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A fiscal capacity for the euro area: lessons from existing fiscal-federal systems

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Contents

Abstract 2

Executive summary 3

1 Introduction 6

2 Literature review 10

3 Performance criteria for interregional transfer systems 14

3.1 Economic efficiency 16

4 Case studies 18

4.1 Austria 18

4.2 Belgium 23

4.3 Germany 28

4.4 Spain 32

4.5 United States 38

5 Cross-country assessment 44

6 Conclusion 46

Data appendix 48

References 52

Abstract

After the financial and economic crisis in Europe, a broad consensus has emerged that a stronger fiscal dimension may be needed to complete the architecture of Economic and Monetary Union (EMU). This paper analyses the performance of interregional transfers in existing fiscal-federal systems, notably in Austria, Belgium, Germany, Spain and the United States, and aims to draw lessons for the design of a euro area fiscal instrument. The empirical risk-sharing analysis in this paper suggests that effective cross-regional stabilisation of asymmetric shocks tends to work via direct cash transfers to households, such as unemployment benefits, which are financed out of cyclical central government taxes and social security contributions. This would suggest that a euro area budgetary instrument for stabilisation should be designed as a tool that enhances the automatic stabilisation capacity in the single currency area. At the same time, it seems important that a prospective central stabilisation instrument for the euro area would be integrated in an overall fiscal policy framework that ensures proper incentives for national policymakers.

Keywords: euro area fiscal capacity, fiscal risk-sharing, fiscal federalism.

JEL codes: E62, H11, H77

Executive summary

After the financial and economic crisis in Europe, a broad consensus has emerged that a stronger fiscal dimension may be needed to complete the architecture of Economic and Monetary Union (EMU). The European Union lacks policy instruments to provide additional, targeted stimulus in the event of a severe economic downturn. A fiscal capacity at euro area level would increase public risk-sharing. This would involve fiscal transfers acting as cross-country insurance against large and unforeseen macroeconomic shocks. It may also facilitate private risk-sharing, driving closer credit and capital market integration. Currently, empirical risk-sharing models point to relatively limited risk-sharing via private channels in the euro area, while public risk-sharing is largely absent.

A large number of more concrete policy proposals for a fiscal capacity for the euro area – such as a budget that can be deployed as a stabilisation tool in case of asymmetric shocks – have been put forward by analysts and policymakers. Common elements of these proposals include macroeconomic stabilisation through transfers to the government budgets of Member States. Also, such transfers would require compliance with fiscal rules under the EU's fiscal governance framework.

This paper analyses the performance of interregional transfers in existing fiscal-federal systems with a view to drawing lessons for the design of a euro area fiscal capacity. The interregional stabilisation mechanisms are analysed, first, with regard to their effectiveness in smoothing regional consumption in the event of idiosyncratic shocks. Second, the paper assesses the efficiency of the intergovernmental transfer schemes in terms of creating transfer dependency and weakened incentives for sound public finances. The following systems are analysed.

- Austria's federal system features significant expenditure decentralisation, but very little revenue decentralisation. About 8% of GDP shocks are smoothed via fiscal channels, most importantly via federal taxes and social benefits (2000-17 estimates). At the same time, the vertical fiscal imbalance – the degree to which sub-national spending is financed via transfers – is very sizeable. This goes hand-in-hand with misaligned incentives for provinces and municipalities.

- In Belgium, regional and local governments are responsible for almost half of public sector expenditures and the federal structure provides for a relatively high degree of tax autonomy. Central government taxes and unemployment benefits provide the largest contribution to macroeconomic stabilisation and convergence across regions. A solidarity mechanism compensates regions with lower personal income tax per capita.

- Germany's federal system features large expenditure decentralisation, but very little tax autonomy for the states. It is estimated that 7.3% of a shock in a state's GDP is smoothed by the government sector, mainly through the social security system (1996-2016 estimates). At the same time, a federal financial equalisation system (known as the FES), which broadly aligns states' per capita tax revenue,

does not play a prominent risk-sharing role. The FES does, however, create negative fiscal incentives particularly for financially weak states, because a rise in tax revenue is almost entirely offset by a concomitant reduction in transfers received.

- Spain is a highly decentralised unitary state, with large expenditure decentralisation and tax autonomy enjoyed by autonomous communities. The government sector smooths around 10.3% of a shock in autonomous regions' GDP (2003-16 estimates), mainly through federal social benefits but also through an interregional revenue-sharing scheme. Significant vertical transfers from the central government to the autonomous regions create clear negative fiscal incentives.

- The United States is characterised by a fairly decentralised fiscal-federal system, with pronounced expenditure decentralisation and tax autonomy at the state and local level. 11.3% of the interstate variation in real GDP growth per capita is stabilised, mostly through federal social security and income maintenance payments (1999-2016 estimates). Intergovernmental transfers only play a limited role in interstate risk-sharing in the United States. The fairly decentralised US fiscal-federal system is typically viewed as having sound fiscal institutions and effective disciplining by financial markets, which supports sustainable public finances at the state level.

