by these intermediate indexes. Such complementarities modify the impact on spending efficiency of one intermediate index depending on the value of other intermediate, complementary indexes. Two aggregation methods taking account of complementarities have been developed in this context.

### Multiplicative aggregation

34. The composite indicator is computed as a random-weighted mean of *transformed* values of the 6 intermediate indexes. The composite indicator is asymptotically equal to:<sup>12</sup>

$$I_i^* = \frac{1}{6} \sum_{j=1}^6 I_{i,j}^*$$

where  $I_i^*$  stands for the composite indicator of country  $i$  according to the multiplicative aggregation method, and  $I_{i,j}^*$  is a transformed value of  $I_{i,j}$ , an intermediate indicator for country  $i$  as computed from low-level indicators using random weights.  $I_{i,j}^*$  is computed as a geometric mean of  $I_{i,j}$  and all its complementary indexes:

$$I_{i,j}^* = \left( \prod_{k=1}^l I_{i,j,k} \right)^{\frac{1}{l}}$$

where  $I_{i,j,k}$  is a complementary indicator of  $I_{i,j} = I_{i,j,1}$ . As mentioned in the main text, the outcome-focused policy index has two complementary indexes (managerial autonomy and benchmarking); the managerial autonomy indicator has one complementary index (outcome-focused policy), and the user choice indicator and the decentralisation indicator each have the benchmarking index as a complementary index.

35. One shortcoming of this method is that the intensity of complementarities cannot be modified. This is achieved in the exponential aggregation method described below.

### Exponential aggregation with variable degree of complementarity

36. As in the previous method, the composite indicator is computed as a random-weighted mean of transformed values of the 6 intermediate indexes. It is asymptotically equal to:

---

12. Given that the weights are drawn from a uniform distribution between zero and one, the mean indicator values are asymptotically equivalent to indicators calculated using equal weights on each of the low-level indicators.

$$I_i^{**} = \frac{1}{6} \sum_{j=1}^6 I_{i,j}^{**}$$

where  $I_i^{**}$  stands for the synthetic indicator of country  $i$  according to the exponential method of aggregation and  $I_{i,j}^{**}$  is a modified value of the intermediate indicator  $I_{i,j}$  of country  $i$ .

$I_{i,j}^*$  is computed from the values of all its complementary indexes  $I_{i,j,k}$  (with  $I_{i,j} = I_{i,j,1}$ ) according to the following formula:<sup>13</sup>

$$I_{i,j}^{**} = -\frac{1}{f(\gamma)} \ln \left[ \frac{1}{2} \left( \exp(-f(\gamma)I_{i,j}) + \exp(-f(\gamma) \min_k I_{i,j,k}) \right) \right]$$

where  $\gamma \in (0;1)$  is a parameter measuring the intensity of complementarity among intermediate indexes and the function  $f(\gamma)$  is increasing.<sup>14</sup> This specification allows for different degrees of complementarity ( $\gamma$ ) in computing the impact on the value of the composite indicator, depending on the dispersion between complementary intermediate indicators. This is explained below taking a few examples (see Figure A1):

- In Mexico, a high dispersion between complementary intermediate indicators lowers the value of the composite indicator. Mexico ranks high on outcome-focused policy (7.0) but low on benchmarking (1.8) and managerial autonomy (1.4). As argued in the main text, such a country may not actually be efficient. With the above mentioned specification, the *transformed* value of the “outcome-focused policy” intermediate index tends to 1.4 if  $\gamma \rightarrow 1$  and lies between 7.0 and 1.4 depending on the intensity of complementarities as measured by the value of  $\gamma$ . Overall the value of the Mexican composite indicator is lessened, all the more as  $\gamma$  is high.

Likewise, the composite indicator in Denmark is detrimentally affected by the low level of the “outcome-focused policy” index which reduces the value of the *transformed* “managerial autonomy” indicator, and thus the value of the composite indicator.

