Fiscal Federalism in Four Federal Countries

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Abstract

This paper provides a characterization of the fiscal policy framework in four established federal countries with heterogeneous intergovernmental relations and demographic characteristics: Canada, Germany, Switzerland and the United States. We consider the implications of fiscal federalism from three different perspectives. First, we study the allocation of expenditure responsibilities and revenue generating instruments to different levels of government (federal, state and local) and discuss the role of intergovernmental transfers schemes and fiscal rules in each country. Second, we study the implementation of macroeconomic stabilization policy across different levels of government. Third, we discuss the evidence on the degree of inter-state risk sharing and the role of federal transfers in smoothing regional income shocks in federal countries. We conclude with the main implications to the euro area and to the debate on common fiscal instruments.

Key words: Fiscal federalism, fiscal union, risk sharing

JEL: F45, E62, H60, H70

Fiskaalinen federalismi neljässä liittovaltiossa

Tiivistelmä

Tässä raportissa tarkastellaan fiskaalista federalismia neljässä liittovaltiossa: Kanadassa, Saksassa, Sveitsissä ja Yhdysvalloissa. Fiskaalista federalismia lähestytään kolmesta eri näkökulmasta. Ensiksi tarkastellaan kuinka vastuu julkisten palveluiden tarjonnasta ja instrumentit näiden rahoittamiseksi ovat jakautuneet eri hallinnon tasoille (liittovaltio, osavaltiot ja kunnat) sekä keskustellaan hallinnonvälisten tulonsiirtojen ja finanssipolitiikan sääntöjen merkityksestä kussakin liittovaltiossa. Toiseksi tarkastellaan kuinka makrotaloudellista vakautuspolitiikkaa harjoitetaan eri hallinnon tasoilla. Kolmanneksi keskustellaan fiskaalisen federalismin ja tulonsiirtojen merkityksestä alueellisen riskinjaon näkökulmasta. Näiden kolmen näkökulman kautta raportissa vertaillaan liittovaltioiden fiskaalista federalismia euroalueen finanssipoliittisiin instrumentteihin ja finanssipoliitisiin sääntöihin.

Asiasanat: Fiskaalinen federalismi, fiskaaliunioni, riskinjako

JEL: F45, E62, H60, H70

1   Introduction

The sovereign debt crisis has renewed interest in deeper fiscal integration in the euro area. According to many policy makers and commentators, the combination of low labour mobility, price and wage rigidities and the lack of common fiscal instruments has imposed significant macroeconomic challenges for the euro area member countries that have been hit by asymmetric shocks during the crisis (see, f.e., Krugman 2012).[1] As a result, and in addition to proposed structural reforms in order to increase job market flexibility, many international institutions, policy makers and scholars have recently suggested various types of area wide fiscal instruments to mitigate problems related to asymmetric shocks and to increase the robustness of the monetary union (see, among others, Van Rompuy 2012, the IMF 2013, Wolff 2012, Caudal et al. 2013 and Bernoth and Engler 2013). The proposals range from a full-scale fiscal union with tax instruments given to the center to an area-wide unemployment insurance and different types of intergovernmental stabilization funds, which would provide fiscal transfers to countries hit by asymmetric shocks.

The concern for the adequacy of the present institutional framework in the euro area follows to a large extent from Friedman's (1953) analysis of the benefits of floating exchange rates and Mundell's (1963) and McKinnon's (1967) influential optimal currency area theory. These authors acknowledged that asymmetric shocks may impose significant challenges for a currency area in which the mobility of productive capital and labour is limited and prices and wages are inflexible in the short-run, but member states abandon the flexible exchange rate as a mechanism to adjust to country specific shocks. A common central bank may not stabilize economic activity in a country hit by an idiosyncratic or asymmetric shock without risking price stability in the currency union as a whole.

As a response to these seminal contributions, Kenen (1969) proposed that fiscal integration may mitigate problems related to labour mobility and price rigidities. Instead of the factors of production flowing over borders when regions are hit by asymmetric shocks, an active fiscal policy and fiscal transfers between regions may serve as a stabilizing tool and, in effect, as a sufficient condition for forming an optimal currency area. Indeed, this latter point of view forms the basis for much of subsequent literature and for the recent critique that has been placed on the present institutional framework in the euro area (see Krugman 2012, Farhi and Werning 2013). At present, the euro area has not adopted any significant common counter-cyclical fiscal instruments and the budget of the European Union amounts to about one per cent of the area wide GDP. Estimates suggests that the budget's stabilizing effect against asymmetric shocks is small, smoothing about one percentage point of disparities in

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[1]Similarly, many critiques considered the common currency a failed project when it was still in the making due to similar concerns (Jonung 2010).

member state income shocks (Furceri and Zdzienicka 2013).

Since the early contributions, the literature has acknowledged other important factors that affect the desirability of common fiscal instruments and their allocation within different levels of government. In particular, fiscal integration in a currency area may be considered as a compromise between different economic costs and benefits.[2] First, integration brings about potential instruments to insure member states against asymmetric shocks that may hit individual countries, as suggested above.[3] Second, integration carries benefits related to designing optimal distribution of work and fiscal instruments across different levels of government. For example, integration may increase efficiency in implementing policies that would be inadequately addressed in regional policy making. Third, with an integrated fiscal policy framework, spillover effects associated with regional fiscal policy shocks may be mitigated or internalized.[4] In addition, within a deeper integration, member states potentially gain from economies of scale in the production and provision of public goods, such as national security and co-operation in foreign policies, which, on the other hand, are not directly related to cyclical policies or otherwise required to fulfill any optimal currency area criteria.

However, common fiscal instruments and the implicit mutual insurance related to shared stabilization tools and fiscal transfers bring about the problem of moral hazard. Joint liabilities, such as jointly issued treasury bonds, intergovernmental transfers and jointly guaranteed debts, potentially have an effect on national governments" incentives to implement reforms or fiscal measures that are politically costly in the short-run, but which might be necessary for longer-term sustainability. Additional fiscal slack brought about by fiscal integration may hence decrease aggregate discipline and fiscal effort. As a consequence, the problems related to moral hazard may undermine the potential benefits of fiscal integration, even if there was significant cross-border solidarity. A further challenge, and an aggravating factor, for designing optimal common fiscal instruments in a currency area arises if the preferences of national governments on the degree and quality of public goods and services are heterogeneous.

Despite these potential drawbacks, many existing federal countries have, in effect, adopted highly integrated fiscal systems and policies in which regional states and their citizens implicitly (and explicitly) assume each others liabilities. Further, for example in Canada and Switzerland, fiscal integration has been combined with considerable cultural and linguistic heterogeneity. The observation that these federal countries have not fallen into similar systemic and existential crisis as the euro area countries in the post-2007 crisis suggests that they

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[2]See Spolaore (2013) for more a detailed discussion of the fiscal integration in the European context.

[3]Farhi and Werning (2013) show that the value of inter-regional insurance is greater for countries that are part of a currency area.

[4]Spillovers include, for example, output spillovers from fiscal policy shocks, see Auerbach and Gorodnichenko (2012), Hebous and Zimmermann (2013) and Carlino and Inman (2013).

have been able to resolve some of the problems that the euro area is believed to potentially face in case of further fiscal integration.[5]

In light of this debate, the aim of this paper is to provide an empirical investigation of the fiscal policy framework and its implications on fiscal policy making, stabilization and risk sharing in four federal countries: Canada, Germany, Switzerland and the United States. These countries constitute a heterogeneous sample to illustrate different strategies to fiscal federalism and, as a consequence, a starting point for the debate about potential fiscal instruments for the euro area. The paper consists of three sections. First, we illustrate the differences in the expenditure responsibilities and revenue instruments allocated to federal and state governments and discuss how each country has aimed to implement fiscal discipline at the state level in order to constrain potential moral hazard. Second, we provide evidence on how fiscal policy is implemented at different levels of government over the business cycle. Third, we discuss the evidence on inter-regional risk sharing in federal countries and their relation to the allocation of fiscal instruments.

2 Fiscal Framework in Federal Countries

In this section, our primary aim is to characterize fiscal federalism in present federal countries. To anchor our analysis to the literature on fiscal federalism we first motivate the allocation of fiscal instruments to different levels of government on a general level. During our analysis we distinguish between three levels of government: the federal or the central government, state governments and local governments, but to make the comparison to euro area explicit, in many cases we refer to the state and local governments as sub-central governments as is usual in the literature.

2.1 Fiscal Federalism and the Conventional Wisdom

The literature on fiscal federalism studies which level of government is responsible for providing public goods and services and which level of government is responsible for collecting the revenues to fund them.[6] In other words, fiscal federalism broadly considers the vertical structure of the public sector, fiscal policy institutions and their interdependence.[7] While

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[5]In particular, individual states in federal countries have not fallen into similar financial troubles or been cut out from the market for liquidity while many of the euro area periphery countries have resorted to non-market sources of borrowing to cover public expenditures.

[6]Oates (1999) provides a concise survey of this literature. See also Oates (1972).