The paper concludes, first, that fiscal-federal structures differ considerably with regard to the degree of sub-national tax autonomy. In particular, US states have a high level of tax autonomy, while European countries typically feature a significant degree of intergovernmental redistribution of central government revenue through grants. Second, estimates indicate a relatively similar degree of fiscal risk-sharing across the countries, in spite of distinct differences between the fiscal-federal structures. Third, intergovernmental fiscal transfers explain a relatively small part of the total fiscal risk-sharing between regions in both the United States and European federal states. Fourth, risk-sharing in the countries considered here mainly occurs via federal taxes and transfers to households rather than intergovernmental transfers.

The insights gained from the case studies can usefully be applied to the policy discourse on a euro area fiscal capacity. Dedicated interregional transfer schemes typically do not provide much income smoothing and are prone to creating vertical imbalances and transfer dependency. In contrast to most recent policy proposals, our analysis provides arguments in favour of a genuine European scheme that operates via direct transfers to citizens (e.g. a European unemployment insurance scheme that complements national systems in severe recessions), financed out of federal European taxes or social security contributions. The US experience seems to indicate that a higher degree of tax autonomy, paired with credible federal no-bailout policies and the resulting self-imposed sub-national balanced budget rules, tends to promote regional incentives for sound fiscal policies.

This policy paper adds to the literature on both fiscal federalism and optimum currency areas (OCA). The "first-generation" fiscal federalism literature looks at the optimal allocation of government functions to ensure macroeconomic stabilisation, among

other things. This paper contributes to the empirical part of this literature by providing structured comparative case studies on fiscal federations and draws lessons for closer fiscal integration in the euro area. The OCA literature investigates essential elements for the smooth functioning of a monetary union. This paper also contributes to this literature by measuring the degree of risk-sharing across fiscal federations. Finally, the paper adds to the second-generation fiscal federalism literature, which analyses the disciplining effect of different institutional arrangements for sub-national public finances.

1 Introduction

Stronger fiscal dimension proposed to complete EMU architecture.

After the Great Recession and the ensuing sovereign debt crisis in Europe, a broad consensus has emerged in both the policy and the academic domain that the architecture of Economic and Monetary Union (EMU) remains incomplete. The Treaty on the Functioning of the European Union (TFEU) provides for a clear division of responsibilities between European and national policymakers.[1] But with taxation and government spending almost entirely at the national level, the European Union lacks policy instruments to provide additional, targeted stimulus in the event of a severe economic downturn.

Empirical risk-sharing models point to more limited risk-sharing via private channels in the euro area compared to the United States while public risk-sharing is largely absent in EMU.

According to empirical estimates, private and public risk-sharing – the notion that economic agents insure their consumption streams against fluctuations in the business cycle – in the United States ensure a smoothing of around 70% of the macroeconomic shocks at the state level (see, for example, Cimadomo et al. (2018)). The bulk of this cross-regional stabilisation takes place through private channels related to portfolio diversification across state borders and the integrated credit market. The US federal budget complements these private channels by smoothing around 10% of shocks. In the euro area, by contrast, empirical estimates suggest that large portions of idiosyncratic shocks in Member States remain unsmoothed, partly because public risk-sharing is largely absent.

A fiscal capacity at euro area level would not only increase public risk-sharing but might also facilitate private risk-sharing.

Closer credit and capital market integration that would provide the euro area with a higher degree of risk-sharing via private channels might require a stronger fiscal dimension in the EMU architecture. Farhi and Werning (2017) show that, even in the case of complete financial markets, private risk-sharing may need to be supplemented by a fiscal transfer scheme, since private agents do not internalise the macroeconomic stabilisation effects of their actions. As a result, the degree of public and private stabilisation provided in individual euro area countries may be sub-optimally low from the perspective of the single currency area as a whole. This suggests that private and public insurance are complements rather than substitutes. In a recent speech, former ECB President Mario Draghi argued that financial integration "only arises in the shelter of public risk-sharing, such as strong backstops and deposit insurance schemes."[2]

Several policy proposals for a euro area fiscal capacity.

The Five Presidents' Report proposes progress towards "a Fiscal Union that delivers both fiscal sustainability and fiscal stabilisation" (Juncker et al. (2015)). Analysts and policymakers subsequently put forward a large number of more concrete policy proposals for a fiscal capacity for the euro area – a budget that can be deployed as a stabilisation tool in the event of asymmetric shocks and that is operated by an institution at the European level (see Table 1). We consider four of these that are the most relevant to the policy debate at the current point in time. First, 14 prominent

1 Monetary policy is conducted at the supranational level for the euro area as a whole, while fiscal policies have remained largely in the competence of national governments and reflect national political preferences and economic conditions. While largely the responsibility of governments in the Member States, fiscal policies are subject to the rules of the Stability and Growth Pact.

2 "Stabilisation policies in a monetary union", speech by Mario Draghi, President of the ECB, at the Academy of Athens, 1 October 2019.

French and German economists suggested, among other things, reforming the fiscal architecture with the aim of making fiscal rules – constraints on fiscal policy through numerical limits on budgetary aggregates – less procyclical and easier to enforce, while at the same time "expanding fiscal stabilisation options in a way that creates good incentives for national economic policy" (Bénassy-Quéré et al. (2018)). Second, IMF staff put forward a proposal for a dedicated macroeconomic stabilisation fund that makes transfers to countries in bad times and is financed by regular annual contributions (Arnold et al. (2018)). Third, the European Commission proposed a macroeconomic stabilisation tool that aims at maintaining public investment in event of large asymmetric shocks, preserving stability and facilitating economic recovery.[3] Finally, in the context of the Meseberg Declaration, the French and German governments propose to implement a euro area budget and European unemployment reinsurance fund.[4] In this context, in June 2019 the Eurogroup agreed on the main features of the budgetary instrument for convergence and competitiveness (BICC) for euro area countries (and for ERM II countries on a voluntary basis) within the EU budget. This instrument is, however, not geared towards macroeconomic stabilisation, aiming instead at providing incentives for structural reforms and public investment at the national level.