- In Sweden and France, the degree of dispersion between complementary indexes is low, suggesting a relatively higher institutional consistency in the public education sector. With the above mentioned specification, the value of the composite indicator is not strongly

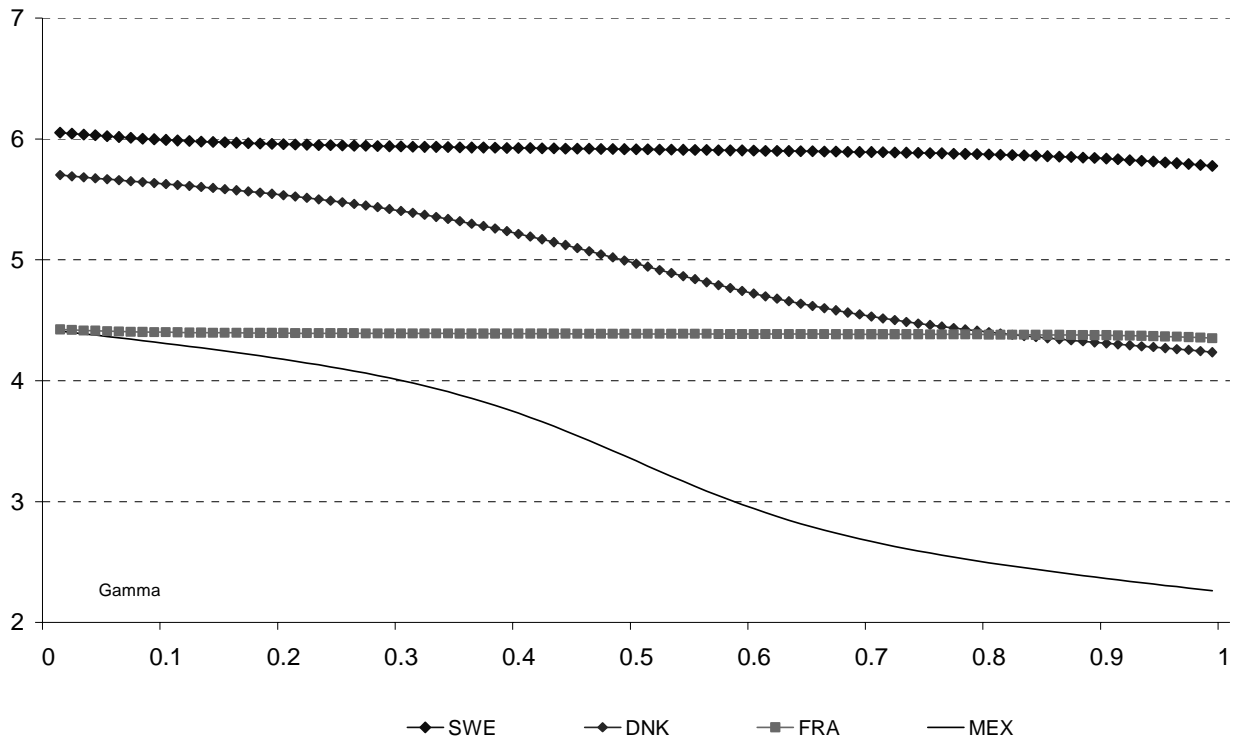
13. This specification is a modified version of a function proposed by Blackorby, Bossert and Donaldson (2005) who model a welfarist social choice function aggregating individual utilities and taking account of the social planner’s aversion to inequality. See Blackorby, Bossert and Donaldson (2005).

14. The function  $f(\gamma)$  is such that  $\lim_{\gamma \rightarrow 0} f(\gamma) \rightarrow -\infty$ ;  $\lim_{\gamma \rightarrow 1} f(\gamma) \rightarrow +\infty$  and  $f(0.5) = 0$ . In practice, we used  $f(\gamma) = -[\tan(\pi\gamma)]^{-1}$  and defined  $I_{i,j,\gamma=0.5}^{**}$  as  $I_{i,j,\gamma=0.5}^{**} = 0.5 * (I_{i,j,\gamma=0.49}^{**} + I_{i,j,\gamma=0.51}^{**})$ .

