

**TOWARD A FISCAL UNION FOR THE EURO AREA:
TECHNICAL BACKGROUND NOTES**

SEPTEMBER 2013

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FISCAL RISK SHARING: NEW EVIDENCE FOR THE EURO AREA²

Common currency areas and federations have historically shared income risk across members and regions, including through fiscal transfers and centralized public spending. Lacking such fiscal schemes, the euro area is vulnerable to large country-level shocks that can become systemic for the area as a whole. Against this background, this paper reviews the economic arguments for risk sharing through both market and fiscal means, and describes how risk sharing works in practice within and across a wide array of countries. It also presents new empirical evidence that suggests that cross-country risk sharing in the euro area is not only limited (roughly half that seen in existing federations), but also falls sharply in severe downturns, just when it is needed most. Moreover, the level of risk sharing in the euro area is similar to that in the European Union, suggesting that euro area members have not benefited from any additional risk sharing, despite giving up domestic monetary autonomy. Simulations indicate that a euro area rainy-day fund financed by country contributions averaging 1½–2½ percent of GNP per year could provide significant stabilization against country-specific income shocks, on par with the level of risk sharing seen in Germany and other federally organized countries. We also find that all countries would be net beneficiaries of such a fund over the long term.

A. Why Would Countries Benefit from Risk Sharing?

- 1. Motivation.** Countries (or regions within a country) can benefit from risk sharing, as it allows for a smoother impact of temporary income shocks on variables such as national or regional consumption. The underlying rationale is similar to that for consumption-smoothing at the household level. As argued by Friedman in his 1957 treatise on the permanent income hypothesis, credit market access allows households to make their consumption move more smoothly than their income, by saving and borrowing. The credit market enables the transfer of household resources across time, improving welfare. In essence, past income (via saving) or future income (via borrowing) acts as a buffer against income shocks today.
- 2. Cross-country risk sharing.** At the country level, the logic of consumption-smoothing would be to ensure that country-wide income shocks do not translate into large fluctuations in the average household's consumption path. International credit market access is one of the key channels through which households and governments save and borrow effectively against such shocks. However, "self-insurance" through credit markets is not the only way to buffer consumption. Other mechanisms, both market- and government-based, can also play a role in cross-country risk sharing. An example of the former is households holding a diversified international asset portfolio, while an example of the latter would be a country participating in an intergovernmental temporary

² Prepared by a team led by John Bluedorn, comprising Davide Furceri and Florence Jaumotte (all Research Department), Franziska Ohnsorge (Strategy, Policy and Review Department), Tigran Poghosyan (Fiscal Affairs Department) and Aleksandra Zdzienicka (African Department).

fiscal transfer scheme. Over time, the benefits of such arrangements are shared by all countries involved: countries receive support when they do worse than their typical performance, but pay back when they do better than their typical performance.

3. Risk sharing within a common currency area. Cross-country risk sharing arrangements take on added importance in a common currency area. Within a currency union, countries cannot use monetary policy to respond to country-specific shocks, since the common monetary policy reflects the (weighted) fundamentals of all of the members and not that of any one country. Likewise, wage and price rigidities and limited labor mobility across countries, whether due to legal constraints like the immobility of pension benefits, or cultural factors, like language differences, can reduce the ability of a country to adjust to country-specific shocks. In principle, domestic fiscal policies are a natural tool in a currency union to manage country-specific shocks. But their scope to act counter-cyclically can sometimes be limited, as was seen in the euro area during the Great Recession: credit markets froze up, making it difficult both for sovereigns and private agents to use borrowing to smooth consumption. To some extent, liquidity provision by the European Central Bank and official cross-country flows (through the TARGET2 settlement mechanism) helped fill the gap left by private credit markets (Cecchetti, McCauley, and McGuire, 2012). But cross-country fiscal arrangements might be a powerful additional instrument to support risk sharing in these circumstances.

4. Country-specific, temporary shocks. Risk sharing across countries of a currency union—whether through private or public mechanisms—should be limited to *country-specific* and *temporary* shocks. These could be shocks that affect only one country at a time or affect different countries in significantly different ways (for example, because of differences in sectoral composition). Common or permanent shocks should be excluded:

- When income shocks across countries happen at the same time and are of similar magnitude—everybody suffers similarly bad times and experiences good times synchronously—there is no scope for mutually beneficial risk sharing between the affected countries. In this case, there is only *aggregate* risk, since shocks are common. In a currency union, the common monetary policy is the best instrument to respond to these common shocks, but coordinated countercyclical fiscal policy can also help, especially if monetary policy is constrained—for example, if interest rates are at the lower bound.
- When an income shock is *permanent*, a country needs to adjust its consumption path to realign it with its new level of long-term income. If it does not, the country must be either making or receiving permanent transfers, which is redistribution rather than risk sharing.
- In practice, it can take time to ascertain whether an income shock is country-specific and temporary in nature. If risk sharing is provided through public mechanisms and the nature of the shock is uncertain, some partial adjustment of consumption combined with partial short-term insurance may be appropriate. This calls for a careful design of the insurance mechanism.

B. How Can Countries Smooth Their Consumption?

5. Mechanisms for consumption-smoothing. There are three key means by which country-level consumption can be smoothed within a group of countries, such as the euro area:

- Saving and borrowing via international credit markets;
- Private insurance via international capital markets (through the holding of diversified portfolio of international assets or explicit insurance);
- Fiscal risk sharing across countries.

We consider each of these mechanisms in turn.

6. Saving and borrowing in credit markets are the most common ways by which countries try to smooth consumption. However, a country's ability to borrow in credit markets is often inhibited when negative income shocks hit (see below). Recessions are typically associated with heightened market uncertainty, which can make banks, and more generally credit markets, reluctant to lend. Moreover, since asset prices tend to fall in downturns, the ability to use other assets (like real estate) as collateral for loans may also be negatively affected. Credit markets can effectively become closed off if these forces are strong enough, short-circuiting their use as tools for consumption smoothing.

7. Insurance through private capital markets can be obtained either by private agents or governments holding a diversified portfolio of international investment assets or purchasing outright insurance against some kinds of income shocks (for example natural disasters). However, insurance through portfolio holdings is often limited, as private investors tend to hold more domestic assets than would be optimal from a diversification perspective (a feature that is referred to as "home bias"). Additionally, markets may be unwilling to provide explicit insurance due to moral hazard and adverse selection problems inherent to any insurance contract. These problems can be especially acute when the income risks against which insurance is sought are large, as would be the case if a government tried to insure against GDP shocks. In spite of these potential problems, there are some precedents. For example, oil producer countries frequently hedge their expected export revenue using oil price derivatives to insure against adverse price movements. This is possible because oil derivative markets (futures and options) are deep and liquid. However, unlike oil price risks, the country-specific income risks of euro area members are less straightforward, and it is not clear which markets euro area governments could draw upon for insurance.

8. Fiscal risk sharing arrangements can act as an important supplement when access to market-based insurance is limited or no longer feasible. Cross-country risk sharing can be either *ex ante*, through common fiscal arrangements, or *ex post*, through mechanisms implemented only in the context of crises. Specific options include:

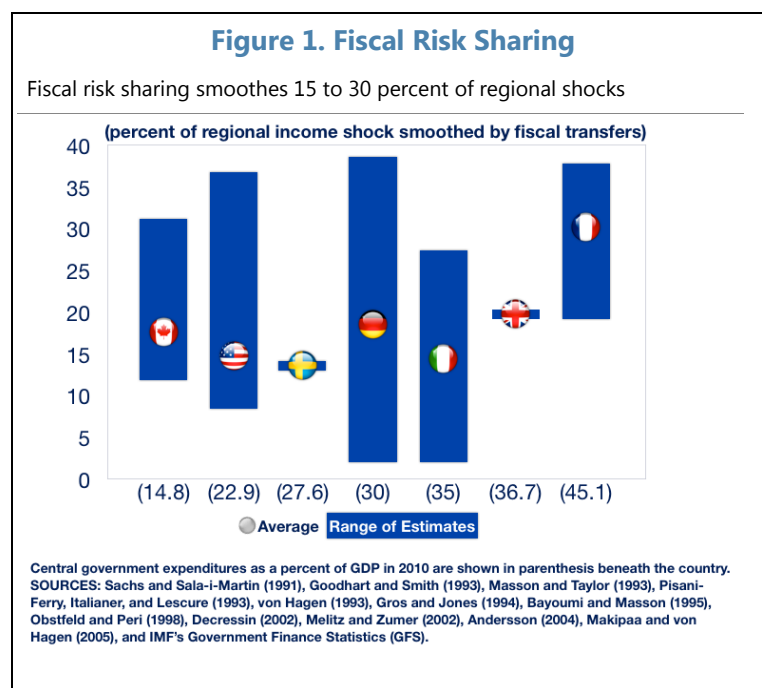
- common tax and transfer mechanisms, including automatic stabilizers, which would move with the business cycles of the countries involved and help offset country-specific shocks;

- centralized provision of public goods and services, possibly including, among other instruments, a universal floor for unemployment insurance (acting as an automatic stabilizer) or common infrastructure investments (which would be insulated from potentially pro-cyclical fiscal policy at the country level);
- bailout agreements or other forms of *ex post* financial support that kick in after crises (including deposit insurance to reduce the likelihood of system-wide spillovers from an isolated bank failure and a common fiscal backstop to shoulder the costs of bank resolution).

C. What is the Degree of Risk Sharing in Practice?

9. Fiscal risk sharing. Cross-country or cross-regional (within a country) risk sharing tools, market or government based, operate in many parts of the world and their characteristics have been studied by a small but growing empirical literature. Many of the earliest studies focused exclusively on the degree of risk sharing through fiscal flows, finding that they smooth on average about a fifth of all shocks faced by regions or states in the countries studied.

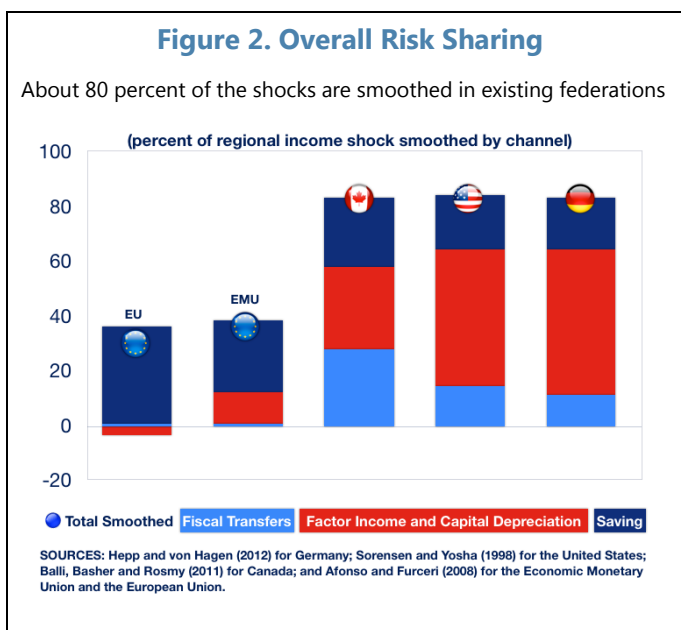
- In a pioneering study, Sachs and Sala-i-Martin (1991) investigated the degree of fiscal risk sharing operating between federal and state governments in the United States (US). Estimating the relationship between regional disposable income and federal taxes on the one hand and transfers on the other, for nine US regions over 1970–80, they found that federal taxes and transfers cushion 33–40 percent of a regional income shock—a substantial amount of insurance against income fluctuations.
- However, because Sachs and Sala-i-Martin’s empirical approach does not distinguish between the redistributive and risk sharing effects of federal fiscal flows and does not control for other channels of risk sharing, their finding likely overestimates the degree of fiscal risk sharing within the United States. Subsequent studies have attempted to refine their approach. For example, von Hagen (1992) uses statistical methods to eliminate common shocks and redistributive effects from the risk sharing estimates for the United States. With data on 48 US states for the period 1981–86, he finds that federal taxes and transfers insure about 10 percent of regional income risk.
- Looking more generally at the literature for various countries, fiscal risk sharing manages on average to smooth between 15 and 30 percent of regional shocks (Figure 1). While the range of estimates vary widely, the degree of



risk sharing tends to increase with the size of central government expenditures over GDP and seems to be larger within unitary states—which also happen to be the most centralized, like France—than within federations.

