Trends in Public Finance: Insights from a New Detailed Dataset

Debra Bloch,
Jean-Marc Fournier,
Duarte Gonçalves,
Álvaro Pina

OECD

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

22-Nov-2016
_____
English - Or. English

ECONOMICS DEPARTMENT

TRENDS IN PUBLIC FINANCE: INSIGHTS FROM A NEW DETAILED DATASET

ECONOMICS DEPARTMENT WORKING PAPERS No. 1345

By Debbie Bloch, Jean Marc Fournier, Duarte Gonçalves and Álvaro Pina

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Authorised for publication by Jean-Luc Schneider, Deputy Director, Policy Studies Branch, Economics Department.

All Economics Department Working Papers are available at www.oecd.org/eco/workingpapers

JT03405918

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Working Papers describe preliminary results or research in progress by the author(s) and are published to stimulate discussion on a broad range of issues on which the OECD works.

Comments on Working Papers are welcomed, and may be sent to OECD Economics Department, 2 rue André Pascal, 75775 Paris Cedex 16, France, or by e-mail to eco.contact@oecd.org.

All Economics Department Working Papers are available at www.oecd.org/eco/workingpapers.

This paper is part of an OECD project on the quality of public finance. Other outputs from this project include:

Fournier, J.M. and Å. Johansson (2016), "The Effect of the Size and the Mix of Public Spending on Growth and Inequality", *OECD Economics Department Working Papers*, No. 1344, OECD Publishing.

Fournier, J.M. (2016), "The Positive Effect of Public Investment on Potential Growth", *OECD Economics Department Working Papers*, No. 1347, OECD Publishing.

Johansson, A. (2016), "Public Finance, Economic Growth and Inequality: A Survey of the Evidence", *OECD Economic Department Working Papers*, No. 1346, OECD Publishing.

ABSTRACT/RÉSUMÉ

Trends in Public Finance: Insights from a New Detailed Dataset

To investigate how public finances could best be designed to promote long-run growth and address inequality, it is essential to have comprehensive, cross-country comparable data on government spending and revenues, along with structural and policy indicators. By identifying key variables of public finance across as many OECD countries as possible, and with a time series element to allow for longitudinal analysis, the OECD Public Finance Dataset provides a detailed data set to contribute to an evidence-based debate on shaping growth-enhancing and equality-promoting fiscal policies. Characteristics of both country groupings and individual country public finance profiles are highlighted as examples of the potential of these data to provide policy insights.

JEL Classification: E62; H2; H5

Keywords: Public finance, public spending, taxes, COFOG, inclusive growth

****

Tendances des finances publiques à la lumière d'une nouvelle base de données

Pour étudier la façon dont les finances publiques pourraient être mieux conçues pour promouvoir la croissance à long terme et remédier aux inégalités, il est essentiel d'avoir des données complètes et comparables entre les pays sur les dépenses et les recettes publiques, ainsi que des indicateurs structurels et politiques. En identifiant les variables clés des finances publiques parmi autant de pays de l'OCDE que possible, et avec une dimension temporelle pour permettre une analyse longitudinale, la base de données de finances publiques de l'OCDE fournit des données détaillées pour contribuer à un débat fondé sur les faits au sujet des politiques budgétaires favorisant la croissance et de l'égalité. Les caractéristiques de groupes de pays et de profils de finances publiques par pays sont mises en avant comme des exemples du potentiel de ces données pour fournir un éclairage sur les politiques budgétaires.

Classification JEL ; E62 ; H2 ; H5

Mots clés : Finances publiques, dépenses publiques, impôts, COFOG, croissance inclusive

TABLE OF CONTENTS

Tables

Figures

Box

TRENDS IN PUBLIC FINANCE: INSIGHTS FROM A NEW DETAILED DATASET

By Debbie Bloch, Jean Marc Fournier, Duarte Gonçalves and Álvaro Pina[1]

1. Introduction

1.   The quality of public finance is at the heart of many policy debates as countries strive to promote growth and address equity issues in their societies. Given the adverse effect of the crisis on the public finances and rising fiscal pressure from ageing, improving the effectiveness and efficiency of public finance is crucial. The recent literature highlights that all tax instruments are not equal in terms of their effects on growth, and certain tax mixes are more redistributive than others. For instance, personal and corporate income taxes have been found to be more harmful for long-term growth than consumption taxes. Likewise, the type and effectiveness of public spending will affect growth and inequality differently. Public investment in infrastructure and innovative activities add to a country's capital stock and raise the productive capacity of the economy, while social and welfare spending can reduce inequality. To investigate how the public finances could best be designed to promote long-run growth and address inequality, it is essential to have comprehensive, cross-country comparable data on government expenditure and revenues, along with structural and policy indicators.

2.   This paper describes the construction of a new public finance dataset which combines various existing data sources. It identifies key public finance variables across as many OECD countries as possible, with a time series element to allow for longitudinal analysis.[2] The dataset construction is explained in detail, with the breakdown of fiscal items highlighted on the expenditure and revenue sides, along with structural and policy indicators which are included in the dataset to enhance the analysis. The dataset is then used in several ways: i) Examples illustrate the potential of the dataset to provide policy insights; ii) cluster analysis is used to describe groups of countries that share similar public finance features; iii) country diamond charts are designed to highlight the characteristics of individual public finance profiles; iv) specific structural features are examined via cross-country analysis; and v) trends in the structure of public finance are illustrated over time across a variety of policy areas. Finally, areas where data collection and coverage can be improved for future use are discussed.

---

2.   This dataset is a key input for the empirical analysis investigating the impact of the size and the structure of public spending on growth and inequality (see Fournier and Johansson, 2016) as well as for the Euro Area Economic Survey chapter reviewing how to make public finances more growth and equity-friendly (OECD, 2016).

2. The OECD Public Finance Dataset

3.   The OECD collects and publishes a wide and detailed array of public finance data. The Annual National Accounts offer complete general government accounts and financial balance sheets, following the System of National Accounts (SNA) methodology and accounting framework. These data are captured in the OECD National Accounts databases and in the Economic Outlook databases, where main expenditure and revenue items are grouped, and are enriched with projections and estimates of cyclical and one-off factors affecting fiscal variables. Tapping into this vast and rich collection of data, the new OECD Public Finance Dataset is motivated by the need for a detailed breakdown of public expenditure and revenues designed specifically for the analysis of the effect of these spending and revenue items on growth and equity. For example, this breakdown singles out both education spending and investment spending, which are two main items through which governments can raise growth.

4.   Starting from earlier work on fiscal consolidation (Cournède et al., 2013), for which a single-year data file was constructed, detailed expenditure and revenue items are grouped to arrive at a comprehensive breakdown. Taking this idea to the next step, the new database takes into account not only a breakdown of fiscal items by policy area, but also includes time variation, cycle variation and structural factors which affect the quality of public finance. The construction of public spending and revenue items is described below, along with a discussion of the comparability of different data sources and the challenges of combining sources. Adjustments for the business cycle are discussed, followed by a summary of the structural indicators selected to enrich the analysis. Technical details concerning the construction of the database are provided in Annex 1.

2.1. Fiscal items

5.   This section outlines the choice of classification of items, which is informed by the role various fiscal variables play for growth and inequality.

2.1.1. General government expenditure

6.   Public spending affects growth and income distribution through many channels. For example it can enhance growth through the accumulation of physical and human capital, innovation and health (Johansson, 2016). Social protection spending such as unemployment and welfare support mainly has a redistributive and risk sharing purpose and can reduce inequality, though in some cases (e.g. well-designed family benefits) it may also be growth-enhancing. General government expenditures are broken down by function and transaction type to better identify various spending instruments which are essential for policy analysis and decision-making. The goal is both to make available classifications of items which adequately describe policy-related actions, and to assure that data are comparable and complete. Specifically, the breakdown of spending instruments is listed in Table 1. An overview of the mapping of this breakdown with the available data is shown in Table 2.

Table 1.   Expenditure item list

	Expenditure Item
Item 1	Education
Item 2	Health
Item 3	Other wages and intermediate consumption
Item 4	Old-age and survivor pensions
Item 5	Sickness and disability
Item 6	Unemployment benefits
Item 7	Family and children
Item 8	Subsidies
Item 9	Investment
Item 10	Other primary expenditure
Item 11	Property income paid (including interest payments)

7.   The breakdown of expenditure items is primarily based on the National Accounts Classification of the Functions of Government (COFOG). Initially developed by the OECD and now considered as a worldwide standard, COFOG classifies government expenditure data from the System of National Accounts by the purpose for which the funds are used. First-level COFOG splits expenditure data into ten "functional" spending groups (such as health, education and social protection), and second-level COFOG further splits each first-level group into up to nine sub-groups. Some first-level COFOG data are available for 32 out of the 34 OECD member countries, with varying time-series availability (OECD, 2015a).

8.   Furthermore, COFOG data availability has been affected by the latest revision of international standards for the compilation of the national accounts. The 2008 System of National Accounts (SNA) has been implemented by most OECD countries as of 2014. However, not all countries have completed the historical re-estimation of data in the COFOG database, and the actual implementation varies depending on country circumstances (OECD, 2015d). Nonetheless, the COFOG data in the 2008 SNA and in the previous SNA 1993 are almost identical where there is overlap for those variables extracted from the Annual National Accounts Table 11 (COFOG). Therefore, as needed, the dataset is completed with the older SNA COFOG data.

Table 2.   Mapping of expenditure data into fiscal items

Transaction / Function	Social benefits and transfers in kind (D62_D631XX)	Wages (D1)	Intermediate consumption (P2)	Subsidies (TSUB)	Investment (IGAA)	Interest payments (YPEPG)	Inventory changes	Capital transfers	Other primary expen-ditures
Education (090)	1	1	1	8	9	11	10	10	10
Health (070)	2	2	2	8	9	11	10	10	10
Social protection (100) — Sickness and disability (1001)	5	5	5	8	9	11	10	10	10
Family and children (1004)	7	7	7	8	9	11	10	10	10
Old age and survivors (1002 + 1003)	4	3	3	8	9	11	10	10	10
Unemployment (1005)	6	3	3	8	9	11	10	10	10
Other social protection (1006-09)	10	3	3	8	9	11	10	10	10
General public services (010)	10	3	3	8	9	11	10	10	10
Defence (020)	10	3	3	8	9	11	10	10	10
Public order and safety (030)	10	3	3	8	9	11	10	10	10
Economic affairs (040)	10	3	3	8	9	11	10	10	10
Environment protection (050)	10	3	3	8	9	11	10	10	10
Housing and community amenities (060)	10	3	3	8	9	11	10	10	10
Recreation, culture and religion (080)	10	3	3	8	9	11	10	10	10

Note: The numbers shown in the main body of the table refer to the expenditure items listed in Table 1. The columns in the table refer to national accounts transactions (codes in parentheses refer to SNA COFOG codes or Economic Outlook database variable codes), while rows show the breakdown by function in the COFOG classification (the codes in parentheses refer to COFOG function codes). The areas coloured in pink refer to data extracted from Annual National Accounts Table 11 (COFOG), the areas in blue refer to data taken from the Economic Outlook database, and the areas without shading are calculated as a difference between total expenditure (YPGT) from the Economic Outlook database and the other aforementioned items.

9.   The second-level of COFOG is particularly important for public finance analysis, as it allows for the breakdown of social protection into different programme areas: old age and survivors' pensions, sickness and disability benefits and services, family and child-related spending, and unemployment-related benefits. However, this disaggregated level is currently only available for 21 OECD European member countries plus Japan (OECD, 2015a). To complete the COFOG second-level data on social protection spending, data are taken from the OECD Social Expenditure Database (SOCX), a reliable and internationally comparable set of statistics on public and (mandatory and voluntary) private social expenditure at the programme level as well as net social spending indicators (Adema et al., 2011). While SOCX data are not perfectly comparable to National Accounts data, the correlation, in cases of overlap, between the two data sources is high, suggesting that SOCX data are a good proxy for COFOG data. This permits the estimation of missing data, including where no second-level data exist. These calculations are not currently possible for Australia, Canada and New Zealand where first-level COFOG data are partially or fully unavailable. Data are more broadly unavailable for Chile, Mexico and Turkey where government accounts are incomplete.

10.   Making use of the transaction level of COFOG, items are specified in order to best take their policy relevance into account. Care is taken to ensure that items do not overlap. For instance, physical investment in education, such as building a school, is included in the public investment item, but not in the

education item which focuses on current education spending. Likewise for health expenditure, the focus is on current spending, so that capital investment in health is included in public investment. Certain government services are provided both in the form of in-kind services to households (e.g. home assistance, day care facilities) and income support while others mostly consist of income transfers (e.g. unemployment benefits, pensions). Therefore, for health, education, family services and sickness and disability services, transfers (both cash and in-kind) and wages and intermediate consumption are included, while for old age pensions and unemployment benefits, only transfers are taken into account (Table 2). This breakdown is based on earlier OECD work on fiscal consolidation, where spending instruments were determined in light of the economic and functional classifications of expenditure, where the former focuses on the economic nature of transactions (such as wages, subsidies or public investment) and the latter on their purpose (for example, education, health or social protection) (Cournède et al., 2013).

11.   Finally, to assure that this dataset is compatible with other main data sources used in analysis across the OECD, the main general government account items are mapped to those available from the OECD Economic Outlook database, which are National Accounts based, so that aggregates match those published by the OECD. Thus, investment, subsidies, property income and other current and capital transfers, along with total primary expenditure, are taken directly from the OECD Economic Outlook database, assuring coherence across the research outputs of the OECD Economics Department. A schema of this construction is shown in Figure 1, and detailed information on the construction of the database is provided in Annex 1.

Figure 1. Data decision process for expenditure items
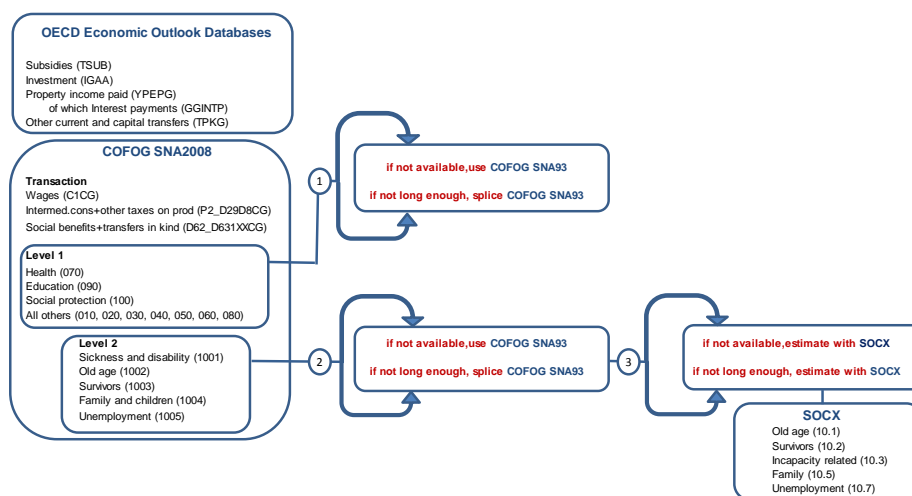
Note: The abbreviations in brackets refer to the variable code in the OECD Economic Outlook database, Annual National Accounts COFOG database and the SOCX database.

2.1.2. General government revenues

12.   The general government revenue structure plays a role in explaining differences in economic performance. Insights from the literature suggest that some tax instruments are more distortionary and harmful for growth than others (Arnold et al., 2011; OECD, 2009). For instance, studies tend to find that corporate and personal income taxes are more detrimental to long-term growth than consumption taxes (Johansson, 2016). The mix and design of taxes can also be used to promote equity and to address social and environmental concerns (Brys et al., 2016). General government revenue items are identified to permit the study of various revenue levers which are important for policy analysis and public finance decision-making. Revenue instruments span the main categories of taxes plus other government revenues and are classified as: (1) personal income taxes; (2) social security contributions; (3) corporate income taxes; (4) environmental taxes; (5) consumption taxes (non-environmental taxes on products); (6) recurrent taxes

on property; (7) other property taxes; (8) sales of goods and services (mainly user charges); (9) other primary revenue; and (10) property income received. The breakdown of revenue items is illustrated in Table 3.

13.   The revenue data are based on four sources: the OECD Revenue Statistics, the OECD Economic Outlook database, OECD Annual National Accounts and OECD Environment Statistics. The government accounts in the OECD Economic Outlook database are derived mainly from the OECD Annual National Accounts, and are thus based on the 2008 SNA methodology. The SNA differs from the OECD Revenue Statistics in their definitions of tax revenues. "In the SNA, taxes are compulsory unrequited payments, in cash or in kind, made by institutional units to the government. Net social contributions are actual or imputed payments to social insurance schemes to make provision for social benefits to be paid. These contributions may be compulsory or voluntary and the schemes may be funded or unfunded. OECD Revenue Statistics treat compulsory social security contributions as taxes whereas the SNA considers them social contributions. This different treatment is because the receipt of social security benefits depends, in most countries, upon appropriate contributions having been made, even though the size of the benefits is not necessarily related to the amount of the contributions" (OECD, 2015b). For the purposes of analysis, the database relies first and foremost on the Revenue Statistics for taxes and social security contributions, given their higher degree of specificity, notably the ability to isolate specific taxes such as recurrent taxes on immovable property and wealth.

14.   As with the expenditure items, an effort is made to ensure that the data are compatible with other main data sources used in analysis across the OECD. Non-tax items are mapped to those available from the OECD Economic Outlook database, which are National Accounts based, and aggregates match those published by the OECD, with other primary revenue catching any discrepancy. Annex 1 provides the methodology used to map these data.

Table 3.   Mapping of key revenue items

| Revenue item		Source items	Source
Item 1	Personal income taxes	Taxes on income, profits and capital gains of individuals (1100)	OECD Revenue Statistics database
		Taxes on income, profits and capital gains, unallocable between individuals and corporations (1300)	
Item 2	Social security contributions	Social contributions, receivable (SSRG)	OECD Economic Outlook database
Item 3	Corporate income taxes	Taxes on income, profits and capital gains, corporate (1200)	OECD Revenue Statistics database
Item 4	Environmental taxes	Environmentally related tax revenue	OECD Environment Statistics
Item 5	Consumption taxes	Taxes on goods and services (5000)	OECD Revenue Statistics database
		Other taxes (6000)	
		(less Environmental taxes - see above)	
Item 6	Recurrent taxes on property	Recurrent taxes on immovable property (4100)	OECD Revenue Statistics database
		Other recurrent taxes on property (4600)	
Item 7	Other property taxes	Recurrent taxes on net wealth (4200)	OECD Revenue Statistics database
		Estate, inheritance and gift taxes (4300)	
		Taxes on financial and capital transactions (4400)	
		Non-recurrent taxes (4500)	
Item 8	Sales of goods and services	Market output and output for own final use (Table 12, P11_P12)	OECD Annual National Accounts
		Payments for non-market output (Table 12, P131)	
Item 9	Other primary revenue	Total receipts (YRGT)	OECD Economic Outlook database
		less sum of Items 1,2,3,4,5,6,7,8 and 10	
Item 10	Property income, receivable of which interest received	Property income received (YPERG)	OECD Economic Outlook database
		Gross government interest receipts (GGINTR)	

Note: The abbreviations in brackets refer to the variable code in the OECD Revenue Statistics, the OECD Economic Outlook database and the Annual National Accounts database.

2.1.3. A snapshot of the OECD-wide spending and revenue composition

15.   Comparing the breakdown of expenditure and revenues for the OECD on average, Figure 2 gives a snapshot of the relative shares of the different items for the period 2011-13. On the revenue side, personal income taxes and social security contributions together account for nearly half of all primary revenues (i.e. total revenues excluding interest received), while corporate income tax revenues, receipts from environmental taxes and property taxes are quite small. On average, consumption taxes bring in nearly as much as personal income taxes, but the differences across countries for these revenue items can be important.