In this specification, the implicit weights of  $I_{i,j}$  and  $\min_k I_{i,j,k}$  in the computation of the transformed value of the intermediate index are not the same, thanks to the use of the exponential:  $I_{i,j} \neq \min_k I_{i,j,k} \rightarrow \exp(-f(\gamma)I_{i,j}) \neq \exp(-f(\gamma) \min_k I_{i,j,k})$ .

affected by the degree of complementarity ( $\gamma$ ) and remains close to the simple average of the non-transformed intermediate indexes  $I_{i,j}$ .

Figure A1. Composite indicator as a function of the degree of complementarity between intermediate indexes (exponential aggregation)



### ANNEX 3 : QUESTIONNAIRE SENT TO THE OECD MEMBER COUNTRIES

#### Policy and institutional settings in the education sector

37. The main objective of the questions included in this sub-section is to build relevant indicators for the policy and institutional settings which may help in understanding why different measures of efficiency for public service providers vary across countries.

38. When were the last major reforms implemented in the education sector? What were the key features of these reforms?

#### *The sharing of responsibilities in education across levels of government and other bodies*

39. This set of questions aims at building indicators on the degree and type of decentralisation.

| Who is involved in:  |                          |                              |                          |                          |                          |                                       |
|--|--------------------------|------------------------------|--------------------------|--------------------------|--------------------------|---------------------------------------|
|  | Central government       | Regional government (if any) | Local government         | Trade unions             | Schools                  | Families, residents, local businesses |
| <i>Personnel management</i>  |                          |                              |                          |                          |                          |                                       |
| a) Selecting teachers for hire                                       | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| b) Firing teachers   | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| c) Setting necessary qualifications                                  | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| d) Establishing teachers' starting salaries                          | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| e) Determining teachers' salary increases                            | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| <i>Infrastructure development</i>                                    |                          |                              |                          |                          |                          |                                       |
| f) Financing new schools and other buildings                         | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| g) Financing the maintenance of existing schools and other buildings | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| <i>Financial resources</i>   |                          |                              |                          |                          |                          |                                       |
| h) Establishing the school overall budget envelope                   | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| i) Deciding on budget allocation within the school                   | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| <i>Curriculum and instruction methods</i>                            |                          |                              |                          |                          |                          |                                       |
| j) Setting curricula   | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| k) Deciding about teaching methods                                   | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| l) Setting instruction time  | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| m) Choosing textbooks to be used                                     | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| n) Designing education programmes                                    | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| o) Setting catchment areas (if any)                                  | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| <i>Student policies</i>  |                          |                              |                          |                          |                          |                                       |
| p) Setting rules for student admissions                              | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |
| q) Opening or closing schools  | <input type="checkbox"/> | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>              |

40. Please signal whether any significant reform in the allocation of responsibilities across levels of governments and agents has been implemented over the past decade. Please also note whether the



responses to the questions on personnel management are the same for government-dependent private schools with teaching personnel paid by a government agency.

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***Setting targets for educational institutions***

41. The management of public spending programmes has shifted focus from the amount of resources used to deliver the service and the results/outcomes achieved. This set of questions aims at measuring the degree to which results-focused targets are used, the nature of these and the arrangements in place to enforce them.

*The setting of results-focused targets*

|  | Yes                      | No                       |                               |                          |                             |
|--|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|
| Have results-focused targets been adopted in your country for primary and lower secondary education institutions?  | <input type="checkbox"/> | <input type="checkbox"/> |                               |                          |                             |
| If so, what are these results-focused targets and to which bodies are they applied?<br>(tick all boxes that apply)   |                          |                          |                               |                          |                             |
|  | School employees         | Schools                  | Local or regional governments | Ministry of education    | Others (including agencies) |
| Minimum number or percentage of pupils achieving a given level of proficiency/qualifications<br>Same as previous question, taking into account the socio-economic background of pupils and/or knowledge base when they enrol in the school | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    |
| Maximum number or share of repeaters   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    |
| Maximum time of replacement for teachers on leave  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    |
| Truancy rates  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    |
| Others (please specify)  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    |

42. What has been the experience with results-oriented targets for educational institutions? To what extent have targets been complied with? What recent reforms have been implemented?