10. Overall smoothing of income shocks. Subsequent studies broadened their approach and provided simultaneous estimates of the degrees of fiscal risk sharing and risk sharing provided through private markets, thereby addressing some of the shortcomings of the Sachs and Sala-i-Martin approach. Based on Asdrubali, Sorensen, and Yosha (1996), these studies have tended to find a similar scale of fiscal risk sharing for federations, with 10 to 25 percent of income shocks smoothed via net fiscal transfers. They also estimate that, taking into account all channels of risk sharing about 80 percent of income shocks are smoothed in existing federations (Figure 2).

- Asdrubali, Sorensen, and Yosha (1996)'s approach involves using the standard income accounting identity to highlight the role of saving, intergovernmental fiscal transfers (between the center and states/regions), capital depreciation, private factor income and insurance flows as the wedge between income (GDP) and consumption. By breaking up the variation of income into its components, they can assess the extent to which GDP shocks at the regional level propagate through the economic system, affecting other income variables in the identity unless they are smoothed by some intermediating factors (Appendix 1). Full stabilization is achieved when there is no link between temporary fluctuations in GDP and consumption. The advantage of this approach is that it allows for the simultaneous estimation of both private and public income shock smoothing channels, giving some indication of the relative importance of fiscal versus market-based risk sharing mechanisms. A practical limitation of the approach, though, is that it requires more detailed information on consumption. For some federations, state or regional consumption data are not necessarily available, necessitating the use of proxies for consumption such as retail sales.
- In a later study, focusing on state-level data in the US, Sorensen and Yosha (1998) find that the federal tax-transfer and grant system smoothes around 15 percent of the income shock. In contrast, income smoothing achieved through market-based channels is estimated to be much larger, at about 45 percent through national capital markets (private income and insurance flows from elsewhere) and about 20 percent through credit markets (saving and borrowing). The remaining 20 percent of income variability at the state level is not smoothed, indicating less than full risk sharing.



- Others have extended this approach to estimate risk sharing in a variety of federations and groups of countries, including Canada, Germany (post-unification), and the European Union (EU) and euro area (both over the period 1998-2005).³ The other existing federations in the sample (Canada and Germany) exhibit results similar to the US: fiscal risk sharing reaches between 10 and 25 percent, and the amount of insurance provided privately (through credit and capital markets) is significant in these federations too, so that overall about 80 percent of the effects of income shocks on the variability of consumption are smoothed out.

11. Risk sharing in the euro area. The estimates from the literature also indicate that the degree of overall risk sharing is much smaller in the euro area:

- As shown in Figure 2, total risk sharing (through both private and public mechanisms) in the EU and the euro area is roughly *half* that seen in existing federations studied above, with only about 40 percent of income shocks smoothed. Furthermore, the overall level of risk sharing in the euro area is nearly the same as in the EU. This suggests that euro area members have not benefited from any additional risk sharing over and above that seen amongst EU members, despite sacrificing domestic monetary autonomy.⁴
- Fiscal risk sharing is almost nonexistent, in both the EU and the euro area—unsurprisingly given that the EU budget is small, at about 1 percent of the area-wide GDP, and not designed for risk sharing. In addition, capital markets in the euro area provide less than half the amount of income insurance seen in the US, Canada or Germany (post-unification). This seems to reflect a stronger “home bias” in households’ investment decisions within the euro area, despite the presence of the Single Market. In aggregate, euro area countries hold a far less diversified portfolio of other euro area countries’ assets than what is common amongst German regions or U.S. states.
- Consequently, to the extent that there is buffering of consumption against income shocks in the euro area at all, it occurs primarily through saving and borrowing in international credit markets.

³ For groups of countries, the income shock decomposition is performed using information on international asset, income and transfer flows.

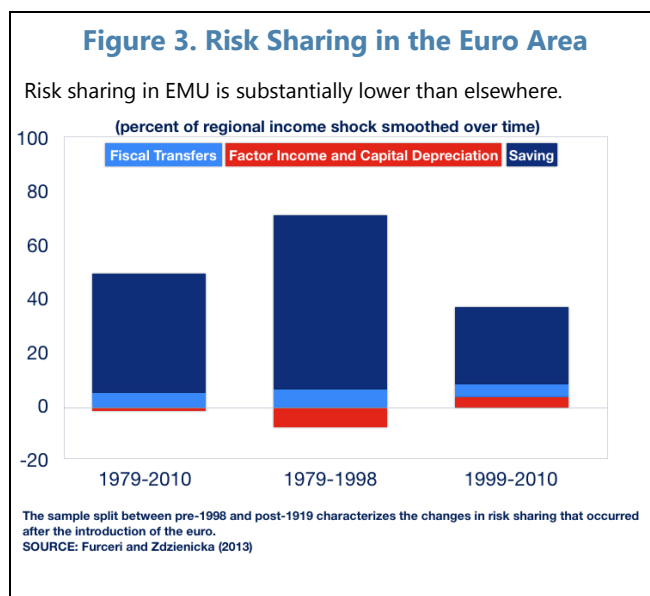
⁴ In some cases, the estimated degree of income shock smoothing by a channel is negative, indicating that the channel actually increases rather than decreases the effect of income shocks on consumption.

D. Risk Sharing in the Euro Area Over Time and Across the Business Cycle⁵

12. Revisiting the euro area results. As discussed above, compared to existing federations, the euro area exhibits a low level of overall risk sharing and almost no fiscal risk sharing. Digging deeper into these findings, we investigated how risk sharing among the Economic and Monetary Union (EMU) member countries has changed over time, and over the business cycle. We find that income shock smoothing in the euro area, through both private and public channels, has been particularly ineffective during recessions and times of sovereign stress—when it would have been most needed—bolstering the case for greater fiscal risk sharing within the euro area.

13. Risk sharing over time. The effectiveness of risk sharing mechanisms in the euro area, both through market-based and intergovernmental fiscal channels, is estimated using the approach of Asdrubali, Sorensen, and Yosha (1996), described above, for a panel of 15 European countries (Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovak Republic, Slovenia and Spain) over 1979-2010 (Figure 3).

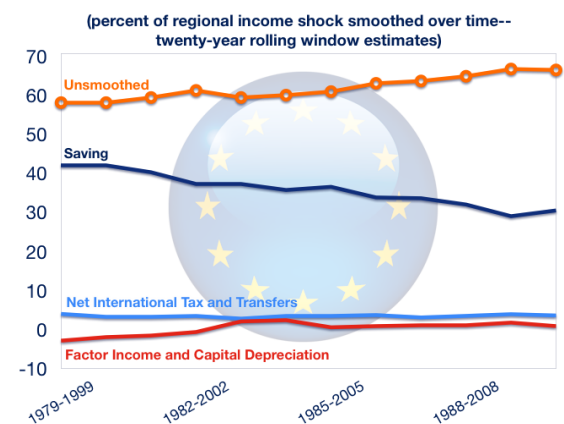
- About two third of the country-level GDP shocks remains unsmoothed in the euro area. As previously found in the literature, risk sharing provided by international capital markets (factor income flows) and fiscal transfers have only small effects on income smoothing. The main risk sharing channel is again found to be through credit markets (countries' saving and borrowing). Furthermore, differentiating between public and private saving and borrowing, we found the latter to provide the largest amount of smoothing (about 20 percent) in normal times.
- The degree of income shock smoothing within this group of countries has decreased over time (Figure 4). Twenty-year rolling window estimates over 1979-2010 suggest that the share of GDP shocks that remains unsmoothed has risen over time (from 58 percent over 1979-99 to 66 percent over 1990-2010). This largely reflects a decline in cross-country smoothing via credit markets after the creation of the euro area—in other words, credit flows have been more procyclical than pre-EMU. Such a decline in the use of credit markets for risk sharing purposes may have arisen from the fall in saving and the underpricing of risks by markets that characterized the first decade of EMU, in a context of over-optimistic growth expectations. In parallel, the amount of income shocks smoothed via international capital markets has risen somewhat, a likely reflection of increasing financial integration within the euro area.



⁵ This section and the following draw extensively on Furceri and Zdzienicka (2013).

Figure 4. Channels of Smoothing Overtime

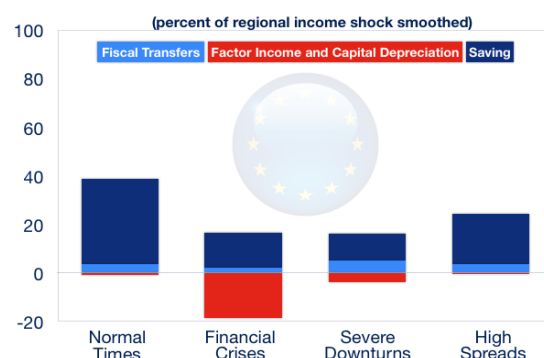
The effectiveness of risk sharing has declined overtime...



SOURCE: Furceri and Zdzienicka (2013)

Figure 5. Risk Sharing in Times of Stress

...especially during periods of severe stress.



SOURCE: Furceri and Zdzienicka (2013)

Note: Normal Times = full sample; Financial Crises = currency, sovereign debt and banking system crises from Laeven and Valencia (2012); Severe Downturns = periods of recession as identified by Harding and Pagan (2002); High Spreads = spread of 10 year government bond to U.S. 10 year treasury bond in excess of 300 basis points.

14. Risk sharing in recessions and times of sovereign stress. Risk sharing mechanisms are found to be particularly ineffective during downturns, with the share of shocks unsmoothed in recessions significantly larger than during normal times (Figure 5).⁶

- The deterioration in the smoothing of income shocks is in part driven by the sharp decline in saving and borrowing in international credit markets. International credit markets appear particularly unwilling to grant cross-country loans when they are most needed for both private citizens and governments, with investors reverting to their own borders. This is particularly true for severe downturns, when capital outflows tend to exacerbate the impact of the shocks. As evidenced by the large private capital outflows from the periphery and financial market fragmentation, the current crisis is no exception. The share of unsmoothed shocks in Europe during 2008-10 (76 percent) is similar to previous episodes of severe downturns (78 percent).
- The ability of risk sharing mechanisms to smooth income fluctuations is also reduced in periods of high sovereign stress. The share of income shocks unsmoothed increases with the magnitude of sovereign interest rate spreads, as higher borrowing costs make credit markets less helpful in smoothing shocks. More precisely, an increase of 100 basis points in the ten-year sovereign yield spread (versus the US ten-year rate) reduces the share of GDP shocks smoothed by about 5 percentage points.

⁶ Downturns are alternatively identified using financial (banking, currency and debt) crises starting dates, taken from Laeven and Valencia (2008, 2010), and by applying the business cycle dating approach proposed by Harding and Pagan (2002) to quarterly GDP data.

E. An Illustration of Fiscal Risk Sharing for the Euro Area: A Supranational Stabilization Fund

15. Motivation. As argued above, the euro area could benefit from greater overall smoothing of country-specific income shocks:

- **Market-based versus fiscal risk sharing.** The creation of a banking union could help reinforce the role of cross-border credit markets in providing risk sharing. It would support the development of cross-border banking services in a truly integrated way and reduce the fragmentation of financial markets along national borders. The functioning of capital markets in the euro area could also be improved through common financial market reporting standards, and further harmonization of financial market regulations. However, a reversal of the recent financial market de-integration will take time to materialize. In this context, there is a clear role to be played by fiscal risk sharing in helping to smooth shocks.
- **Illustrating fiscal risk sharing.** As alluded to earlier, there are many possible mechanisms to achieve greater fiscal risk sharing. Cross-country fiscal risk sharing can be either *ex ante*—through common tax and transfer mechanisms, or the centralized provision of public goods and services—or *ex post*, through arrangements implemented only in the context of crises. We illustrate here the potential gains of fiscal risk sharing, by considering one of these mechanisms, a simple rainy-day stabilization fund for the euro area. The principle idea is to provide greater international insurance through a common stabilization fund that collects contributions in good times and transfers back resources where and when a bad shock hits.⁷ We also use this illustration to quantify the order of magnitude of the resources required to achieve a level of overall risk sharing similar to that seen in existing federations.