[7]As commonly reminded by the authors in this literature (see Oates 1999), it needs to be noted that in fiscal federalism, the term "federalism" is not directly related to federalism as it is conventionally regarded in political considerations. Rather, fiscal federalism concerns the inter-relationship between different levels

several political factors may affect the desirable allocation of tasks and resources, the eco-
nomic aspects emphasized in the literature and faced by designers of intergovernmental fiscal
relations consists of four main component.

First, it needs to be determined to which level of government different expenditure respon-
sibilities are assigned. The conventional starting point is that local governments hold more
detailed information on the preferences of their citizens than any higher level of government
and that, as a consequence, it is in their competence to provide many of the public goods and
services to their own citizens. In general, this suggest that public goods and services should
be provided by the lowest possible level of government. This consideration is also implicit
in the European Union subsidiarity principle and fiscal decentralization in most sovereign
countries. However, according to the conventional view, policies concerning macroeconomic
stabilization and redistribution should be left primarily for a higher level of government, such
as the federal government, as they serve national interests and are less likely to be adequately
dealt with decentralized policy due to free-riding or competition among jurisdictions.[8] In ad-
dition, policies that induce significant spillover effects to other jurisdictions could justify
assigning particular tasks to the central government.

Second, one needs to determine the strategy to finance a given level of public goods and
services. The starting point is that the level of government that is responsible for provision
of a particular good or service should also be responsible for its funding and collecting the
necessary revenue. In this case, it is more likely that the provider bears the full costs related
to provision and, as a consequence, moral hazard is limited.[9] As different types of tax
instruments have heterogeneous characteristics, for example due to differences in the mobility
of their tax base, the instruments should be allocated to the level which is most effective in
raising the revenue. Thus, tax instruments should be assigned so that each government could
realistically collect sufficient tax revenues. In practice, different levels of government are only
rarely self-sufficient in terms of financing their legal responsibilities.

Third, and as a consequence of the previous, one needs to determine the appropriate
instruments (and their degree) to equalize disparities in fiscal resources and fiscal needs, both
over time and across jurisdictions. In most federal systems there exist both vertical transfers,
in which there are transfers from different levels of government to each other, and horizontal
transfers, in which there are transfers within the same level of government. The differences
between revenues and expenditures are called vertical and horizontal fiscal imbalances, or

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of government in a fiscal sense. These considerations are common to all countries in which the policy making
is decentralized at any degree.

[8]This would be the case if, for example, regional governments could free-ride on other regional governments
favorable policies or there would exists a so-called race to the bottom in some tax rates.

[9]For example, Eyraud and Lusinyan (2013) suggests that low vertical fiscal imbalances are associated with
improved general government budget balance.

fiscal gaps. Borrowing and different types of transfers (including tax sharing, conditional and unconditional grants and transfers based on demographic factors) are alternative instruments to stabilize the imbalances in revenues and government expenditures over time.

Fourth, and to the extent that the vertical design does not impose fiscal discipline to an adequate degree, one needs to adopt strategies to cap excessive spending and borrowing at each level of government. The logic is mainly to avoid fiscal free-riding and moral hazard: given the interconnected area and fiscal framework, governments may implement policies that have negative spillover effects on other jurisdictions and regions. Governments may also aim to benefit from transfers from other regions. In all of the federal countries there exists some form of fiscal rules and governance with respect to budget deficits and borrowing, but the strategies differ.

Finally, it needs to be noted that in many respects the allocation of responsibilities and instruments to different levels of governments is never so clear cut as there is always some degree of overlapping. For example, many government responsibilities are either shared between the federal and state governments or their actions are coordinated. In addition, harmonization in tax bases and national standards imply that fiscal instruments are not always fully adjustable to regional preferences even if the instruments were solely assigned to their own use. Acknowledging these limitations, our aim is next to elaborate the allocation of fiscal instruments in Canada, Germany, Switzerland and the United States by highlighting the most important characteristics and differences.

2.2   Allocation of Responsibilities

In order to understand the differences in the allocation of tasks across federal countries it is necessary to first look at the primary orders of magnitude. Figure 2.1 shows the government expenditure as a share of GDP for federal, state and local levels of government. It shows that the federal governments tend to be responsible for the most significant part of general government expenditure, amounting to more than 15% of GDP in all countries. This suggests that all four federal countries are to a significant degree centralized unlike mere currency union such as the euro area. Yet, the role of each level of government differs importantly also across federal countries. In Canada, the provincial governments have a much more significant role than in any other federal country of our sample.[10] On the other hand, if we look at the sub-central governments combined, responsibilities are to a significant degree decentralized also in Switzerland and to a lesser extent in the United States. Based on this same metric, Germany is the most centralized among the four countries as the share of responsibilities

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[10]In the United States the central and state governments have an equal weight in total expenditures, but this masks the fact that in our data the state government also includes local governments.

Figure 2.1: Government Expenditure, % of GDP (1990-2011 average)
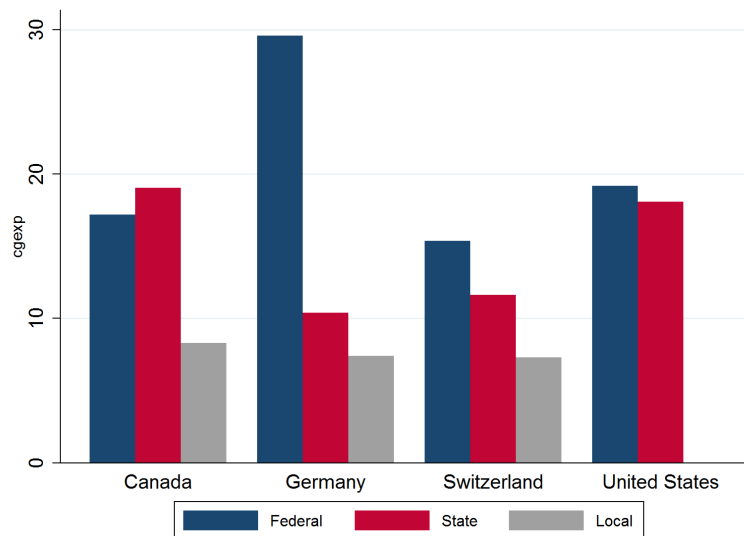
assigned and governed by its central government the is largest, both as a share of GDP and as a share of total government expenditure.

The differences in the shares of government expenditure across government levels reflect the responsibilities allocated to them. Table 2.1 provides an overlook on the significance of different types of expenditure categories for each level of government in the four federal states. In general, the federal government is responsible for financing general public services (including, f.e., executive and legislative organs, fiscal affairs, external affairs, research and debt expenses), national defense and social protection, most of which have either a national objective or a non-individual public good character. Sub-central governments, on the other hand, are responsible for providing services that have a local character, such as education, public order and safety, environment protection, housing, transportation and recreation and cultural activities. In these respects, the allocation appears to be in line with the subsidiarity principle.

Yet, the allocation of some of the main responsibilities also differs importantly across federal countries, which accounts for the observed differences. First, there are differences in the organization of health care, which is one of the main expenditure categories in public sector (see Paris et al. 2010). In part, the organization reflects demographic characteristics. In Canada, public health care is the responsibility of the provinces and there are some important differences in its coverage across provinces. On average the provincial health care

Table 2.1: Government Expenditure by Function Across Government Levels (% of Potential GDP)

	Canada				Germany				Switzerland				United States		
	Central	State	Local	Total	Central	State	Local	Total	Central	State	Local	Total	Central	State	Total
General public services	8.06	3.50	0.87	10.70	4.26	3.58	1.28	6.35	2.70	1.44	1.26	3.64	3.48	2.23	5.68
Defense	1.26	0.00	0.00	1.26	1.25	0.00	0.00	1.23	0.92	0.04	0.04	0.99	4.28	0.00	4.24
Public order and safety	0.69	0.68	0.68	1.77	0.14	1.22	0.28	1.60	0.17	1.12	0.42	1.68	0.29	1.76	2.02
Economic affairs	1.33	2.10	1.05	3.85	2.65	1.66	1.03	4.33	2.41	2.03	1.07	4.48	1.46	2.76	3.76
Environment protection	0.13	0.10	0.43	0.57	0.08	0.12	0.58	0.76	0.13	0.11	0.47	0.66	0.00	0.00	0.00
Housing and community amenities	0.27	0.35	0.48	0.95	0.21	0.37	0.45	0.89	0.01	0.04	0.17	0.20	0.49	0.38	0.73
Health	0.56	6.83	0.10	6.44	6.17	0.28	0.16	6.54	0.04	1.70	0.26	1.97	4.75	3.71	6.99
Recreation, culture and religion	0.36	0.23	0.54	0.97	0.06	0.28	0.54	0.82	0.08	0.28	0.53	0.88	0.04	0.27	0.30
Education	0.50	5.27	3.61	8.07	0.17	3.28	1.15	4.25	0.89	3.78	1.90	5.91	0.53	5.81	6.07
Social protection	8.23	3.29	0.52	10.36	20.10	2.49	2.25	20.59	13.01	2.61	1.32	13.18	6.89	1.16	7.41
Total	21.39	22.35	8.28	44.95	35.08	13.29	7.73	47.37	20.35	13.15	7.43	33.60	22.21	18.07	37.21

Source: OECD National Accounts and U.S. Bureau of Economic Analysis (http://www.bea.gov/national/sna.htm) and author's calculations.