|  |
|--|
|  |
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*Administrative reward and sanction systems*

|  |                          |                          |                                     |                              | Yes                                       | No                       |
|--|--------------------------|--------------------------|-------------------------------------|------------------------------|---|--------------------------|
| Are there administrative incentives (sanctions or support) associated with educational results as evaluated against the targets? |                          |                          |                                     |                              | <input type="checkbox"/>                  | <input type="checkbox"/> |
| If your country has any administrative incentives, what are they and to which body are they applied?<br>(tick as many as apply)  |                          |                          |                                     |                              |   |                          |
|  | <b>School employees</b>  | <b>Schools</b>           | <b>Local or regional government</b> | <b>Ministry of education</b> | <b>Others (including public agencies)</b> |                          |
| Can employees in charge of implementing the targets be dismissed in the case of sub-par performance?                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>                  | <input type="checkbox"/> |
| Can employees in charge of implementing the targets be promoted in the case of high performance?                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>                  | <input type="checkbox"/> |
| Has the frequency of inspection increased in the case of sub-par performance?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>                  | <input type="checkbox"/> |
| Is freedom in decision making restricted in the case of sub-par performance?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>                  | <input type="checkbox"/> |
| Are there other forms of incentives (if so, please specify)?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>     | <input type="checkbox"/>                  | <input type="checkbox"/> |

*Financing principles for educational institutions*

43. This set of questions aims at clarifying what are the main funding principles for public and privately-managed schools.

|   | Yes                                | No                       |
|---|------------------------------------|--------------------------|
| Can privately-managed schools receive some funding from the general government? | <input type="checkbox"/>           | <input type="checkbox"/> |
| <b>If the answer is "yes", please specify the conditions for funding:</b>       | <b>Tick as many boxes as apply</b> |                          |
| a) Compliance with admission rules set by the national authorities.             | <input type="checkbox"/>           |                          |
| b) Inability to charge tuition fees.  | <input type="checkbox"/>           |                          |
| c) Compliance with regulations on tuition fees.                                 | <input type="checkbox"/>           |                          |
| d) The curriculum is set by the government                                      | <input type="checkbox"/>           |                          |
| e) Inability to select pupils.  | <input type="checkbox"/>           |                          |
| f) Compliance with other regulations  | <input type="checkbox"/>           |                          |
| (if so, please specify)   |                                    |                          |

|  | Publicly managed         |                          | Privately managed but mainly publicly financed |                          |
|--|--------------------------|--------------------------|--|--------------------------|
|  | Yes                      | No                       | Yes  | No                       |
| <p>Does the financing of schools reflect, at least partly, the quantity and/or quality of services delivered?<br/> <b>If the answer is “yes”, tick as many as apply:</b></p>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                       | <input type="checkbox"/> |
| <p>If schools are financed by public authorities on the basis of the number of pupils, please specify the method:</p> <ul style="list-style-type: none"> <li>-- on a pure capitation basis (i.e. public funding is strictly dependent on the number of pupils enrolled). <input type="checkbox"/></li> <li>-- largely on a capitation basis (i.e. should one pupil move from a public school to a mainly publicly funded school, between 66 and 99% of the cost of educating a child in a public school would be reallocated from the origin to the destination school). <input type="checkbox"/></li> <li>-- partly on a capitation basis (i.e. should one pupil move from a public school to a mainly publicly funded school, between 33 and 66% of the cost of educating a child in a public school would be reallocated from the origin to the destination school). <input type="checkbox"/></li> <li>-- on a “very soft” capitation basis (i.e. should one pupil move from a public school to a mainly publicly funded school, between 0 and 33% of the cost of educating a child in a public school would be reallocated from the origin to the destination school). <input type="checkbox"/></li> <li>-- with some adjustment to account for pupils’ special needs and/or their socio-economic backgrounds. <input type="checkbox"/></li> </ul> |                          |                          |  |                          |
| <p>If the quality of educational outputs is accounted for in financing individual schools, please specify the method.</p> <ul style="list-style-type: none"> <li>-- High performing schools receive a financial reward? <input type="checkbox"/></li> <li>-- Low performing schools receive extra financial support to allow them to improve the quality of services? <input type="checkbox"/></li> <li>-- Other output-quality incentives apply? (If so, please specify) <input type="checkbox"/></li> </ul>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>                       | <input type="checkbox"/> |
| <p>There are other types of key quality and quantity criteria applicable to the financing of public school? If so, please specify</p>  | <input type="checkbox"/> |                          | <input type="checkbox"/>                       |                          |