16. A rainy-day stabilization fund. To estimate the contribution of each country to such a fund, we set up a thought experiment in which the fund collects taxes as a share of the GNP of each member state and pays transfers to countries negatively hit by output shocks. Each time a euro area member is hit by a negative shock, it receives a transfer proportional to the size of the shock, the relative size of its economy, and the resources available in the stabilization fund (Box 1). If no member experiences a negative shock, the contributions are saved in the fund.⁸ This setup mimics some of the fiscal mechanisms operating in federal states—for example, through unemployment insurance. The rate of contribution is then computed to achieve a given level of fiscal risk sharing over a chosen period.

⁷ Since the fund is allowed to build up over time, it will be able to help offset income shocks that impact all members simultaneously (common income shocks). By accumulating, it incorporates an element of fiscal saving in addition to risk sharing.

⁸ We use GNP, rather than GDP, as a scaling measure of income to control for consumption smoothing that occurs through international capital markets.

Box 1. Structure of the Rainy-Day Stabilization Fund in the Thought Experiment

The designed scheme collects taxes as a share of the GNP of each member state:

$$\text{Stabilization Budget}_t = \sum_i \tau * \text{GNP}_{i,t-1} \quad (1)$$

where τ is the common contribution rate. The fund pays transfers to member countries negatively hit by shocks:^{1/}

$$T_{i,t} = 0 \text{ if } \epsilon_{i,t} \geq 0 \quad (2)$$

$$T_{i,t} = |\epsilon_{i,t}| * \frac{\text{DNI}_{i,t-1}}{\sum_i \text{DNI}_{i,t-1}} * \sum_i \tau * \text{GNP}_{i,t-1} \text{ if } \epsilon_{i,t} < 0 \quad (3)$$

where $\epsilon_{i,t}$ are the shocks for country i at time t . Transfers are a function of three factors: (i) the size and sign of the income shock; (ii) the size of the stabilization fund; and (iii) the relative size of the economy. Given that we are interested in the stabilization properties of a supranational fiscal mechanism that pays temporary transfers, the analysis will mostly focus on shocks ($\epsilon_{i,t}$) that are unrelated over time (serially uncorrelated). These shocks are derived from the following simple regression model, estimated country-by-country:

$$\Delta \log \text{GDP}_{i,t} = \alpha_i + \sum_{j=1}^2 \beta_j \Delta \log \text{GDP}_{i,t-j} + \epsilon_{it}$$

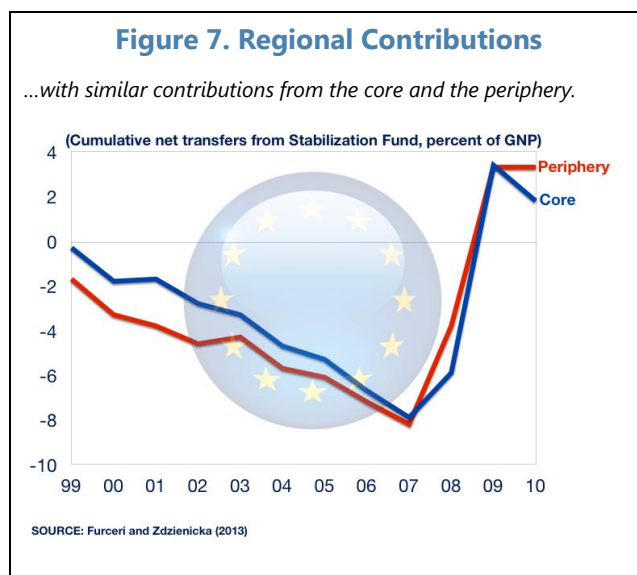
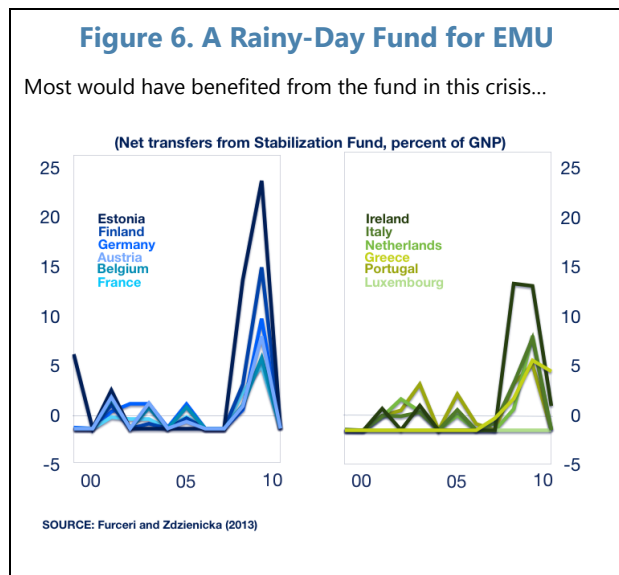
1/. If the required amount of current year transfers exceeds the current year's contributions to the fund, transfers are drawn out of the funds saved from previous years. When there are no saved funds, only a part of the shock can be smoothed.

17. Size of Contributions. We find that in order to achieve a level of stabilization close to what is common in existing federations, a euro area stabilization fund based on temporary transfers (defined as a share of GDP) would need relatively limited contributions, although we recognize that they would be substantially larger than the resources transferred under the existing EU budget. For example, in a counterfactual experiment, a fund put in place in 1999—coincident with the introduction of the euro—could have increased the overall level of stabilization (from about 40 percent currently) to the level found within Germany—where 80 percent of income shocks are smoothed through private and public channels combined—with *annual* contributions of about 1½ to 2½ percent of GNP.⁹

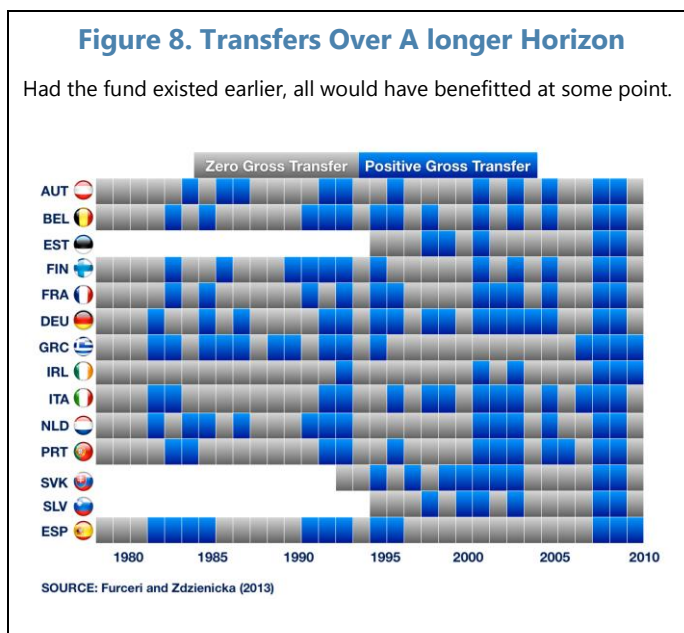
18. Providers and recipients. Had the fund been in place since 1999, most of the euro area countries would have been net contributors to the fund until 2007 and net recipients during the most recent crisis (Figure 6). Smaller countries would have tended to receive larger transfers relative to the size of their economy, a reflection of the higher volatility of their economic performance. But importantly, for the entire period, the average net contribution by each country would have been

⁹ The estimate hinges critically on the ability to distinguish between temporary and permanent shocks. Contributions would likely have to be higher if such a distinction cannot be fully made in real time. While the contribution to the stabilization fund may seem low compared to the size of the central government in existing federations (which is on average near 30 percent of GDP), it has to be kept in mind that this mechanism is uniquely designed for stabilization purposes across countries. As such, it is not directly comparable with the size of the central budget of existing federations, which also covers provision of public services to the sub-national levels.

close to zero (with the exception of Luxembourg), showing that risk sharing of this type need not entail permanent transfers from one part of the euro area to another. More specifically, the periphery countries would have contributed relatively more than the core countries until 2007—as they were growing faster—but would have also received larger net transfers during the Great Recession (Figure 7).



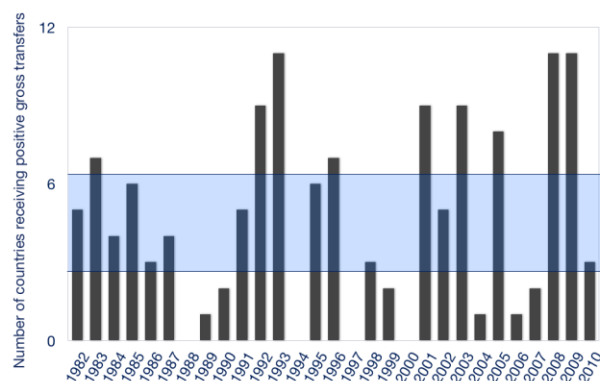
19. All benefit longer term. Although fiscal risk sharing of this type means that countries doing better support those that are experiencing negative income shocks, it does not mean that the same countries always benefit. To illustrate this fact, we examine which countries would have been beneficiaries at different points in time if a rainy-day fund like that described above had been in place over the past three decades (Figure 8). Over that period, all euro area members would have benefited at some point. This is not to say that a stabilization fund should have existed in the 1980s (when nominal exchange rates were not permanently fixed and some countries, such as Estonia, Slovenia, and Slovakia were still part of the Eastern bloc). But the simulation reinforces that a fund motivated by the goal of smoothing country-specific income shocks need not imply permanent transfers.



20. Providing both cross-country and intertemporal insurance. Beyond providing for cross-country insurance against idiosyncratic shocks, such a fund would also allow for counter-cyclical fiscal actions for the region as a whole by accumulating reserves for the occurrence of large common shocks (intertemporal insurance). Looking again at the features of such a fund, had it existed over the past three decades, we find that most of the years, about a fourth to half of the countries in the sample would have benefitted from *gross* transfers, as they were impacted by negative shocks—the cross country dimension (Figure 9). In addition, the fund would have accumulated reserves to deal with the rare events of large common shocks, at which point positive *net* transfers would have been provided to almost all countries—enabling intertemporal smoothing (Figure 10). Shocks with a large common negative output effect would have occurred during the 1992-93 ERM crisis, the burst of the dot.com bubble in the early 2000 years, and the two years following the failure of Lehman Brothers.

Figure 9. Incidence of Positive Gross Transfers

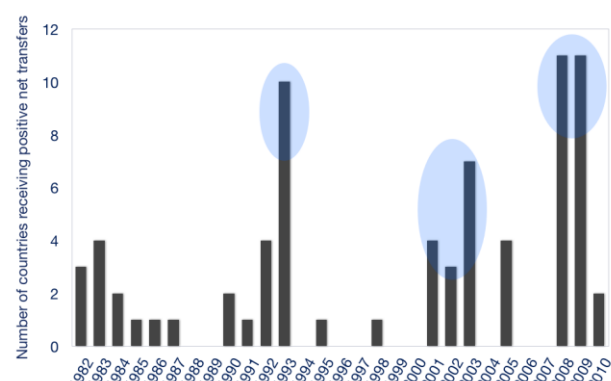
Most times, a fourth to half the sample receives gross transfers...



SOURCE: Fuceri and Zdzienicka (2013)
NOTE: The computation is done with the 11 EMU members of the sample for which data exists prior to 1990.

Figure 10. Incidence of Positive Net Transfers

...while reserves are used for rare large common shocks



SOURCE: Fuceri and Zdzienicka (2013)
NOTE: The computation is done with the 11 EMU members of the sample for which data exists prior to 1990.