16.   On the expenditure side, social protection spending makes up about one-third of all primary spending, with old age and survivor pensions accounting for the largest chunk. General administrative expenditure (wages and intermediate consumption across general government in all functions except in health, education and certain social protection categories) appears as the second largest item. Subsidies are quite small and public investment accounts for 8% of total primary spending. Again, there are country specificities which change this mix, but the differences tend to be less stark than for the revenue shares.

Figure 2. Breakdown of total primary revenues and expenditure in the OECD

Average, 2011-13
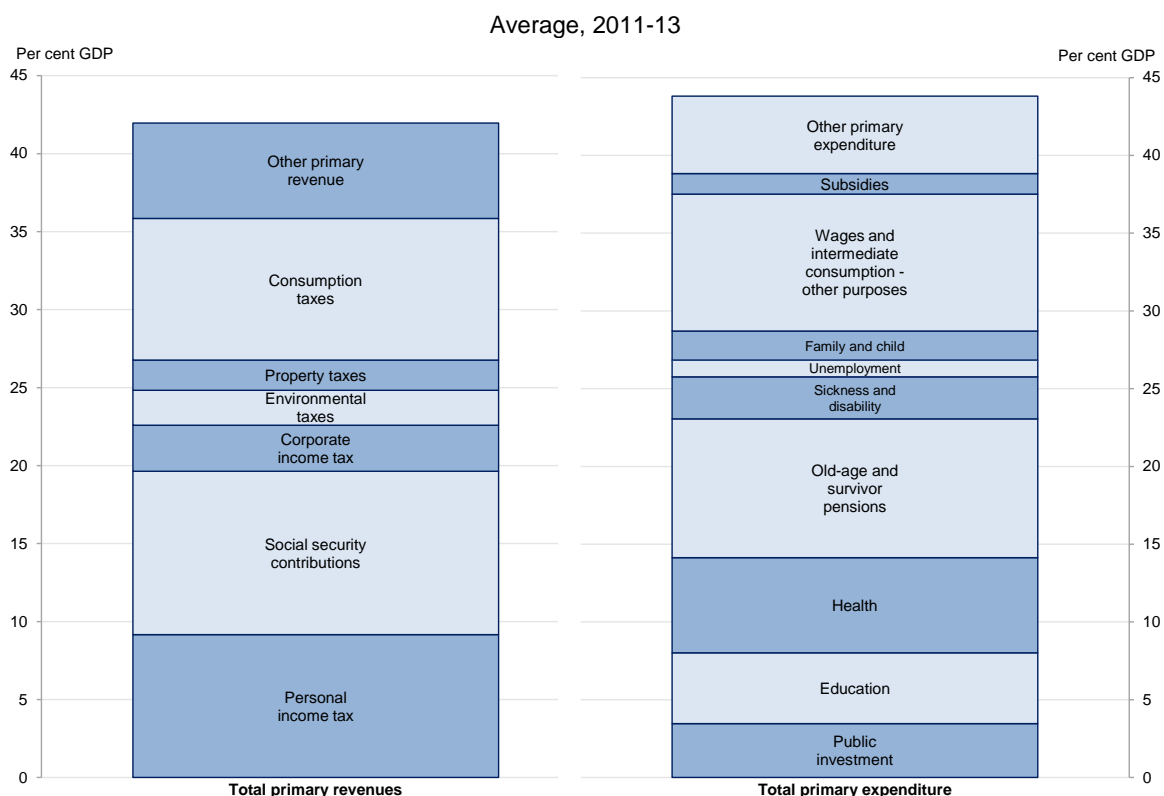
Note: Unweighted average for 31 countries for the revenue bar, and for 28 countries for the expenditure bar.

Source: OECD Public Finance Dataset (forthcoming).

2.1.4. Widening the dataset to account for cyclical factors and including main fiscal indicators

17.   The OECD Public Finance Dataset contains cyclically adjusted and non-adjusted data on spending and revenue, allowing various types of analyses. In case of large and persistent cyclical swings, adjusted data may be preferable. For instance, the actual spending to GDP ratio has increased in Greece,

because GDP has declined, rather than because of a fast rise in spending. However, cyclically-adjusted data depend to some extent on the method of accounting for the cycle. In the case of short cycles, cyclical factors can be ruled out with non-adjusted data averaged over time.

18. A number of headline fiscal indicators are included in the dataset, allowing for a variety of choice, when analysing public finance issues. Overall budget deficits and surpluses are available, along with primary balances, cyclically-adjusted overall and primary balances, and underlying (i.e. corrected both for the cycle and for one-offs) overall and primary balances. The inclusion of government net and gross debt, along with financial assets, is useful for the analysis of fiscal risks and sustainability issues (Bloch and Fall, 2015).

19. Government expenditure and receipts are sensitive to the business cycle. To obtain a measure of structural expenditure, unemployment benefits and other income-related transfers (family and child benefits are cyclically adjusted following the methodology of Price et al. (2015). Further, the residual spending item (other primary expenditure, which includes *inter alia* capital transfers) is corrected for one-offs – non-recurrent fiscal operations, such as a one-time capital transfer to bail out a bank – as defined in the OECD Economic Outlook database (Joumard et al., 2008). The remaining spending items are not cyclically-adjusted as their automatic sensitivity to the cycle is limited (e.g. public investment is not cyclically-adjusted as changes reflect discretionary choices rather than automatic stabilisers) (Fournier and Johansson, 2016).

20. Government revenues are, to a greater extent, subject to business cycle fluctuations. Specifically, personal income tax, social security contributions, corporate income tax are all directly related to earnings, and are therefore adjusted for the cycle (Price et al., 2015). Consumption taxes, too, are linked to sales and are adjusted for the cycle. To ensure consistency with the OECD Economic Outlook database, the cyclical components of the four main tax categories (taxes on production and imports, direct taxes on business, direct taxes on households and social security contributions) are allocated to the seven tax and contribution items shown in Table 2 (e.g. the first seven items in the table). As on the spending side, the residual item (other primary revenue) is corrected for one-offs as in the OECD Economic Outlook. Annex 1 provides further detail on the methodology used for cyclical and one-off adjustments.

21. Adjusted for the business cycle, primary spending as a share of potential GDP has remained fairly stable since 2001 for the OECD on average, with over half of all spending centred on social protection and wages and intermediate consumption for non-education, non-health purposes (Figure 3, Panel A). Spending on old age and survivor pensions has registered the greatest structural increase since 2001 (1.3% of potential GDP for the OECD average), while public investment spending contracted by about ¾ of a per cent of potential GDP over the same period. The structural revenue mix has also remained stable over the past decade on average, with personal income taxes and social security receipts accounting for half of all receipts (Figure 3, Panel B).

22. The detailed cyclically-adjusted spending and revenue items available in the Public Finance dataset provide a useful input to the analysis of periods of fiscal consolidation. Identifying post-crisis multi-year fiscal consolidation episodes based on the behaviour of the underlying primary balance, Box 1 illustrates the decomposition of the total improvement of that balance into the several revenue and expenditure items identified in the dataset (cyclically-adjusted and corrected for one-offs, and expressed as a percentage of potential GDP) for the euro area. This has provided a detailed statistical basis to assess the impact of recent fiscal consolidation episodes on the composition of public finances, and on whether that composition has become more or less growth and equity-friendly.

Figure 3. Structure of general government expenditure and revenues adjusted for the business cycle

Panel A. Cyclically-adjusted primary spending

Per cent of potential GDP
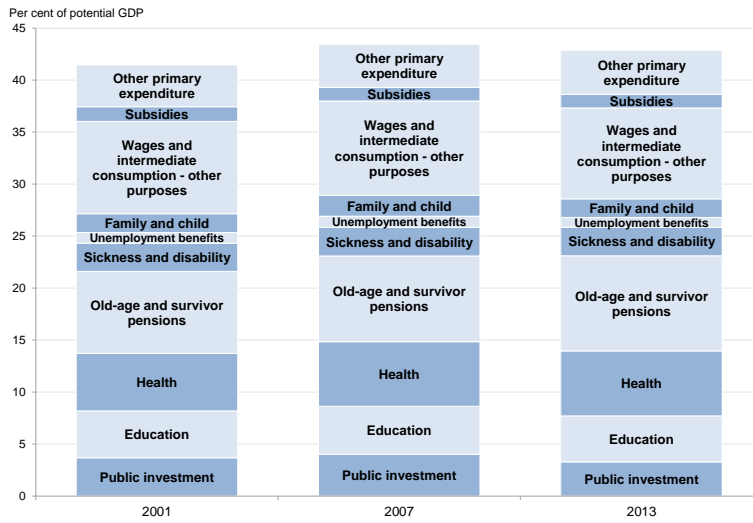
Panel B. Cyclically adjusted primary receipts

Per cent of potential GDP
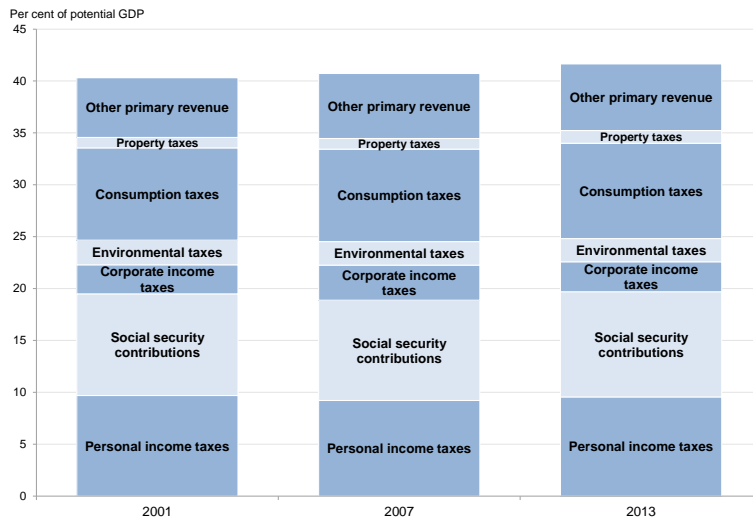
Note: Unweighted average of OECD countries where data are available. The cyclically-adjusted primary spending average for 2013 includes data for 2012 for Israel and the United States. The figure shows cyclically-adjusted spending and revenue items.

Source: OECD Public Finance Dataset (forthcoming); OECD (2016), "OECD Economic Outlook No. 98 (Edition 2015/2)", OECD Economic Outlook: Statistics and Projections (database), DOI: http://dx.doi.org/10.1787/bd810434-en.

Box 2. The composition of spending and revenues in the euro area during recent fiscal consolidation[1]

Across the euro area, the ability of public finances to support equitable growth has tended to deteriorate. The expenditure composition has generally become less growth-friendly, with large cuts in public investment. On the revenue side, already high taxes on labour have tended to increase further (OECD, 2016), though some efforts have been made to favour less-distortive taxation.

Euro area public finances have been particularly hard hit by the global financial crisis. In the ensuing period, concerns about rising debt led all euro area countries to undertake consolidation efforts. The size of consolidation varied across countries, from under 1% of potential GDP for Finland to 18.5% for Greece over the consolidation period until 2013 (Figure 4).

Figure 4. Post-crisis fiscal consolidation episodes: Change in the underlying primary balance[1]

Percentage points of potential GDP
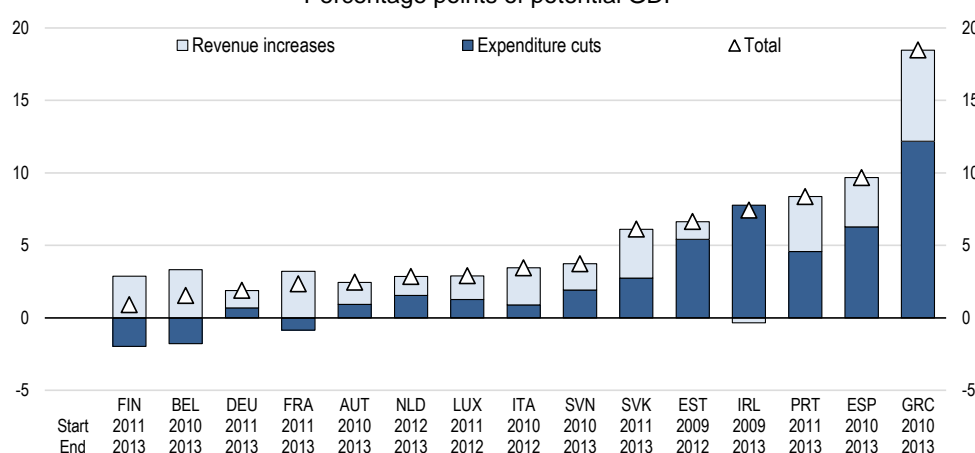
1. A fiscal consolidation episode is a period of consecutive years where the underlying primary balance is improving. A deterioration of this balance in an intermediate year is admissible, provided the balance improves in the sum of any two adjacent years. Episodes considered in the chart are those starting in 2009 or later. Due to data limitations on the composition of consolidation, the final year considered is 2013, though for some countries consolidation efforts have continued afterwards.

Source: Gonçalves D. and Á. Pina (forthcoming) and OECD Public Finance Dataset (forthcoming).

Changes in the composition of public expenditure to meet consolidation needs have generally been detrimental to equity and longer-term growth, particularly in countries facing the largest fiscal adjustments (OECD, 2016). Public investment has been particularly squeezed during the consolidation period in those countries which have been hardest hit by the crisis (Figure 5). Public consumption, including for education and health care purposes, was also substantially cut as a percentage of potential GDP. Conversely, in most instances (with the notable exception of Greece), pension spending has not been strongly affected by consolidation efforts. However, other social protection spending has been cut, most notably regarding transfers and in-kind services and benefits to families and children, particularly in countries with large consolidation programmes,[2] which raises important equity concerns.

Movements in the revenue mix during the latest consolidation episode have generally been less unfavourable for growth and equity. The largest increases are seen in consumption taxes and personal income taxes. Increases in personal income taxes can have mixed effects, improving income equality, while having distortionary effects on growth. The increases in consumption taxes are seen to be among the least distortionary for growth, and therefore a positive tool for fiscal consolidation efforts from a growth perspective. Few countries have implemented large increases in social security contributions (Figure 5), which are generally thought to be bad for both growth and equity (Cournède et al., 2013). Furthermore, smaller non-distortive items, particularly property taxes and in some cases environmental taxes, have been substantially increased (Table 1.1 in OECD (2016)) during the consolidation period in several euro area countries.

Box 1. The composition of spending and revenues in the euro area during recent fiscal consolidation *(cont.)*

Figure 5. Post-crisis fiscal consolidation episodes: Contributions from revenue and expenditure[1]

Percentage points of potential GDP

A. Expenditure cuts
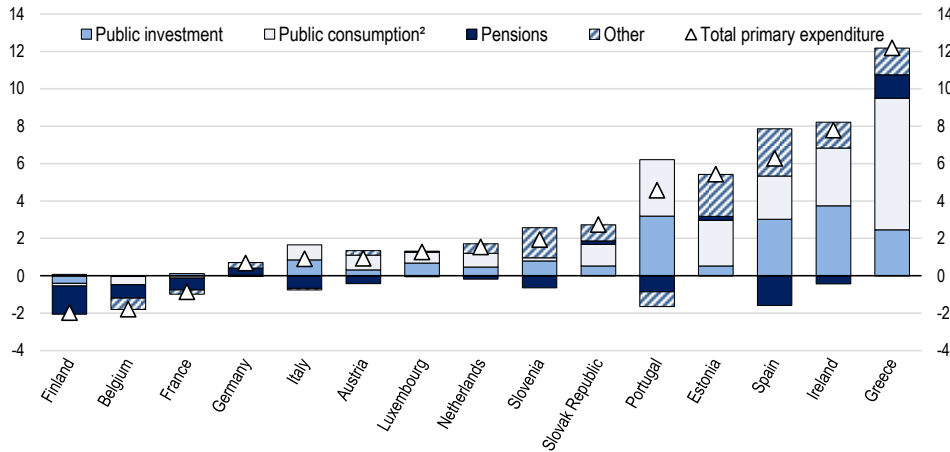
B. Revenue increases
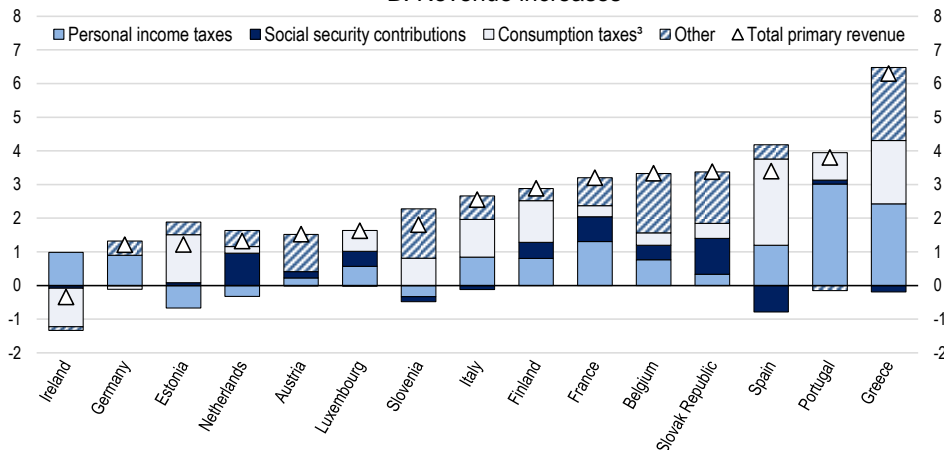
1. Fiscal consolidation episodes are the same as those in Figure 4. On both the revenue and expenditure side, increases or decreases in cyclically-adjusted budget items do not always relate to discretionary policy measures. For instance, tax elasticities can fluctuate for reasons not captured by the corrections performed for the economic cycle and for one-offs.
2. Other wages and intermediate consumption.
3. Other than environmental taxes.

Source: Gonçalves D. and Á. Pina (forthcoming) and OECD Public Finance Dataset (forthcoming).

_____

1. This box draws on a chapter of the 2016 OECD Economic Survey of the Euro Area (OECD, 2016) and an accompanying paper (Gonçalves and Pina, forthcoming). Based on data from the Public Finance dataset, this latter study employs a multivariate analysis of the determinants of fiscal consolidation success, focusing on the composition of fiscal consolidation and on fiscal institutions.
2. For the cumulative change in revenue and expenditure by item, see Table 1.1 in OECD (2016).

2.2. *Structural indicators and reference data*

23.	The environment within which fiscal policy operates can influence the quality of public finance, growth and well-being in several ways. For instance, budget practices, notably the rules that determine the preparation and execution of the budget can play a role for the prioritisation and allocation of spending. Regulation and economic openness can also impact the functioning of public finance. Reflecting this, a variety of structural indicators has been collected to accompany revenue and expenditure data to facilitate the analysis of the quality of public finance, and the relationship of public finance with growth and equity. Table 4 gives a snapshot of the main indicators, organised by broad themes.