Common elements of proposals include macroeconomic stabilisation through intergovernmental transfers and conditionality of funding.

There are common elements to these prominent recent proposals for a euro area fiscal capacity in the policy discourse described above (see Table 1). First, the proposals specifically target macroeconomic stabilisation. The proposed instruments are largely based on intergovernmental transfers. In other words, even if some of the proposals call for funds to be incorporated in the EU budget, the euro area fiscal capacity is a dedicated fund that makes payments to national governments and is financed by national contributions. Payments are normally triggered automatically by changes in a cyclical economic indicator. Second, proposals for a euro area fiscal capacity typically include mechanisms to limit the adverse incentives of the stabilisation mechanism. More specifically, the proposals usually include eligibility criteria for access to the stabilisation mechanism in form of adherence to the EU's fiscal governance framework.

Paper aims to draw lessons for EMU from national experiences with interregional transfer mechanisms.

Against the background of existing proposals for a euro area fiscal capacity, this paper analyses the performance of interregional transfers in existing fiscal-federal systems with the aim of drawing lessons for the design of a euro area fiscal capacity. Its core content comprises case studies on Austria, Belgium, Germany, Spain and the United States, five countries with distinct fiscal-federal systems. The case studies provide a description of the structure of fiscal federalism as well as the mechanisms for interregional stabilisation and convergence in each country. The interregional stabilisation mechanisms are analysed across two dimensions. First, the paper assesses the effectiveness of interregional transfers in facilitating risk-sharing by estimating empirically the degree to which such transfers smooth regional consumption in the event of idiosyncratic shocks.[5] To the best of our knowledge, this is the first paper to provide a consistent cross-country comparison of the quantitative

3 "European Investment Stabilisation Function", European Commission, 31 May 2018.

4 "French German roadmap for the Euro Area", non-paper, 20 June 2018.

5 We consider both intergovernmental transfers and federal taxes and transfers to households. The analysis is not carried out for Belgium, which only has three federal regions.

importance of different fiscal channels for cross-regional consumption-smoothing in the event of asymmetric shocks. Second, the paper also assesses the efficiency of the intergovernmental transfer schemes. More specifically, the case studies look at the potential adverse impact on economic efficiency at the sub-national level in terms of vertical fiscal imbalances – transfer dependency due to significant shares of regional spending not financed out of own tax revenues – and weakened incentives for sound public finances (Eyraud and Lusine (2013)). The analytical approach used in this paper helps to provide a comprehensive assessment – in terms of stabilisation and economic efficiency – of the design and functioning of federal institutions in major European economies and the United States. Our findings are therefore relevant for the ongoing debate on the creation of a stabilisation function at the euro area level as well as for the assessment of concrete design proposals.

Main findings

The paper first concludes from the case studies that fiscal-federal structures differ considerably with regard to the degree of sub-national tax autonomy. In particular, US states have a high degree of tax autonomy, while European countries typically feature a significant degree of intergovernmental redistribution of central government revenue through grants. Second, estimates indicate a relatively similar degree of fiscal risk-sharing across the countries, in spite of distinct differences between the fiscal-federal structures. Interregional risk-sharing is estimated to total around 11% of GDP in the United States and Spain and only slightly less in Germany and Austria at 7-8% of GDP. Third, intergovernmental fiscal transfers explain a relatively small part of the total fiscal risk-sharing between regions in both the United States and European federal states. Fourth, risk-sharing in all the countries considered here mainly occurs via federal taxes and transfers to households rather than intergovernmental transfers.

Policy implications

The insights gained from the case study can usefully be applied to the policy discourse on a euro area fiscal capacity. First, the analysis shows that existing large-scale, formula-based transfer schemes do not provide for significant risk-sharing. Cross-regional stabilisation in these fiscal-federal systems takes place mainly via the (federal) social benefit and tax system. Automatic and discretionary stabilisation mainly happens via the federal budget and the tax and social security system. This finding suggests that a genuine European scheme involving direct transfers to citizens (e.g. a European unemployment insurance scheme that complements national systems in severe recessions) that is financed by federal European taxes or social security contributions may be better suited to enhance the euro area's resilience to economic shocks.[6] Second, dedicated intergovernmental transfer schemes may lead to significant vertical imbalances and transfer dependency, which weakens sub-national incentives for sound public finances as a result. The US experience seems to indicate that a higher degree of tax autonomy, paired with credible federal no-bailout policies and the resulting self-imposed sub-national balanced budget rules, tends to promote regional incentives for sound fiscal policies. This reduces the trade-off between providing effective cross-regional risk-sharing on the one hand and reducing the adverse incentives of interregional transfers on the other.