21. Practical considerations. The main challenge of any stabilization fund would be to correctly identify “insurable” shocks that are unrelated over time (hence not too persistent) and not consistently positive or negative (zero-mean)—shocks that would warrant the activation of the scheme, and hence transfer payments. What is a simple statistical exercise in hindsight is a much more complex task in real time. Here, simple operational techniques based on the output gap or the deviation from trend growth rates may offer feasible compromises. However, because it is extremely difficult to identify the exact nature of income shocks as they occur, there is a risk that what would initially be thought a temporary negative income shock would turn out to be permanent, leading to persistent transfers. In fact, the practice of existing federations suggests that some of the risk sharing functions of a stabilization fund could be institutionalized through mechanisms that are already well-established elsewhere, such as the centralized provision of unemployment benefits. That being said, a risk sharing mechanism focusing on unemployment insurance might involve undesirable implementation lags and only partial insurance for overall income risk.

F. Conclusion

22. The long-term viability of a currency union depends on its capacity to deal with country-specific shocks that can generate large spillovers. In this context, risk sharing mechanisms to help consumption smoothing are essential.

23. However, empirical studies suggest that risk sharing in the euro area is limited—be it through market-based or fiscal channels—and considerably lower than in existing federations such as Canada, the United States and Germany. In addition, the existing euro area risk sharing mechanisms are particularly ineffective during periods of downturns.

24. These results suggest that in the absence of alternative risk sharing mechanisms, euro area member countries are likely to remain particularly vulnerable to severe downturns, and their attendant spillovers. As an illustration, a supranational fiscal stabilization mechanism could provide euro area countries with some insurance against shocks.

25. A thought experiment using our empirical estimates suggests that such a supranational fiscal risk sharing mechanism, based on temporary transfers and automatic rules, could significantly buffer income shocks and increase consumption smoothing in euro area countries. For a relatively small contribution (1½ – 2½ percent of GNP), such a rainy-day fund could have provided a level of stabilization, over time and across countries, close to the one within Germany.

26. Finally, it is important to acknowledge that the effectiveness of further fiscal integration, and its political acceptance, depends on its specific design. Deeper integration would provide insurance for euro area members against country-specific adverse income shocks, and thereby help to prevent negative spillovers to the membership at large. Although this means that countries that are doing well support those that are experiencing negative income shocks, it does not mean that the same countries are always net recipients. This observation does not minimize the political difficulties associated with putting in place such a risk sharing mechanism at the current juncture.

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Appendix: Estimating the Effectiveness of alternative Risk Sharing Channels—A Technical Note on the Asdrubali, Sorensen, and Yosha Approach

In their 1996 paper, Asdrubali, Sorensen, and Yosha use the national income and product accounts to measure the degree of risk sharing between sub-national or regional entities; and in a 1998, they extend the approach to national entities. They do so by breaking up the variability in output into various sub-components, and then relating that variability in output to the variability in consumption. They start with the following identity:

$$GDP_{i,t} = \left(\frac{GDP_{i,t}}{GNP_{i,t}} \right) \left(\frac{GNP_{i,t}}{NI_{i,t}} \right) \left(\frac{NI_{i,t}}{DNI_{i,t}} \right) \left(\frac{DNI_{i,t}}{[C_{i,t} + G_{i,t}]} \right) [C_{i,t} + G_{i,t}],$$

where i indexes countries, t indexes time (years), GDP is gross domestic product (output), GNP is gross national product (income), NI is net national income, DNI is net national disposable income, C is private consumption, and G is public consumption (government consumption expenditures).

This identity highlights a number of risk sharing channels, through which national consumption ($C + G$) can be insulated from shocks to output (GDP):

- $GDP - GNP =$ international income flows (factor income flows)
- $GNP - NI =$ capital depreciation
- $NI - DNI =$ net international tax and transfer flows (fiscal risk sharing)
- $DNI - [C + G] =$ saving

Output shocks affect consumption to the extent that these risk sharing channels do not move countercyclically—they are unable to offset output shocks. For ease of discussion the international income flows and capital depreciation channels are aggregate as a capital markets channel, as the bulk of factor income flows are capital income. Since saving works through the credit market (fixed income securities and deposits), the saving channel is also referred to as the credit market channel.

By evaluating how much the various components in the identity move with output, Asdrubali, Sorensen, and Yosha derive a measure of the degree of income shock smoothing that each channel provides. Specifically, they assess these channels by estimating the following system of equations:

$$\begin{aligned} \Delta \log GDP_{i,t} - \Delta \log GNP_{i,t} &= \alpha_t^m + \beta^m \Delta \log GDP_{i,t} + \varepsilon_{i,t}^m \\ \Delta \log GNP_{i,t} - \Delta \log NI_{i,t} &= \alpha_t^d + \beta^d \Delta \log GDP_{i,t} + \varepsilon_{i,t}^d \\ \Delta \log NI_{i,t} - \Delta \log DNI_{i,t} &= \alpha_t^s + \beta^s \Delta \log GDP_{i,t} + \varepsilon_{i,t}^s \\ \Delta \log DNI_{i,t} - \Delta \log [C_{i,t} + G_{i,t}] &= \alpha_t^s + \beta^s \Delta \log GDP_{i,t} + \varepsilon_{i,t}^s \\ \Delta \log [C_{i,t} + G_{i,t}] &= \alpha_t^u + \beta^u \Delta \log GDP_{i,t} + \varepsilon_{i,t}^u \end{aligned}$$

where α coefficients are common time effects, absorbing any common shocks, and β coefficients indicate the average amount of income shock smoothing contributed by a given channel (measured as the percent of an income shock smoothed), with $\sum \beta = 1$. The β coefficients can be negative,

when the channels in question exacerbate, rather than smooth the effect of income shocks. For example, β^m indicates the share of income shocks that are smoothed by international income flows. The last coefficient, β^u , indicates how consumption (private and public) moves with output—the larger it is, the less income shock smoothing is occurring. Full insulation of consumption from output is achieved if $\beta^u = 0$. See Furceri and Zdzienicka (2013), for further details and discussion on the estimation for the euro area.

FISCAL UNION: COMMON PRACTICES IN FEDERAL STATES¹

This paper looks at seven existing federal states to understand how fiscal unions operate and to distill the essential elements of such unions. We find that institutionalized fiscal risk sharing arrangements between the central and sub-national levels of government tend to go hand-in-hand with strong governance frameworks to ensure good fiscal practices. Together, these institutions can complement market mechanisms to prevent and buffer the impact of idiosyncratic regional shocks, adding to the stability of the union. Fiscal risk sharing takes different forms but in all cases includes some form of a national banking sector backstop (although not always explicitly defined ex ante) and a social safety net (although not always fully harmonized). In contrast, the euro area lacks ex ante fiscal risk sharing mechanisms. Likewise, in those federations, an institutional framework for subnational fiscal policies has emerged that reconciles governance with bailout (or no bailout) practices. This raises the question whether there is room in the euro area for stability-enhancing reforms that would ensure such consistency.

A. Motivation

1. Rationale for a fiscal union. Close economic and financial linkages among regions allow deeply integrated economies to operate more efficiently than others. But these same linkages also create the potential for local, temporary shocks to spread. In a fiscal union, common governance frameworks ensure that regional policies do not add to such shocks but contribute to a stable environment. When shocks occur, cross-regional fiscal risk sharing arrangements can help buffer their impact and limit contagion (See first background note, “Fiscal risk-sharing: new evidence for the euro area”).

2. Benchmarks. Moving toward deeper fiscal integration in a common currency area of highly integrated sovereign economies such as the euro area is without precedent.² Moreover, European integration is the result of a particular set of political and social choices taken against the background of Europe’s historical trajectory. Nonetheless, case studies can be useful: they can help identify key features that have contributed to both reducing and sharing risks within existing fiscal unions, and inform options for the euro area. Candidates for such case studies include:

- *Unitary states* that tend to tightly control the fiscal behavior of sub-national government levels and provide a high degree of fiscal risk sharing—in the extreme, the central government takes all revenue and expenditure decisions for the country as a whole.

¹ Prepared by Fabian Bornhorst, Esther Perez Ruiz (both European Department) and Franziska Ohnsorge (Strategy, Policy and Review Department).

² In this context, the Padoa-Schioppa Group called for a “*sui generis* fiscal federalism approach for the euro area” (Enderlein et al, 2012).

- *Federal states* that often exercise less central control of lower-level fiscal behavior and tend to have less fiscal risk sharing—though risk sharing still occurs, for example through transfers or central backstopping of social and financial safety nets.
- *Existing currency unions*, such as the West African Economic and Monetary Union (WAEMU) or the Eastern Caribbean Currency Union (ECCU), that have minimal joint fiscal institutions—although the former has some joint regional funds (e.g. to finance infrastructure investment, agriculture, and energy supply) and the latter substantial harmonization of non-fiscal institutions (e.g., in education).

While the euro area is not a federal state, the degree of economic and financial integration between member states is high and the potential for spillovers is larger than that in existing currency unions.

Moreover, the latter comprise economies with significantly lower per capita income levels compared to the euro area, reflecting a different stage of economic development. This suggests that federal states—and not existing currency unions—offer the closest benchmark for the euro area. These considerations led us to focus our case studies on seven federations with comparable economic development, and where the lessons to be learned in terms of institutional settings and governance could be instructive (Table 1).³

	Area (square km)	Dispersion of per capita income (coefficient of dispersion)	Number of regions/states (excl. territories and special districts)
Federations			
Australia	7,692	0.19	6
Belgium	31	0.50	3
Brazil	8,512	0.63	26
Canada	9,012	0.35	10
Germany	357	0.27	16
Switzerland	41	...	26
USA	9,162	0.40	50
Currency Unions			
Euro area	2,712	0.53	17
WAEMU	3,464	0.84	8
Source: OECD, Wikipedia, Staff estimates.			

3. Objective of the paper. Seeking to draw lessons for the euro area, this paper analyzes the common institutional fiscal arrangements in these seven countries, typically characterized as federal states: Australia, Belgium, Brazil, Canada, Germany, Switzerland and the U.S.. In particular, we ask the following questions and attempt to answer them based on the example of these seven federations: What role does a central budget play? Are social safety nets and financial sector backstops funded centrally or regionally? How do these federations overcome moral hazard arising from financial relations with the center? And what are the modalities for fiscal governance frameworks, depending on the history of bailout (or no bailout) episodes? In distilling the lessons relevant for the euro area, we do not focus on how objectives outside the remit of risk reduction and risk sharing, such as distributional objectives, are fulfilled in other federations. We are, however, aware that in practice

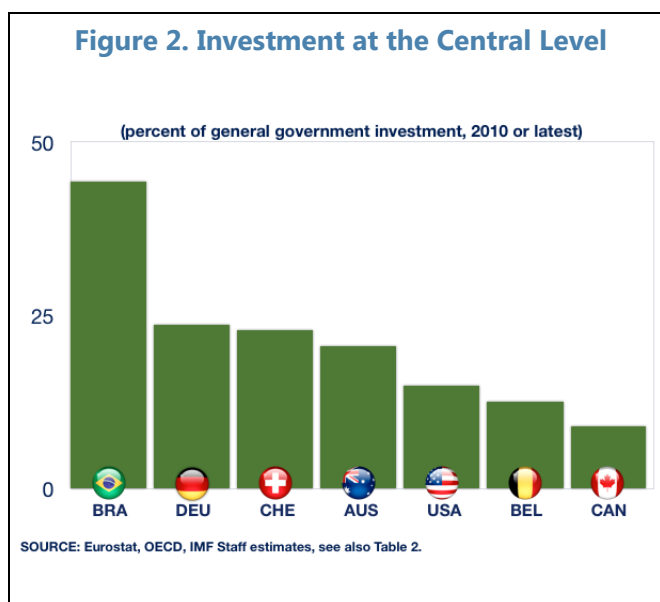
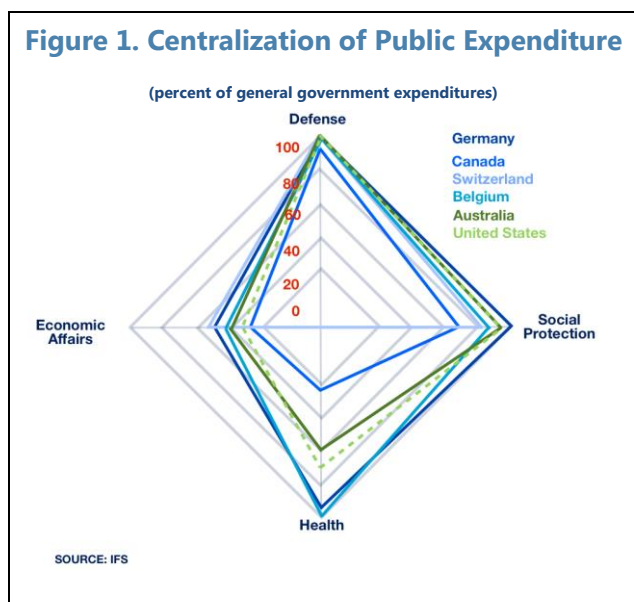
³ Other studies have also focused on a similar sample (Bordo et al, 2011, Henning and Kessler, 2012).

these objectives may overlap.⁴ The main findings of the paper are summarized in the next section. Section C discusses how fiscal risk sharing is institutionalized in the sample federations. Section D then examines how these federations address the nexus between solidarity and discipline, through their governance framework but also in the interplay of bailout (or no bailout) and governance. The final section draws preliminary lessons for the euro area.