Note: Canada (1990-2006), Germany (1991-2011), Switzerland (2005-2011), United States (1990-2011). All figures are averages of the time period considered.

expenditure amounts to close to 7% of GDP. In Germany, health care (6% of GDP) is funded by a compulsory health insurance and collected from income related social contributions. The funds are pooled at the central level and redistributed to individual insurance funds on the basis of the characteristics of the people that belong to their pool respectively. In addition, the federal government supports the health insurance for the disadvantaged while people with high earnings may opt for a private insurance scheme. In Switzerland, the basic health insurance is compulsory and uniform for all across the federal country, but privately funded and provided by insurers that operate at the cantonal level. Hence, the significance of health care costs is small, amounting to to less than 2% of GDP. In the United States, the provision of health care is mostly private and funded from private health insurance which is mostly linked to employer contributions. Public health care contributions (such as Medicare and Medicaid) are financed by both federal and state governments, amounting to 7 per cent of GDP in total despite their non-universal coverage. Overall, these differences in the degree of public health care coverage and their provision at different levels of government explain a significant part of the expenditure differences between federations.

Another important difference between the countries, and more significantly from the point of view of the optimum currency area literature, is the provision of unemployment insurance. In all countries, there is a certain degree of central government funding in the form of central government backstop for unemployment benefits and some form of harmonization, which is consistent with the macroeconomic stabilization aims at the central level. In addition, job centers and employment offices are supported by the federal government. In Canada, Germany and Switzerland, the unemployment insurance is administered by the federal government and financed by contributions from employers and employees. In contrast, the unemployment insurance in the United States is funded by both the federal and state governments and it is less harmonized (see, f.e., Shaw and Stone 2012). In principle, each state provides the basic unemployment insurance to its own citizens and has considerable discretion on its level, eligibility criteria and duration. The federal government supports the states by covering administrative costs and, in the case of severe economic downturns, by funding extended unemployment benefits. Hence, the federal government effectively provides an active counter-cyclical stabilization tool in recessions. This was the case, for example, during the recent economic crisis when extended unemployment insurance schemes were introduced.

2.3   Allocation of Revenue Generating Instruments

Total revenues for governments consist of three main sources: tax revenues, user fees and inter-governmental transfers. In addition, each level of government may potentially borrow to smooth revenues and expenditures over time and within the limits of their mandate. We

Figure 2.2: Government Revenue, % of GDP (1990-2011 average)
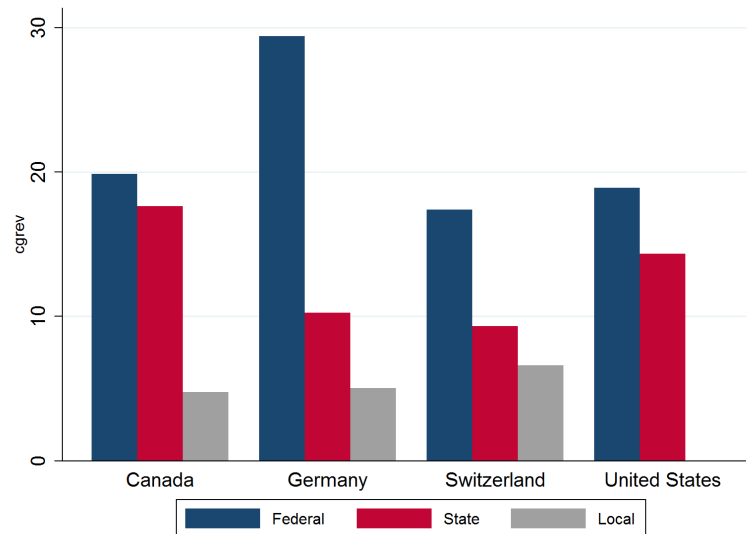
Source: OECD Fiscal Decentralization Database and OECD Economic Outlook.

begin by discussing the governments' own revenue instruments (i.e. tax revenues and user fees) and proceed to other instruments in the following section.

There are three main considerations with respect to tax revenues that needs to be solved: i) which level of government levies taxes and by how much, ii) which of the available tax instruments are assigned to each level and iii) what degree of autonomy each level of government has in determining the use of its tax instruments. We will next discuss these three element each in turn.

Firstly, to put the figures on perspective, in all four federal countries the federal government collects most of the total tax revenues (Figure 2.2). In Germany and in the United States central government tax revenues comprise 70% and 64% of total tax revenues, correspondingly. In Canada, the state government's share of total tax revenues is the highest (39%) and that of central government (51%) the lowest among the four counties. Indeed, the orders or magnitude are similar to government expenditure, which suggests that a significant degree of expenditures are financed by governments' own revenue. However, the significant degree of centralization in government revenue has important implications with respect to individuals states and the efficacy of taxation. In particular, it implies that individual states and regions are to a significant degree sheltered from regional shocks that might affect their tax revenues. A decline in regional economic activity decreases regional tax revenues, but it is compensated by a higher share of revenue from other regions. While the extent of this risk

sharing channel is necessarily affected by the specific mix of the fiscal instruments, which we discuss below, this is in contrast to the euro area where, in practice, all tax revenue is collected by the member states.

Secondly, the allocation of tax instruments differs in each country (see Table 2.2 which shows tax revenues by tax instrument for each level of government). The table shows that the federal government (including social security funds) collects most of its tax revenue from direct taxes (taxes on personal income, corporate profits etc.) and social security contributions. This is especially the case in Canada and in the United States where these instruments account for the majority of federal government tax revenues. The sensitivity of these revenue sources to the business cycle (corporate taxes in particular), implies that these instruments serve as significant risk sharing devices against regional shocks, but also as counter-cyclical automatic stabilizers in the case of national shocks. In contrast, this effect is less significant in Switzerland where personal income taxation is assigned primarily to the state governments.

Further, there are some differences in the allocation of taxes on goods and services. They constitute a significant source of revenue for state and provincial governments in Canada and the United States but, in contrast, they are a significant source of federal government revenue in Germany and Switzerland. Compared to state and federal governments, local governments rely significantly on property taxes which are considered to have the least mobile tax base. In the U.S. and Canada, where the significance of property taxation is higher than in Switzerland and Germany, property taxes constitute the highest source of total tax revenues for local government. Overall, there is a clear qualitative difference in how tax instruments are allocated across government levels. In particular, sub-central governments tend to collect taxes that have a less mobile tax base (property taxes and consumption) and central governments collect taxes that have relatively mobile tax bases (personal income, capital and corporations).

Thirdly, one needs to assess the autonomy of governments in taxation. In particular, the aggregate figures mask differences in the degree that sub-central governments may implement discretionary tax measures. Table 2.3 illustrates the taxing power of sub-central governments. It shows some important differences between countries. On the one hand, state governments have a high degree of independence in determining their fiscal instruments and their use in Canada, Switzerland and the United States. This is due to the fact that their tax instruments consist of instruments that are assigned primarily for their individual use or, alternatively, that their respective share of the particular tax instrument is under their sole discretion. In Switzerland, for example, cantons have a high level of autonomy in imposing and levying taxes that are not specifically assigned to the federal government level and may adjust rates

Table 2.2: Tax Revenues by Tax Category Across Government Levels (% of Potential GDP)

	Canada				Germany				Switzerland				United States			
	Central	State	Local	Total	Central	State	Local	Total	Central	State	Local	Total	Central	State	Local	Total
Income, profits and capital gains	10.35	6.04	0.00	16.39	4.47	4.10	2.21	10.78	3.38	5.16	3.86	12.40	10.20	2.15	0.21	12.56
Of individuals	7.89	4.94	0.0	12.83	3.98	3.62	1.67	9.27	1.55	4.17	3.26	8.98	8.06	1.81	0.17	10.04
Corporate	2.12	1.10	0.0	3.22	0.49	0.48	0.54	1.51	1.00	0.84	0.48	2.32	2.14	0.34	0.04	2.52
Social security contributions	4.45	0.51	0.00	4.96	14.24	0.00	0.00	14.24	6.88	0.00	0.00	6.88	6.72	0.00	0.00	6.72
Payroll and workforce	0.00	0.73	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On property	0.00	0.69	3.02	3.71	0.01	0.44	0.48	0.92	0.64	0.97	0.63	2.24	0.21	0.17	2.73	3.11
Goods and services	3.61	5.02	0.06	8.69	6.78	3.39	0.12	10.37	5.44	0.48	0.05	5.97	0.86	3.07	0.82	4.75
Other	0.00	0.00	0.22	0.22	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tax revenue	18.42	12.98	3.29	34.69	25.50	7.93	2.81	36.43	16.35	6.60	4.54	27.49	17.98	5.38	3.77	27.13

Source: OECD Tax Statistics and author's calculations.

Note: Figures based on 1990-2011 average.