**Table 4.	An overview of structural indicators to buttress public finance analysis**

Governance and political stability

Stability of the government: average number of governments over 5 years
Election turnout

Control of corruption
Government effectiveness
Political stability and absence of violence/terrorism
Regulatory quality
Rule of law
Voice and accountability

Use of a medium term perspective in the budget process
Use of performance budgeting practices at the central level of government

Fiscal councils
Fiscal rules
VAT revenue ratio

Average size of municipalities
Share of spending by central government

Women in public sector employment
Share of women parliamentarians
Share of women ministers

Human capital and well-being

Average years of schooling
Average PISA scores
PISA scores in science, by gender
PISA score in reading, by gender
PISA score in math, by gender

Share of active labour market policies in total LMP
Active Labour Market Policy spending
Passive Labour Market Policy spending

Labour participation rate of women
Fertility rate
Life expectancy at birth

Disposable income Gini
Market income Gini
Gross income Gini

Research, digital economy and investment

Individuals using the internet to interact with public authorities
OURdata Index: Open, Useful, Reusable Government Data

Share of public R&D spending in total R&D spending
Government R&D spending to GDP ratio
Basic research

Public capital stock
Public-private partnership (PPP) capital stock

Regulation and economic openness

Overall product market regulation indicator
PMR: State control
PMR: Barriers to enterpreneurship
PMR: Barriers to trade and investment

Employment Protection of Regular Contracts

Openness ratio

24.   Indicators on governance and political stability are gleaned mainly from the work produced for the OECD Governments at a Glance series (OECD, 2015b), along with the World Bank's World Governance Indicators (Kaufmann et al., 2010). Indicators on human capital and well-being include measures related to education, labour force participation, active labour market policies, demographics and income inequality. These indicators are available from several OECD sources, notably the OECD Programme for Student Assessment (PISA), the OECD Employment database, the OECD Income Distribution database and OECD Health Statistics. The regulatory and trade environments are captured via OECD indicators on Product Market Regulation and Employment Protection Regulation, along with a measure of trade openness. Indicators on government involvement in the digital economy (OECD, 2015b) are collected, along with public spending on research and development from the OECD Research and Development Statistics database. Estimates of the general government capital stock, along with estimates of the capital stock of Public Private Partnerships (IMF, 2015) provide proxy indicators for the stock of infrastructure.

25.   As a simple example of the interaction of structural indicators and public finance, Figure 6 illustrates the relationship between the perception of government effectiveness and the drag on public finances of servicing public debt. In this example, the World Bank's World Governance Indicator of government effectiveness is compared to the general government interest payments as a percentage of GDP. This government effectiveness indicator is a composite indicator, measuring perceptions of the quality of public services, the civil service and policy formulation and implementation, as well as the credibility of the government's commitment to such policies and the degree of its independence from political pressures (Kaufmann et al., 2010). The link between higher interest payments and lower government effectiveness is notable in the upper left corner with Greece, Italy and Hungary, where the public debt burden likely weighs heavily on public perceptions[3]. Inversely, the lower right quadrant includes a number of countries (Austria, Denmark, Finland Luxembourg, Netherlands, New Zealand, Norway, Sweden and Switzerland) where perceptions of high government effectiveness correspond to low levels of debt servicing payments. As work progresses and data become available, more structural indicators will be added to the dataset with the aim of providing a vast array of items which may influence or be influenced by the quality of public finance.

26.   Finally, a number of key reference data are included in the dataset to facilitate analysis. Notably, the dataset includes standard measures of population, labour force, employment, GDP, inflation and interest rates.

---

3.   Another possible driver of such a correlation could be that ineffective governments are more likely to borrow to finance inefficient spending, i.e. spending that does not increase, or may even reduce, output.

Figure 6. Debt interest payments and government effectiveness

2011-13 averages

General government interest payments, % GDP
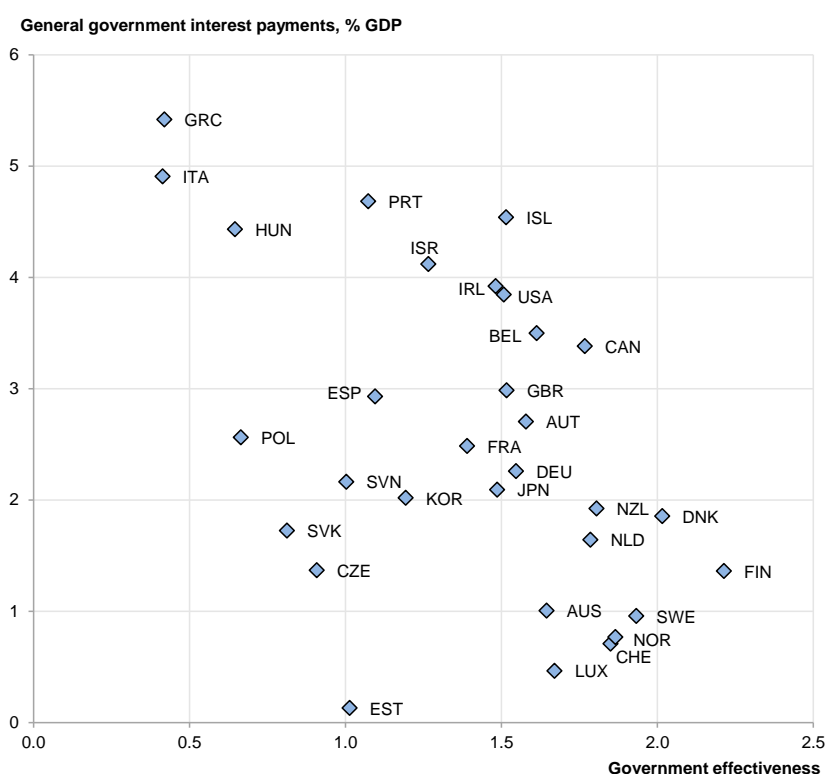
Source: OECD Public Finance Dataset (forthcoming); World Bank, The Worldwide Governance Indicators, www.govindicators.org.
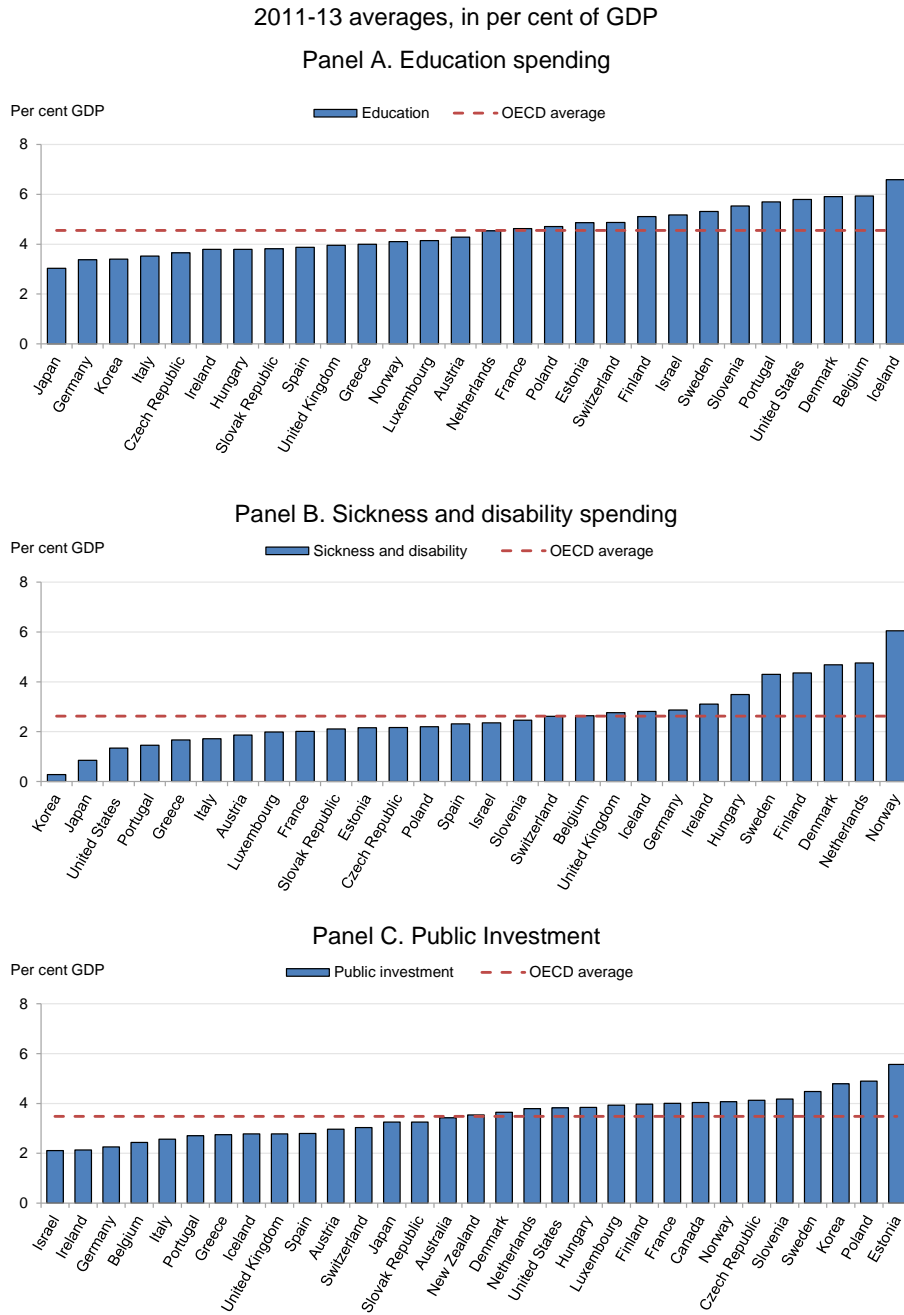
3. Cross-country patterns in the structure of public finance

27.   The OECD Public Finance Dataset allows for comparisons and analyses across many dimensions. Using the breakdown defined in the dataset, the cross-country patterns of specific policy areas can be highlighted. Cluster analysis may be used to identify groups of countries that share similar public finance features, and individual profiles for countries can be developed and compared against the OECD average in various ways.

3.1. Cross-country patterns of specific spending and revenue items

28.   Individual expenditure and revenue items can be examined across countries for the purpose of comparing an individual country to its peers. The breakdown chosen for the OECD Public Finance Dataset is particularly useful for such an exercise, as specific usages and functions have been targeted with a view to better isolating policy-relevant items. Figure 7 highlights government spending across countries for education, sickness and disability, and government investment. The red dotted line shows the unweighted OECD average for each item. While the differences across countries for these spending items as a per cent of GDP are not massive, it is interesting to note the low and high spenders in each category. For education, Japanese public spending is around 3% of GDP, while public education expenditure in Iceland is over 6.5% of GDP. Of the data presented here, the biggest range of spending is found for sickness and disability, with Korea spending just 0.3% of GDP compared with 6% for Norway at the other end of the panel. For government investment spending, Estonia leads with 5.6% of GDP on average over the period 2011-13, compared with 3.5% of GDP for OECD countries on average.

Figure 7. Selected government expenditure items across OECD countries

2011-13 averages, in per cent of GDP

Panel A. Education spending

Panel B. Sickness and disability spending

Panel C. Public Investment

Note: Data refer to the average over the period 2011-13. The OECD average is the unweighted average of the countries shown in the figure.

Source: OECD Public Finance Dataset (forthcoming).

29. Figure 8 highlights the variations in revenue for personal income taxes, corporate income taxes and consumption taxes across OECD countries. The differences in magnitude of these revenues are striking. Thus while Korea collects just 11% of GDP in personal income tax and social security contributions, Belgium collects 29%, well above the OECD average. The figure highlights the relative importance of personal income taxes and social security contributions (averaging 19% of GDP) and

consumption taxes (averaging 9% of GDP), compared with corporate income taxes, for which the average OECD-wide receipts stand under 3% of GDP for the 2011-13 period. While most countries raise corporate taxes at a level close to the OECD average, Norway stands out with corporate tax revenues at nearly 10% of GDP thanks in large part to off-shore energy revenues. The United States and Switzerland are notable for their low consumption tax receipts, while Hungary and Sweden have the highest revenues from consumption taxes at close to 15% of GDP.

Figure 8.   Selected government revenue items across OECD countries

2011-13 averages, in per cent of GDP

Panel A. Personal income tax and social security contributions

Panel B. Corporate income tax

Panel C. Consumption taxes

Note: Data refer to the average over the period 2011-13. The OECD average is the unweighted average of the countries shown in the figure.
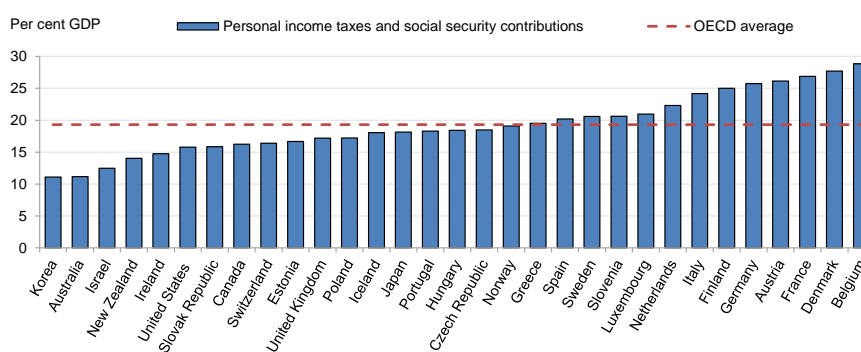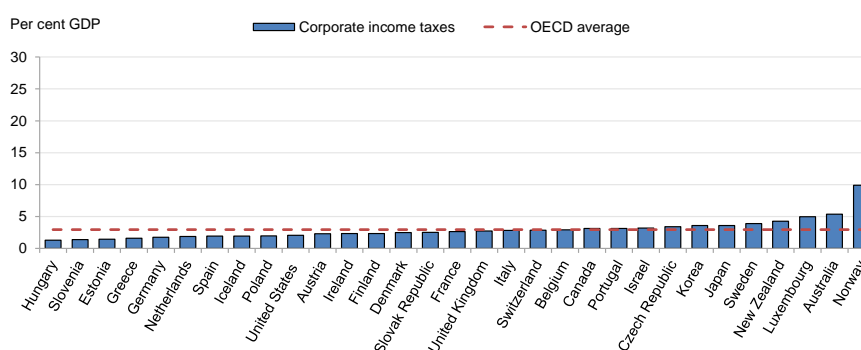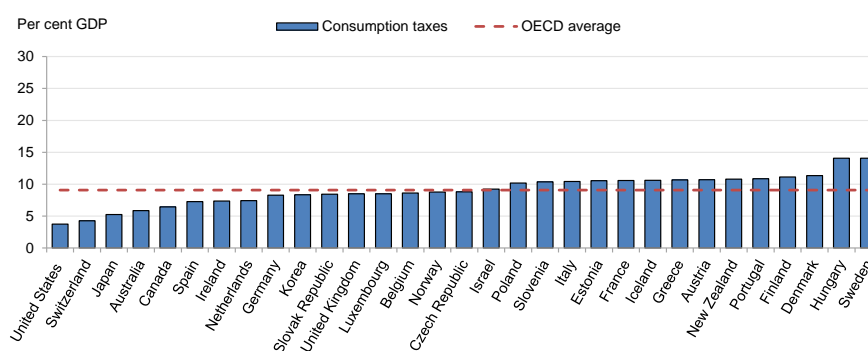
Source: OECD Public Finance Dataset (forthcoming)

3.2. A cluster analysis to identify groups of countries with similar public finance characteristics

30.   Seven groups of countries sharing similar public finance characteristic have been identified using a cluster analysis (Figure 9). The analysis is based on a set of 18 public finance indicators, including expenditure items, revenue items and structural indicators chosen to represent a balanced public finance view. Spending and revenue items are regrouped into five broad categories each. On the expenditure side, this includes education, health, social protection (comprising old age and survivors pensions, sickness and disability, family and child support and unemployment benefits), public investment and other government wages plus intermediate consumption. The five broad revenue items are personal income taxes plus social security contributions, corporate income taxes, consumption taxes, environment taxes and property taxes. Capital transfers and other current transfers received and paid were excluded to avoid co-linearity in the clustering exercise. Total primary expenditure and total primary receipts were included, both to measure the size of government and to capture the primary balance. Three-year averages were calculated where possible in order to smooth the data, and the latest three-year average (2011-13) was used for most indicators. Changes in total primary spending and revenues were included, comparing the period average 2011-13 to the period average 2001-03.

31.   Four indicators capturing other country characteristics were chosen, both for their diversity and based on data availability. Interest payments on public debt as a percentage of GDP capture the financial drag of the debt burden of countries. The public capital stock from the IMF (IMF, 2015) is used to proxy the level of infrastructure, an indicator relevant for long-term growth and well-being. The Household Disposable Income (HDI) Gini was chosen as a proxy for the impact of government finance on income inequality. While the difference between the market income Gini and the HDI Gini would have better captured this concept, missing data for the market income Gini for key economies dictated this choice. Finally, the World Bank's World Governance Indicator of government effectiveness was chosen as a broad measure for the quality of governance.
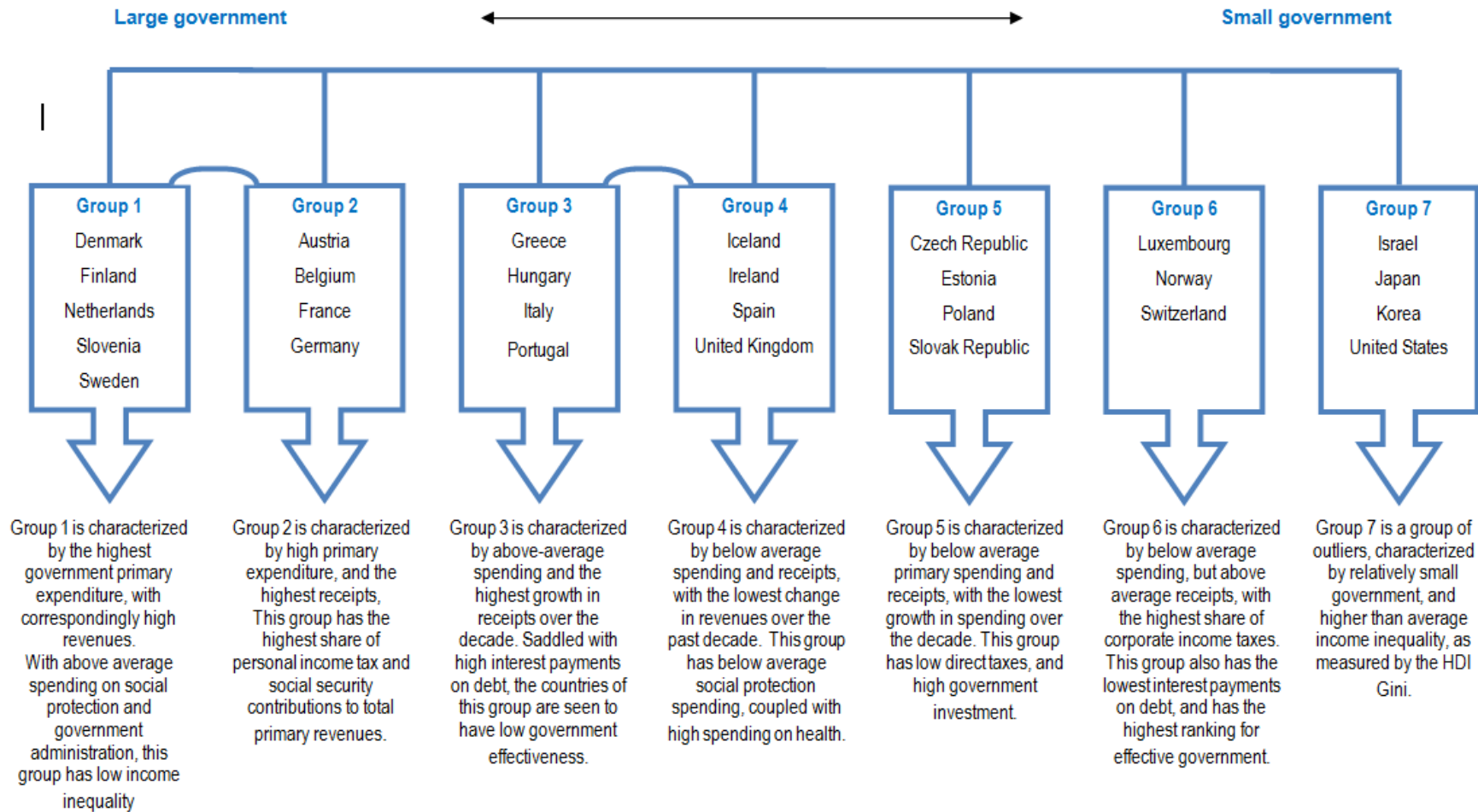
32.   The seven groups identified in the clustering exercise, and ordered by the size of government (as measured by the ratio of total primary spending to GDP), are as follows:

- A group – **including three Nordic countries (Denmark, Finland and Sweden), plus the Netherlands and Slovenia** – is characterised by having large governments – as measured by total primary expenditure, with corresponding high receipts. This group also shows the largest increase in the size of government over the past decade, the lowest share of corporate taxes and the highest share of environmental taxes. The share of social protection in total primary spending is above average, as is general government administrative spending, while education and health spending are around the OECD average. The countries in this group have high government effectiveness, and on average, this group has the lowest income inequality (as measured by the HDI Gini).