B. Main Findings

In federations, a centrally managed budget with a sizeable amount of public revenue and expenditure is an important risk sharing vehicle. A common social safety net and backstop for the banking sector usually provide insurance to individuals and regions against income shocks. Public debt is issued separately by each level of government, with no example of joint and several liability. A governance framework characterized by subnational fiscal rules and enforcement rules that are consistent with bailout (or no bailout) underpin the risk sharing arrangements.

4. Large role for the central budget. A significant amount of risk sharing in federal states is delivered through centralized revenue and expenditures, including through social security systems. In that context, expenditure responsibilities are backed by a centralized fiscal authority endowed with the power to raise revenues.



- For the seven federations under study, at least one-third of general government expenditure is assumed by the center, and half or more of general government revenue is collected by the center.

⁴ For a fuller discussion of fiscal arrangements in federations, see IMF (2013).

- The central government typically provides insurance against idiosyncratic shocks through two broad channels. First, central governments are usually deeply involved in the operation and funding of social protection and, in most cases, health care. Second, a significant portion of overall public capital expenditure—ranging from about 10 percent in Canada to over 40 percent in Brazil—is conducted by the central government, ensuring that long term public investment decisions are decoupled from regional economic conditions. Similarly, the central authority is often vested with spending authority for the public administration and defense, exploiting the economies of scale pertaining to the delivery of such public services (Figures 1 and 2).

5. Common social safety net and backstop for the banking sector. All federal states in the sample provide insurance against two specific types of risks: individual income and financial sector shocks. In all countries, the first insurance channel is embedded in a federation-wide social safety net, the second in an (explicit or implicit) backstop for all banks in the federation. However, the degree of central government involvement varies.

- *Social protection:* In almost all countries, unemployment, pension, and health insurance benefits are harmonized and funded mostly nationally—although health *services provision* itself is often funded and administered locally. In the U.S., the sub-national level tends to play a larger role. For example, unemployment insurance is mainly state-based with varying benefits and eligibility criteria, within federally-set basic requirements. But, even in the U.S., large parts of the health and pension insurance system are organized and funded at the federal level and the federal government provides a minimum backstop during exceptionally severe economic downturn.
- *Banking sector backstops:* In all countries in the sample, the responsibility for resolving nationally active banks or providing deposit insurance falls on the federal level.⁵ The U.S., Canadian, Australian, and Belgian systems are run by the federal government or have explicit provisions for federal government fiscal backing when dedicated funds fall short. In contrast, the Swiss and German deposit insurance systems are privately-funded and do not benefit from an explicit *ex ante* fiscal backstop (although the German resolution system established since 2008 has such a backstop). However, even in that setting, in case of need, the federal government has stepped in to provide *ex post* support.

6. Debt. Responsibility for the issuance and servicing of debt remains separated between the central and sub-national levels. No federation in our sample allows for the central level to borrow with the backing of revenues of the sub-national levels (“joint and several liability”). For example, the federal government borrowing in Belgium is not backed by regional government revenues. Instead, it is backed by its own revenue, itself supported by the fiscal legal framework. Likewise, when sub-national governments decide to finance their expenditures through debt, they do it backed by their own revenue and in most cases without an explicit guarantee from the central level (Appendix 1).

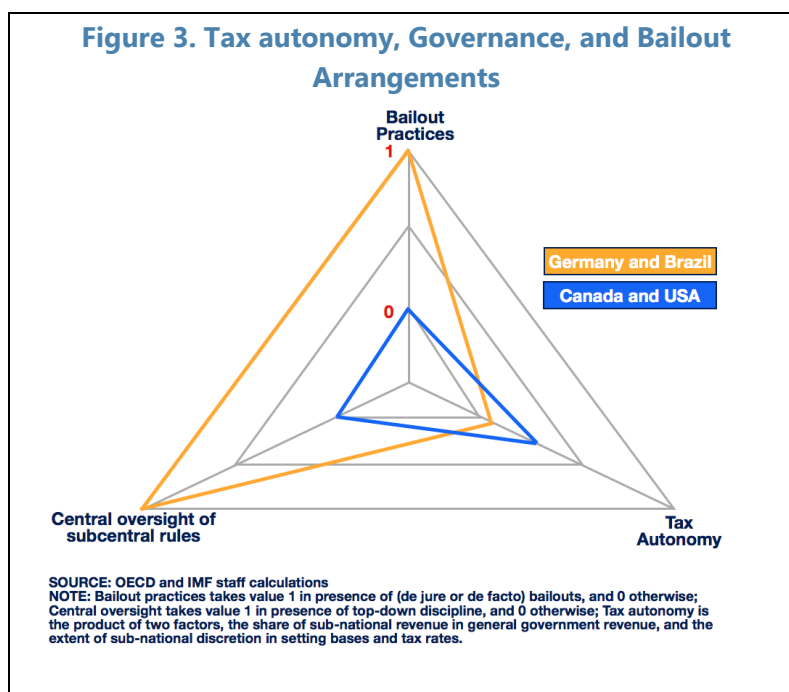
⁵ In Canada, credit unions whose activities are restricted to individual provinces are insured by provincial deposit insurance funds.

7. Fiscal rules. Higher risk sharing can lead to poor fiscal discipline, hence the need to control subnational finances. In response to this challenge, sub-national fiscal rules exist in most federations. The most common rule takes the form of balance-budget requirements, sometimes associated with constraints on sub-national borrowing. More granular rules, for example on spending, are less common as they constrain more directly sub-national fiscal policy choices.

8. Governance framework and nexus with bailout/no bailout.

Different arrangements to foster discipline and enforce fiscal rules emerge in the sample of federations studied (Figure 3). On one end of the spectrum, the U.S. and Canada rely on markets to instill fiscal discipline at the sub-national level. In that model, regional governments are made fully responsible for their fiscal decisions, and adopt self-imposed fiscal rules to signal their creditworthiness to the market. This comes with wide-ranging tax autonomy for the regional governments but also a history of the center forgoing bailout and allowing a regional default. Arguably, the no-

bailout approach, where enforced, is credible because of the amount of fiscal risk sharing offered through other means. This guarantees that a region or state falling into bankruptcy will not be without minimum government services, social security, and financial stability. At the other end of the spectrum, in countries such as Brazil and Germany, bailout episodes of subnational governments have occurred in the recent past—so they cannot rely as extensively on market discipline. As a consequence, in these federations, a “center-based” approach has emerged, where the federal level retains a larger share of tax raising powers and imposes stricter spending or borrowing limits on sub-national governments. Thus far spared by bailout episodes, Australia, Belgium and Switzerland have intermediary systems, with varying degrees of tax autonomy and alternative means to achieve fiscal discipline, be it a strong component of intergovernmental coordination (Australia, Belgium) or direct democratic control (Switzerland).



C. Fiscal Risk Sharing

Fiscal risk sharing takes many forms.⁶ This section illustrates how it is achieved in practice in the sample federations by analyzing the features of the central budget, social security systems, and backstop facilities for the financial sector.

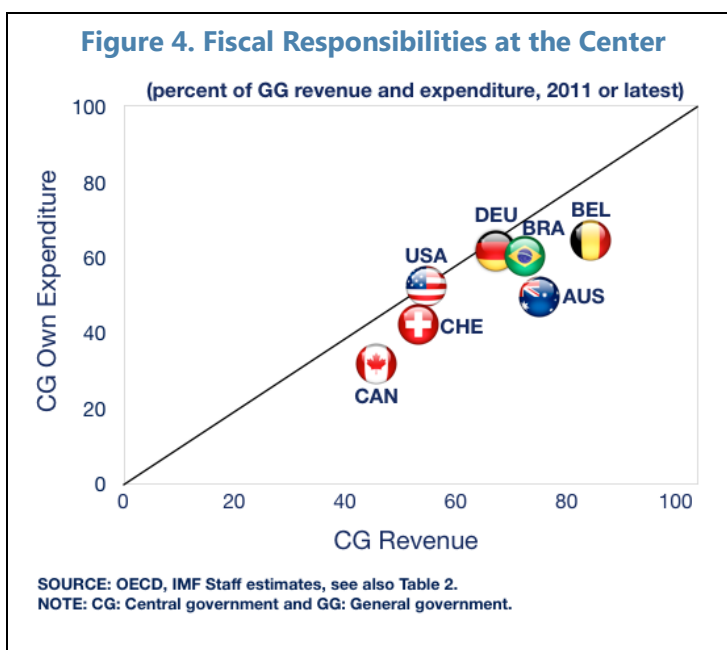
A large fiscal capacity at the federal level

9. Centralized revenue. In all federations in the sample, the central government, consolidated with social security funds, holds the largest share of public finances. Central government revenue makes up about half of general government revenue in Canada, Switzerland, and the U.S., two thirds in Germany and even higher shares in Australia and Belgium.. This setup provides for a powerful insurance mechanism: a region’s relative tax contribution may fall during a downturn, but the pooling of resources with that of other regions to finance a continuous flow of central expenditures reduces its impact.

10. Centralized spending.

Expenditure responsibilities go hand in hand with central revenue authority: the central government’s own expenditure (net of transfers) is high where revenue collected by the center is also high (Figure 4 and Table 2).

- In most cases, revenue levied at the center finances federation wide health and social protection, among other things (see below).
- A central budget typically contains some budget items with long planning and implementation horizons. These include support programs and infrastructure, with typically large economies of scale and positive externalities for neighboring regions within the federations. As such, a sub-national government might have difficulty financing them on its own, or might tend to scale these back in case of a (regional) downturn. Conversely, placing some of the spending responsibility for these types of spending at the central level protects them from discretionary policy or financing constraints at the sub-national level. Indeed, in the seven federations in our sample, the central level controls a significant share of total investment spending (10 to 45 percent, and 20 percent on average, Figure 2).



⁶ see ¶8 of the first background note for a detailed discussion.

- General public services and defense are also economic functions carried out centrally, primarily because of economies of scale and the classic public good nature of the services provided (Figure 1).

Federal social safety nets

11. Insuring against individual risks. Social benefit systems insure individuals against idiosyncratic risks of employment loss, sickness and income loss in old age. All countries in the sample have a minimum level of centralization of health care, pension, and unemployment insurance systems—ensuring a floor to individuals’ income and social services provision regardless of where they reside in the federation. The U.S. is the only country in the sample where social protection systems show a significant degree of decentralization.

Unemployment benefits

12. High degree of centralization in most cases. All countries have at least partial central government *funding*, a central government *backstop* for their unemployment benefit systems, and unemployment *benefits* that are at least partially harmonized. Some countries, like Belgium, have latitude in the administration of the benefits at the sub-national level. In case of the U.S., unemployment insurance is funded jointly by the federal and state governments and largely unharmonized across states. But even there, common federally-sponsored support has been provided when severe negative shocks occurred.

13. Australia. The Australian unemployment benefit system is fully centralized (Vroman, 2002), and fairly representative of most countries in the sample. The unemployment benefit system is funded through general government revenues. Benefit levels are uniform across the country, income- and asset-tested (to take into account partial unemployment and family income) and centrally administered through a federal agency (*Centrelink*). Eligibility criteria are also harmonized, with compliance assessed by *Centrelink* local offices. Benefit payment is conditional on job search, which is assisted and assessed by independent, but federally-approved and -funded, private or community organizations.