Table 2.3: Taxing Power of Sub-Central Governments

	Canada		Germany		Switzerland		United States	
	State	Local	State	Local	State	Local	State	Local
Full discretionon rates and reliefs	90.8	1.9	0	0	100	1.5	100	0
Full discretionon rates	0	96.4	0	14.1	0	0	0	0
Restricted discretion on rates	0	0	0	44.7	0	97.4	0	0
Tax revenue split with SCG consent	1	0	89.4	40.4	0	0	0	0
Other	8.1	1.7	10.6	0.8	0	1.1	0	100

Source: OECD Fiscal Decentralization Database.

Note: Share of total tax revenues that falls on each category respectively. The data refers to 2008.

and deductions according to their own discretion (see Frey and Wettstein 2008). In contrast, the starting point in Germany is that the tax rates and the tax instruments assigned to the states are determined at the central level in mutual agreement with other state governments (Hepp and von Hagen 2009). Further, the collected tax revenues are thereafter shared by different levels of government (see below). This is despite the fact that individual state governments are responsible for collecting the tax revenues.

In addition to tax revenues governments may also collect revenue from user charges. Specifically, user charges constitute a significant source of revenue for sub-central governments that are responsible for services that are provided locally for individuals, but they provide a negligent source of total federal government revenue. This is consistent with the traditional view on the desirable allocation of resources: services that are delivered locally are financed locally. However, there also exist significant differences across countries in the extent that user charges are effectively used. For example, user fees are much more significant in the United States and Switzerland than in Germany.

2.4   Intergovernmental Transfers

In all federal countries there exists some degree of vertical fiscal imbalances, i.e. governments' own expenditure is not matched by own revenue. This is illustrated in Figure 2.3, which shows the vertical fiscal gap (or vertical fiscal imbalance) in the four countries. We define the fiscal gap as the difference between consolidated government expenditure and consolidated revenues.[11] Thus, positive values are associated with government expenditure exceeding total own revenues for the respective level of government, and negative values are associated with

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[11]We define consolidated government expenditure as the total expenditure for each level of government less the intergovernmental transfer expenditure. Similarly, consolidated government revenue is defined as the total revenue for each level of government less intergovernmental transfer revenue.

Figure 2.3: Vertical Fiscal Gap (% of Potential GDP, 1990-2011)
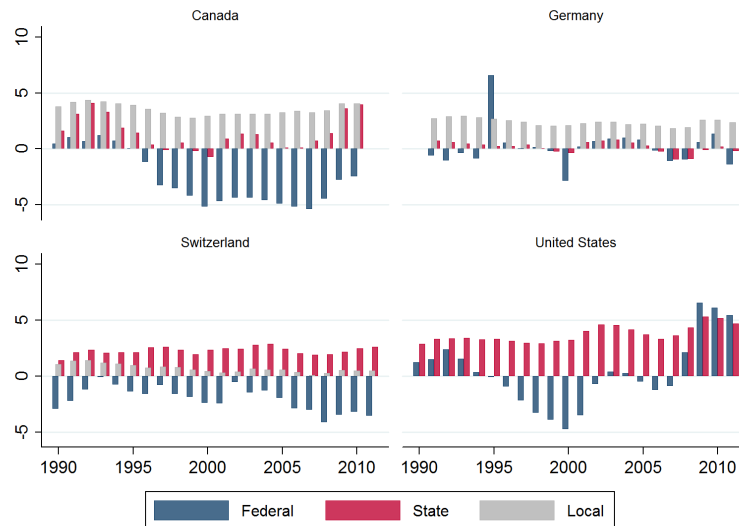
Note: Vertical fiscal gap is defined as the difference between consolidated government expenditure and consolidated government total revenues. Source: OECD Fiscal Decentralization Database and OECD Economic Outlook.

government own expenditure being less than total revenues for the same respective level of government. The figure displays a clear pattern in which sub-central governments tend to collect less own revenues than is necessary for providing the services assigned to them. The gap is most significant in Canada and the United States.[12] In contrast, we see that the vertical gap between central and state governments in Germany is much less significant. This is mostly due to the tax sharing arrangements between state and federal government, and hence not directly comparable to the other countries.[13] Further, the Figure 2.3 also suggests that the fiscal gap for sub-central governments tends to be relatively stable as compared to the federal government fiscal gap.

The vertical gap may be financed either through borrowing or intergovernmental transfers, but the former is only significant in smoothing differences in the medium-term. Indeed, intergovernmental transfers constitute a significant source of sub-central government revenue (see Table 2.4). On average, 20% of state government revenues consist of inter-governmental transfers. For local governments, the share varies from 43% in Canada to 11% in Switzerland.

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[12]For the latter, the deterioration of central government balance during the recent financial crisis has also resulted in positive gap also at the central government level, but this should be regarded mainly as a cyclical imbalance rather than as an indication of structural *vertical* imbalance.

[13]If we account for the fact that a significant part of the tax revenues are shared, we may conclude that vertical imbalances are indeed largest in Germany. See, for example, Eyraud and Lusinyan (2013).

Table 2.4: Intergovernmental Transfers (% of Potential GDP, 1990-2011)

	Canada			Germany			Switzerland			United States	
	Central	State	Local	Central	State	Local	Central	State	Local	Central	State
Transfer Rev.	0.07	3.66	3.42	0.27	2.19	2.71	0.42	3.29	0.80	0	3.08
Transfer Exp.	3.68	3.45	0.02	1.96	2.89	0.32	2.75	1.22	0.54	3.08	0
Net Rev.	-3.61	0.21	3.40	-1.69	-0.70	2.39	-2.33	2.07	0.26	-3.08	3.08

Source: OECD Fiscal Decentralization Database, author's own calculations.

Most of the transfer payments are based on conditional transfer schemes to address specific needs or fiscal equalization payments from region to other in order to equalize fiscal capacity (see the Appendix).

However, there is some heterogeneity in how the burden of intergovernmental transfer are allocated. For example, Germany and Canada have adopted different approaches to fiscal transfers. Canadian transfer payments are primarily vertical. The amount of transfers is first determined at the central level from which they are distributed to state governments which may thereafter make transfers to local governments. In Germany, on the other hand, the transfer payments are primarily horizontal, i.e. the high-income states make transfers to low-income states. In part, this is explained by the structural differences in German states after the unification, but the transfer payments are essentially based on the inter-state solidarity. These institutional differences are visible in Table 2.4 which shows that central government is the main contributor to transfer payments in Canada, Switzerland and the United States, but that the main contributors in Germany are state governments.

2.5   Fiscal Rules and Borrowing

There are two main approaches to constrain fiscal policy activity and excessive deficits in the four federal countries. First, in Canada and in the United States the approach is primarily market based. The state level fiscal policy is constrained by balanced budget rules that have been self-imposed by most states (Henning and Kessler 2012). The rules are not always formal nor do they necessarily encompass all state-level spending. Fiscal discipline is enforced by the federal government as in both countries there exists a so-called no-bailout rule, which prohibits federal government intervention to individual states in the case of excessive deficits and debt. The rule has proved effective and credible in that it has left markets to discipline state government borrowing (Bayoumi et al. 1995, Bohn and Inman 1996 and Schuknecht et al. 2009), with some rare exceptions during their rather long history (see Henning and Kessler 2012).

This is in contrast to the second approach, adopted in Germany and Switzerland, where the center imposes fiscal rules on sub-central governments. In both countries state level fiscal policy is to be constrained by a so-called debt brake rule (see Kirchgässner 2013 for Switzerland and Deutsche Bundesbank 2011 for Germany). The debt break rule posits that state governments are not allowed to have structural budget deficits, i.e. the state budget should be in balance when corrected for the effect of business cycle on its budget. If consistently estimated in real-time and honored in practice, the structural budget balance mechanically prevents the accumulation of excessive debt burdens at the state level. However, in both countries state governments have still been left some room for maneuver when it comes to the implementation of this rule. The experience from the effectiveness and credibility of the debt break rule is still relatively scarce as the Swiss rule came into force only in 2001 at the federal level and cantons adopted the rules only gradually after that. On the other hand, Germany introduced the debt brake rule to the constitution in 2009 and is only to take effect gradually in the years to come. Some early evidence, however, suggest that the Swiss state level fiscal rules have decreased both federal and state level deficits when compared to the old regime (Feld and Kirchgässner 2006 and Feld et al. 2013).

Prior to the recent modifications to the legislation and the debt brake rule, both Germany and Switzerland had fiscal rules that could be best described as soft budget balance rules. There was no centrally imposed and effective no-bailout rule. The interest rate spreads on state level borrowing showed no clear responses to fiscal deficits, indicating implicit trust that states would benefit from additional fiscal transfer or that they would be bailed out in case of excessive debts (see, f.e., Schukenect et al. 2009 and Heppke-Falk and Wolff 2008). Indeed, for example, the states of Saarland and Bremen were bailed-out by the federal government in 1992 on the basis that their high debt levels were caused by economic developments not under their own control (Seitz 1999).