6 The US state unemployment scheme, for example, is co-financed by state and federal payroll taxes and provides for the extended benefits or federal emergency compensation in times of high unemployment in a given state (see, for example, U.S. Department of Labor (2019)).

Paper overview

The rest of this paper is organised as follows. In Section 2, we review the relevant literature. Section 3 develops performance criteria for intergovernmental transfer systems. Section 4 then presents the five case studies. Section 5 draws lessons from these case studies and Section 6 concludes.

Table 1

Selected proposals for a euro area fiscal capacity

	Description	Objective	Type of instrument	Automatic trigger	Contribution financed	Fiscal rule compliance
Reconciling risk-sharing with market discipline (CEPR economists, January 2018)	**Reinsurance fund for large shocks affecting the labour market in euro area countries**	**Macroeconomic stabilisation** (of large shocks affecting the labour market)	**Intergovernmental** (in the EU budget or as a subsidiary of the ESM)	**Yes** (changes in the unemployment rate, employment or the wage bill)	**Yes** (0.1% of GDP of the participating countries)	**Yes** (ex ante and ex post conditionality)
A Central Fiscal Stabilization Capacity for the Euro Area (IMF staff, March 2018)	**Dedicated macroeconomic stabilisation fund that makes transfers to countries in bad times and is financed by regular annual contributions**	**Macroeconomic stabilisation** (proportional to cyclical fluctuations)	**Intergovernmental** (build up assets in good times, i.e. rainy-day fund)	**Yes** (deviation in unemployment above 7-year moving average)	**Yes** (e.g. annual contributions of 0.35% of GDP)	**Yes** (implementation of medium-term spending plans)
European Investment Stabilisation Function (European Commission, May 2018)	**Maintain public investment in event of large asymmetric shocks, preserving stability and facilitating economic recovery**	**Macroeconomic stabilisation** (loans when public finances become stretched)	**Intergovernmental** (fund assigned to the EU budget)	**No** (funds to be requested by Member States)	**Yes** (equivalent to a share of monetary income)	**Yes** (eligibility criteria based on sound policies)
French German roadmap for the Euro Area (Meseberg Declaration, May 2018)	**Eurozone budget and European Unemployment Stabilization Fund**	**Competitiveness and convergence** and **macroeconomic stabilisation**	**Central capacity** and **intergovernmental**	Not indicated	**Partially** (national contributions, allocation of tax revenues and European resources)	Not mentioned

2 Literature review

Paper links to fiscal federalism and optimum currency area literature.

This paper assesses fiscal-federal systems in terms of both their effectiveness in stabilising asymmetric macroeconomic shocks and their efficiency in maintaining sound sub-national public finances. By looking at the macroeconomic stabilisation performance of fiscal-federal arrangements, the paper adds to the literature on both fiscal federalism and optimum currency areas (OCA). The assessment of the fiscal sustainability of fiscal-federal systems mainly links with the second generation of fiscal federalism literature.[7]

First-generation fiscal federalism literature targets the optimal allocation of government functions to ensure macroeconomic stabilisation, among other things.

Broadly speaking, the first-generation fiscal federalism theory – seeking to combine the advantages of both decentralised and centralised forms of government – posits the following fiscal arrangements in a federation: local public goods should be supplied at the regional/local level to ensure that it best reflects heterogeneous regional/local preferences and conditions (Oates (1972)).[8] At the same time, national public goods (like defence) and government policies for macroeconomic stabilisation and income redistribution are best allocated to the central government level (Oates (1999)). Taxes on relatively immobile tax bases should be assigned to regional/local governments, while taxes on relatively more mobile tax bases should be assigned to the central government level in order to avoid harmful tax competition (Musgrave (1983) and Oates (1999)).[9]

Paper contributes to empirical literature by providing structured comparative case studies on fiscal federations…

This paper contributes to a large set of first-generation fiscal federalism literature that describes the performance of fiscal-federal systems with several layers of government.[10] It presents accounts of the fiscal federalism arrangements – how revenue and spending are assigned to the central and regional/local level – in Austria,

7 The fiscal federalism literature "lays out a general normative framework for the assignment of functions to different levels of government and the appropriate fiscal instruments for carrying out these functions" (Oates (1999), p. 1121). It asks at which level of government – local, regional or central – revenue and spending functions and instruments should be allocated to achieve an efficient provision of public goods, other fiscal objectives (income redistribution, macroeconomic stabilisation) but also to maintain sound public finances. The more macroeconomy-driven optimum currency area literature asks which criteria need to be met for a currency union of heterogeneous entities to function smoothly (Mundell (1961), McKinnon (1963) and Kenen (1969)). More specifically, the literature focuses on how a shock in one member of a currency area can be addressed, given that countries have lost their monetary policy instrument and cannot adjust their nominal exchange rates. One central instrument for this purpose is a fiscal transfer mechanism to entities adversely affected by an asymmetric shock.

8 According to the "decentralisation theorem", decentral public good provision is more efficient than central provision in the case of heterogeneous local preferences and in the absence of spillover effects and economies of scale.

9 In practice, the allocation of taxation and spending responsibilities to different layers of government commonly results in a mismatch between decentralised revenues and expenditures (vertical imbalance) that relies crucially on the implementation of a mechanism to determine intergovernmental transfers and revenue-sharing (Jha (2015)). In fact, in most (decentralised) countries, the central government keeps control of the major tax bases, while the regional/local government level is tasked with many government functions, meaning that vertical transfers are needed to balance the budget at the sub-national level. At the same time, horizontal revenue-sharing is typically used to equalise living standards and financial resources across entities where there are large structural differences.