14. Belgium. The Belgium unemployment benefit system is characterized by greater regional autonomy in determining access to benefits than in Australia. The unemployment insurance fund is funded through national social contributions (Ohnsorge, 2012). Benefits and eligibility criteria are harmonized nationally. However, compliance with eligibility criteria is recorded and assessed by employment offices run by the regional governments, and in some places, by privately-owned employment services. Regions appear to use some latitude in assessing compliance: the sanction rate for non compliance varies from 1 to 3 per thousand job seekers between regions.

Table 2. Main Features of the Central and Sub-National Governments & Social Security Systems in Federations

	Own expenditure (percent of total GG expenditure) 1/	Revenue (percent of total GG revenue) 2/	Degree of fiscal autonomy 3/	Intergovernmental transfers expenditure (percent of total GG expenditure) 4/	Capital expenditure (percent of total GG capital expenditure) 4/	Pension system (net replacement rates for average wage earner, 2010) 5/	Health care	Federal unemployment benefits (net replacement rate for average wage earner, 2010)
Federations								
Australia	50	74	100	23	20	National (14.8 percent)	National for all	National (56 percent)
Belgium	63	83	100	25	13	National (52.1 percent)	National for all	National (60 percent)
Brazil	60	70	62	25	44	National (96.6 percent)	National for all	National (50-60 percent)
Canada	34	45	91	19	9	National (50.4 percent)	National for all	National (82 percent)
Germany	61	65	0	11	24	National (56 percent)	National for all	National (72 percent)
Switzerland	43	53	100	16	23	National (38.2 percent)	National for all	National (90 percent)
USA	54	54	100	10	15	Federal, suppl. by states (47.3 percent)	National for seniors and poor, suppl. by some states for uninsurable risks	National and state level (45 percent)
Currency Unions								
Euro area	<2	<2	100	no	no	no
WAEMU	1	<1	100	Ad hoc, e.g. for disaster relief	...	no	no	no

1/ Central government and social security, consolidated, excluding transfers, 2011 or latest. Source: OECD. For Australia: 2009, IFS. For Brazil: IMF Staff estimates of primary expenditure shares, 2007-2010 average.

2/ Central government and social security, consolidated, 2011 or latest. Source: OECD. For Australia: IFS, 2009. For Brazil: IMF Staff estimates of primary revenue shares, 2007-2010 average.

3/ Share of sub-national revenues on which sub-national authorities have discretion in rate setting. For OECD countries: OECD, 2010. For Brazil: IMF Staff estimates.

4/ Eurostat, OECD 2010. For Canada and Australia, Haver, 2011. For Brazil, IMF staff estimates for 2007-10.

5/ OECD Pensions at a Glance, 2011.

Sources: Eurostat, OECD, IFS, IMF Staff estimates.

15. U.S. At the other end of the spectrum, the U.S. system is decentralized, only partially federally-funded and not fully harmonized across states along a number of dimensions.

- *Large role for the states.* Each state has its own unemployment insurance scheme, with benefits funded by state payroll taxes. Federal payroll taxes are collected into a federal unemployment insurance fund (FUTA), which covers the administrative cost of states' unemployment funds and backstops unemployment insurance funds should states' own funds fall short (Shaw and Stone, 2012). FUTA sets broad guidelines, but eligibility criteria, state payroll contribution rates, and benefits are set by and vary across states.
- *Eligibility.* Eligibility of unemployment benefits differs by states, with many states excluding some groups of workers. Individuals qualify for unemployment benefits if their highest quarterly wages in any of the past four—or more, depending on the state—quarters of employment are above a state-specific threshold, which varies widely across states.

- *Benefits.* The benefit policy also fluctuates across states. Some states have waiting periods, before unemployment benefits are paid, others do not. There is large variability both on minimum and maximum benefits, with the later affecting jobseekers with fairly low prior income in some states while being uncapped in others. Only half of the U.S. states allow unemployment benefits to be received in the presence of partial employment income.
- *Benefit duration.* Benefit duration ranges from 6 to 30 weeks. Some states allow a uniform number of weeks of benefit duration while others cap it to when a state-specific threshold on unemployment benefit payments is reached.
- *Federal role in case of severe economic downturns.* The state unemployment benefit systems are supplemented by ad hoc federally-funded emergency programs during national downturns (Shaw and Stone, 2012). The latest of these was the Emergency Unemployment Compensation Program, created in 2008, repeatedly modified and set to expire in 2014. This program extends benefit payments to 34 weeks and more in states with particularly high unemployment. An earlier program had been the Temporary Extended Unemployment Compensation in 2002-03. In addition, Extended Benefits programs, funded in equal parts by the state and the federal government, automatically provides an additional 13 weeks of benefits in states where unemployment exceeds 5 percent and is one-fifth above the level of the previous two years. In extreme cases, like in 2009, emergency legislation can temporarily establish full federal funding for this program too.

Pension benefits

16. Nationwide systems in most cases. All non-U.S. sample countries have a single unified, centrally-funded public pension system, supplemented to varying degrees by private pensions. As with unemployment insurance, the U.S. public pension system is more differentiated: the federal level provides a means-tested minimum pension which states can supplement (OECD, 2011). Eight states pay only the federal minimum, another 29 states administer their own system, while the last 15 offer supplements operated by the federal Social Security Administration, in some cases, jointly with the state agencies—providing an average supplement of 29 percent of the maximum federal benefit for single pensioners and 50 percent for couples.

Health insurance

17. Centralization. Health insurance systems are centralized in all the countries in our sample, although funding differs and some are supplemented by private or state plans. In Australia and Brazil, health insurance is funded through general taxes, in Belgium and Germany through social contributions, and in Switzerland through individual specific premiums (Paris, Devaux and Wei, 2010 and OECD 2011). In the U.S., even though a large part of health insurance is supplied privately, *Medicare* provides federally-funded health insurance for seniors, *Medicaid* provides state- and federally-funded health insurance for the very poor (recently expanded in the *Patient Protection and Affordable Care Act*), and 35 state-level insurance plans—with varying coverage, cost, and benefits—

provide access to insurance for people with pre-existing medical conditions (Thomasson, 2010; US Government Accountability Office).

Backstops for the banking sector

18. Insuring against financial risks. Banking stress can have severe effects on financial stability and confidence, and can trigger contagion within the federation through integrated financial markets.

- *Nation-wide schemes.* Sub-national governments would often not have the fiscal means to rescue banks without seriously endangering their creditworthiness. In that context, common backstops for the resolution of insolvent banks and deposit insurance can buffer the impact of a localized bank failure and reduce the risk of destabilizing bank runs. Indeed, the countries in our sample all have (implicit or explicit) nation-wide bank resolution mechanisms and deposit insurance systems (Appendix 1).
- *Fiscal backing.* The deposit insurance schemes are in principle designed as privately funded—although in the case of Belgium, contributions are channeled through the federal budget—but all except the Swiss and German systems also have an explicit fiscal backstop. Even when there is no explicit fiscal backstop, the federal level has stepped in at times of crisis—as evidenced by the ad hoc fiscal support provided during the financial crisis in Belgium, Switzerland, the U.S., and Germany. These programs were temporary in nature.⁷

19. Canada. The Canadian system is highly centralized in its operations, and benefits from an explicit fiscal backstop from the federal level, as is the one in the U.S.⁸

- *Deposit insurance.* The deposit insurance scheme is run by a federal entity, the *Canada Deposit Insurance Corporation* (CDIC) and funded by the banking sector.⁹ It covers most Canadian chartered banks, but not credit unions, which are backed by sub-national insurance plans (CDIC, 2011a). Individual contributions are based on the amount of insured deposits and qualitative criteria including risk. At end-2011, available funds stood at 0.4 percent of insured deposits but an increase to 1 percent is targeted (CDIC, 2012). In case this proves insufficient to cover disbursements, the fund can borrow up to C\$18 bn (1 percent of GDP) from the federal government and financial markets and repay the loans subsequently by increasing contributions from member institutions (CDIC, 2011b).

⁷ The US TARP expired in October 2010; the German Soffin is set to expire in 2014; and the Swiss and Belgian bailouts were limited to the resolution of individual banks.

⁸ The Australian and Belgian deposit insurance systems are similarly government-funded; and administered by the treasury (Belgium) or the regulator (Australia). The Canadian, US, and Brazilian deposit insurance entities are endowed with full or partial resolution powers, while the Australian and Belgian ones are not (FSB, 2012b).

⁹ Separately, provincial deposit insurance funds provide insurance for credit unions that are active in individual provinces.

- *Resolution framework.* The CDIC is also the bank resolution authority, working in close cooperation with the supervisory agency for federally regulated financial institutions, the Office of the Superintendent of Financial Institutions (OSFI, 2011; FSB, 2012a). If a bank has to be resolved, the OSFI would temporarily assume its operational control, while the CDIC would initiate the winding up of the institution. Funding for deposit insurance—the only funding envisaged—would be provided by the CDIC. Creditors that are not eligible for deposit insurance would be satisfied in the bank resolution process according to the seniority of their claims.

20. Switzerland. Because there is no explicit fiscal backstop for the Swiss banking sector, banks are mandated to hold large buffers. Yet, *de facto*, the federal level has been ready to provide support *ex post* when systemic banks were at risk.¹⁰

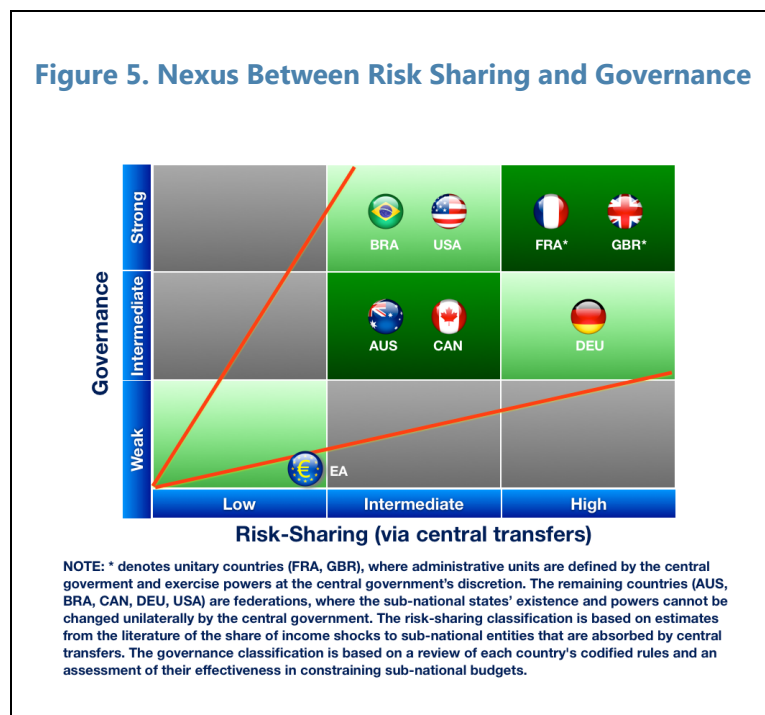
- *Deposit insurance.* All banks that take insurable deposits are required to be members of the *Esisuisse* and contribute in proportion to insured deposits (Chapter 13 of Federal Law on Banks and Credit Unions) The deposit insurance fund is capped at CHF 6 bn (just over 1 percent of customer savings and deposits) and has no explicit fiscal backstop. (Esisuisse, 2012a; IMF, 2009). In that context, to ensure sufficient funds, banks are required to hold strong buffers at all times. These take the form of (i) secured domestic assets in the amount of 125 percent of insured deposits and (ii) liquid assets in the amount of 50 percent of maximum potential contributions—in addition to those required to comply with prudential liquidity ratios (Esisuisse 2012b).
- *Resolution authority.* The Swiss federal supervisory agency, FINMA, has single authority over bank supervision, bankruptcy and resolution proceedings. FINMA would solely be empowered to trigger a request for disbursements by the deposit insurance fund.
- *No fiscal backstop but ad hoc bailouts.* While there is no formal bank resolution fund with explicit fiscal support—except for some small cantonal guarantees for some cantonal banks—the Swiss federal budget bailed out a systemic bank, UBS, in 2008 on an ad hoc and temporary basis.