The centrally-imposed approach to fiscal governance is also the dominant strategy in the euro area, where fiscal rules are, in practice, imposed by the (supranational) center and individual member countries may not opt out. The rules have become increasingly multidimensional and, at present, concern the amount of sovereign debt, general government deficits and structural balance, the latter of which is part of the recent fiscal compact enshrined in member state legislation. However, the common wisdom on the effectiveness of these centrally imposed fiscal rules has become notorious. On the one hand, the rules were breached during the first decade of the currency union, both in the form of excessive deficits and bail-out programs during the recent economic crisis. On the other hand, market reactions to budget deficits in the euro area countries were deemed inadequate to serve as market based constraints in national fiscal policy (see, f.e. de Grauwe and Yi 2012), implying that the

Figure 2.4: Gross Debt (1990-2011)
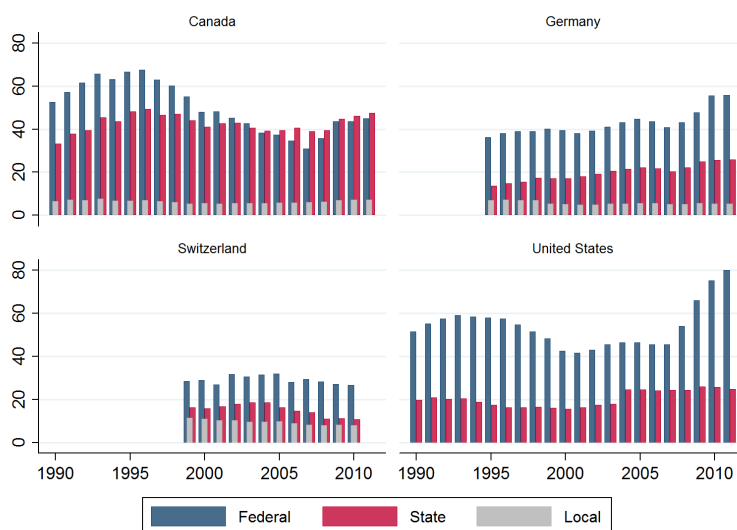
Source: OECD Fiscal Decentralization Database and OECD Economic Outlook.

no-bailout rule embedded in the Stability and Growth pact was not credible.[14]

Yet, it needs to be noted that there is an important difference in the fiscal rules in the euro area when compared to federal countries. Since the responsibilities of euro area member states are much larger than those of individual states in any of the federal countries (and due to the fact that individual countries are responsible for the significant majority of transfers to their citizens), the fiscal rules in the euro area apply to a much larger entity than the partial state entity in any federal country considered in our study. Also, while in the euro area member states are responsible for their sovereign debt and no common debt instruments exist at present, in federal countries the federal government holds the majority of the debt (see Figure 2.4). We will next concentrate on aspects related to stabilization policies in more detail and this will make the point also more clear.

3   Fiscal Policy Across Government Levels

While in the euro area sovereign member states are responsible for implementing fiscal policy, federal countries may allocate fiscal policy and counter-cyclical stabilization policies across

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[14]Yet, it is notable that the empirical evidence on the effectiveness of market discipline in the euro area was not as clear prior to the economic crisis (see, f.e., Schuknecht et al. 2009). Indeed, it appears that there might have been some non-linearities in the discipline imposed by sovereign spreads.

different levels of government. Thus, our aim is next to illustrate the degree of stabilization policy implemented at different levels of government in the four federal countries. This serves to address a central topic in the active debate about the common fiscal instruments and the role of national fiscal policy in the euro area. Also, while the cyclicality of general government fiscal policy has been studied extensively in the literature, so far there is relatively little empirical evidence on fiscal cyclicality across different levels of government. We propose a simple, traceable analysis and take advantage of the data available by different levels of government. At this stage, we do not consider explicitly how cyclicality affects horizontal interrelationship and how fiscal policy is implemented in response to idiosyncratic shocks, but concentrate on the aggregate fiscal responses over the business cycle.

3.1   Fiscal Policy Over the Business Cycle

Following the previous literature on fiscal cyclicality (see, f.e., Galí and Perotti 2003 Lane 2003, Fatás and Mihov 2010 and Bénétrix and Lane 2013), we study the cyclical responsiveness of fiscal policy across government levels by estimating a simple model

$$BB_t^g = \alpha_i^g + \beta_1 Y_{i,t}^{GAP} + \beta_2 BB_{i,t-1}^g + \beta_3 D_{i,t-1}^g + \varepsilon_{i,t},$$

where BB is the budget balance to GDP, Y^{GAP} is the output gap to trend GDP, D is the government total liabilities (i.e., gross debt), α is the country fixed effect and $G \in \{Federal, State, Local\}$. We employ the data from the OECD Fiscal Decentralization Database and OECD Tax Statistics, which available for the three levels of government (see Table A.5 in the Appendix). To approximate the output gap we employ a standard Hodrick-Prescott filter to the GDP data.[15] We estimate the model for each level of government individually in a panel of the four federal countries. Thus, within this model specification, the coefficient β_1 captures the effect of automatic stabilizers as well as systematic policy responses to cyclical conditions, i.e. the systematic policy response over the business cycle. The coefficients β_2 and β_3, on the other hand, capture the persistence of fiscal policy and government debt stabilization aims respectively. [16]

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[15]The results are not sensitive to alternative estimates of the output gap (in this case, the OECD estimate), but we decide to take advantage of the larger sample for trend GDP data.

[16]If fiscal policy shocks have real effects on economic activity within a year, the results do not have any structural interpretation. To control for the endogeneity problem, previous studies have instrumented the output cycle with alternative instrumental variables. For example, Fatas and Mihov 2010 and Galí and Perotti 2003 instrument the output cycle with t-1 output gap, share of industrial production as a share of GDP.

Table 3.1: Cyclicality of Fiscal Policy

	Full Sample			Pre-Crisis[A]		
	(1)	(2)	(3)	(4)	(5)	(6)
	Federal	State	Local	Federal	State	Local
Y_t^{GAP}	0.314***	0.112***	0.014	0.263***	0.092***	-0.000
	(0.063)	(0.030)	(0.010)	(0.063)	(0.034)	(0.011)
BB_{t-1}	0.801***	0.571***	0.737***	0.780***	0.588***	0.759***
	(0.053)	(0.082)	(0.100)	(0.054)	(0.090)	(0.107)
D_{t-1}	0.030**	-0.001	-0.015	0.036***	0.004	-0.019
	(0.012)	(0.008)	(0.018)	(0.011)	(0.009)	(0.019)
constant	-1.717***	-0.250	0.072	-1.933***	-0.344*	0.124
	(0.484)	(0.192)	(0.124)	(0.480)	(0.203)	(0.132)
N	109	109	68	94	94	57
R^2	0.757	0.532	0.704	0.757	0.509	0.741

[A]: Sample period restricted to pre-financial crisis (1970-2007).

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.1 shows the estimates of fiscal policy over the business cycle when we pool all countries together. First, it shows that central government has the most significant responsibility for cyclical fiscal policy or systematic counter-cyclical fiscal policy (automatic stabilizers+discretionary policy within a year). This is reflected in the positive sign of the coefficient on Y_t^{GAP}. This is consistent with the fact that in most of our sample countries the federal government revenues consist of the most cyclical revenues (corporate taxes and income taxes and social security contributions that are related to movements in unemployment) and also with the conventional wisdom that central government should be responsible for macroeconomic stabilization. Second, we may note that state governments tend to implement counter-cyclical fiscal policy, as reflected in positive, yet smaller coefficient on Y_t^{GAP}. This is consistent with the distribution of labour and cyclicality of tax revenues at the state level as well as with the state level fiscal rules. Finally, and in contrast to the higher levels of government, local governments practically maintain constant budget balances over the business cycle. The coefficient is small and clearly insignificant. This is consistent with the fact that local governments attain most of their funds from property taxes and intergovernmental revenues which are largely non-cyclical and that stabilization policies implemented at local level are not likely to have considerable or desirable effects.

The business cycle is not the only determinant of movements in fiscal policy. First, the debt stabilizing effect captured by the positive and significant coefficient on D_{t-1} is significant

for the federal government, consistent with the relatively higher share of debt held by federal governments as opposed to sub-central governments. Second, within all levels of government, there exists some degree of persistency in deficits, which is captured by the term BB_{t-1}. The persistency suggests that many of the effects in observed balances are determined prior to the realized economic activity. In particular, as many of the decisions that concern government budgets must be prepared in advance and the implementation of new legislature takes some time, many of the discretionary measures are likely to lag observed economic activity.

Even though the recent crisis induced significant discretionary fiscal policy actions, the estimates are not driven by the recent crisis (see Figure 3.1 right panel). By restricting the sample to the period prior to 2008 and the onset of the global financial crisis, we find essentially similar qualitative results, though the cyclical responsiveness is somewhat lower for all levels of government which is consistent with the exceptional nature of the recent crisis and the discretionary fiscal action that followed.