10 According to the European system of accounts (ESA 2010), the general government sector has four subsectors: central government, state government, local government and social security funds. The general government is defined as consisting of "institutional units which are non-market producers whose output is intended for individual and collective consumption, and are financed by compulsory payments made by units belonging to other sectors, and institutional units principally engaged in the redistribution of national income and wealth."

Belgium, Germany, Spain and the United States. In-depth country case studies are available for practically all federal states, including the United States (e.g. Baicker et al. (2012)), Germany (e.g. Hepp and von Hagen (2012)), Spain (e.g. Suárez Pandiello (2005)) and Switzerland (e.g. Feld et al. (2018)). There are also several collections of cross-country studies into fiscal federalism (Fossati and Panella (2005), Eccleston and Krever (2017) and Ter-Minassian et al. (2017)). In contrast to these studies, this paper provides a structured juxtaposition of the country cases, which allows more meaningful policy conclusions to be drawn from the comparison.

… and draws lessons for closer fiscal integration in the euro area.

This paper also contributes to a growing body of literature that attempts to draw lessons from established federations for closer fiscal integration in the euro area. Baimbridge and Whyman (2004), for example, build their discussion on fiscal federalism in the EU and the euro area on country case studies for Australia, Canada and Switzerland. Henning and Kessler (2012) draw lessons from the history of US fiscal federalism for the euro area, arguing, among other things, in favour of a central capacity for countercyclical macroeconomic stabilisation. Balassone et al. (2014) find that the experience of other successful currency unions suggests that the euro area would benefit from a fiscal capacity.

OCA literature investigates elements needed for smooth functioning of EMU.

The OCA literature is commonly referred to in the debate on institutional reforms of EMU. A currency union implies that a member entity does not have monetary independence to deal with asymmetric shocks, and national fiscal policy is the primary policy instrument left to deal with asymmetric shocks.[11] In a currency union with limited factor mobility and rigid prices and wages, fiscal policy plays a particularly important role in macroeconomic stabilisation, along with financial market integration.[12] At the same time, fiscal constraints may be more binding for governments in a currency union, given that they may be subject to fiscal rules as part of the union and they cannot monetise their debt (De Grauwe (2018)). Here, asymmetric shocks may need to be mitigated by international transfers either vertically from a common budget or horizontally between entities.[13] In their seminal theoretical contribution, Farhi and Werning (2017) show that fiscal risk-sharing in currency unions

11 During a slowdown, the government can open up a budget deficit that is financed by public borrowing. In an upswing, the government then runs a budget surplus in order to pay back its debt. This decentralised system is an insurance mechanism with intertemporal transfers within a country from good to bad times, which smooths economic differentials between countries.

12 Closer financial market integration fosters cross-border lending, borrowing and shareholding. Theoretically, fully integrated financial markets can make union-wide fiscal risk-sharing unnecessary, if the central authority is solely concerned with providing insurance to member countries (Kehoe and Pastorino (2017) and Mundell (1973)). However, this requires financial markets to be fully integrated and efficient. Yet, while sharing and smoothing the volatility of the real economy, growth and integration of financial markets can also create volatility. When a systemic crisis erupts, financial markets typically fail to provide insurance (Schelkle (2017)).

13 These transfers can be implicit or explicit. Implicit transfers between regions result from the centralisation of large budget items in the automatic budgetary stabilisers. Explicit transfers exist when there is revenue redistribution between regions through grants from the central government or transfers between regions. These transfers typically depend on the regions' relative income level, as is the case in some federal states.

smooths consumption across countries and improves macroeconomic stability in the union.[14]

Paper contributes to growing literature measuring the degree of risk-sharing.

This paper contributes to the empirical literature on risk-sharing within fiscal-federal systems by providing a consistent measure of the degree of risk-sharing through interregional transfers in the country case studies. To the knowledge of the authors, it is the only study that attempts such a cross-country analysis. Other empirical studies typically find a relatively high degree of risk-sharing between states in the United States and a relatively low degree of risk-sharing between countries in the euro area. In their seminal contribution, Asdrubali et al. (1996) find that in the United States, for example, 13% of shocks to gross state product are smoothed by the federal government, while 39% are smoothed by capital markets and 23% by credit markets, and 15% remain unsmoothed.[15] According to Melitz (2004) and Cimadomo et al. (2018), private and fiscal risk-sharing in the euro area lags behind the United States. Dreyer and Schmid (2015) show that a risk-sharing capacity providing a similar degree of redistribution and stabilisation to the US system would require significantly larger intergovernmental transfers in the euro area.

Second-generation fiscal federalism literature targets mechanisms to discipline government fiscal policy.