D. Risk Reduction: Fiscal Governance and Bailout Practices

Because sub-national governments may be inclined to implement riskier policies knowing that the federal level will provide insurance, greater risk sharing typically comes hand in hand with stronger governance. Sub-national fiscal rules typically take the form of balanced budget rules, complemented at times with borrowing controls. Enforcement and coordination of these budget constraints can either emerge from a “center-based” approach of oversight, market discipline, or cooperative arrangements. In some cases, these arrangements have emerged from crisis episodes: where the center has credibly committed to a no-bailout policy, fiscal discipline has ensued naturally from market pressures. But where the center assisted those in difficulties, fiscal discipline has been imposed top-down.

¹⁰ Similarly, the German deposit insurance system is privately-based without an *ex ante* fiscal backstop.

21. Stronger governance in presence of greater risk sharing. Existing federations, through the various institutional arrangements described above, exhibit a sizeable level of fiscal risk sharing: of every one percent of a country-specific income shock, about 0.15 to 0.2 percent is smoothed through federal fiscal transfers (see first background note). The extent of risk sharing is even higher in unitary countries. Experience shows that a relatively higher degree of fiscal risk sharing tends to go hand in hand with stronger fiscal governance of subnational policies (Figure 5). Indeed, with the existence of a safety net provided by risk sharing, subnational governments may take spending decisions more liberally and deviate from the optimal fiscal stance federation-wide. Thus, hard budget constraints and stronger governance are needed to mitigate moral hazard.



Budget constraints

22. Rationale. Having some fiscal decisions decentralized at the sub-national level is efficient, as it tailors them better to local needs (Tiebout, 1956; Oates, 1972). Yet, sub-national governments may be tempted to conduct unsustainable policies, as they do not fully internalize negative spillovers to federation-wide macroeconomic stability. As mentioned above, the existence of risk-sharing mechanisms from the center can reinforce the incentive to deviate from sound policies at the local level. A natural solution to this coordination problem is to establish budget constraints on sub-national governments.

23. Types of rules. The rule most commonly used to pre-empt fiscal excesses is some form of balanced budget requirements, present in most federations in our sample (Appendix 2). Restrictions to sub-national borrowing are also common where market discipline plays less of a role, either through explicit limits (imposed by the Senate in Brazil; granted constitutional status in Germany) or as the result of a coordination process with the federal government (Australia, Belgium). Restraining sub-national spending is less common (Brazil, Belgium) as it interferes directly with fiscal choices and therefore restrains more strongly fiscal autonomy at the local level.

Discipline enforcement

24. Sources of discipline. To be properly implemented, budget constraints are complemented by enforcement frameworks, which provide the right incentives for sub-national governments to comply. In some federations in our sample, such as the U.S. and Canada, budget constraints are sanctioned by markets, with states and provinces having self-imposed fiscal rules in their legislation to signal sound policies. In others, like Germany and Brazil, subnational budget constraints have emerged as a result of stronger involvement and oversight from the federal level. In intermediary systems, cooperative arrangements prevail (Appendix 1).

25. Interplay with (no) bailout. Bailout expectations can undermine the incentives for sub-national governments to abide by their budget constraints.

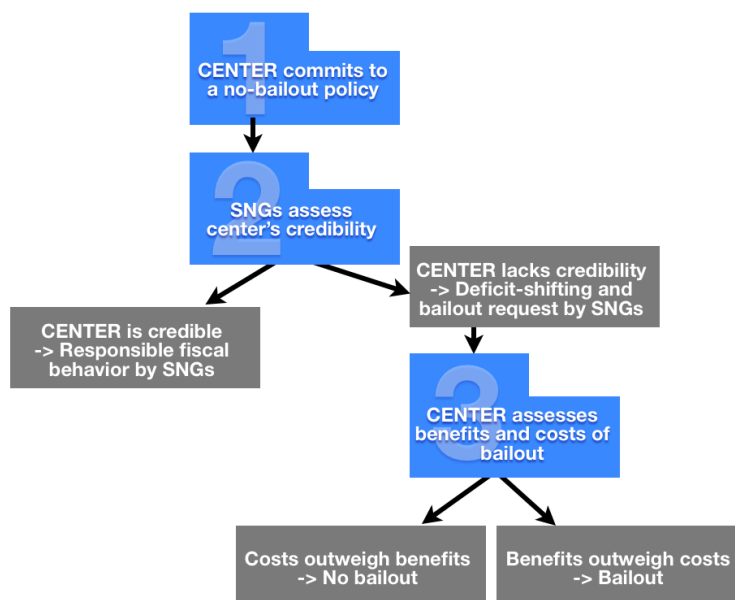
- *A dynamic relationship with the center.* Where sub-national governments have strong beliefs that the center is committed to a no bailout policy, they will have the incentive to run sustainable fiscal policies. But if the credibility of the no-bailout policy is in doubt, sub-national governments may be tempted to overspend on the expectation that they will eventually be rescued, increasing the likelihood of bailout requests. If these materialize, the center may be confronted with the choice of letting the sub-national government default—reestablishing the credibility of the rule, or providing support—thereby switching to a bailout regime (Box 1). An example of these dynamics is provided by the U.S. in the 19th century when the credibility of the no bailout commitment was established (see below).
- *Credibility.* Commitments to no bailout rules are more credible when risk sharing mechanisms are in place to lessen the negative impact of a potential default at the sub-national level—both by ensuring that basic public services are still provided in the defaulting entity and that spillovers to other constituencies are minimized.

Box 1. To Bail Out or Not To Bail Out?

A Sequential Game Between the Center and Sub-National Governments

The (no) bailout policy can be viewed in the context of a dynamic game played by the central and sub-national governments (Box Figure 1). In the first stage of the game, the central government announces its financing policies, and commits not to bail out profligate sub-national governments. At a second stage, sub-national governments examine the center's commitment to these policies and decide to spend within its means—at which point the game ends with a stable outcome—or to borrow excessively—a decision that can ultimately lead to a bailout request. In the latter case, the central government can then choose to provide a bailout—in which case it switches to a different regime, or to resist it and allow default—reinforcing the credibility of its initial commitment to a no bailout regime.

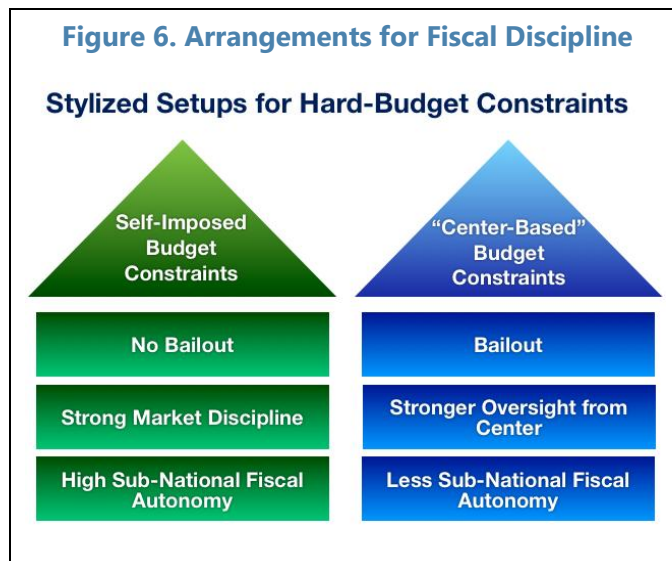
Box Figure 1. Bailouts as a Sequential Game



The credibility of no bailout arrangements hinges on a number of factors, including the scope for spillovers, the extent of federation-wide risk sharing and the degree of tax authority of sub-national governments. The more interconnected sub-national economies are and the larger the risk of contagion from one economy to another, the greater the center's bailout payoffs. The center will also be prone to meeting bailout demands if, in a context of limited ex ante risk-sharing arrangements, sub-national governments are failing to provide key social services. A low degree of local tax authority leaves sub-national governments with little flexibility to cushion region-specific shocks, thus directing market pressure to the center and increasing the probability of bailouts.

26. Different arrangements. The way fiscal discipline is achieved is deeply intertwined with how relationships between national and sub-national governments are organized. At the extreme, two different arrangements have emerged—often as a solution to a crisis at some point in time—with some countries having intermediary approaches (Figure 6).

- *Self-imposed budget constraints* (U.S., Canada): In these countries, market discipline is underpinned by a credible (and established) no-bailout commitment. Self-imposed budget constraints serve as a signaling device to markets of commitment to sustainable policies. In that context, sub-national governments tend to be granted wide-ranging fiscal autonomy.
- *“Center-based” approach* (Brazil, Germany): Where bailout episodes of subnational governments have occurred in the recent past, market discipline cannot be relied upon as extensively to foster discipline. Instead, the central government can exercise extensive controls over sub-national fiscal policies, with less fiscal autonomy left to the sub-national governments.
- *A consensual process*: The remaining federations in the sample stand between these two types of arrangements, relying on intergovernmental coordination (Australia, Belgium) or direct democracy in combination with market discipline (Switzerland) to reach agreement on sustainable fiscal policies at the sub-national level.



Self-imposed budget constraints in the context of well-established no bailout policy: the case of the U.S. and Canada

27. Setup. Market discipline plays its role in the context of established no-bailout policies and substantial fiscal autonomy.¹¹

- *No bailout rules.* U.S. states and Canadian provinces have few reasons to anticipate bailouts. The federal government in these federations has consistently resisted bailouts. Moreover, in the U.S., there are clear mechanisms to prevent local sovereign obligations from being assumed by other jurisdictions and from extending federal protection for states’ creditors. (11th amendment of the

¹¹ Limited depth of sub-national debt markets can constrain the scope for purely market-based systems. Conversely, the mobility of workers and firms across states can increase competitive pressures at sub-national levels to maintain fiscal discipline, while ensuring low taxation and high quality public services.

Constitution), and attempted bailouts by the federal government could risk being challenged on constitutional grounds.

- *Fiscal autonomy.* Sub-national governments have wide-ranging fiscal autonomy: they can determine the bases and the rates of broad-base taxes, and their central governments place no constraints on their spending and borrowing decisions. This provides the sub-national governments with the needed tools to fulfill their self-imposed budget constraints.

28. Model emerging after crisis. The no-bailout commitment in the US and Canada was tested in several historical events where the federal government repeatedly resisted bailouts. The self-imposed budget constraints then emerged as a way for sub-national governments to pre-commit prudent fiscal behavior to markets (Bird and Tassonyi, 2003).

- *Crisis episodes in the 19th century:* In the 1830s and 1840s, following an investment boom in railroads, canals, and state banks, many US states were led to default, with no support from the federal government. Under pressure from voters, fiscal rules were added to state constitutions to prevent fiscal excesses and future defaults: By 1857, most states had a constitutional balanced budget amendment, and 49 of 50 states have some version of this restriction today (Laubach, 2005; Wibbels 2003; Sbragia 1996).
- *Recessions in the 1980s and 1990s:* As the post-war era of rapid growth came to an end and large transfer programs were downsized—as a consequence of fiscal consolidation at the federal level—, several *Canadian* provinces' level of public debt rose substantially, triggering an increase in risk premia and a downgrade of their bonds. With the federal government resisting bailouts, provincial governments responded to creditors and voters' pressures by adjusting tax rates and, by 1993, a majority of provinces had enacted some form of balanced-budget rule. Around the same period, *U.S.* states experienced regional economic downturns, unexpected increases in health care costs, and cuts in federal grants, to which they adjusted on their own.¹² One notable consequence was the set-up of state rainy-day funds—whose number rose from 12 in 1982 to 45 in 1995—as a means to avoid having to run pro-cyclical policies in downturns in the context of balanced-budget rules.

“Center-based” approach: the case of Brazil and Germany

29. Strong central oversight following bailout episodes. In Brazil and Germany, strict rules have emerged following historical experiences to restrain sub-level governments spending and borrowing after actual episodes of bailout.