- A group of **four European economies – Austria, Belgium, France and Germany** – is closely associated with the Nordic group, with high total primary expenditure, and has on average the highest level of government revenues. With an above-average share of spending on social protection and average spending on health, this group has below average spending on wages and intermediate consumption and low government investment spending. This group has particularly low corporate tax receipts like the Nordic group, but differs with the highest share of personal income tax and social security contributions on the receipt side. This group is also notable for its low public capital stock.

- A group of **four European countries – Greece, Hungary, Italy and Portugal** – with above average spending and receipts, and notably the highest increase in revenues as a percentage of GDP over the decade, explained largely by high consumption tax receipts, particularly in Hungary, and despite low corporate income tax receipts. Social protection spending as a share of total primary expenditure is the highest of the seven groups, and general government administrative spending is above average, but education spending is the lowest. This group is saddled with by far the highest burden of debt interest payments, has higher than average income inequality, and is considered to be the lowest in terms of government effectiveness.

- A group of **four western European countries – Iceland, Ireland, Spain and the United Kingdom** – with below average spending and receipts and having the smallest change in revenues over the past decade. This group has below average social protection spending, coupled with the highest spending on health and above average education spending. This group has low public investment spending, and above average income inequality.

- A group of **four central and eastern European countries – Czech Republic, Estonia, Poland and Slovak Republic** – has below average spending and receipts, with the smallest change in expenditure over the past decade. This group mostly has below average social protection spending, coupled with high spending on government administration and a high share of government investment spending. Compared with the average, this group has low income inequality, but also has less effective governance than the other six groups.

- **Luxembourg, Norway and Switzerland** are grouped together, characterised by low (Switzerland) to average (Luxembourg and Norway) levels of primary spending, coupled with a high share of corporate income tax receipts (particularly Norway due to off-shore income), and low consumption taxes. Social protection, education and government investment spending are all above average, while the share of health spending is particularly low in Switzerland, as health care is largely managed by non-profit organisations (Cournède et al., 2013). These governments face the lowest debt interest payment burden by far, and rank highest on government effectiveness.

- Finally, a group of **outliers – Israel, Japan, Korea and the United States** – have on average the smallest governments as measured by primary expenditure and correspondingly low receipts. While these countries differ, they share several traits: relatively high property taxes, low public administration spending, low environmental taxes (except for Israel) and low social protection spending (except for Japan). Each country, however, also stands out in its own: Korea and Israel have low shares of personal income tax and social security contributions, Japan has the highest capital stock, and the United States has the lowest consumption taxes and the highest income inequality.

33.   A number of OECD countries have been excluded from the cluster exercise because of data limitations. For Australia, Canada and New Zealand, a lack of COFOG data has made it impossible to include them. Nonetheless, analysis of available data (revenue statistics, total primary receipts and total primary expenditure, as well as the various structural indicators) shows that Canada would fit best with Group 4, while New Zealand's profile is closer to that of Group 6. Australia appears to be an outlier, and might be best grouped with Group 7. Given the lack of national accounts data for the general government sector, Chile, Mexico and Turkey are also excluded.

Figure 9. Seven groups of countries share similar public finance traits[1]

Large government ⟷ **Small government**

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Denmark	Austria	Greece	Iceland	Czech Republic	Luxembourg	Israel
Finland	Belgium	Hungary	Ireland	Estonia	Norway	Japan
Netherlands	France	Italy	Spain	Poland	Switzerland	Korea
Slovenia	Germany	Portugal	United Kingdom	Slovak Republic		United States
Sweden						

Group 1 is characterized by the highest government primary expenditure, with correspondingly high revenues. With above average spending on social protection and government administration, this group has low income inequality

Group 2 is characterized by high primary expenditure, and the highest receipts, This group has the highest share of personal income tax and social security contributions to total primary revenues.

Group 3 is characterized by above-average spending and the highest growth in receipts over the decade. Saddled with high interest payments on debt, the countries of this group are seen to have low government effectiveness.

Group 4 is characterized by below average spending and receipts, with the lowest change in revenues over the past decade. This group has below average social protection spending, coupled with high spending on health.

Group 5 is characterized by below average primary spending and receipts, with the lowest growth in spending over the decade. This group has low direct taxes, and high government investment.

Group 6 is characterized by below average spending, but above average receipts, with the highest share of corporate income taxes. This group also has the lowest interest payments on debt, and has the highest ranking for effective government.

Group 7 is a group of outliers, characterized by relatively small government, and higher than average income inequality, as measured by the HDI Gini.
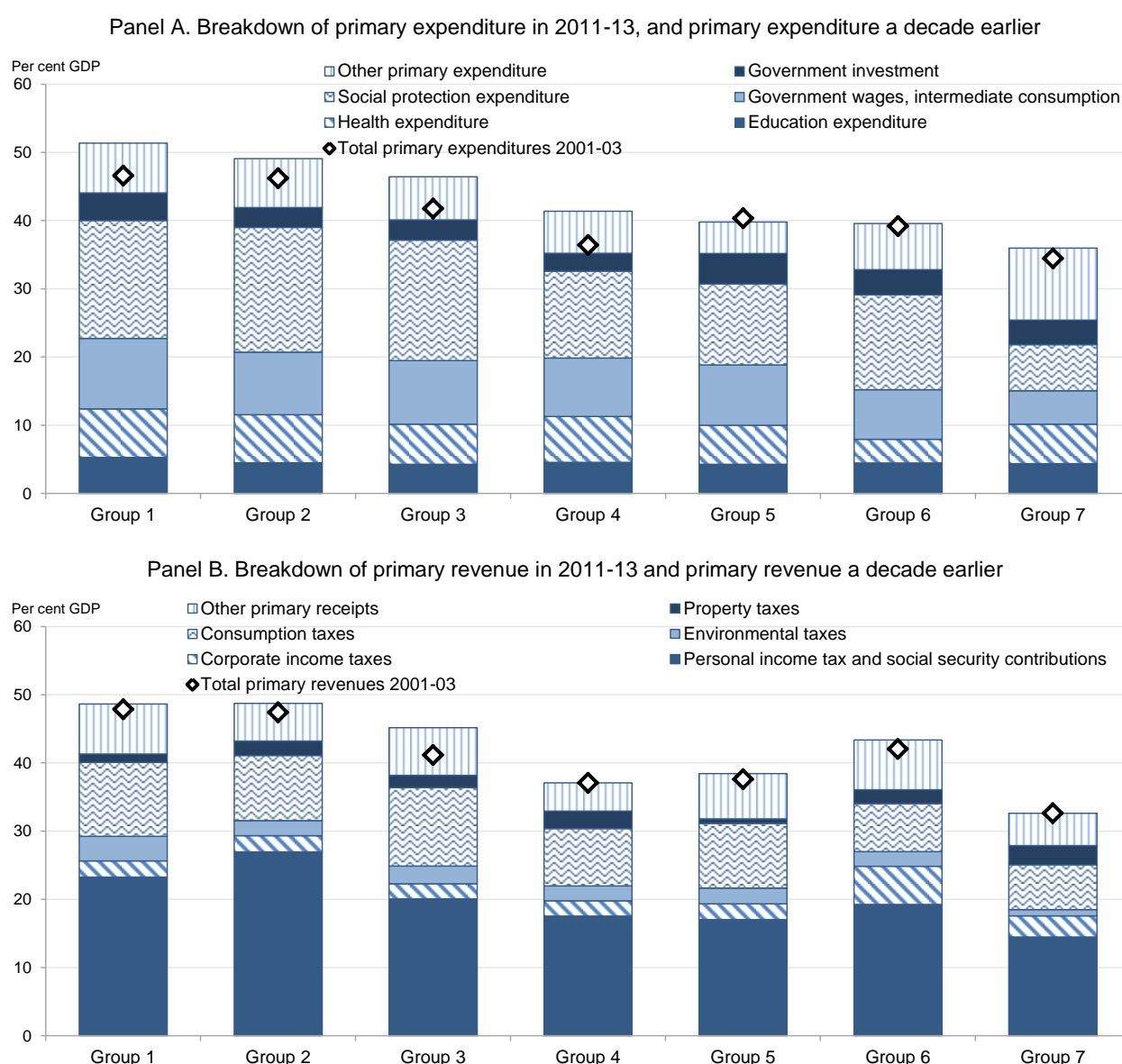
1. Country groups are derived from a cluster analysis of a set of 18 public finance indicators (expenditure items, revenue items and structural indicators), with standardised values and unsquared Euclidean distance to measure differences between groups. As indicated by the rounded line, larger groupings were also evident, with characteristics shared among them (Group 1 and 2, and Group 3 and 4). Group 7 artificially includes Israel, which was an outlier in the cluster analysis, not fitting statistically with any other group, but sharing the characteristic of low government spending and receipts, coupled with high income inequality with other countries in Group 7.

3.3. Indicators to capture the broad picture

3.3.1. Broad characteristics of the seven groups

34.   Figure 10 illustrates the breakdown of primary expenditure (Panel A) and primary revenue (Panel B) of the seven groups, with the diamond indicating the level of total primary expenditure and total primary revenues a decade earlier. The group ranking, ordered by size of total primary expenditure for both panels, highlights the difference between total primary expenditure and total primary revenues across groups. With lower revenues, Group 4 (i.e. Iceland, Ireland, Spain and the United Kingdom) and Group 5 (i.e. Czech Republic, Estonia, Poland and Slovak Republic) appear to have greater primary deficits, while Group 6 (i.e. Luxembourg, Norway and Switzerland) boasts a primary surplus on average (thanks to Norway).

Figure 10.   Breakdown of expenditure and revenue by group

Panel A. Breakdown of primary expenditure in 2011-13, and primary expenditure a decade earlier

Panel B. Breakdown of primary revenue in 2011-13 and primary revenue a decade earlier

Source: OECD Public Finance Dataset (forthcoming).

35.   Social expenditure is by far the largest component of primary spending in all groups except Group 7 (i.e. Israel, Japan, Korea and the United States), and investment is relatively small for all groups. Education expenditure is fairly equal across groups, while health expenditure is notably small in Group 6 (driven largely by Switzerland).

36.   The small share of corporate tax receipts is evident for all groups, with the exception of Group 6 (again Norway makes the difference, with important off-shore energy revenues). Personal income taxes and social security contributions embodies the largest share of revenue for all groups. However, this item also highlights the biggest differences between groups, with the relatively highest share for Group 2 (i.e. Austria, Belgium, France and Germany) and the relatively lowest share for Group 7.

37.   Table 5 highlights other key characteristic of the seven groups. Group 1 (i.e. Denmark, Finland, the Netherlands, Slovenia and Sweden) with the largest government size has below average debt and a lower than average unemployment rate. Group 3 (i.e. Greece, Hungary, Italy and Portugal) is the most indebted group, has the highest unemployment rate and is faced with the greatest elderly dependency ratio. With the largest gap between the highest and lowest income deciles, Group 7 (i.e. Israel, Japan, Korea and the United States) also has the second-highest debt level, but the second-to-lowest unemployment rate. Group 6 (i.e. Luxembourg, Norway and Switzerland) boasts the lowest level of government debt and unemployment rate, along with a relatively small gap between the highest and lowest income deciles.

Table 5.   Other key characteristics of country groups

2011-13 averages

|	Total general government primary expenditure as a per cent of GDP	Unemployment rate	General government gross debt as a per cent of GDP	Elderly dependency ratio (population age 65+ as a per cent of the population age 15-64)	Inequality (P90/P10 disposable income decile ratio)
Group 1	51.4	7.6	61.2	26.9	3.2
Group 2	49.1	6.9	101.5	28.2	3.5
Group 3	46.4	14.8	128.3	28.9	4.4
Group 4	41.4	13.1	104.8	22.1	4.0
Group 5	39.8	10.3	46.1	23.6	3.7
Group 6	39.6	4.5	36.4	23.1	3.4
Group 7	36.0	5.6	111.2	23.0	5.7
OECD average	42.5	9.1	85.1	25.3	3.9

Note: Data for groups are unweighted averages of the countries shown in Figure 9. The OECD average is an unweighted average for OECD countries where data are available.

Source: OECD Public Finance Dataset (forthcoming); OECD (2016), "Income distribution", OECD Social and Welfare Statistics (database), DOI: http://dx.doi.org/10.1787/data-00654-en; OECD (2014), "Population" (indicator), DOI: http://dx.doi.org/10.1787/d434f82b-en.

3.3.2. Performance in key areas

38.   The performance of the seven groups according to structural indicators is shown in Figure 11. The data are normalised around the OECD average to simplify comparison. Differences in country groupings are shown for these indicators. The groups are generally close to the OECD average for capital stocks (below one standard deviation), with Group 7 (i.e. Israel, Japan, Korea and the United States) showing the greatest deviation above the average. However, large differences in government effectiveness can be seen with a low score for Group 3 (i.e. Greece, Hungary, Italy and Portugal) and to a lesser extent Group 5 (i.e. Czech Republic, Estonia, Poland and Slovak Republic), and relatively higher scores for Groups 1 (i.e. Nordics, Netherlands and Slovenia) and 6 (i.e. Luxembourg, Norway and Switzerland). The general government interest payment burden also shows a wide dispersion and is notably high for Group 3 and low for Group 6. Finally, the high Gini level of Group 7, indicating relatively high income inequality, is in stark contrast to the low level of Group 1.

Figure 11.   Selected structural indicators by group
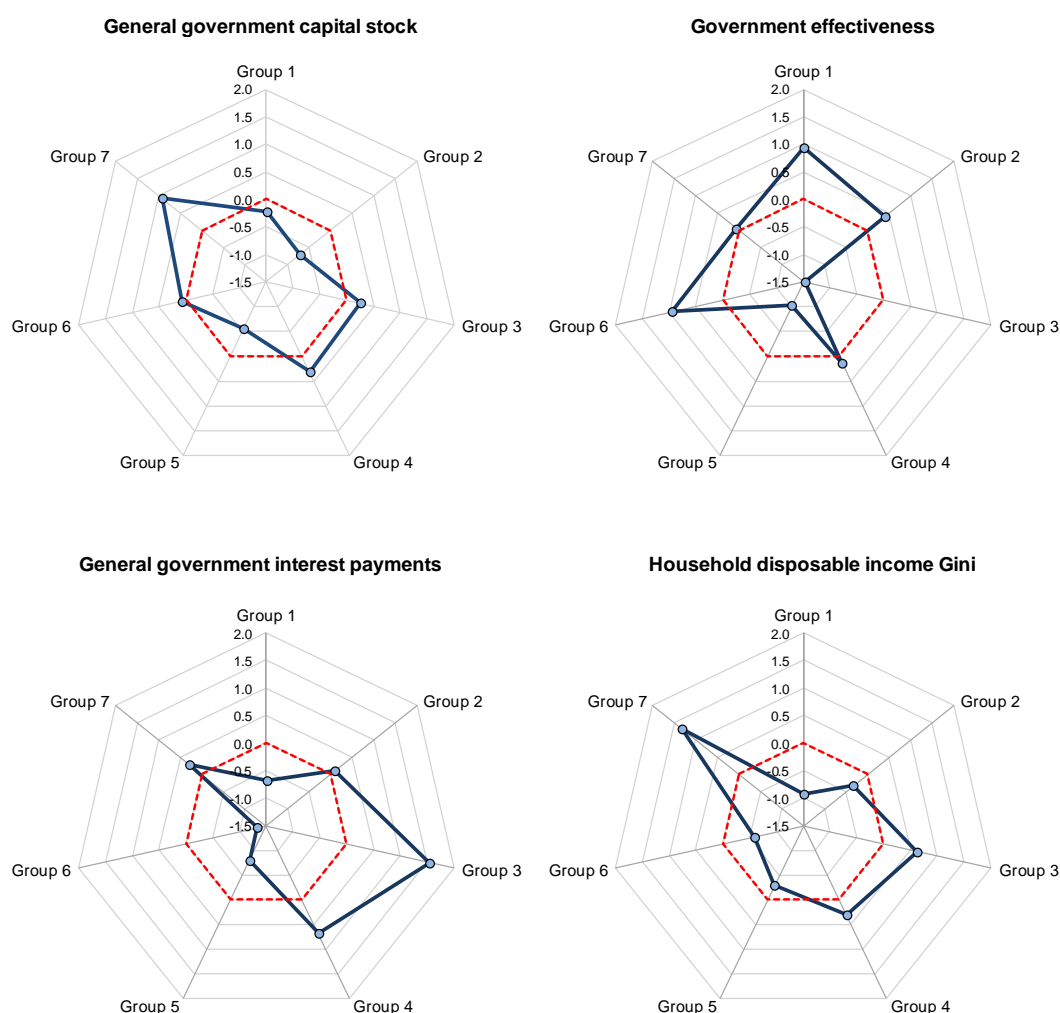
Source: OECD   Public   Finance   Dataset   (forthcoming);   IMF   Investment   and   Capital   Stock   Dataset, www.imf.org/external/np/fad/publicinvestment/data/data.xlsx;   World   Bank,   The   Worldwide   Governance   Indicators, www.govindicators.org.

3.4. Country profiles

39.   The subset of indicators used in the cluster analyses also lends itself to illustrate the different public finance profiles of individual countries. Figure 12 highlights these profiles for four OECD countries, from four of the different groups identified above.