Table 3.2: Cyclicality of Government Expenditure and Tax Revenues

	Government Expenditure			Tax Revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
	Federal	State	Local	Federal	State	Local
Y_t^{GAP}	-0.546***	-0.200*	-0.394***	1.332***	1.298***	0.402
	(0.192)	(0.104)	(0.144)	(0.202)	(0.156)	(0.264)
G_{t-1}	-0.229***	0.112	0.290**	0.210**	0.0960	0.174
	(0.0777)	(0.0909)	(0.111)	(0.0809)	(0.0784)	(0.124)
D_{t-1}	-0.163***	-0.125***	-0.0598	0.0406	-0.0614	0.350
	(0.0344)	(0.0320)	(0.176)	(0.0358)	(0.0442)	(0.417)
constant	9.986***	5.658***	1.849	-0.0437	3.857***	-0.698
	(1.553)	(0.940)	(1.338)	(1.586)	(1.198)	(3.036)
N	107	107	67	102	95	65
R^2	0.266	0.233	0.206	0.358	0.463	0.090

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.3: Cyclicality of Net Intergovernmental Transfers

	(1) Federal	(2) State	(3) Local	(4) Federal	(5) State	(6) Local
Y_t^{GAP}	-0.000813	0.0144	-0.0234***	-0.00242	0.0164	-0.0245***
	(0.0124)	(0.0120)	(0.00883)	(0.0124)	(0.0119)	(0.00882)
first lag	-0.00283	-0.188**	-0.102	-0.00622	-0.175*	-0.0517
	(0.0996)	(0.0925)	(0.110)	(0.0994)	(0.0918)	(0.115)
Y_{t-1}^{GAP}				0.0149	-0.0214*	0.0128
				(0.0122)	(0.0119)	(0.00924)
constant	-0.0126	0.0192	-0.00841	-0.0113	0.0175	-0.00689
	(0.0223)	(0.0216)	(0.0157)	(0.0223)	(0.0214)	(0.0156)
N	113	118	78	113	118	78
R^2	0.000	0.043	0.101	0.014	0.070	0.124

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

If we break down the budget balance by its main components and look at the cyclical policies on government spending, tax revenues and intergovernmental transfers, we may note that the assignment of cyclical fiscal instruments to the central level mostly accounts for the main differences (see Table 3.2).[17] First, both government spending and tax revenues are more counter cyclical at the federal level than at other levels of government. Most of the counter cyclical fiscal policy comes through cyclicality in tax revenues. In particular, the coefficient on the output gap for federal tax revenues is more than double that of federal expenditure. Combined, these two movements yield a much larger cyclical response at the federal level than at other levels of government. Second, we may note that intergovernmental transfers, which constitute a significant source of sub-central government revenue, are largely non-cyclical (see Table 3.3). In particular, it is clear that while intergovernmental transfers provide a constant flow of funds for lower levels of government, they do not constitute a significant automatic counter-cyclical instrument to direct funds from federal to the state level in recessions. This is consistent with fiscal equalization and transfer schemes illustrated above, which target persistent and demographic imbalances rather than cyclical imbalances at the sub-central level. Yet, as the flow of transfers is relatively constant, it indeed provides an insurance against national shocks for state and local governments given that their own revenues are

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[17]To study how each of these components responds to the business cycle, we estimate the following model

$$\triangle X_{i,t} = \alpha_i + \beta_1 \triangle Y_{i,t}^{GAP} + \beta_2 \triangle X_{i,t-1} + \varepsilon_{i,t}, \tag{1}$$

where X is the component (government expenditure, tax revenue, or intergovernmental transfers). Otherwise the specification is similar to the one presented above.

Figure 3.1: Budget Balance to Output Gap
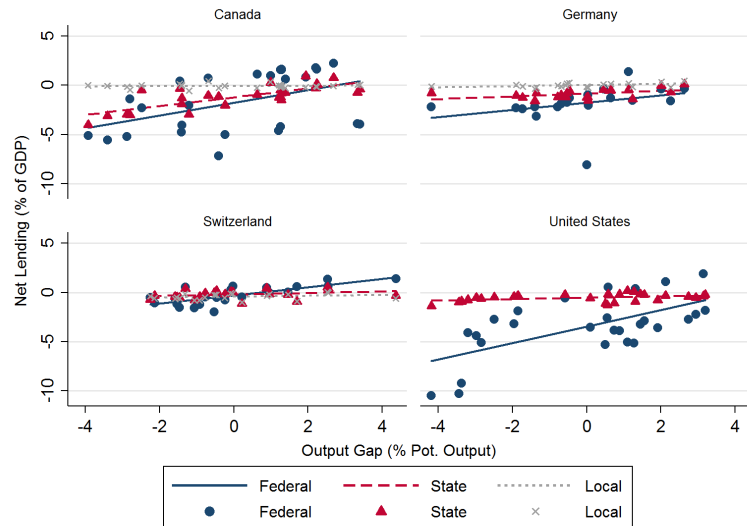
Source: OECD Fiscal Decentralization Database and OECD Economic Outlook.

affected by the business cycle. This does not imply, however, that intergovernmental transfers may not be aimed to be used specifically as vehicles for counter-cyclical stabilization. The United States federal government for example, introduced significant counter-cyclical policies in the form of intergovernmental transfers to state governments in the late crisis.

The pooled estimation strategy, while beneficial as it allows for a larger sample of observations, does not allow the fiscal policy reactions of different levels of government to vary across countries and, hence neglects from the some important differences in allocation of stabilization burden. Thus, we next re-estimate the effect of the business cycle on fiscal balances for each country individually. First, Figure 3.1 illustrates this in graphical form. Second, table A.1 shows the results. While these are based on a much smaller sample that is available for individual countries, they illustrate the most important similarities and differences in the four federal states.[18] In particular, the country level estimates maintain the prediction that federal government is responsible for most of the counter-cyclical fiscal policy measures The coefficient on the output gap is always positive and significant for all countries at the 90% significance level. A one percent cyclical movement in output induces a reduction of 0.2-0.5 p.p. in federal government budget balance. In contrast, the role of sub-central governments in counter-cyclical fiscal policy is different in the four countries. State government's fiscal

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[18]The small sample for Germany and Switzerland is dictated by government level debt data. However, the results are robust to estimating the reaction functions based only on the output gap and budget balance persistency.

balance responses to cyclical conditions significantly only in Canada, but the fiscal balance is largely non-responsive to cyclical conditions in Germany, Switzerland and the United States. The coefficients are smaller and the results are not significant at traditional confidence levels. Further, as a whole the local government response to cyclical conditions is relatively small in all countries for which the data are available.

If we break down the fiscal balances to components and study tax revenues, government expenditure and intergovernmental transfers by country we may note some particular patterns. The results may be summarized as follows. First, federal government expenditure is most cyclical in all countries except Canada, where the state government expenditure is cyclical to a similar extent, consistent with its larger role in fiscal responsibilities. Second, the tax revenues account for the largest cyclical component in fiscal balances in all countries. The federal government response to business cycle is most significant. Finally, we find little evidence that intergovernmental transfers were cyclical during the full sample period. The effect of business cycle is small and insignificant in all countries.

The latter is also consistent with previous evidence on the cyclicality of inter-governmental revenues. In particular, Blöchlier and Egert (2013) show that intergovernmetal transfers have been mostly insignificant or negatively associated with cyclical fluctuations in Canada, Germany, Switzerland and the United States. They argue that this is, among other things due to the fact that i) many transfers are tied to actual government spending (matching grants) rather than spending needs, ii) transfers are tied to central government revenues, iii) transfers depend on regional cyclical differences which move with the cycle and iv) strong revenue growth increases transfer spending in good times. In addition, a significant amount of intergovernmental transfers needs to be determined in the previous period, similar to general government expenditure, and hence are subject to considerable decision and implementation lags which suggests that there might be little systematic responses to cyclical shocks. Our results are consistent with the fiscal equalization formula, which does not include significant and automatic federal-to-state transfers on the basis of economic activity.

4   Inter-State Risk Sharing

We have now characterized the distribution of work in different federal countries and how it affects discretionary and systematic fiscal policy over the business cycle. However, we have not yet discussed what implications this distribution of work will have on individuals and regions in terms of risk sharing. By risk sharing, we refer to individual's or region's ability to smooth their disposable income or consumption through three main alternative channels: net

Table 4.1: Effects of Federal Transfers and Taxes On State Disposable Income (Percent)

Study	Redistribution	Stabilization	Sample
Sachs and Sala-i-Martin (1992)		40	US (1970-1988)
Von Hagen (1992)		10	US (1981-1986)
Bayoumi and Masson (1995)	22	31	US (1969-86)
	39	17	Canada (1965-88)
Melitz and Zumer (2002)	16	17	US
	16	10-14	Canada
Obstfeld and Peri (1998)	19	10	US
	53	13	Canada

fiscal transfers, capital markets and credit markets.[19] The stabilizing effect of net transfers comes through both federal taxes and federal fiscal transfers. The former takes effect when regional income decreases and, as a consequence, the amount of taxes paid to the central level decreases. The latter comes in the form of increased federal transfers to the region hit by a negative income shock in the form of unemployment insurance and through other fiscal transfer schemes. Regions may also smooth consumption over time by credit markets and benefit from capital income to insure themselves against regional shocks. In addition to the risk sharing nature of fiscal transfers it needs to be noted that the fiscal equalization schemes also redistribute income from region to the other.