While the first-generation theory of fiscal federalism and the OCA literature argue in favour of the centralisation of macroeconomic stabilisation and redistribution policy, the second-generation theory emphasises the incentive structures of government agents at central and regional/local level. With a public choice perspective, this literature assumes that policymakers are rent- or vote-seekers rather than benevolent welfare-maximisers (Weingast (2009)). It typically argues that decentralisation of spending should go together with large tax autonomy for regional and local governments and that the resulting tax competition is not necessarily harmful, but may have instead a disciplinary effect (Brennan and Buchanan (1980)). Other authors have also argued that the lack of assigned regional or local taxation powers is responsible for bailout expectations from central government and is therefore connected to deficit biases (Von Hagen and Eichengreen (1996)). It should be noted, however, that conclusions of empirical studies are mixed with regard to the effect of fiscal decentralisation on fiscal sustainability.[16]

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14 At the same time, other authors point to the problems of such stabilisation mechanisms, such as the difficulty for central governments to appropriately target grants (Lockwood (1999)) and issues of moral hazard pertaining to insurance mechanisms (Person and Tabellini (1996a and b)). In particular when shocks and transfers become permanent, a large degree of solidarity or sense of common destiny is necessary, which goes hand-in-hand with the formation of a political union (Baldwin and Wyplosz (2015)).

15 Similarly, Sala-i-Martin and Sachs (1991) provide evidence that the federal US government insures member states against regional income shocks in the magnitude of between one-third and one-half of the initial shock. Obstfeld and Peri (1998) show that fiscal transfers from booming to depressed regions in the United States are crucial for both redistribution and stabilisation purposes.

16 Oates (1985), using cross-section data for 43 countries, does not find a significant correlation between decentralisation and government size. However, a significant number of authors find evidence for the "Leviathan hypothesis", namely that tax competition limits the growth of government spending in decentralised countries (Marlow (1988), Rodden (2003), Neyapti (2010) and Foremny (2014)). Rodden (2003) puts emphasis on the form of decentralisation: using an OECD sample, he finds that when the decentralisation is financed by autonomous local taxation, it is associated with a small government size. In this context, Nepyapti (2013) shows that fiscal rules can contribute to the effectiveness of decentralisation in achieving fiscal discipline. Rodden (2002) shows that large and persistent aggregate deficits occur when sub-national governments are simultaneously dependent on intergovernmental transfers and free to borrow – a combination found most frequently among constituent units in federations.

Paper contributes to second-generation fiscal federalism literature by providing overview of mechanisms for fiscal discipline.

This paper links with the second-generation fiscal federalism literature insofar as it provides an overview of the mechanisms for fiscal discipline at play across the countries included in the study. It adds to contributions such as Rodden et al. (2003), who provide a multi-country study of the conditions under which decentralised countries might ensure fiscal discipline. They find that most countries rely on both market mechanisms and hierarchical constraints to maintain fiscal discipline. Bordo et al. (2013), drawing on the experience in Argentina, Brazil, Canada, Germany and the United States, argue in favour of a credible commitment to a no-bailout rule under Article 125 TFEU. Finally, Henning and Kessler (2012), drawing lessons from the history of US fiscal federalism, argue in favour of strong ownership of national fiscal rules in the euro area.

3 Performance criteria for interregional transfer systems

Cost and benefits of intergovernmental transfers need to be evaluated when assessing the effectiveness of federal schemes.

As highlighted in Section 2, the theoretical literature on optimum currency areas suggests that interregional transfers play an important role in currency unions where jurisdictions do not have the exchange rate mechanism available to adjust to asymmetric shocks. Risk-sharing via interregional transfers that flow from regions experiencing a boom to ones in recession tends to improve macroeconomic stability in a currency union. Among interregional transfers, intergovernmental transfer schemes are typically not designed to exclusively provide risk-sharing against idiosyncratic shocks or convergence. Instead, they are primarily intended to distribute tax revenues across regions allowing them to provide similar levels of public goods and services. To the extent that they result in large vertical fiscal imbalances of permanent nature, entailing transfer dependency due to significant shares of regional spending not financed out of own tax revenues, such intergovernmental transfers may create problems of soft budget constraints and undermine regional economic efficiency. An evaluation of the effectiveness of intergovernmental transfer schemes therefore needs to weigh the costs in terms of possible inefficiencies against the benefits of macroeconomic stabilisation across regions. Effectiveness in providing risk-sharing

Interregional transfers may support consumption-smoothing in the event of asymmetric regional shocks.

The concept of risk-sharing typically relates to the synchronisation of output and consumption in a federation or currency union. Two channels exist to smooth shocks to GDP by reducing the correlation between consumption growth and output growth. First, intertemporal private consumption may be smoothed by means of private savings or debt-financed government transfers to households. Second, consumption may also be insured via risk-sharing through interregional fiscal transfers which help to cushion asymmetric shocks. The empirical literature in this respect typically identifies three different channels (see the seminal contribution by Asdrubali et al. (1996)): the "capital channel" (or "factor markets channel"), which operates via cross-border flows of factor income (e.g. dividends);[17] the "credit channel", which relates to cross-border loans; and the "fiscal channel". The latter captures not only taxes, social security contributions and social benefits to households, but also intergovernmental transfers.[18]

The effectiveness of interregional transfers in contributing to interregional risk-sharing may be used as an economic performance criterion.