Figure 12.   Public finance profiles of selected OECD countries
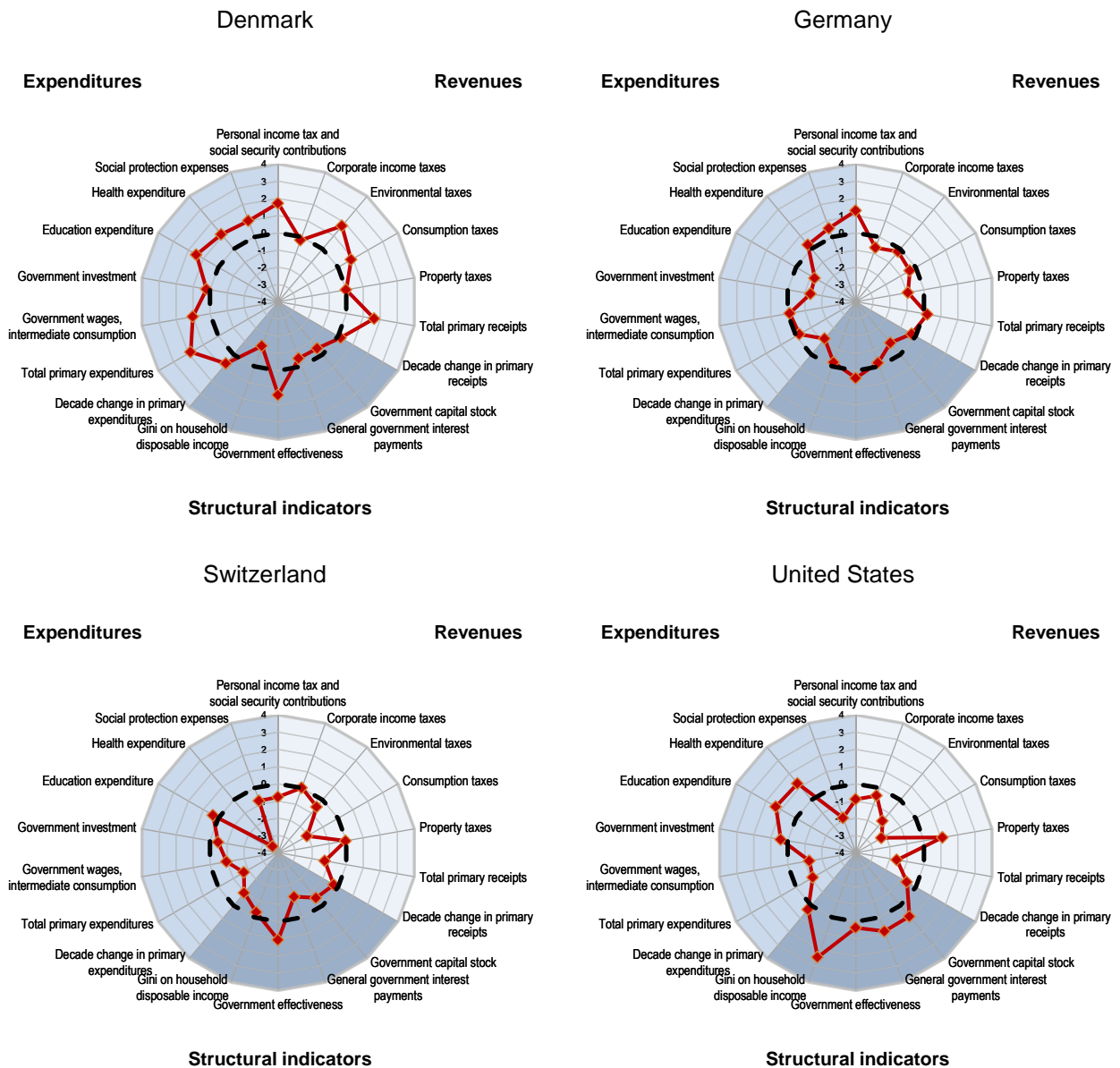
Note: The dotted lines represent the OECD average, and the data are presented in units of standard deviation. Data refer to the period 2011-13, or the latest available data. Primary expenditure and revenue items are expressed as per cent of GDP, as are government interest payments. The general government capital stock is constructed by the IMF using a perpetual inventory method and expressed as a ratio to GDP (IMF, 2015). These IMF Capital stock data are based on the previous National Accounts methodology (SNA 93), with the exception of the United States. The latest System of National Accounts (2008 SNA) include upward revisions for general government capital stock which, for some countries, can be significant.

40.　　Denmark, one of the Nordic countries identified in the first group, is characterised by a high level of primary expenditure, along with higher than average social protection, health and education spending. Denmark's high primary receipts are nearly symmetrical with expenditure, with notably high personal income taxes and environmental taxes, higher than average consumption taxes, and average corporate and property taxes. The capital stock is slightly below average and the debt interest burden is above average, as expenditure grew faster than revenues over the previous decade. Income inequality as measured by the HDI Gini is quite low, buttressed by social transfers, and government effectiveness is judged to be above average.

41.　　Germany is one of the countries identified in the second group. Germany has an average ratio of primary expenditure and revenue to GDP, with somewhat higher than average social protection, and to a lesser extent, health spending. Both spending on education and government investment as a share of GDP are below the OECD average. Germany has consolidated relatively more than the OECD average, as the spending ratio is lower now than it was a decade ago. The tax mix is characterised by high personal income tax and social security contributions, along with lower than average corporate and property taxes. Germany's structural indicators are close to the OECD average, with the exception of the capital stock which is low, echoing a lower than average level of public investment.

42.　　Switzerland is part of the sixth group, comprised of small atypical European countries, and is characterised by a small government and low debt interest burden. Switzerland's primary expenditure ratio is well below the OECD average, and has contracted over the past decade. Health spending is particularly low as a percentage of GDP, as health insurance in Switzerland is compulsory, but private. Social protection spending is also lower, while education spending is just above the OECD average. While primary revenues mirror the low level of primary expenditure, the tax mix is fairly close to the OECD average, with the notable exception of consumption taxes which are quite low, with an 8% VAT rate for most goods and services. Finally, Switzerland is judged to have high government effectiveness, average income inequality and a low debt interest burden.

43.　　The United States is in the seventh group of small government countries. Both primary expenditure and revenue are low as a per cent of GDP. Social protection spending is well below average, while education and health spending are relatively high compared with the OECD average. In terms of revenues, all categories of taxation, with the notable exception of property taxes, are below average. Consumption taxes are particularly low. Government effectiveness is judged to be average, while HDI income inequality is particularly high, which can be related to a low level of social transfers and a tax system which is not very redistributive.

4. Trends in the structure of public finance

44.　　The time dimension of this new database, exceeding two decades for some countries, makes it possible to characterise the main trends in the spending and revenue composition. These trends reflect largely common factors, such as the impact of ageing, globalisation or that of the global financial crisis, but also idiosyncratic developments in national economies and policies. As seen in Figure 13, primary spending and revenue shares have trended up in most G7 countries. Japan shows the strongest increase in cyclically-adjusted primary spending, increasing by 11% of potential GDP since 1990, while Italy has shown the strongest increase in cyclically-adjusted primary revenues (10.6% of potential GDP) since 1986. After a peak in 1996 due to post-reunification spending, Germany has reduced spending by about 3% of potential GDP, while the United Kingdom had slightly lower revenues in 2014 (by 2.6 per cent of potential GDP) than in 1986. Canada has decreased both cyclically-adjusted spending and revenues over the last two decades by about 5% of potential GDP.

Figure 13.   Evolution of general government spending and revenues in the G7 countries
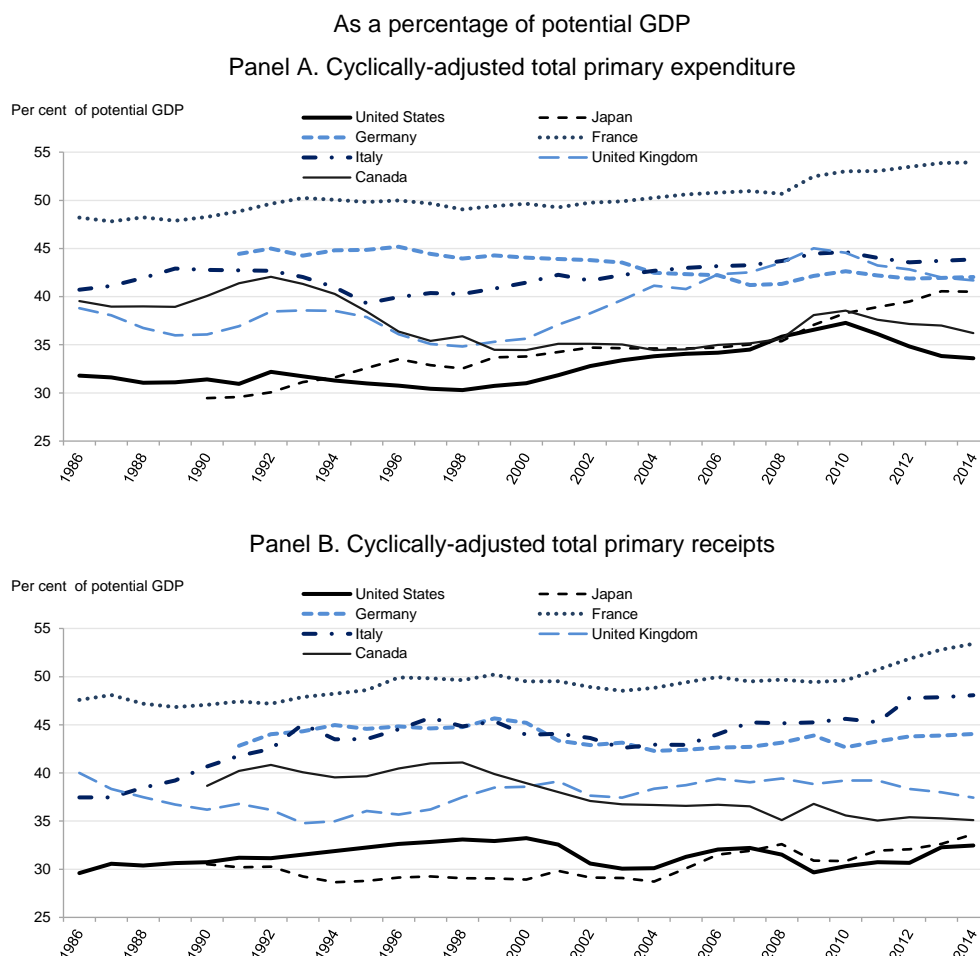
As a percentage of potential GDP

Panel A. Cyclically-adjusted total primary expenditure

Panel B. Cyclically-adjusted total primary receipts

Source: OECD Public Finance Dataset (forthcoming); OECD (2016), "OECD Economic Outlook No. 98 (Edition 2015/2)", OECD Economic Outlook: Statistics and Projections (database), DOI: http://dx.doi.org/10.1787/bd810434-en.

4.1. The structure of spending and revenue

45.   Over time, the spending and revenue splits have changed. Figure 14 illustrates the shifts in spending and receipts over the past two decades for the Netherlands and Spain. The inner circles represent the situation in 1995 and the outer circles the breakdowns in 2013. On the spending side, while the share of education remained unchanged for both countries, health spending in the Netherlands rose substantially as a share of total primary spending, and spending on old age and survivors' pensions rose significantly in both countries. In Spain, unemployment and family benefits take a bigger piece of the pie than two decades ago, largely reflecting effects of the crisis, while the share of public investment spending has been halved. In the Netherlands, a decrease in the share of sickness and disability benefits accompanies the increases in the share of health and elderly spending, and there is a large drop in other current spending (other current and capital transfers, non-interest property income paid).

Figure 14. Bird's eye view of the breakdown of primary spending and revenues in the Netherlands and Spain

1995 and 2013

Netherlands
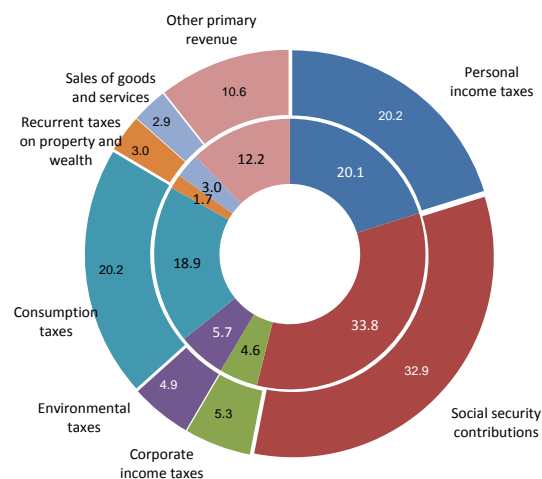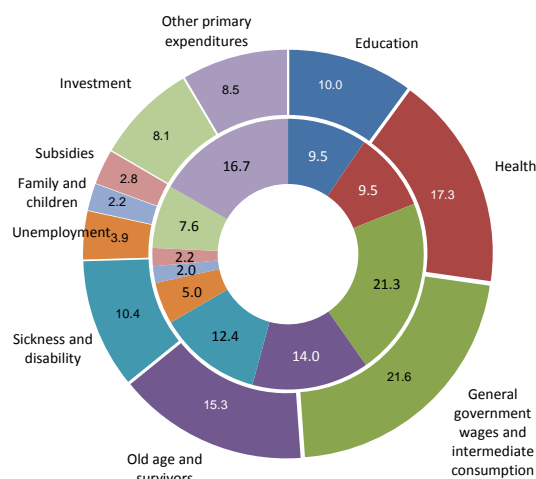
Spain
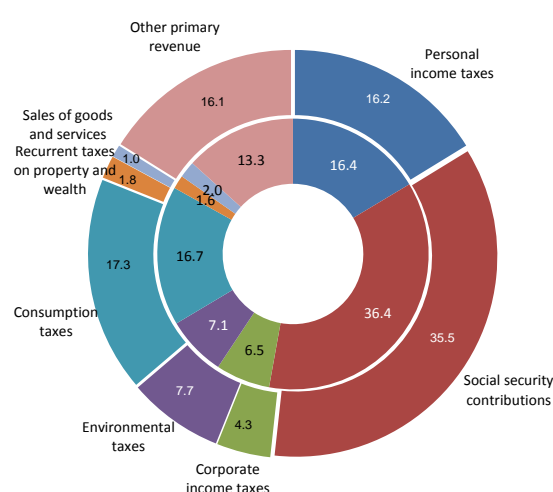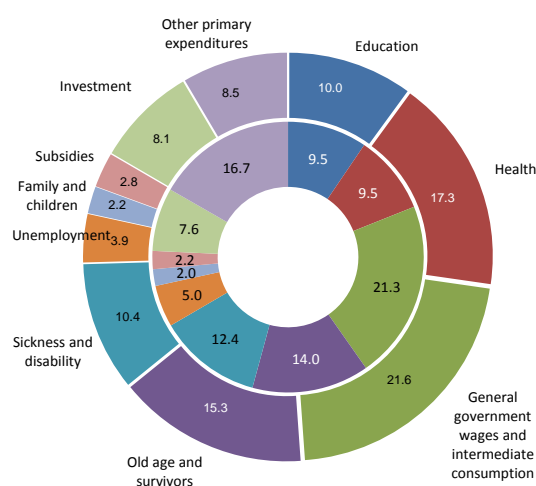
Note: The inner circles refer to 1995, while the outer circles to 2013.
Source: OECD Public Finance Dataset (forthcoming).

46.   The tax mix has remained broadly stable over the two decades for the Netherlands and Spain, with nonetheless a drop in the share of corporate income taxes in the Netherlands, and a small increase in Spain. Environmental taxes have declined in Spain, while consumption taxes have increased slightly for both countries as a share of total primary receipts. Other primary revenues, including the sales of goods and services and property income received, have increased in the Netherlands and declined in Spain, while recurrent taxes on property and wealth have increased as a share of primary revenues in both countries.

4.2. The structure of public finance, growth and inequality

47.   One insight from the literature is that a spending shift towards productive spending (e.g. education and investment) would raise long-term growth. Also, shifting taxation towards consumption and property taxes away from income taxes would boost growth. Over the past 15 years, the share of education and investment increased (albeit modestly) in Germany, Sweden, the Slovak Republic and the

United Kingdom, while these countries succeeded in moving away from distortionary income taxes (Figure 15, upper left quadrant). Denmark also increased the share of education and investment in its spending mix over this period, but also increased somewhat its reliance on the personal income tax, social security contributions and corporate income tax. Countries in the lower right quadrant of Figure 15 – France, Iceland, Ireland, Italy, Korea, Norway, Portugal and Spain – have both decreased the share of "productive" spending and increased the share of distortionary taxation over the period 1998 to 2013.[4] The majority of countries shown fall into the category of both decreased "productive spending" shares and decreased reliance on distortionary taxation, factors which might cancel each other out in terms of their effects on growth.

Figure 15.   The evolution of the shares of productive spending and distortionary taxation

Changes over the period 1998 to 2013, in per cent of total primary expenditure and total primary revenues
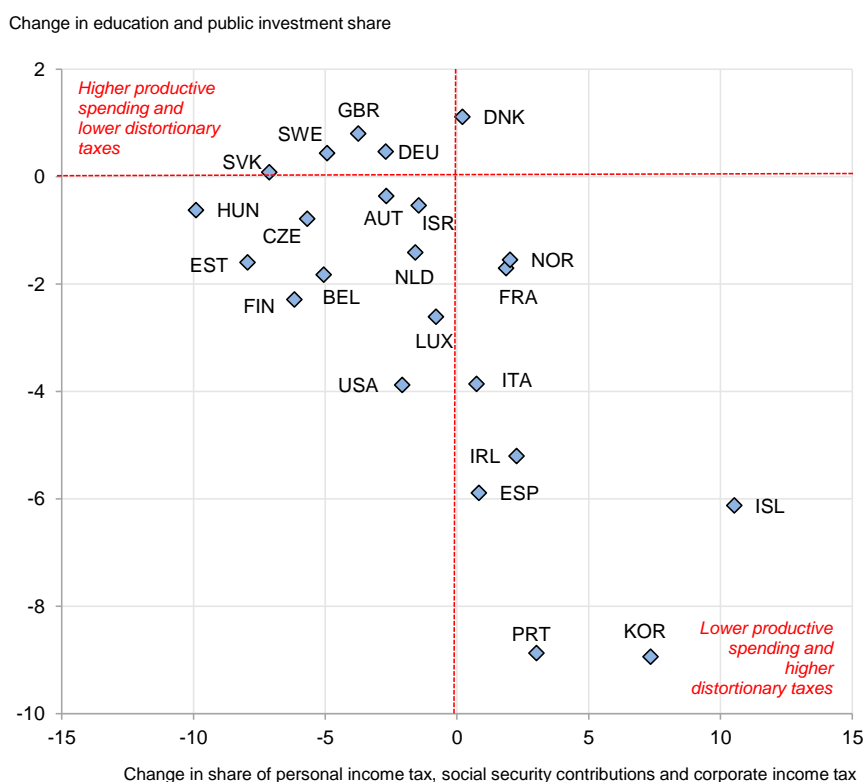
Note: Education and investment data are expressed as a percentage of total primary expenditure; personal income tax, social security contributions and corporate income tax receipts are expressed as a percentage of total primary revenues.
Source: OECD Public Finance Dataset (forthcoming).

48.   Public investment in infrastructure, education and innovative activities adds to a country's capital stock, which enhances the economy's long-run productivity growth. A cross-country correlation provides suggestive evidence that greater spending on public investment is associated with higher growth (Figure 16). New empirical evidence supports this correlation in a cross-country panel of OECD countries (Fournier and Johansson, 2016). Developments in public investment spending for the years 2007, 2009 and 2012 capture the global crisis and its aftermath. In most countries, the share of investment spending rose in

---

4.   Spending is classified into productive and non-productive, depending on whether they are included in the production function or not. Education and investment are considered productive spending. Corporate and personal income taxes including social security contributions are considered relatively more distortionary than consumption and property taxes (Johansson, 2016).

2009 compared with the pre-crisis period, as governments attempted to boost activity. However, by 2012 investment had returned to the pre-crisis level as a per cent of GDP, or dipped lower. Significant declines in investment are evident in those countries which faced particularly stringent austerity measures – Iceland, Ireland, Italy, Greece, Portugal and Spain.