The empirical evidence suggest that in all federal countries all the three main channels of risk sharing play a significant role. First, the Table 4.1 summarizes the estimates for both the stabilizing and redistributive role of federal net transfers as estimated in some of the seminal contributions to this literature. While the estimates suggests that there are some important differences, which can be mostly attributed to different methodologies and accounting principles, there are some important implications for inter-state income shocks. First, in all federal (and non-federal countries), net transfers from the center bring about significant stabilization to regional shocks. Von Hagen (1992) and Sachs and Sala-i-Martin (1992) suggest that the most significant source of stabilization are federal taxes which are progressive and account for fluctuations in personal income regionally. Second, there is also an important redistributive element to net transfers, which smooth about one fifth

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[19]There exists a considerable amount of estimates on the stabilizing role of fiscal transfers to personal income at the regional level in federal countries and there are some notable differences in the methodology underlying different estimates. However, we aim to illustrates the main qualitative implications of these results rather than the exact quantitative estimates. See Melitz and Zumer (2002) for a review of the literature.

of income differences across regions. However, there are some differences across countries. For example, Bayoumi and Masson (1995) find that, consistent with the fiscal equalization schemes described above, the redistributive effect in the form of intergovernmental transfers (transfers+grants) is much higher in Canada than in the United States (22% vs. 4%). In contrast, estimates suggest the stabilization effect is higher in the United States than in Canada, which is consistent with the fact that more significant counter cyclical instruments have been assigned to state level in Canada than in the United States.

Second, Table 4.2 shows the estimates of inter-state risk sharing in federal countries brought about by all the tree channels combined. While the quantitative estimates differ, all studies suggest that net federal transfers smooth at least about 10 percent of regional income shocks while credit and capital markets provide about 50% of the smoothing. In contrast to all the federal countries, the estimates for risk sharing in the euro area are much smaller. In particular, as there are no significant net transfers between member countries and capital and credit markets bring about less smoothing than in federal countries and, in effect, about 70% of the national shocks are left non-smoothed.

The higher level of stabilization brought about by credit and capital markets suggests that federal net transfers are only a secondary source of stabilization in different regions. However, the three channels potentially provide differing degrees of stabilization to different types of households (Vihriälä 2014). For example, credit constrained or low income households may not benefit from credit markets or capital markets if they do not have access to credit in times of crisis or if they do not have sufficiently large and diversified capital portfolios. It is likely that federal transfers provide a much more significant source to low income households or households that become unemployed during regional shocks. Similarly, it is likely that federal transfers provide a more significant source of income smoothing to unanticipated and severe shocks against which individual households may not be able to insure against (see, f.e. Furzeri and Zdzienicka 2013).

5   Conclusions

In this paper we have characterized the allocation of tasks, fiscal instruments and fiscal rules to different levels of governments in Canada, Germany, Switzerland and the United States and compared them to the present fiscal framework in the euro area. We have illustrated that even in these relatively heterogeneous federal countries the federal government has significant responsibilities and effects on macroeconomic stabilization. Yet, there exists substantial differences in the fiscal framework and in the degree of centralization in fiscal policy making in these countries. These differences include differences in the extent to which macroeconomic

Table 4.2: Estimates of Inter-State Risk Sharing

Study	Country	Capital Markets	Net Transfers	Credit Markets	Not Smoothed
Asdrubali et al. (1996)	U.S.	39	13	23	25
Melitz and Zumer (1999)	U.S.	34	10	26	29
Melitz and Zumer (1999)	Canada	30	8	25	37
Balli et al. (2012)	Canada	29	27	24	20
Hepp and von Hagen (2013)	Germany	50	11	18	21
Furceri and Zdzienicka (2013)	Euro Area	13	1	21	70

stabilization has been allocated to the federal level, the degree of risk sharing among regions and the inter-relationship between regions in the form of fiscal rules and fiscal transfers.

The main implication of the relatively large role of the federal government even in highly decentralized federal countries is that there is significant passive insurance mechanism to individual states and regions in all federal countries. During significant regional downturns, households may rely on the direct support of federal transfers in the form of unemployment benefits and health insurance. Many recent contributions to the fiscal integration in the euro area tend to suggests that member states should adopt a form of stabilization fund where fiscal resources would flow to countries hit by asymmetric shocks, i.e. that there would be an active policy device to mimic the fiscal transfers in the federal countries. However, it needs to be noted that no such inter-governmental policy devices are in use in the federal countries. Rather, fiscal equalization and intergovernmental transfer schemes in the federal countries have been mainly designed to address longer term disparities in regional income, not to act as active counter-cyclical policy devices.

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A   Appendix

A.1   Fiscal Transfer Schemes

Canada   Canadian intergovernmental fiscal transfers consists of four main elements (share of transfers in 2013-2014)[20]:

- Canada Health Transfer (CHT, 49%)

- Canada Social Transfer (CST, 19%))

- Equalization (26%)[21]

- Territorial Formula Financing (TFF, 5%)

other transfer payments comprise about 1% of all transfers.

The first two fiscal transfers are conditional. The CHT is the largest of transfer payment programs to state governments in Canada. According to the Canadian Department of Finance, it provides a predictable source of funding for health care in the longer term. The payments are made on per capita basis and are hence independent of the individual states contribution to economic activity and revenue collection. The CST is likewise an equal per capita cash transfer to provincial and territorial governments for financing post-secondary education, social assistance and social services and early childhood development and child care. Hence, all provincial governments receive these payments.

The Equalization and the TFF programs are *unconditional* transfer schemes to provincial and territorial governments. Equalization payments depend on individual state's fiscal capacity, or it's ability to raise own revenue. First, an average fiscal capacity (a so-called 10 province standard) is determined and then the transfers are allocated on the basis how far individual province's fiscal capacity is from this benchmark. The benchmark is calculated by determining how much own revenue each state could raise from direct taxes, indirect taxes and property taxes if they had applied equal tax rates. In addition, the fiscal capacity calculation takes into account the revenue raising potential from natural resources by directly including revenues from natural resources to each states fiscal potential.[22] Only the so-called "have-not" provinces with less fiscal potential receive fiscal equalization payments.

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[20]Source: http://www.fin.gc.ca/fedprov/eqp-eng.asp

[21]The fiscal equalization scheme that is based on the 1982 constitution stating: *"Parliament and the government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation."* Subsection 36(2) of the Constitution Act, 1982.

[22]There are some exceptions to natural resource potential calculation since 2007. In addition there exists a fiscal capacity cap that prevents any state from having a higher after-equalization fiscal capacity than any state not receiving equalization payments.

At present, all Canadian federal transfer payments grow in line with the GDP growth in the long and medium terms. For instance, fiscal equalization payments are based on a three-year lagged moving average: a fiscal equalization payment in year t is determined by fiscal capacity in t-1, t-2 and t-3.

Germany   German intergovernmental transfers consists of three main elements, which equalize fiscal capacity between Länder to a significant degree[23]

- Revenue sharing of the value added tax (VAT)

- Horizontal fiscal equalization

- Federal grants to individual Länder (including general grants and grants for special needs)

According to the Federal Ministry of Finance, "aligning the revenue of the Länder is intended to create and maintain equal living conditions ofr the entire population in all of Germany". All of the three transfers are, in principle, unconditional transfers, i.e., that the states may freely choose how to allocate their transfer revenues within their mandate.

First, the VAT revenue, which is collected by the fiscal authorities of each state, is shared among all the Länder. This consists of two parts. About 25% of the VAT revenue is first allocated to the Länder whose receipts from their own taxes (income, corporate and land taxes) fall below the national per capita average. The remaining 75% of the revenue is allocated according to equal per capita basis and, as a consequence, does not correspond to the revenue raising ability of individual states.

Second, horizontal fiscal transfers from wealthy states to poor states aim to equalize fiscal capacity per capita. The fiscal capacity of each state is assessed as the sum of state own receipts and its municipal tax receipts as states are responsible for providing the municipalities with the necessary means. In principle, it is assumed that each state has an equal financial requirement per inhabitant, but some demographic adjustments are made so that, for example, city-states and sparsely populated states are given a higher per capita financial requirement. The equalization does not cover all disparities in state revenue, which is, according to the government documents, motivated by guaranteeing the autonomy and sovereignty of the Länder. Also, the fiscal equalization does not change the order of states with respect to their fiscal capacity: the states that started with the lowest capacity will have the lowest capacity also after the transfer payments.

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[23]See Federal Ministry of Finance, The Federal Financial Equalization System in Germany

Third, federal grants are unconditional vertical transfers to states that have (even after the equalization payments) a fiscal capacity that is less than 99.5% of the average fiscal capacity. The general grants correct for 77.5% of the remaining difference. In addition, there are so-called specific purpose grants, such as the present Solidarity Pact -grant to eastern states, which compensate individual states due to special burdens that they have and which require additional fiscal capacity. For example, in the eastern states, this aimed to improve the lagging infrastructure and address the additional fiscal capacity needed due to higher structural unemployment.