¹² Even though the U.S. government is committed to the no-bailout rule for states, it has at times provided financial support to *local* entities. In 1975, New York City was on the brink of default when the U.S. government refused a bailout. In the event, the New York City teachers' union agreed to buy municipal bonds through its pension fund, and the federal government provided a credit line following the teachers' union's decision. After the financial crisis of 1994-95, the District of Columbia also received loans from the federal government.

- *Brazil.* Following a series of sub-national bailouts in the late 1990s, the central government assumed the states' liabilities in return for bilateral contracts strictly restricting their fiscal policies for the following 30 years. States are required to maintain expenditures and debt levels below ceilings set by the (federal) Senate. If a state government does not abide to the caps, the federal government may deduct any over-spending from tax-sharing transfers (Hallerberg, 2011; Webb, 2004). To avoid future bailouts, important elements of these contracts were legislated in a Fiscal Responsibility Law in 2000.
- *Germany.* Amidst increases in the *Länder* debts over the 1970s and 1980s, Bremen and Saarland began to receive "supplementary transfers" in 1987 (further augmented in 1992) explicitly aimed at coping with their high debts. These precedents eroded fiscal conservatism by the *Länder* and contributed to Germany's noncompliance with the Stability and Growth Pact (SGP) in 2002. To restore the commitment toward a no-bailout policy, a constitutional debt-brake rule was adopted in 2009, which binds all government levels to having a structurally balanced budget, instead of a golden rule as in the past. In addition, a Stability Council was created in 2010 to enforce fiscal discipline and ensure fiscal sustainability of sub national policies. Under the new regime, *Länder* with distressed public finances receive small transfers (financed by the federal and *Länder* governments in equal parts) and consent, in return, to a macroeconomic adjustment program. Five *Länder* are currently under such programs. It remains to be seen how effective these institutional changes will be in encouraging fiscal discipline by the *Länder* while sustaining past levels of risk sharing.

A cooperative process: the case of Australia, Belgium and Switzerland

30. Consensus building. In Australia, Belgium and Switzerland, a culture of cooperation and intergovernmental coordination has prevailed. It has not been tested by episodes of subnational fiscal crises. While sharing many attributes with the governance setting of the U.S. and Canada, notably market discipline, Switzerland relies on direct democracy to encourage responsible fiscal behavior. In Australia, a strong commitment to fiscal transparency has also contributed to instilling sound fiscal sub-national policies.

- *Fiscal transparency.* Fiscal transparency has greatly assisted fiscal discipline in Australia: States negotiate borrowing allocations within the Loan Council, which then regularly discloses fiscal information and requires states to publicly explain any overruns in the agreed envelopes. A similar setup exists in Belgium, whereby borrowing allocations are negotiated within the High Finance Council (alongside intergovernmental transfers) and debt issuance by subnational entities is approved by the Council of Ministers. All fiscal targets are published in annual reports. In the event of misalignments, the federal government can cap regional borrowing for two years.
- *Direct democracy.* Subject to some informal coordination with the Confederation, the Swiss cantons enjoy a high degree of autonomy for the preparation of their budgets. But, direct democracy has secured effective constraints on taxation and loan finance. In some cantons, sub-national borrowing, for instance, is restricted to investment projects (golden rule) and subject to popular referenda.

E. Lessons For the Euro Area

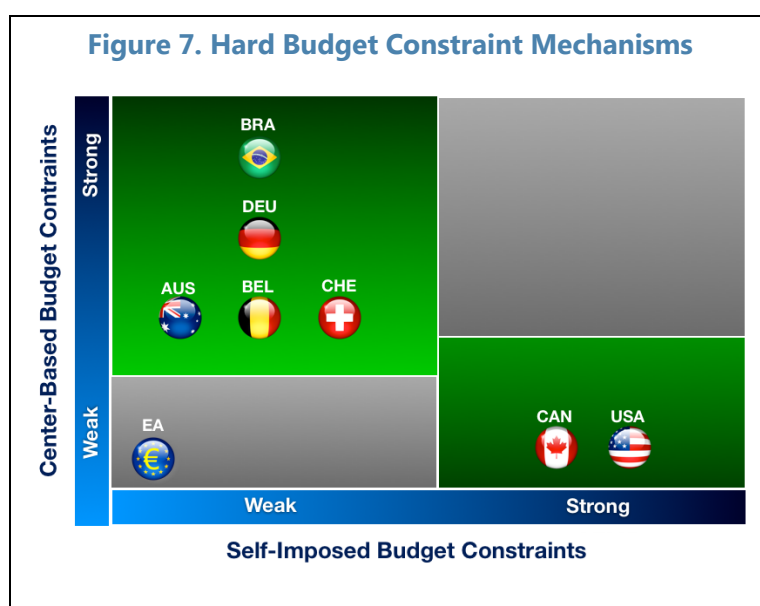
31. Risk sharing combined with strong governance. All federations in our sample have some form of pooling of fiscal resources, centralization of expenditure functions—especially on social protection—and an implicit or explicit backstop of the financial sector from the center. These insurance mechanisms come hand in hand with strong governance and discipline enforcement mechanisms. Where bailouts have occurred, they have been implemented in conjunction with central coordination or oversight over sub-national fiscal policy. While these federations are all unitary political systems—which the euro area is not—their setting is informative on how a fiscal union can work in a context of deeply interconnected economies. In contrast to these existing federations, the euro area has few risk sharing mechanisms in place, and its governance is less effective.

32. Improving the institutional setting.

The euro area cannot count on market discipline when expectations of bailouts are high, and the central oversight—especially in terms of *enforcing* discipline—remains weak (Figure 7). Cooperative approaches implemented elsewhere have shown their limits in the first decade of EMU. Experience from federations also suggests that intergovernmental coordination is most challenging with a large number of jurisdictions. Even if the option is chosen to aim to restore the

credibility of the no bailout rule, the transition to such a regime will have to be carefully managed and implemented in a gradual and coordinated way. In the interim, enforcement will have to be imposed more directly by the center. The Fiscal Compact, calling for effective implementation of automatic corrective mechanisms at the national level, and the “two-pack”, enhancing budgetary transparency and monitoring, are first steps in that direction.

33. Transition as the result of the crisis. As historical episodes described above show, episodes of fiscal stress and bailout are often first steps to a rebalancing of power towards the center. In these episodes, the crisis has provided the momentum to transition to more stable institutional mechanisms that restrict sub-national borrowing and enhance fiscal monitoring from the center. The current crisis presents the euro area with a similar opportunity.



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Appendix 1. Features of Banking Union, Common Borrowing, and Governance in the Sample's Federations

	Banking union		Common borrowing			Governance		
	Deposit insurance	Bank resolution/ supervision	Borrowing arrange- ments	Joint and several	Share of CG debt in GG debt 1/	Subnational fiscal rules	Central oversight	Bailout Practices 2/
Federations								
Australia	National with government guarantee	State governments	separate	No	64	State level rules	None	...
Belgium	Deposit and financial instrument protection fund, funded by bank contributions with fiscal backstop	Central bank	separate	No	92	Ad hoc political commitments	None	...
Brazil	National (FGC)	Central bank	separate	No	70	yes	Yes, through contracts	Bailouts in 1990s
Canada	CDIC with fiscal backstop for all but two provinces	CDIC	separate	No	48	Provincial budget rules and unemployment insurance rule, but no federal budget rule	None	Federal governments resisted bailouts
Germany	National, but private with ad hoc government guarantee during crisis	National joint BaFIN (micro) / Buba (macro)	separate	No	63	yes (debt brake rule)	Some, stability council, fiscal rule	Bailout over 1970s and 1980s
Switzerland	Privately operated national, without explicit fiscal backstop	Supervision national, resolution cantonal for cantonal banks	separate	No	57	Cantonal rules, usually balanced budget with qualifiers	None	...
USA	FDIC, with fiscal backstop	FDIC	separate	No	79	yes, golden rule balanced budgets	No	Federal governments resisted bailouts
Currency Unions								
Euro area	no	no	separate	No	...	SGP	"two" and "six" pack	Ongoing programs
WAEMU	no	Country-level resolution, de jure regional supervision	Separate	No	0	Country specific; and WAEMU-wide convergence criteria	Convergence reports, discussed by Council of Ministers	...
1/ OECD, national authorities, QPSD database. 2011 or latest available								
2/ See text.								

Appendix 2. Sub-National Fiscal Frameworks in the Sample's Federations

Country	Approach	Fiscal Framework	Enforcement
Australia	Cooperative	<p>* <i>Fiscal Rules</i>: Most states have adopted balanced budget rules;</p> <p>* <i>Borrowing</i>: Commonwealth and state borrowing is coordinated by the Loan Council taking into account each jurisdiction's fiscal position, infrastructure needs and macroeconomic objectives.</p>	<p>* <i>Peer pressure</i>. The states are required to explain publicly overruns in the borrowing allocations set by the Council.</p> <p>* <i>Market discipline</i>. States borrow on their own account and the Loan Council provides information to markets on borrowing plans. Enhanced fiscal transparency has sharpened market discipline.</p>
Belgium	Cooperative	<p>* <i>Fiscal Rules</i>: Targets for the overall balance and expenditure growth are set for communities and regions;</p> <p>* <i>Borrowing</i>: regions and communities can borrow subject to government approval.</p>	<p>* <i>Peer pressure</i>: fiscal targets are negotiated and published in annual reports;</p> <p>* <i>Administrative sanctions</i>: The federal government is allowed by law to cap regional borrowing for two years.</p>
Brazil	Hierarchical oversight	<p>* <i>Fiscal Rules and borrowing</i>: After the Fiscal Responsibility Law (FRL), states are required to maintain debt below ceilings set by the Senate. The law requires annual targets for revenues, expenditures, the primary balance and the indebtedness of all government levels.</p> <p>* <i>Contracts</i> between the federal government and states remain in place from subnational bailout episodes and determine subnational fiscal policies.</p>	<p>* <i>Sanctions</i>: The FRL foresees financial sanctions for sub-national governments breaching debt ceilings, personnel ceilings or transparency requirements; contracts or administrative decisions that violate the FRL are nullified; Governors responsible for violation risk imprisonment.</p> <p>* <i>Escape clauses</i>: Debt limits established by the Senate can be revised in event of a severe recession/natural disasters.</p>
Canada	Market-based	<p>* <i>Fiscal Rules</i>: Many provincial governments have introduced some sort of balanced-budget legislation, while municipal governments must post balanced positions.</p> <p>* <i>Borrowing</i>: No restriction on provincial borrowing but municipal borrowing is limited to investment projects (golden rule).</p>	<p>* <i>Market discipline</i>. The federal government does not guarantee sub-national debts.</p> <p>* <i>Escape clauses</i>. In most provinces, surpluses can be carried over to finance a deficit in a subsequent year. Legislation in many provinces builds in escape clauses for special events.</p>
Germany	Hierarchical oversight	<p>* <i>Fiscal Rules</i>: Lander must gradually converge towards a structural balance position by 2020 and maintain it thereof (Constitutional debt brake).</p> <p>* <i>Borrowing</i>: Borrowing linked to investment projects until 2020 (golden rule) and cyclical developments thereof. Some states will feature a quicker transition.</p>	<p>* <i>Constitutional debt brake</i>. Enforcement mechanisms are not automatic, but compliance with the structural balanced budget rule can be challenged to Courts and financial assistance to failing states can be cut off if they do not adhere to targets.</p> <p>* <i>Escape clauses</i> activated by two thirds majority of Parliament for emergencies outside the control of the government.</p>
Switzerland	Democracy-based	<p>* <i>Fiscal Rules</i>: Informal coordination takes place between the Confederation and the cantons for the preparation of the budget. Most of the cantons have fiscal rules, but these vary with respect to the target.</p>	<p>* <i>Sanctioning mechanisms</i> vary across cantons. Municipal finances are subject to oversight by the respective canton. Close links between spending decisions and the responsibility for their financing.</p>
United States	Market based	<p>* <i>Fiscal Rules</i>: Most states have constitutional balanced budget rules.</p> <p>* <i>Borrowing</i>: No restrictions.</p>	<p>* <i>Market discipline</i>. The federal government does not guarantee sub-national debts.</p>

Source: Joumard and Kongrud (2003); and Fund Staff.