**Figure 16.   Public investment and growth**

A: Public investment and GDP growth over 1998-2013

B: Public investment, selected years
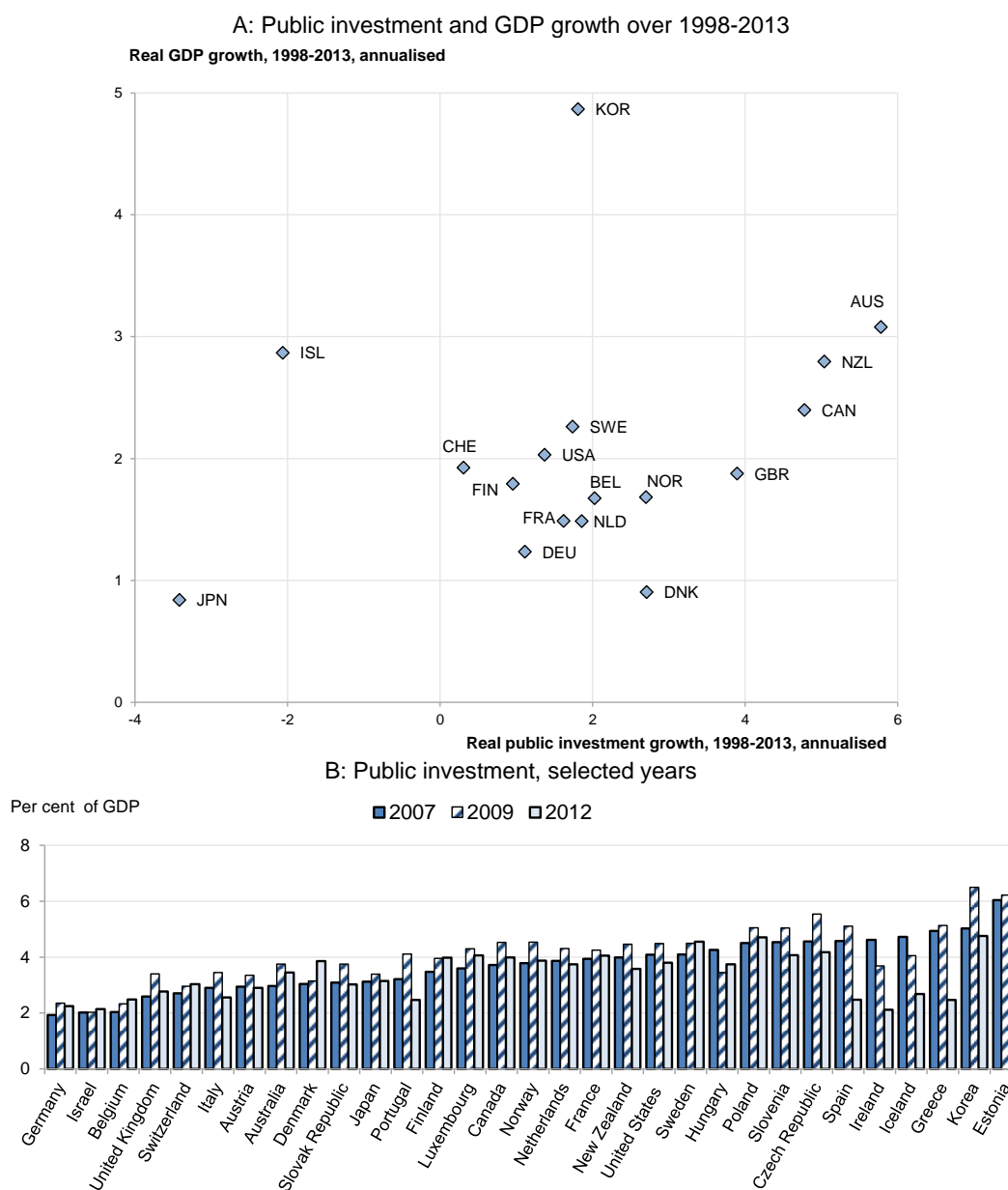
Note: In Panel A, some countries are not included due to missing data on real public investment.
Source: OECD Public Finance Dataset (forthcoming); OECD (2016), "OECD Economic Outlook No. 98 (Edition 2015/2)", OECD Economic Outlook: Statistics and Projections (database), DOI: http://dx.doi.org/10.1787/bd810434-en.

49.   Apart from affecting growth, the public finances influence inequality. Redistribution due to taxes and transfers varies across countries. In most countries the bulk of redistribution occurs via transfers. On average in the OECD, about three-quarters of the reduction in inequality between market income and disposable income are due to transfers (Brys et al, 2016). Looking at the relationship between spending on

social protection spending on family and children and inequality (Figure 17), it appears that countries with higher income inequality as measured by the household disposable income (HDI) Gini often have lower levels of social protection spending on families and children, as is the case in the United States (under 3% of total primary spending). Higher social protection spending on children and families in Denmark and Norway (8.6% of total primary spending in Denmark, 7.3% in Norway) translates into greater income equality. However, higher spending on social protection is not systematically associated with greater income equality, as witnessed in Figure 17 for Israel. Social support measures need to be well targeted and efficiently implemented, with adequate support for lower-income individuals, and policies designed to adapt to changes in income and labour market developments, such as during the recent crisis (OECD, 2015c).

Figure 17.   Higher social protection spending on families and children relates to lower income inequality in many OECD countries

2011-13 averages
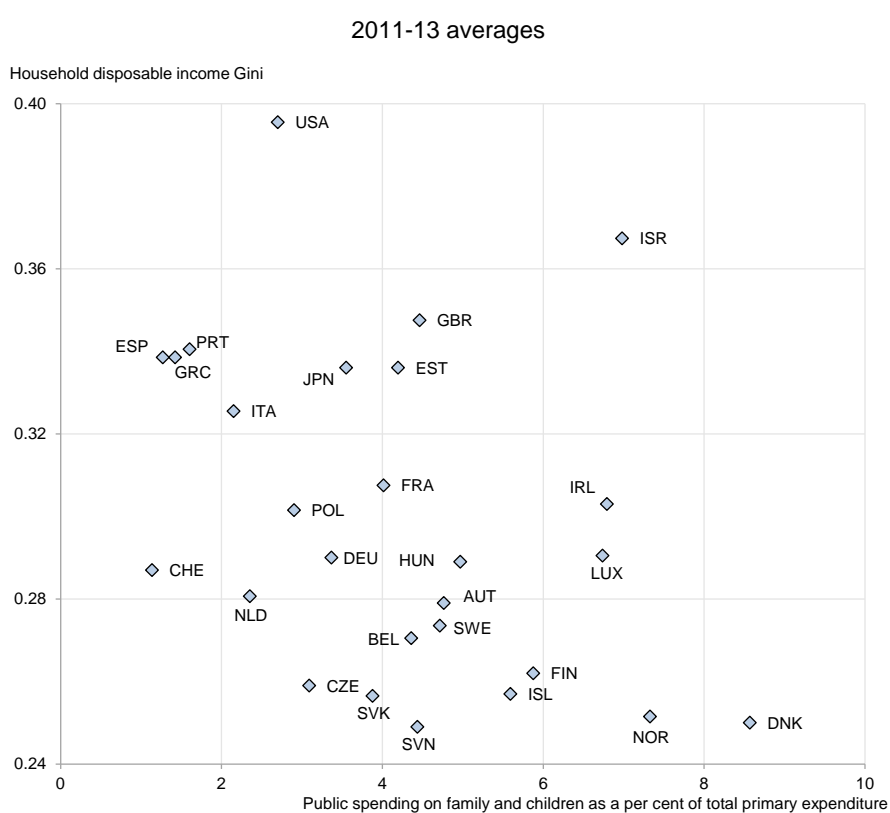
Source: OECD Public Finance Dataset (forthcoming).

5. Outstanding data issues

50.   The OECD Public Finance Dataset pulls together data from several sources, building largely on National Accounts reporting and, where data are lacking, using alternative sources to ensure the broadest coverage possible, for the longest time period available. The dataset, and any empirical analyses which rely on it, would benefit greatly from improved coverage. This is particularly the case for second-level COFOG data, where data are only reported by European Union members and Japan. As key social protection policy areas are included in these categories, wider reporting, notably for non-European countries, and longer time series would be beneficial, strengthening future analyses of the effect of the spending mix on growth and income distribution.

51.   For a number of countries, a lack of data has resulted in their exclusion from part or all of the current study. Specifically, Australia, Canada and New Zealand lack the first level COFOG data needed to construct the expenditure breakdown used in the OECD Public Finance Dataset. These countries have therefore been omitted from the cluster analysis, but have been included in the country profiles in Annex 2. Increased coverage following the 2008 SNA COFOG breakdown by function and transaction type would be welcome for future analyses.

52.   Better data coverage is needed for the overall government accounts for Chile, Mexico and Turkey. The lack of comparable data for these three countries, both on the expenditure and the revenue side, prevents any detailed empirical analysis of their public finances. Improved coverage to encompass these countries would be a great advantage for researchers and policy makers.

53.   Specific issues with regard to spending and revenue items need to be addressed in order to better analyse the information available, and the differences between various data sources. Often, data differences can be explained by the timing of update cycles between different data sources. However, there exist conceptual differences between notably the National Accounts data and OECD Revenue Statistics, on the receipts side, and the OECD Social Expenditure Database on the spending side. In practice, the consistency between the sources was checked and in most cases it was highly acceptable, implying that SOCX is a reasonable proxy for COFOG National Accounts data (see Annex 1 for details). Furthermore, there is room for improvement in the reporting and harmonisation of certain concepts, such as tax expenditures, in order to better compare countries and capture policy initiatives.

54.   Finally, the OECD Public Finance Dataset benefits from a vast array of data on relevant structural features. However, many of these indicators are available only for one point in time or for a sub-set of countries (for example, fiscal governance). Greater time coverage of structural variables and broader country coverage would greatly enhance the analytical relevance of the dataset, improving future research.

6. Conclusion

55.   As governments endeavour to promote growth and address income inequalities in their societies, they turn increasingly to the analysis of the quality of public finance in order to identify the optimal mix of spending and revenue instruments to achieve their goals. A comprehensive set of public finance data, accompanied by related structural indicators, has been assembled in order to facilitate the study of the quality of public spending and receipts, and to assist policy makers in shaping their fiscal policy to promote growth and improve equity.

56.   This paper has set out the rationale and specifics of the construction of a new fiscal dataset which draws on various existing sources of data. By identifying key variables of public finance across as many OECD countries as possible, and with a time series element to allow for longitudinal analysis, the OECD Public Finance Dataset is intended to contribute to the debate on shaping growth-enhancing and equality-promoting fiscal policies. Examples of the potential of these data to provide policy insights have been offered. Characteristics of both country groupings and individual country public finance profiles have been highlighted, along with a sample of cross-country analyses, both over time and across a variety of policy-specific areas. Finally, areas for improvement in data collection and coverage are suggested, with the hope that future work will allow for an even richer collection of public finance data.

**ANNEX 1. CONSTRUCTION OF THE RESEARCH DATABASE –
METHODOLOGY AND SOURCES**

57.   This annex details the construction of the OECD Public Finance Dataset, highlighting the sources, the methods used to lengthen time series and to find robust solutions to missing data where possible.

A1.1. Expenditure Items

A1.1.1. Summary of the main operations

58.   Public spending is disaggregated into 11 items that do not overlap (Tables 1 and 2 in the main text). The National Accounts Classification of the Functions of Government (COFOG) data are the source of items 1 to 7 (i.e. education, health, wage and intermediate consumption, old age and survivors pensions, unemployment benefits and family and child benefits). The COFOG data are extracted from OECD.stat and complemented if needed with Eurostat data in instances where COFOG has yet to incorporate Eurostat updates. The dataset is designed to be consistent with the OECD Economic Outlook database, and consequently the National Accounts database. Therefore, investment (item 9), interest payments (item 11) and total expenditure are taken directly from the OECD Economic Outlook database, while subsidies (item 8) are taken from the OECD Analytical Data Base (ADB), for which a vintage consistent with the OECD Economic Outlook database is used. The remaining item 10 (other primary expenditure) is calculated as the difference between total spending (OECD Economic Outlook database) and all other items.

A1.1.2. Imputations

59.   COFOG data availability is more limited than the national accounts data used in the OECD Economic Outlook, especially second-level COFOG data needed for social protection items 4-7. These data are available for a limited number of country-year observations. The sample is extended via imputations for social benefits and transfers in kind, wages and intermediate consumption. Figure 1, at the beginning of this paper, illustrates the decision schema used to extend the data. Two alternative sources are used for these imputations: (i) the COFOG data published according to the 1993 System of National Accounts (SNA 1993) that was used before the introduction of the current 2008 System of National Accounts (2008 SNA)[5] and (ii) the OECD Social Expenditure Database (SOCX).[6] Slight discrepancies between the data sources are picked up by item 10 (other primary expenditure), which is calculated as the difference between total spending and all other items.

60.   The SNA 1993 data are very similar, and often identical, to the 2008 SNA data, reflecting similarities of concepts and data collection process. Discrepancies in concepts and data collection process

---

5.   This corresponds to arrows 1 and 2 in Figure 1.

6.   This corresponds to arrow 3 in Figure 1.

are larger between 2008 SNA and SOCX. Hence SOCX data are only used if the SNA 1993 data cannot be used. The consistency between COFOG and SOCX data is checked on a case by case basis.

A1.1.2.1. SNA 1993

61.   When no 2008 SNA data are available, SNA 1993 data are directly used given the similarities between these two sources. When 2008 SNA data are available for some years, SNA 1993 data are adjusted to correct for the small level difference between the two vintages. Using the overlap in data between the two vintages, an adjustment factor is calculated as the average ratio between 2008 SNA and SNA 1993. For each country and expenditure item, the SNA 1993 data are adjusted as follows:

$$expitemX_t^{imputed} = expitemX_t^{SNA93} * \underbrace{\frac{1}{t_2-t_1+1}\sum_{t_1 \le t \le t_2}\frac{expitemX_t^{SNA2008}}{expitemX_t^{SNA93}}}_{Average\ discontinuity\ in\ level\ between\ SNA93\ and\ SNA2008} \qquad (A1.1)$$

where t_1 and t_2 are the first and last year of overlap. This imputation is used for the years for which 2008 SNA data are not available. SNA 1993 data are not used for countries with 2008 SNA data available for some years but where there is no overlap with SNA 1993, in order to avoid any discontinuity in levels. These discontinuities can be due in particular to differences in concepts, such as a different treatment of research and development spending.

A1.1.2.2. Using SOCX to impute social transfer and benefits in kind

62.   SOCX data are used to impute social transfer and benefit in kind for items 4 to 7 (i.e. transaction D62_631XX in COFOG). Two imputation methods are considered depending on whether there is an overlap or not between COFOG and SOCX data.

A1.1.2.2.1. Overlap between COFOG and SOCX

63.   Option 1: The preferred option is to calculate the fitted values for each pair of country-expenditure item from the following regression:

$$COFOG_{i,t,f} = \beta_{0,i,f} + \beta_{1,i,f}SOCX_{i,t,f} + u_{i,t,f} \qquad (A1.2)$$

where i is the country, t is time, f is the expenditure item (i.e. item 4-7). $SOCX_{i,t,f}$ is the level of expenditure in country i and item f at time t according to SOCX and $COFOG_{i,t,f}$ is the level of social transfers and benefits in kind in the same item according to COGOF. This imputation is applied if the R^2 is above 0.7 and no imputation returns a negative result.

64.   In very few cases, the sum of the imputed values for items 4 to 7 is greater than the total social expenditure in COFOG (this can occur when the total social expenditure is directly available as a one-digit COFOG item while the second-digit COFOG data is not available). In these cases an adjustment is done with an estimation of the size of social transfers and benefits in kind in the "other social expenditure component" ($COFOG_{i,t,other}$) in Table 1. The SOCX counterpart ($SOCX_{i,t,other}$) is defined as the total social expenditure less expenditure on health, active labour market policies, pensions, sickness and disability benefits, unemployment benefits and family benefits. This "other social expenditure component" is imputed with the regression (A1.2) if the R^2 is above 0.7. Then the imputed values of items 4 to 7 are rescaled as:

$$COFOG_{i,t,f}^{imputed} = \frac{COFOG_{i,t,f}^{step1}}{\sum_{f=4}^{7}COFOG_{i,t,f}^{step1}+COFOG_{i,t,other}^{step1}} \times COFOG_{i,t,social\ protection\ total} \quad (A1.3)$$

where step1 denotes the imputed value after applying the imputation from regression A1.2.

Option 2: If the R^2 in the regression A1.2 (or A1.3 when necessary) is below 0.7 an alternative regression is used:

$$COFOG_{i,t,f} = \beta_{1,i,f}SOCX_{i,t,f} + u_{i,t,f} \qquad (A1.4)$$

where the variables are defined as in A1.2. The difference between A1.4 and A1.2 is that equation A1.4 does not include a constant. This imputation is done if the R^2 is above 0.9 and if no imputation returns a negative value. If the sum of the imputed values for items 4 to 7 is above total social expenditure in COFOG, a similar adjustment as in option 1 is applied. In this case, equation A1.4 is used to estimate the "other social expenditure" component if the R^2 is above 0.9. The imputed values are rescaled using equation A1.3.

Option 3: If both equations A1.2 and A1.4 do not pass the fitness requirements, a regression using public spending shares is used:

$$\frac{COFOG_{i,t,f}}{YPGT} = \beta_{0,i,f} + \beta_{1,i,f}\frac{SOCX_{i,t,f}}{YPGT} + u_{i,t,f} \qquad (A1.5)$$

where YPGT denotes total spending according to COFOG data and the other variables are as denoted in equation A1.2. This imputation is done if the R^2 is above 0.5 and if no imputation returns a negative value. If the sum of the imputed values for the items 4 to 7 is above the total social expenditure in COFOG, the adjustment (A1.3) is applied. In this case equation A1.5 is used to estimate the "other social expenditure" component if the R^2 is above 0.5.

Option 4: If equations A1.2, A1.4 and A1.5 do not pass the fitness requirements, a final regression using public spending shares is used:

$$\frac{COFOG_{i,t,f}}{YPGT} = \beta_{1,i,f}\frac{SOCX_{i,t,f}}{YPGT} + u_{i,t,f} \qquad (A1.6)$$

The difference between A1.6 and A1.5 is that equation A1.6 does not includes a constant. This imputation is done if the R^2 is above 0.9 and if no imputation returns a negative value. If the sum of the imputed values for the items 4 to 7 is above the total social expenditure in COFOG, the adjustment (A1.3) is applied. In this case equation A1.6 is used to estimate the "other social expenditure" component if the R^2 is above 0.9.

A1.1.2.2.2. No overlap between COFOG and SOCX

65.   In cases where there is no second-level COFOG data for social expenditure, the SOCX data are rescaled to match the SOCX social expenditure sub-total that corresponds to the items 4 to 7 (i.e. the total SOCX minus health and social expenditure in active labour market policies):

$$COFOG_{i,t,f}^{imputed} = \frac{SOCX_{i,t,f}}{SOCX_{i,t,total} - SOCX_{i,t,health} - SOCX_{i,t,ALMP}} \times COFOG_{i,t,social\ protection\ total}$$

where ALMP denotes active labour market policies. The correlation between COFOG and SOCX total social protection expenditure is above 0.9, which justifies this approach.

A1.1.2.3. Imputation of wages and intermediate consumption

66.   The imputation methods discussed above need to be adjusted to include wages (D1) and intermediate consumption (P2) for items 5 and 7. In practice, wages and intermediate consumption represent quite a small share of these items, and this share represents structural features that are likely to be quite stable over time within each country. This share is thus set constant in the imputed period, and the earliest three years (τ_1 to τ_2)[7] for which there is data for wages (D1) and intermediate consumption (P2), are used to calculate a proportionality coefficient:

$$COFOG_{i,t,f}^{D1+P2} = \underbrace{\sum_{\tau=\tau_1}^{\tau_2} \frac{COFOG_{i,\tau,f}^{D1+P2}}{COFOG_{i,\tau,f}^{imputed}}}_{proportionality\ coefficient} \times COFOG_{i,t,f}^{imputed}$$

Where $COFOG_{i,t,f}^{imputed}$ denotes either the original or the imputed value for the social transfer and benefit in kind transaction (D62_631XX).

---

7.   Whenever only one or two years are available, only one and two are used, respectively.

A1.2. Revenue Items

A1.2.1. Adjustment factor

67.   As with spending, revenue data are designed to be compatible with the OECD Economic Outlook database, while allowing for a more detailed breakdown of revenue items (see Table 3 in the main text). The OECD Revenue Statistics data slightly differ from the National Accounts data used in the OECD Economic Outlook. The vintage is not exactly the same, and some concepts differ. The OECD Revenue Statistics data are multiplied by the following adjustment factor to correct for this discrepancy[8]:

$$adj_{factor} = \frac{TY + TIND}{r1100 + r1200 + r1300 + r5000 + r6000 + r4100 + r4600 + r4200 + r4300 + r4400 + r4500}$$

where rXXXX denotes the item XXXX in the OECD Revenue Statistic database, TY total direct taxes in the OECD Economic Outlook database and TIND taxes on production and import in the OECD Economic Outlook database.

68.   There can also be a small discrepancy between the OECD National Account data and the OECD Economic Outlook (in particular, calendar years or the vintage can differ). The "Other primary revenue" is calculated here as the difference between total receipts and all other items, so that the items used in the database add up exactly to the total.