## *Management of schools*

### *Employment status, mobility and wage setting in public schools*

44. Implementing a results-oriented management approach has often been accompanied by changes in human resource management.

| Please define the employment status of public school personnel according to the following characteristics:   | Yes                      | No                       |
|--|--------------------------|--------------------------|
| Public school teachers have life-long job contracts.   | <input type="checkbox"/> | <input type="checkbox"/> |
| There are regulatory constraints reducing the geographical mobility of public school personnel to reflect changing needs (e.g. demographic developments)<br>If so, please specify. | <input type="checkbox"/> | <input type="checkbox"/> |
| The pension system hinders the mobility of staff between the public and private education sectors (e.g. non-portability of pension rights).  | <input type="checkbox"/> | <input type="checkbox"/> |
| Other regulatory constraints hinder the mobility of staff between the public and private education sectors.<br>If so, please specify.  | <input type="checkbox"/> | <input type="checkbox"/> |

| Please define the wage-setting process of public school personnel along the following lines:  | Yes                      | No                       |
|---|--------------------------|--------------------------|
| Wages of public school teachers reflect:  |                          |                          |
| -- The number of years of experience  | <input type="checkbox"/> | <input type="checkbox"/> |
| -- Academic credentials   | <input type="checkbox"/> | <input type="checkbox"/> |
| -- Individual performance (if so, please specify below)   | <input type="checkbox"/> | <input type="checkbox"/> |
| -- Others   | <input type="checkbox"/> | <input type="checkbox"/> |
| (please specify)  | <input type="checkbox"/> | <input type="checkbox"/> |
| There are important differences in teachers' wages across regions or municipalities (for similar positions, working time and qualifications). | <input type="checkbox"/> | <input type="checkbox"/> |
| There are important differences in teachers' wages across subject areas (for similar positions, working time and qualifications).             | <input type="checkbox"/> | <input type="checkbox"/> |

|  | Yes                               | No                       |
|--|-----------------------------------|--------------------------|
| Are public school teachers working in areas with children from a disadvantaged socio-economic background given specific support? | <input type="checkbox"/>          | <input type="checkbox"/> |
| <b>If the answer is "yes", please specify:</b>   | <b>Tick all boxes that apply:</b> |                          |
| Wages are adjusted upward  | <input type="checkbox"/>          | <input type="checkbox"/> |
| Teachers are given extra training  | <input type="checkbox"/>          | <input type="checkbox"/> |
| Working hours are shorter  | <input type="checkbox"/>          | <input type="checkbox"/> |
| Class size is generally smaller  | <input type="checkbox"/>          | <input type="checkbox"/> |

45. Please note any comments you may have on the job status and wage-setting arrangements for schools' personnel and discuss recent reforms in your country in this area. Please also note whether the responses to the questions on the management of schools are the same for government-dependent private schools with teaching personnel paid by a government agency.

### *Using market-like instruments to improve incentives for educational institutions*

*Benchmarking*

46. This set of questions aims at measuring the extent to which measures of school performance are made public and their main features.