The framework presented in Asdrubali et al. (1996) has been used to identify and quantitatively assess the different channels of interregional risk-sharing in several existing federations, including the United States, Canada, Germany, Spain and Switzerland (see, for example, Alberola and Asdrubali (1997), Hepp and von Hagen (2013) and Feld et al. (2018)). In this paper, we place the emphasis on the fiscal risk-sharing channel. Concretely, we aim to assess the effectiveness of interregional transfers by estimating the degree to which these support the smoothing of (public and private) consumption in the event of idiosyncratic shocks. Next, we distinguish

17 Note that this channel also contains the effect of the smoothing of corporations' dividends over the business cycle.

18 See, for example, Cimadimo et al. (2018).

between the role of intergovernmental schemes and the role of taxes, social security contributions and transfers to households (social benefits).

The risk-sharing framework of Asdrubali et al. (1996) can be used to identify the stabilising role of fiscal transfers across regions within a federation.

This standard risk-sharing framework builds on the following decomposition of the cross-sectional variance of regional GDP:

$$\begin{aligned} var\{\Delta \log gdp\} = {} & cov\{\Delta \log gdp\,, \Delta \log gdp - \Delta \log si\} \\ & + cov\{\Delta \log gdp\,, \Delta \log si - \Delta \log dsi\} \\ & + cov\{\Delta \log gdp\,, \Delta \log dsi - \Delta \log c\} + \; cov\{\Delta \log gdp\,, \Delta \log c\} \end{aligned} \quad (1)$$

where *gdp* is regional gross domestic product, *si* is regional primary income, *dsi* is regional disposable income and *c* is regional (public and private) consumption (all in per capita terms).[19] In order to derive ordinary least squares estimates of the different risk-sharing channels, both sides of equation (1) are divided by the variance of $\Delta \log gdp$.

The β-coefficients measure the estimated impact of the "capital channel" (*K),* the "credit channel" (*C*) and the "fiscal channel" (*F*) respectively, and fulfil the following restriction:

$$1 = \beta_K + \beta_F + \beta_C + \beta_U$$

As mentioned above, we are interested in assessing the fiscal risk-sharing channel and therefore in estimating β_F. According to Asdrubali et al. (1996), this can be done by estimating

$$\Delta \log si_t^i - \Delta \log dsi_t^i = \beta_F \, \Delta \log gdp_t^i + v_{F,t} + u_{F,t}^i \quad (2)$$

where $v_{F,t}$ are time-fixed effects which are introduced to ensure that common shocks to the federation are absorbed, so that β_F only captures the fiscal smoothing of asymmetric or region-specific shocks.[20]

The fiscal channel can be further decomposed into its subcomponents by estimating

$$\Delta \log(si_t^i + x_t^i) = \beta_{F,x} \, \Delta \log gdp_t^i + v_{F,x,t} + u_{F,x,t}^i \quad (3)$$

where x_t^i is the quantitative impact of the respective fiscal subcomponent, such as specific fiscal transfers to a regional government or households located in region *i*. In their paper, Asdrubali et al. (1996) fully decompose the fiscal channel into the respective sub-items by separating the impact of (i) federal taxes and social security

[19] Regional primary income is the sum of regional households' primary income and indirect and corporate taxes generated in the respective region. Regional disposable income and regional consumption reflect the income and consumption of both households and regional governments in the respective region.

[20] Estimation equations (2) and (3) are estimated using standard pooled OLS with Driscoll and Kraay standard errors that account for cross-sectional dependence.

contributions, (ii) direct transfers to households including social security payments, and (iii) intergovernmental transfers. In the case studies presented in Section 4, we aim to replicate this approach to the extent possible for our sample countries. Unlike the literature so far, which has typically focused on individual country cases, we aim to provide a consistent cross-country comparison of the quantitative importance of different fiscal channels for cross-regional consumption-smoothing in the event of asymmetric shocks.

Interregional risk-sharing mainly reflects intergovernmental fiscal transfers and direct federal transfers to households.

Based on the empirical approach described above, differences in regional primary income and regional disposable income, and hence interregional risk-sharing, mainly reflect the redistribution of tax revenues and social security contributions via intergovernmental fiscal transfers and direct federal transfers paid to households. As highlighted in the literature (see, for example, Dullien (2019)), it is important to be aware that the approach adopted by Asdrubali et al. (1996) does not capture regional income stabilisation effects via direct federal spending, except in the case of social transfers (e.g. investment or subsidies). Moreover, as highlighted above, it only captures the smoothing of asymmetric economic shocks. The impact of fiscal stabilisation of aggregate macroeconomic shocks affecting the entire federation by means of discretionary federal policy measures, for example, is not reflected.

3.1 Economic efficiency

Strong transfer dependency and vertical fiscal imbalances may undermine economic efficiency due to weakened incentives for fiscal discipline at the sub-national level.

While intergovernmental transfers financed by central government revenue can help to smooth business cycles across regions, such transfers may also have an adverse impact on economic efficiency at the sub-national level. Concretely, multi-tiered governments may face problems of moral hazard if regional governments can finance their spending out of a common pool of resources, particularly if net transfers become permanent (see Section 2.3.2). Strong transfer dependency or vertical imbalances tend to undermine fiscal discipline and can result in an excessive accumulation of debt in the presence of implicit bailout expectations (see, for example, Rodden (2002)). Eyraud and Lusine (2013) argue that a vertical fiscal imbalance exists if own spending (i.e. total spending net of transfers paid) exceeds own revenues (i.e. total revenues minus transfers received). The theoretical literature suggests that such vertical imbalances may reduce the incentives for sub-national governments to raise distortionary taxes while increasing incentives to spend. Such incentives are typically related to the presence of common pools and the failure of sub-national policymakers to fully internalise the externalities on other jurisdictions. Moreover, strong transfer dependency – which may also reflect regional income inequality – is typically associated with soft budget constraints and hence weak incentives for own financial responsibility in the presence of bailout expectations.