Switzerland   A 2008 reform changed the fiscal equalization system significantly combined with redefinition of tasks of federal and cantons in Switzerland. The Swiss National fiscal equalization scheme consist of three main features.[24]

- Resource Equalization

- Federal Cost Compensation

- Cohesion Fund

The resource equalization is a redistributive transfer instrument based on cantonal resource potential. The resource potential index takes into account differences between tax potential of cantons, which depend on the cantonal tax base (level of taxable income of tax payers, earnings from taxable assets and taxable profits of firms) on a per capita basis and is employed to rank cantons to financially weak and financially strong cantons. The transfers are made from both the federal level and from the financially strong cantons to the financially weak cantons, the federal level accounting for about 60% of the transfers. Unlike the former system which considered, for example, actual tax revenues, this avoids the potential of cantons to influence their own financial strength and hence the trasfers they receive.

The federal cost compensation addresses differences in financial needs of cantons and is fully vertical, i.e., the federal level makes the transfers to cantons. It consists of two elements which take into account disparities in geographic and topographic situations and is aimed at mountainous and rural cantons, which affect the costs of public services. and "considers socio-demographic factors pertinent to urban areas".

In addition to these two programs there exists a Cohesion fund which aims to facilitate the transition to the new fiscal framework and providing cantons that would have lost some of their fiscal capacity during the reform with resources and time adapt to the new regime. It is financed by both the federal level (2/3) and strong cantons (1/3). However, the transfers from the Cohesion fund are set to decline gradually.

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[24]Swiss Federal Departent of Finance, Frey and Wettstein (2008).

United States   In contrast to the other three federal countries, there exists no direct fiscal equalization scheme in the United States that would aim to provide state governments equal fiscal capacity or that would aim to equalize horizontal imbalances. Rather, the majority of fiscal transfers consists of conditional vertical grants to sub-central governments based on specific federal grant programs. These so-called Grants-in-Aid programs consists of conditional federal grants to the states which bring financial assistance in the fields of, for example, education, health care, housing and transportation (see, f.e., Edwards 2013). The conditionality means that these grants are designed to address specific purposes which need to fulfill some form of standards as regulated by the federal government.

There are two main types of federal grants to the states. The first category is project grants, which offer funding for specific projects for a fixed period. Hence, they are mostly discretionary in their nature and subject to screening and political decision making over time.

The second category is formula grants, which, in contrast, allocates funds for the states on a continuing basis for some predetermined purpose. The amount of these grants is calculated on the basis of state income, poverty rates and population and some of the grants need to be matched by a proportion of state own spending on the programs. The matching nature means that some transfers are dependent on state own programs and hence they are open ended. About half of the grants are related to health care and, for example, the largest of these programs is the Medicaid program. In addition, the conditionality of the grants differs in different programs. Most programs are highly conditional in that they need to be used for specific purposes (so called categorial grants) some grants are more flexible and may be used with flexibility for different purposes (so called block grants).

A.2   Tables

A.3   Data Sources

Table A.1: Cyclicality of Fiscal Policy by Country

	Federal Government				State Government				Local Government		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland
Y_t^{GAP}	0.227***	0.474*	0.253*	0.425***	0.231***	0.0890	-0.001	0.026	-0.003	0.0503*	0.024
	(0.076)	(0.263)	(0.121)	(0.106)	(0.069)	(0.0538)	(0.048)	(0.026)	(0.011)	(0.0272)	(0.028)
BB_{t-1}	0.921***	-0.0830	0.361*	0.828***	0.452***	0.588***	0.790***	0.630***	0.809***	0.355*	0.813***
	(0.058)	(0.237)	(0.188)	(0.098)	(0.139)	(0.184)	(0.155)	(0.141)	(0.133)	(0.199)	(0.136)
D_{t-1}	0.046***			0.021	-0.000			-0.024	-0.011		
	(0.012)			(0.021)	(0.013)			(0.017)	(0.023)		
constant	-2.196***	-1.541	-0.215	-1.657*	-0.562	-0.490*	-0.031	0.307	0.045	-0.112	-0.057
	(0.543)	(1.114)	(0.154)	(0.853)	(0.418)	(0.242)	(0.073)	(0.286)	(0.151)	(0.101)	(0.071)
	40	20	21	41	40	20	21	41	40	20	21
R^2	0.889	0.174	0.503	0.788	0.584	0.534	0.617	0.612	0.808	0.435	0.686

Standard errors in parentheses

$* \ p < 0.05$, $** \ p < 0.01$, $*** \ p < 0.001$

Table A.2: Cyclicality of Government Expenditure by Country

	Federal Government				State Government				Local Government		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland
Y_t^{GAP}	-0.436	-0.487	-0.958	-0.703***	-0.655***	-0.055	0.016	0.051	-0.541**	0.043	-0.746*
	(0.336)	(0.843)	(0.728)	(0.150)	(0.202)	(0.225)	(0.285)	(0.107)	(0.205)	(0.183)	(0.380)
BB_{t-1}	0.120	-0.438*	-0.403*	0.331***	-0.061	0.087	0.051	0.663***	0.283*	0.378**	-0.088
	(0.157)	(0.229)	(0.225)	(0.110)	(0.134)	(0.251)	(0.225)	(0.125)	(0.145)	(0.178)	(0.233)
D_{t-1}	-0.151***			-0.090***	-0.145***			-0.087	0.048		
	(0.052)			(0.026)	(0.042)			(0.059)	(0.208)		
constant	9.239***	1.834	2.537**	6.325***	8.790***	1.036*	2.273***	2.599**	1.446	0.439	1.108*
	(2.608)	(1.734)	(1.082)	(1.310)	(1.783)	(0.533)	(0.683)	(1.243)	(1.569)	(0.423)	(0.544)
	39	19	20	40	39	19	20	40	39	19	20
R^2	0.331	0.192	0.189	0.597	0.429	0.015	0.003	0.480	0.252	0.221	0.201

Standard errors in parentheses

$* \ p < 0.05$, $** \ p < 0.01$, $*** \ p < 0.001$

Table A.3: Cyclicality of Tax Revenues by Country

	Federal Government				State Government				Local Government		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland
Y_t^{GAP}	1.124***	0.661***	0.663	2.024***	1.158***	1.504***	0.232	1.553***	-0.433	1.801***	0.097
	(0.002)	(0.007)	(0.113)	(0.000)	(0.000)	(0.000)	(0.280)	(0.000)	(0.301)	(0.477)	(0.205)
BB_{t-1}	0.141	0.008	-0.595***	0.331***	0.005	0.347*	-0.188	0.127	0.012	0.341*	-0.147
	(0.305)	(0.971)	(0.000)	(0.010)	(0.969)	(0.051)	(0.262)	(0.341)	(0.162)	(0.176)	(0.167)
D_{t-1}	0.041			0.044	-0.065			-0.110	0.341		
	(0.370)			(0.491)	(0.181)			(0.446)	(0.408)		
constant	-0.061	1.294**	3.973***	-0.276	5.209***	0.959	2.313***	4.763	0.088	1.042	1.724***
	(0.977)	(0.020)	(0.000)	(0.928)	(0.009)	(0.190)	(0.000)	(0.111)	(2.969)	(0.993)	(0.478)
	37	19	37	37	37	19	37	30	37	19	37
R^2	0.313	0.375	0.397	0.524	0.421	0.590	0.069	0.571	0.073	0.526	0.030

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.4: Cyclicality of Net Intergovernmental Transfers by Country

	Federal Government				State Government				Local Government		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland	USA	Canada	Germany	Switzerland
Y_t^{GAP}	-0.012	0.023	-0.007	0.017	0.039	-0.006	0.007	-0.017	-0.042***	-0.005	0.005
	(0.699)	(0.200)	(0.731)	(0.327)	(0.145)	(0.712)	(0.707)	(0.327)	(0.015)	(0.013)	(0.013)
$IGTR_{t-1}$	-0.247	0.661***	-0.013	0.355**	-0.430***	0.561**	-0.086	0.355**	-0.142	0.004	0.297
	(0.177)	(0.002)	(0.961)	(0.047)	(0.005)	(0.013)	(0.732)	(0.047)	(0.147)	(0.262)	(0.249)
constant	0.005	0.001	-0.064*	-0.013	-0.002	-0.009	0.075**	0.013	-0.004	-0.014	-0.004
	(0.928)	(0.981)	(0.059)	(0.690)	(0.959)	(0.796)	(0.027)	(0.690)	(0.027)	(0.026)	(0.017)
	34	19	20	40	39	19	20	40	39	19	20
R^2	0.060	0.450	0.010	0.104	0.232	0.326	0.020	0.104	0.205	0.010	0.077

Standard errors in parentheses

$* p < 0.05$, $** p < 0.01$, $*** p < 0.001$

Table A.5: Data Sources

Data	Source	Countries	Years	Accessed
Government Expenditure by Function	OECD National Accounts	CAN, GER, CHE		25/10/2013
Government Expenditure by Function	Bureau of Economic Analysis	U.S.		25/10/2013
Tax Revenue Statistics	OECD Tax Statistics	All		25/10/2013
Output Gap	OECD Economic Outlook No. 93	All		25/10/2013
Others	OECD Fiscal Decentralization Database	All		25/10/2013

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