|  | Yes                              | No                       |
|--|----------------------------------|--------------------------|
| Are pupils regularly submitted to standardised tests?  |                                  |                          |
| -- At national level   | <input type="checkbox"/>         | <input type="checkbox"/> |
| -- At regional level   | <input type="checkbox"/>         | <input type="checkbox"/> |
| <b>If the answer is at a national level "yes", tick as many as apply:</b>  | <b>tick all boxes that apply</b> |                          |
| a) Tests are mandatory for all public schools.   | <input type="checkbox"/>         |                          |
| b) Tests are mandatory for all private schools.  | <input type="checkbox"/>         |                          |
| c) Tests are mandatory for private schools only if public funds are their dominant financial resource.   | <input type="checkbox"/>         |                          |
| d) The results of individual schools' tests are officially published.  | <input type="checkbox"/>         |                          |
| e) The value a school adds to each pupil's performance is evaluated and these "corrected" results are published and promoted at an official level. | <input type="checkbox"/>         |                          |
| f) Tests are designed and results assessed by independent auditors.  | <input type="checkbox"/>         |                          |
| g) Test results are reflected in decisions on public funding decisions for individual schools.   | <input type="checkbox"/>         |                          |
| And:   |                                  |                          |
| -- High performing schools receive more resources or other form of financial reward.   | <input type="checkbox"/>         |                          |
| -- Poor performing schools receive more resources, with the objective to enable them to improve results in the future.                             | <input type="checkbox"/>         |                          |
| h) Poor performing schools are sanctioned, either financially or administratively (e.g. dismissal of school principal).                            | <input type="checkbox"/>         |                          |

|   | Yes                              | No                       |
|---|----------------------------------|--------------------------|
| Is the performance of teachers and/or schools regularly scrutinised through personnel assessment or visits from inspectors? | <input type="checkbox"/>         | <input type="checkbox"/> |
| <b>If the answer is "yes", tick all boxes that apply:</b>   | <b>tick all boxes that apply</b> |                          |
| a) Assessments or visits are performed only in publicly managed schools?  | <input type="checkbox"/>         |                          |
| b) Assessments or visits are performed in both public and privately managed, but mainly publicly funded schools.            | <input type="checkbox"/>         |                          |
| c) Assessments are made public.   | <input type="checkbox"/>         |                          |
| d) Frequency depends on past performance.   | <input type="checkbox"/>         |                          |
| e) How frequent are assessments? (please give average number of years between inspections)                                  | <input type="checkbox"/>         |                          |

47. Please note any comments you may have on benchmarking in the education sector and on recent reforms in this area. In particular, has benchmarking contributed to an improvement in education outcomes in your country? If so, how and why? Are there studies and/or data on this subject? If there is no, or limited, benchmarking of schools or if results are not made public, please give the rationale behind this policy.

*Outsourcing*

48. This set of questions aims at identifying whether some constraints hinder the development of outsourcing in the education sector.

|   | Yes  | No   |
|---|--|--|
| Are there legal restrictions preventing public schools from sub-contracting:  |  |  |
| <ul style="list-style-type: none"> <li>• Auxiliary services (e.g. canteen or library services)?</li> <li>• "Core" education services (e.g. foreign languages courses)?</li> </ul> | <input type="checkbox"/><br><input type="checkbox"/> | <input type="checkbox"/><br><input type="checkbox"/> |
| If sub-contracting is allowed, do any of the following factors act as constraints:  | <b>tick all boxes that apply</b>                     |  |
| a) The status of employees (e.g. the predominance of permanent contracts) is an impediment to outsourcing.  | <input type="checkbox"/>                             |  |
| b) Segments of the education sector are excluded from the tendering rules applying to public procurement.   | <input type="checkbox"/>                             |  |
| c) Public procurement policies are used to protect local and/or small enterprises.  | <input type="checkbox"/>                             |  |
| d) The tax system distorts the choice between in-house provision and outsourcing (e.g. VAT provisions for public bodies).   | <input type="checkbox"/>                             |  |
| e) Other regulatory constraints apply (e.g. public schools are required to buy these services from public institutions).<br>If so, please specify                                 | <input type="checkbox"/>                             |  |

49. Has outsourcing by educational institutions contributed to improved cost efficiency for public spending on education in your country? Give a brief explanation. Are there any studies and data available on this subject for your country?