---

8.   An alternative would be to adjust for explicit differences in specific tax items between OECD Revenue Statistics and National Accounts prior to calculating a global adjustment. Development of such methodology could be explored in future work.

A1.3. Cyclical Adjustment

A1.3.1. Cyclically-adjusted expenditure

69.   The cyclical adjustment of expenditure follows closely the adjustment done in the OECD Economic Outlook. Unemployment benefits, family benefits and other primary expenditure items are adjusted, while all other items are identical to the unadjusted variables. The cyclical adjustment assumes that these sub-categories of spending have the same sensitivity to the cycle.

70.   Unemployment benefits are cyclically-adjusted as follows:

$$expitem6_{adj} = expitem6 + YPGX * \left(\left(\frac{GDPTR}{GDP}\right)^{\alpha} - 1\right)$$

where $YPGX$ is primary expenditure, GDP is nominal GDP, GDPTR is nominal potential GDP, α is the output gap elasticity of current primary expenditure due to unemployment-related spending only.[9]

71.   Family and child benefits are cyclically-adjusted as follows:

$$expitem7_{adj} = expitem7 + \underbrace{\beta}_{\substack{share\ of\ family\ and \\ children\ benefits}} \times \left((YPGXA - YPGX) - YPGX \times \left(\left(\frac{GDPTR}{GDP}\right)^{\alpha} - 1\right)\right)$$

where β is the share of social expenditure for families and children in total income-dependent social benefits (other than unemployment benefits) averaged over the years 2001-11 and scaled (multiplied) by the ratio between the average of family and children benefits in this database and the average of family and child benefits in SOCX, YPGXA is cyclically-adjusted primary spending, YPGX is primary spending.

72.   The other primary expenditure adjusted item is calculated as a remainder:

$$expitem10_{adj} = YPGTU - \left(\sum_{K=1}^{9} expitemK_{adj} + expitem11_{adj}\right)$$

73.   A correction for one-offs is implicitly included in a consistent manner corresponding to the most recent OECD Economic Outlook, so that the sum of the eleven adjusted expenditure items equals the Economic Outlook's underlying total disbursements.

---

9.   Column [1], Table 8 in Price et al. (2015).

A1.3.2. Cyclically-adjusted revenue items

74.   The cyclical adjustment of revenues is anchored on the OECD Economic Outlook cyclical adjustment. Some adaptions are done as the breakdown differs (see Table 3), with assumptions similar to those in Cournède et al. (2013), as developed below.

$$revitem1_{adj} = revitem1 + \cfrac{revitem1}{revitem1 + \left(\cfrac{revitem6}{2} + \cfrac{revitem7}{2}\right) \cdot \cfrac{revitem1}{revitem1 + revitem3}}$$
$$\times (TYHA - TYH)$$

$$revitem2_{adj} = revitem2 + (SSRGA - SSRG)$$

$$revitem3_{adj} = revitem3 + \cfrac{revitem3}{revitem3 + \left(\cfrac{revitem6}{2} + \cfrac{revitem7}{2}\right) \cdot \cfrac{revitem3}{revitem1 + revitem3}}$$
$$\times (TYBA - TYB)$$

$$revitem4_{adj} = revitem4 + \cfrac{revitem4}{revitem4 + revitem5 + \cfrac{revitem6}{2} + \cfrac{revitem7}{2}} \times (TINDA - TIND)$$

$$revitem5_{adj} = revitem5 + \cfrac{revitem5}{revitem4 + revitem5 + \cfrac{revitem6}{2} + \cfrac{revitem7}{2}} \times (TINDA - TIND)$$

$$revitem6_{adj} = revitem6 + \cfrac{\cfrac{revitem6}{2} \cdot \cfrac{revitem1}{revitem1 + revitem3}}{revitem1 + \left(\cfrac{revitem6}{2} + \cfrac{revitem7}{2}\right) \cdot \cfrac{revitem1}{revitem1 + revitem3}}$$
$$\times (TYHA - TYH) + \cfrac{\cfrac{revitem6}{2} \cdot \cfrac{revitem3}{revitem1 + revitem3}}{revitem3 + \left(\cfrac{revitem6}{2} + \cfrac{revitem7}{2}\right) \cdot \cfrac{revitem3}{revitem1 + revitem3}}$$
$$\times (TYBA - TYB) + \cfrac{\cfrac{revitem6}{2}}{revitem4 + revitem5 + \cfrac{revitem6}{2} + \cfrac{revitem7}{2}}$$
$$\times (TINDA - TIND)$$

$$revitem7_{adj} = revitem7 + \frac{\frac{revitem7}{2} \cdot \frac{revitem1}{revitem1 + revitem3}}{revitem1 + \left(\frac{revitem6}{2} + \frac{revitem7}{2}\right) \cdot \frac{revitem1}{revitem1 + revitem3}}$$
$$\times (TYHA - TYH) + \frac{\frac{revitem7}{2} \cdot \frac{revitem3}{revitem1 + revitem3}}{revitem3 + \left(\frac{revitem6}{2} + \frac{revitem7}{2}\right) \frac{revitem3}{revitem1 + revitem3}}$$
$$\times (TYBA - TYB) + \frac{\frac{revitem7}{2}}{revitem4 + revitem5 + \frac{revitem6}{2} + \frac{revitem7}{2}}$$
$$\times (TINDA - TIND)$$

$$revitem9_{adj} = YRGTU - \left(\sum_{K=1}^{8} revitemK_{adj} + revitem10_{adj}\right)$$

$$revitem8_{adj} = revitem8$$

$$revitem10_{adj} = revitem10$$

where revitemX and revitemX$_{adj}$ denote the item No. X in Table 3 and its cyclically-adjusted counterpart respectively, TYB are direct taxes on business, TYH are direct taxes on households, TIND are taxes on production and imports and YRGTU are the underlying total receipts, YPGTU is "underlying total disbursements", TKTRGU is "underlying capital tax and transfers receipts" and TRGOE is "other exceptional transfers received", sourced from the OECD Economic Outlook database. The suffix A denotes cyclically adjusted data in the OECD Economic Outlook database (for instance, TYBA are cyclically-adjusted direct taxes on business). Revitem9$_{adj}$ implicitly includes a correction for one-offs done in a consistent way to the Economic Outlook, so that the sum of the ten adjusted revenue items equals the Economic Outlook's underlying total receipts.

75.   For Norway, there are a few specific calculations because of the difference between mainland and off-shore activities:

$$revitem8_{adj} = revitem8 + \frac{revitem8}{revitem8 + revitem9} \times (TOCRML - TOCR)$$

$$revitem10_{adj} = revitem10 + (YPERGML - YPERG)$$

$$revitem9_{adj} = YRGTU - \left(\sum_{K=1}^{8} revitemK_{adj} + revitem10_{adj}\right)$$
$$= revitem9 + \frac{revitem9}{revitem8 + revitem9} \times (TOCRML - TOCR) + (TKTRGU - TKTRG)$$
$$- TRGOE$$

where TOCR is the component "other current receipts", YPERG is "property income received", TKTRGU is "underlying capital tax and transfers receipts", TKTRG is "capital tax and transfers receipts", TRGOE is "other exceptional transfers received", all sourced from the OECD Economic Outlook database. The suffix ML stands for mainland.

ANNEX 2. PUBLIC FINANCE COUNTRY PROFILES

Figure A2.1. Public finance indicators

Australia

Austria
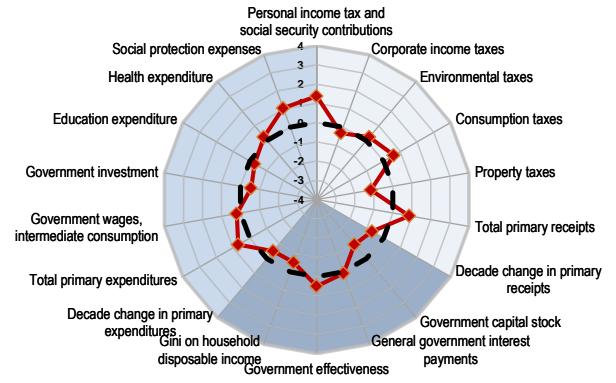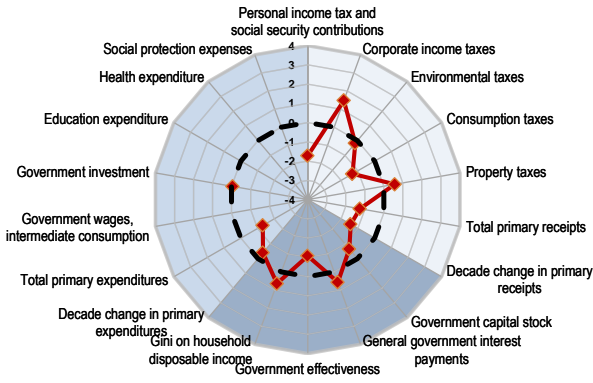
Belgium

Canada
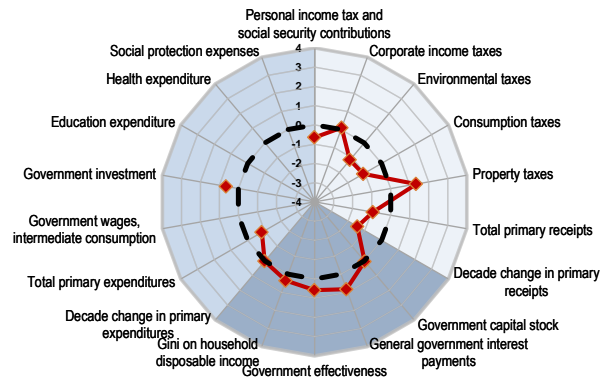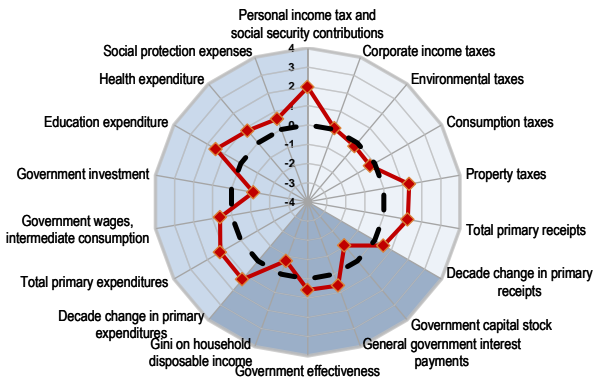
Figure A2.1. Public finance indicators *(cont.)*

Czech Republic

Expenditures · Revenues · Structural indicators

Denmark
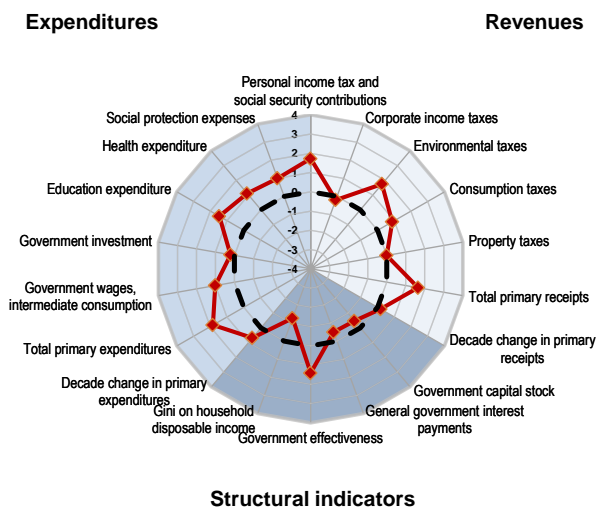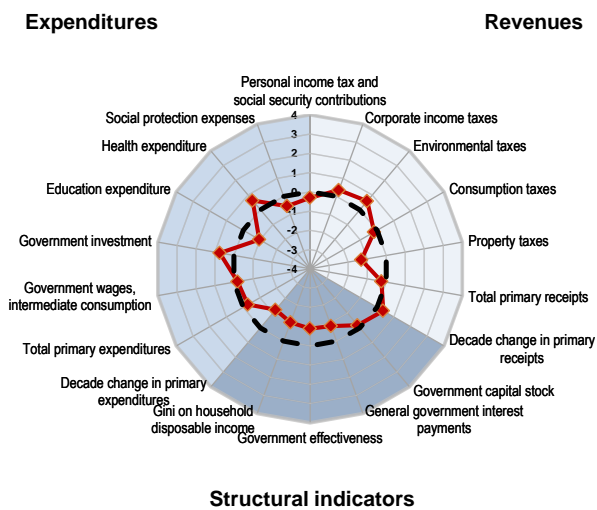
Expenditures · Revenues · Structural indicators

Estonia
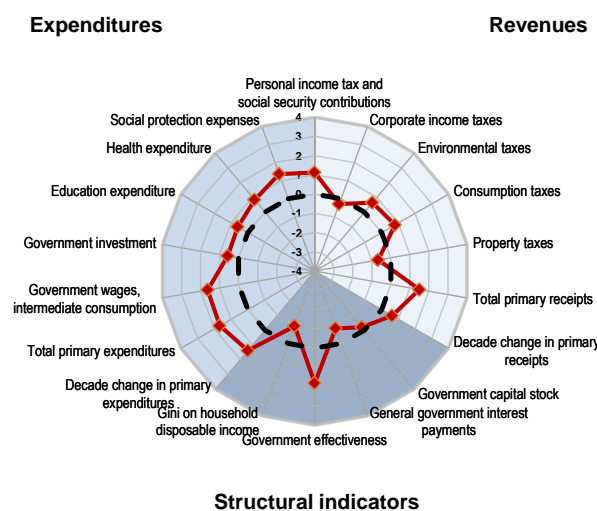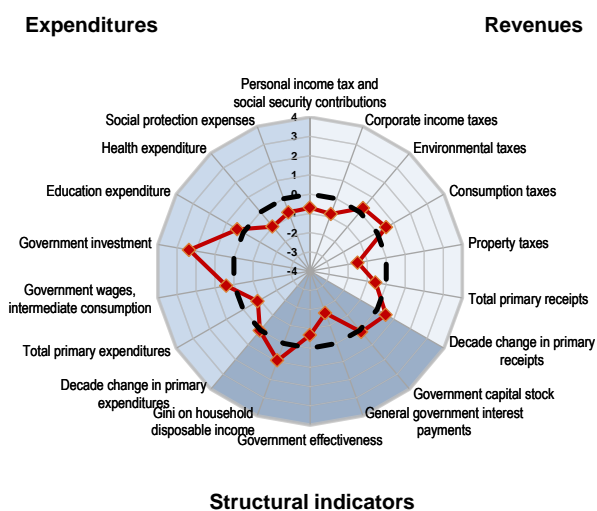
Expenditures · Revenues · Structural indicators

Finland

Expenditures · Revenues · Structural indicators

45

Figure A2.1. Public finance indicators *(cont.)*

France

Germany
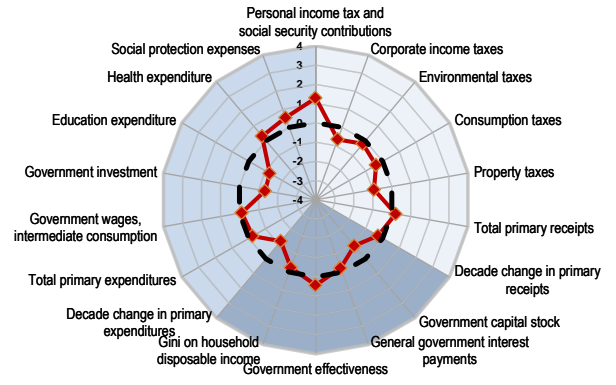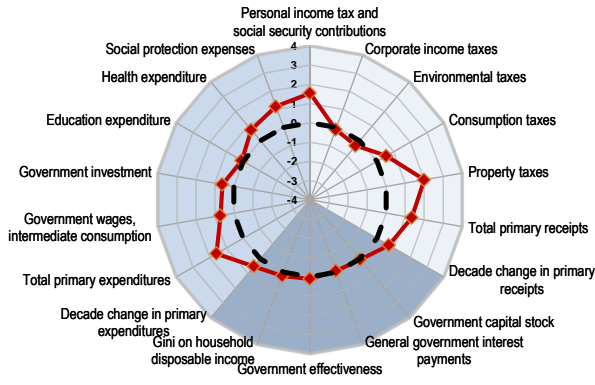
Greece

Hungary
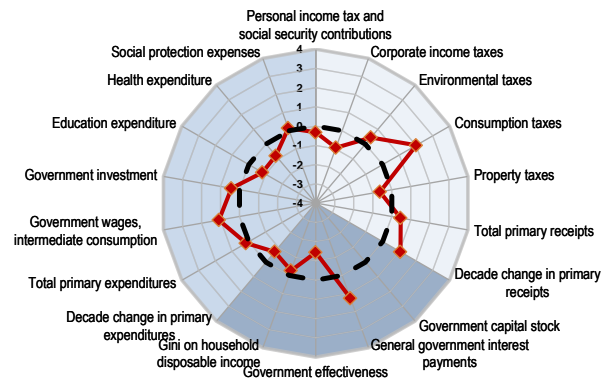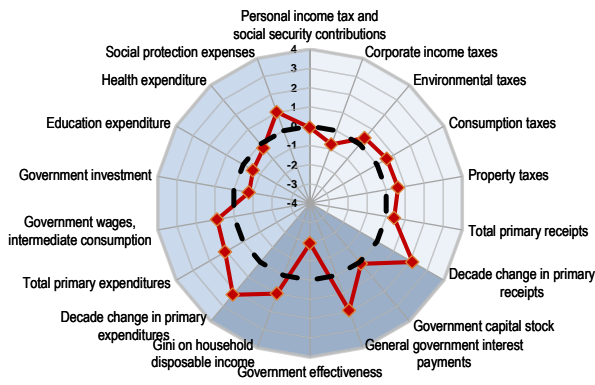
Figure A2.1. Public finance indicators *(cont.)*

Iceland

Ireland
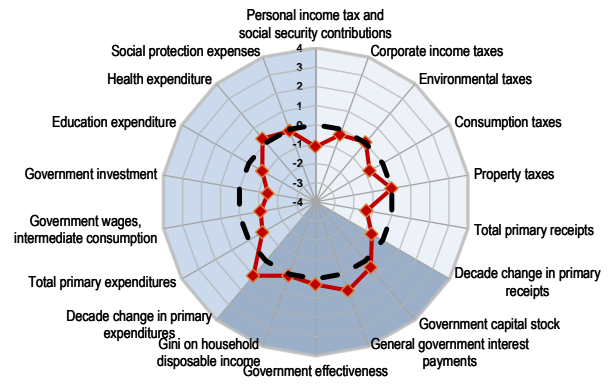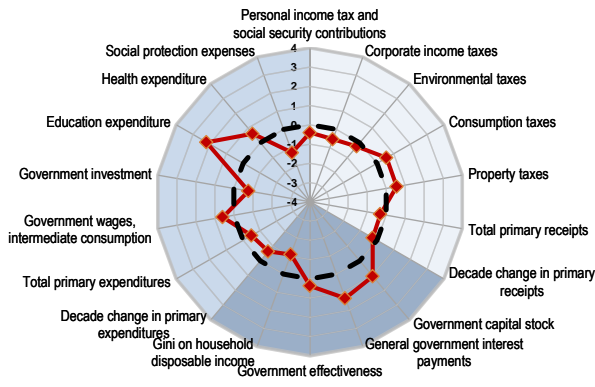
Israel