*Family choice for schools and competition between schools*

50. This set of questions aims at examining the degree of family choice for schools and the extent to which schools can respond to demand preferences.

|  | Yes                      | No  |
|--|--------------------------|---|
| Do families have a choice among publicly managed schools at the primary and lower secondary education levels?                                      | <input type="checkbox"/> | <input type="checkbox"/>                                    |
| <b>If the answer is "yes", specify the principles for both public schools and privately managed but mainly publicly funded schools:</b>            | <b>Public schools</b>    | <b>Privately managed and mainly publicly funded schools</b> |
| a) Pupils are given a general right to enrol in any school they wish.  | <input type="checkbox"/> | <input type="checkbox"/>                                    |
| b) Pupils have to apply for a derogation to enrol outside his/her zone (rather than being given a general right to enrol in any school they wish). | <input type="checkbox"/> | <input type="checkbox"/>                                    |
| c) Others<br>(please specify)  | <input type="checkbox"/> | <input type="checkbox"/>                                    |

|   |                                 |                                |
|---|---------------------------------|--------------------------------|
| Are there serious constraints impeding “popular” public schools and/or publicly financed private schools from meeting demand?                                 | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/> |
| <b>If the answer is “yes”, please specify the nature of the constraint:</b>   | <b>tick as many as apply</b>    |                                |
| a) Financing constraints (e.g. because the money does not fully follow the pupils)  | <input type="checkbox"/>        |                                |
| b) Physical constraints (e.g. norms imposed by the central government on the size of school buildings)  | <input type="checkbox"/>        |                                |
| c) Public transport arrangements for pupils from home to schools discourage families from exercising their school choice options                              | <input type="checkbox"/>        |                                |
| d) Regulatory constraints (e.g. the share or number of pupils enrolled in privately managed schools is controlled by the government)<br>If so, please specify | <input type="checkbox"/>        |                                |
| e) Other constraints<br>If so, please specify   | <input type="checkbox"/>        |                                |

|   |                                 |   |
|---|---------------------------------|---|
| Are “popular” public schools and publicly financed private schools given the possibility of turning away the enrolment demand of some pupils? | Yes<br><input type="checkbox"/> | No<br><input type="checkbox"/>                              |
| <b>If the answer is “yes”, please specify:</b>  | <b>Tick as many as apply</b>    |   |
|   | <b>Public schools</b>           | <b>Privately managed but mainly publicly funded schools</b> |
| a) Schools decide upon their own admission policies and which pupils to admit   | <input type="checkbox"/>        | <input type="checkbox"/>                                    |
| b) Family residence is the predominant criterion for admission  | <input type="checkbox"/>        | <input type="checkbox"/>                                    |
| c) Admissions are determined on a “first come, first served” basis.   | <input type="checkbox"/>        | <input type="checkbox"/>                                    |
| d) There are other criteria which can be used by schools<br>If so, please specify   | <input type="checkbox"/>        | <input type="checkbox"/>                                    |

51. Please add any comments you may have on family choice and competition among schools, as well as on recent reforms in this area. In particular, has school choice, if at all, improved education outcomes and if so why? Please refer to data and studies on this subject where available. If there is no, or limited, school choice, why?

***Final comments on the policy and institutional settings which may influence efficiency***

**Note: Replying to this section is optional**

52. Please use the box below to provide any additional comments on the policy and institutional settings which may have had an important influence on the efficiency of public spending on education, or append your comments on a separate sheet.

53. Finally, if there are any studies that draw a link between efficiency in public spending on education and the policy and institutional settings in your country, we would welcome information on these studies. Please provide web-links to abstracts or the reports themselves in the box below.

***Measuring efficiency of public spending on primary and lower secondary education***

54. Data available from the Education at a Glance and PISA databases will be used for the estimation of efficiency. However, we would welcome information on national studies measuring the efficiency in the provision of education services. In addition, we would be interested in studies that measure the progress of cohorts through education (for example, using information on the number of students repeating a year or results from intermediate tests), changes in completion rates, and studies linking educational attainment to growth in labour productivity or real earnings. Please provide web-links to abstracts or the reports themselves in the box below.

55. The measurement of spending efficiency may be complicated by tax expenditures and private spending on education outside educational institutions (such as for private tutoring). If national estimates are available for these factors, please provide these data including some information on the methodology (such as the revenue forgone approach for tax expenditures). Please note whether tax expenditures are refundable or non-refundable and, if possible, their importance by level of education (pre-primary, primary and lower secondary).



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