Italy

Figure A2.1. Public finance indicators *(cont.)*

Japan

Structural indicators

Korea
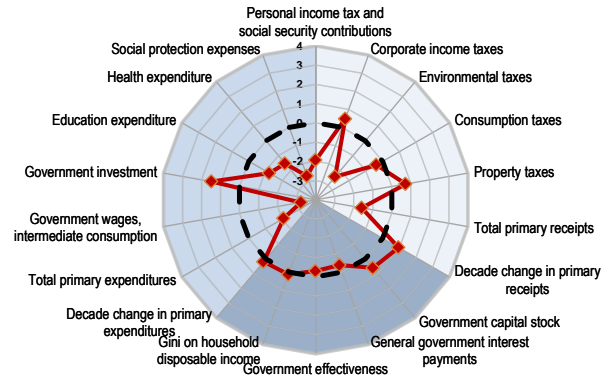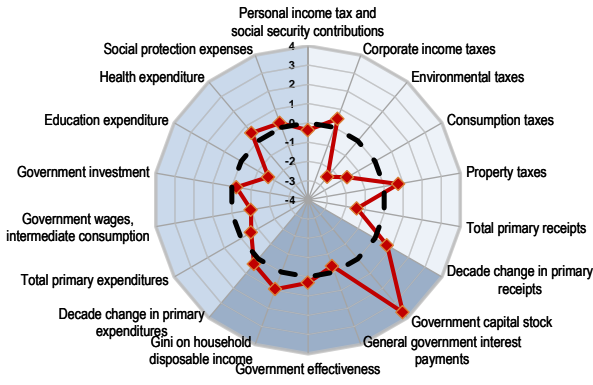
Structural indicators

Luxembourg
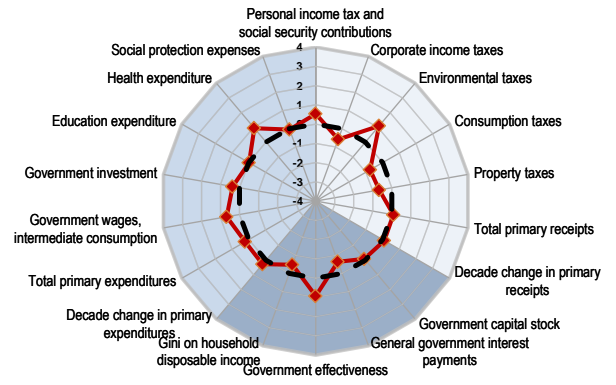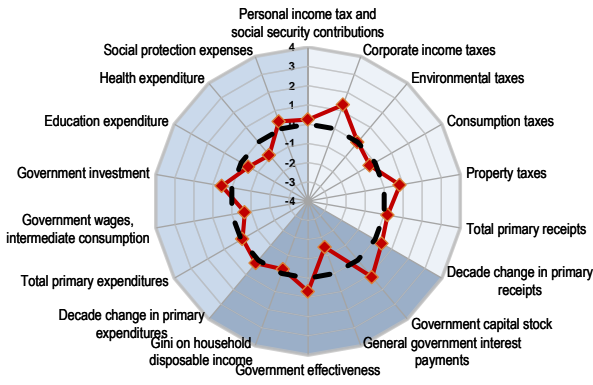
Structural indicators

Netherlands

Structural indicators

Figure A2.1. Public finance indicators *(cont.)*

New Zealand
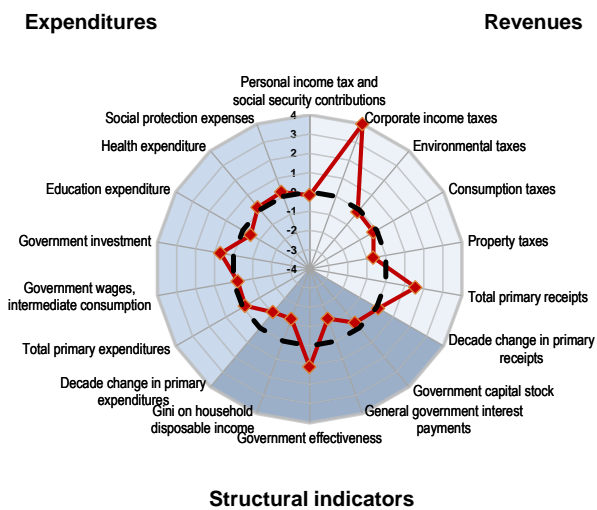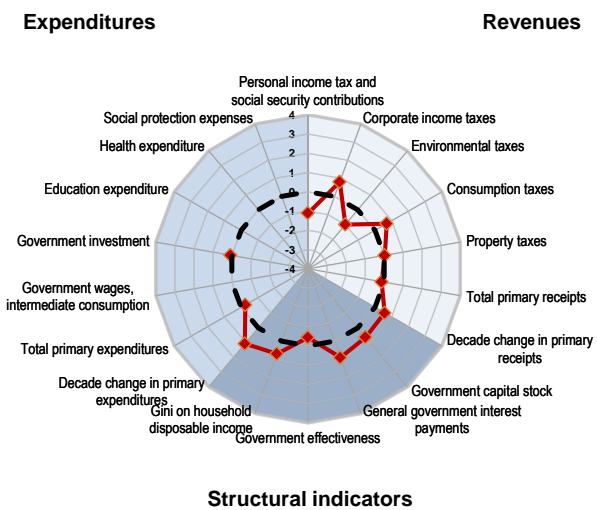
Expenditures   Revenues

Structural indicators

Norway

Expenditures   Revenues

Structural indicators

Poland
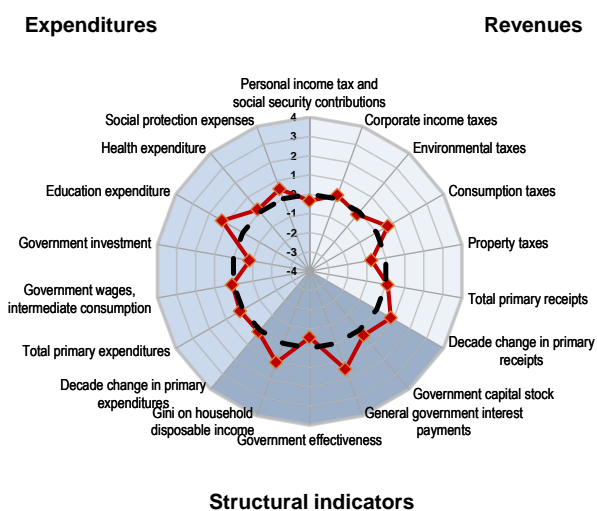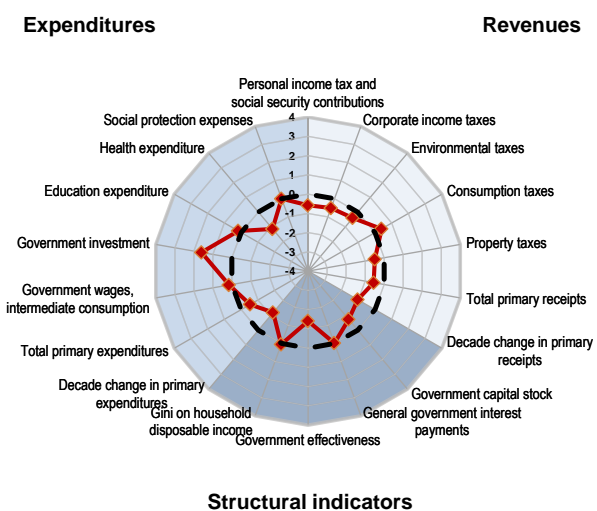
Expenditures   Revenues

Structural indicators

Portugal

Expenditures   Revenues

Structural indicators

Figure A2.1. Public finance indicators *(cont.)*

Slovak Republic

Structural indicators

Slovenia
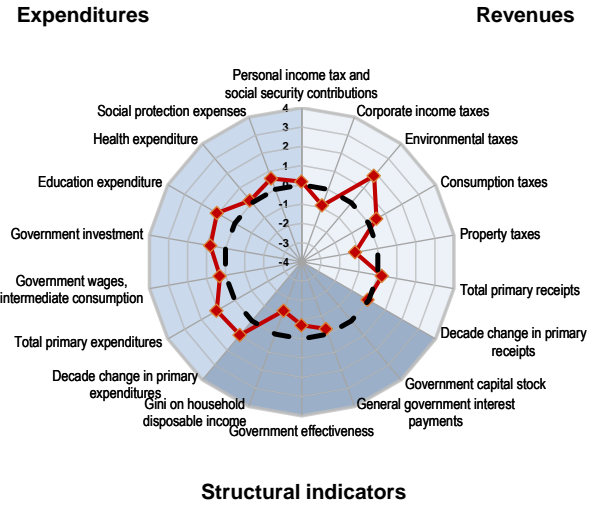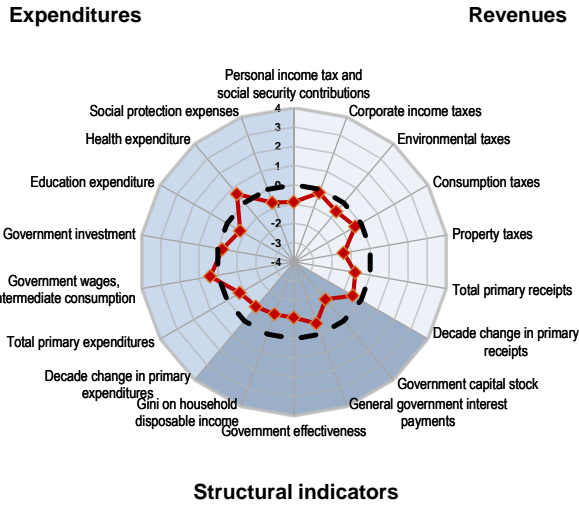
Structural indicators

Spain

Structural indicators
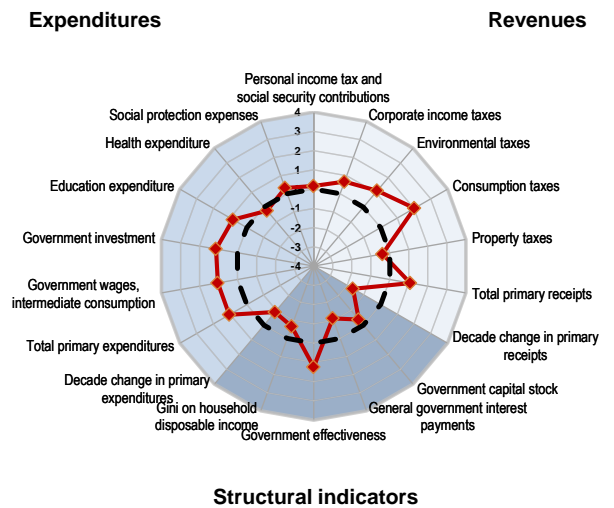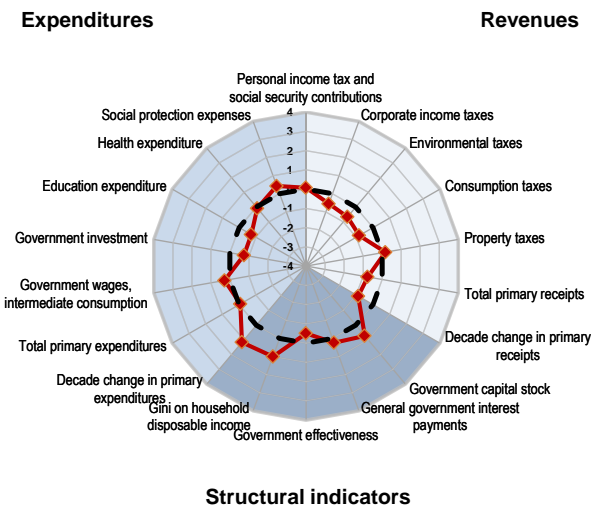
Sweden

Structural indicators

Figure A2.1. Public finance indicators *(cont.)*

Switzerland

Expenditures   **Revenues**

Structural indicators

United Kingdom

Expenditures   **Revenues**

Structural indicators

United States

Expenditures   **Revenues**

Structural indicators
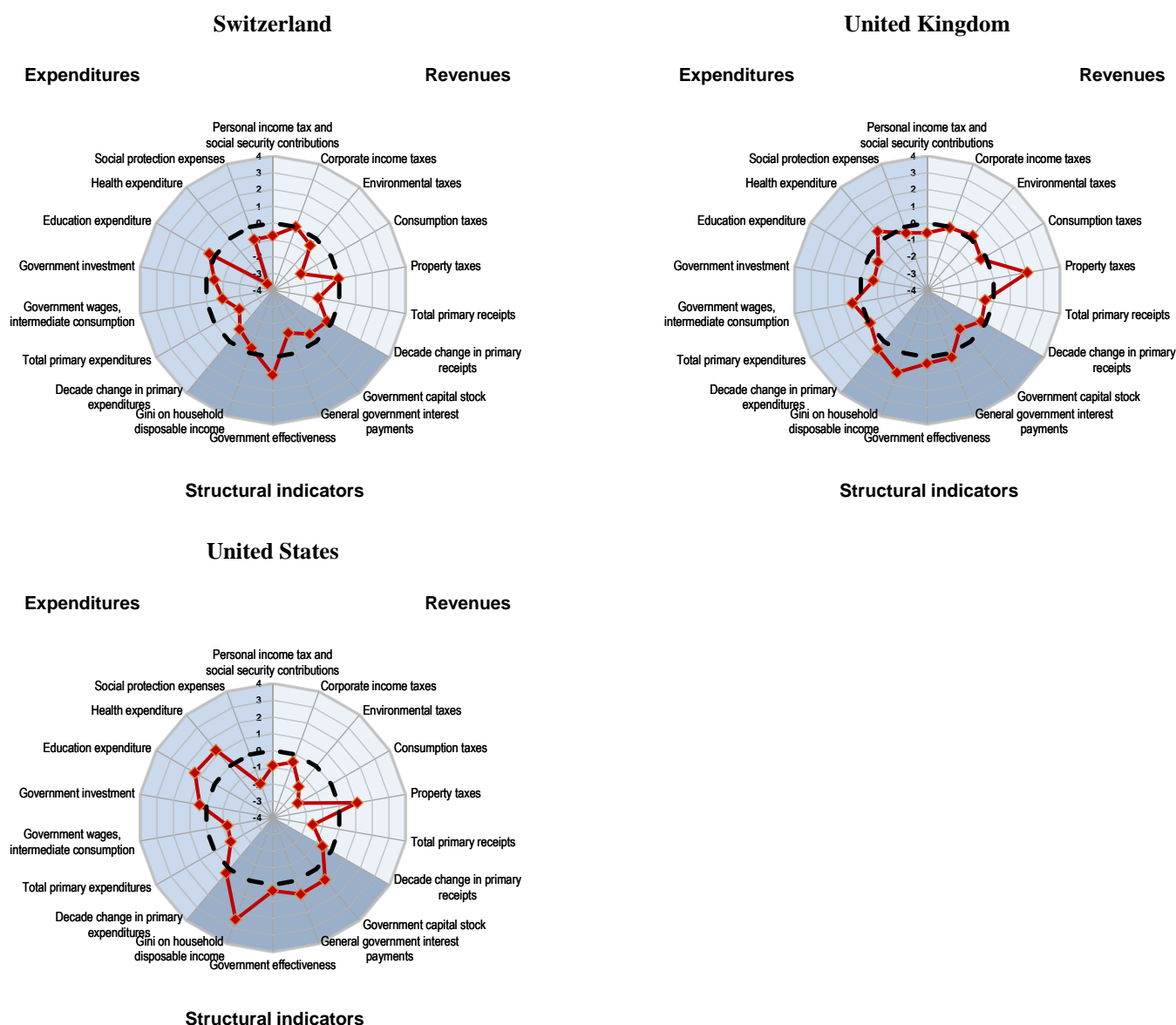
Note: The dotted lines represent the OECD average, and the data are presented in units of standard deviation. Data refer to the period 2011-13, or last available data. Expenditure and revenue items are expressed as per cent of GDP, as are government interest payments. The government capital stock is constructed by the IMF using a perpetual inventory method and expressed as a per cent of GDP (for more on the methodology, see www.imf.org/external/np/fad/publicinvestment/data/info.pdf). These IMF capital stock data are based on the previous National Accounts methodology (SNA 93), with the exception of Australia, Canada, Israel, Korea and the United States. The latest System of National Accounts (2008 SNA) include upward revisions for general government capital stock which, for some countries, can be significant.

REFERENCES

Adema, W., P. Fron and M. Ladaique (2011), "Is the European Welfare State Really More Expensive? Indicators on Social Spending, 1980-2012; and a Manual to the OECD Social Expenditure Database (SOCX)", *OECD Social, Employment and Migration Working Papers*, No. 124, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5kg2d2d4pbf0-en

Arnold, J., B. Brys, C. Heady, A. Johansson, C. Schwellnus and L. Vartia (2011), "Tax Policy for Economic Recovery and Growth", *Economic Journal,* Vol. 121.

Bloch, D. and F. Fall (2015), "Government Debt Indicators: Understanding the Data," *OECD Economics Department Working Papers*, No. 1228, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jrxv0ftbff2-en.

Brys, B., et al. (2016), "Tax Design for Inclusive Economic Growth", *OECD Taxation Working Papers*, No. 26, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jlv74ggk0g7-en

Cournède, B., A. Goujard and Á. Pina (2013), "How to Achieve Growth- and Equity-friendly Fiscal Consolidation? A Proposed Methodology for Instrument Choice with an Illustrative Application to OECD Countries," *OECD Economics Department Working Papers*, No. 1088, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5k407lwvzkkh-en.

Fournier, J.M. (2016), "The Positive Effect of Public Investment on Potential Growth", *OECD Economics Department Working Papers,* No. 1347, OECD Publishing, Paris.

Fournier, J.M. and Å. Johansson (2016), "The Effect of the Size and the Mix of Public Spending on Growth and Inequality", *OECD Economics Department Working Papers*, No. 1344, OECD Publishing, Paris.

Gonçalves D. and Á. Pina (forthcoming), "The composition of fiscal consolidation episodes: Impacts and determinants", *OECD Economics Department Working Papers*, OECD Publishing, Paris.

IMF (2015), "Making Public Investment More Efficient", *IMF Board Paper*, June 2015, www.imf.org/external/pp/longres.aspx?id=4959.

Johansson, Å. (2016), "Public Finance, Economic Growth and Inequality: A Survey of the Evidence", *OECD Economics Department Working Papers*, No. 1346, OECD Publishing, Paris.

Joumard, I., M. Minegishi, C. André, C. Nicq and R. Price (2008), "Accounting for One-off Operations when Assessing Underlying Fiscal Positions", *OECD Economics Department Working Papers*, No. 642, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/236220765316

Kaufmann, D., A. Kraay and M. Mastruzzi (2010), "The Worldwide Governance Indicators: Methodology and Analytical Issues", *World Bank Policy Research Working Paper*, No. 5430.

Lequiller, F. and D. Blades (2014), *Understanding the National Accounts: Second Edition*, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264214637-en

OECD (2009), "Taxation and Economic Growth", in: *OECD Economic Policy Reforms 2009: Going for Growth*, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/growth-2009-6-en

OECD (2015a), "Classification of the Functions of Government (COFOG)", in: *Government at a Glance 2015*, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/gov_glance-2015-68-en

OECD (2015b), *Government at a Glance 2015*, OECD Publishing, Paris.
DOI: http://dx.doi.org/10.1787/gov_glance-2015-en

OECD (2015c), *In It Together: Why Less Inequality Benefits All*, OECD Publishing, Paris.
DOI: http://dx.doi.org/10.1787/9789264235120-en

OECD (2015d), "New Standards for Compiling National Accounts: What's the Impact on GDP and Other Macro-economic Indicators?", *OECD Statistics Brief*, No. 20, February 2015.

OECD (2016), *OECD Economic Surveys: Euro Area 2016*, OECD Publishing, Paris.
DOI: http://dx.doi.org/10.1787/eco_surveys-euz-2016-en

Price, R. W., T. Dang and J. Botev (2015), "Adjusting Fiscal Balances for the Business Cycle: New Tax and Expenditure Elasticity Estimates for OECD Countries", *OECD Economics Department Working Papers*, No. 1275, OECD Publishing, Paris.
DOI: http://dx.doi.org/10.1787/5jrp1g3282d7-en