Government finance statistics and the OECD decentralisation database can be used to quantify and assess vertical fiscal imbalances across countries.

Government finance statistics data provide a rich set of indicators at the sub-national level measuring the degree of revenue and expenditure decentralisation as well as intergovernmental transfers and sub-national deficit and debt levels. These can be complemented by data from the OECD fiscal decentralisation database on

sub-national tax autonomy to provide an overview of fiscal-federal structures.[21] The country case studies in Section 4 provide information on the sub-federal revenue and expenditure structure, the level of sub-national debt and the size of vertical imbalances. This quantitative information is complemented by a detailed qualitative description of the fiscal-federal system in place in the different countries to present an overall assessment of economic efficiency.

[21] See Dougherty et al. (2019) for a recent overview paper.

4 Case studies

4.1 Austria

4.1.1 Fiscal-federal structure

Austria's federal system features significant expenditure decentralisation, but very little revenue decentralisation.

Austria is a federal country with nine provinces, one of which, covering the capital Vienna, is a city-province. The other eight provinces comprise about 2,100 municipalities, with which they are heavily interconnected on a financial and regulatory level (so it makes sense to consolidate the province and municipal level as done in Table 2). Table 2 shows that the vertical imbalance in Austrian fiscal federalism is particularly large.[22] The share of the provinces and municipalities in consolidated government expenditure is relatively large due to their tasks in the areas of hospitals, education (elementary, primary and lower secondary), social protection (long-term care, basic social assistance) and infrastructure. At the same time, their share in consolidated revenue is small as tax revenue decentralisation is extremely low in Austria, and even within these small non-federal taxes, there is little tax autonomy. This set-up is heavily criticised by fiscal experts (from both Austria and international organisations), as it leads to misaligned incentives for provincial governments.

Table 2
Fiscal decentralisation in Austria

	1999	2017	Change
Fiscal decentralisation indicators (province and local gov. consolidated)			
Revenue decentralisation (%)[1)]	10.0	10.0	0.0
Tax revenue decentralisation (%)[2)]	7.0	6.3	-0.7
based on tax-setting autonomy (%)	1.6	1.5	-0.1
Expenditure decentralisation (%)[1)]	30.9	31.8	0.9
Vertical imbalance (% of GDP)[3)]	11.2	10.8	-0.4
Vertical imbalance (% of own expenditure)[3)]	69.3	69.0	-0.3
Sub-national public finances (province and local gov. consolidated)			
debt (% GDP)[4)]	6.0	9.9	3.9
mean[5)] (% of regional GDP)	n.a.	10.3	n.a.
range (% of regional GDP)	n.a.	17.2	n.a.
variation coefficient (% of regional GDP)	n.a.	0.6	n.a.

Source: National statistics.
[1)] Share of consolidated revenue (expenditure) of province and local government in total revenue (expenditure) of general government. Based on national accounts.
[2)] Share of province and local government tax revenue in total federal, province and local government tax revenue. Tax-setting autonomy: share of revenue from province and local government taxes for which the tax rates are set autonomously. Based on government finance statistics.
[3)] Transfers received by consolidated province and local government from central government and social security. Based on national accounts.
[4)] Debt of province and local government incurred with the public and non-public sector. Based on national annual debt statistics.
[5)] Not population-weighted.

22 When calculating the tax revenue of provinces and municipalities based on tax-setting power, the vertical imbalance becomes even larger as the tax rate of by far most important local tax (the municipal payroll tax) is set by the federal government.

Budgetary framework: fiscal rules and bailouts

The Austrian fiscal rules framework is set by the "Österreichischer Stabilitätspakt". This intergovernmental agreement between the federal government and the nine provincial governments specifies structural balance targets for the federal government (including social security funds), for each provincial government and (implicitly) for the sum of municipal governments province by province. It also aims to break down the other EU fiscal rules across the different levels of government. There is neither a no-bailout clause nor an explicit bailout obligation for the federal government in the Austrian constitution. However, the constitution does state that the different levels of government should not be overburdened in fulfilling their tasks, which can be interpreted as obliging the federal government not to neglect provinces facing financial difficulties. However, this does not necessarily imply complete bailouts (as was shown in the recent case of the province of Carinthia[23]).

4.1.2 Mechanisms for stabilisation and convergence

Federal transfers are the main source of revenue for provinces and municipalities.

Transfers from the federal government and from health insurance funds are the main sources of finance for provinces and municipalities. These vertical transfers consist of the following three major components:

Table 3
Overview of intergovernmental transfer schemes in Austria

	Intergovern-mental transfers (total)	Sharing of federal tax revenue	Other federal transfers to provinces and municipalities	Transfers by health insurance funds for hospital funding
Macroeconomic objective/effect		Risk sharing/ convergence	Risk sharing/ convergence	Risk sharing/ convergence
Activation trigger		Largely based on population size (permanent)	Expenditure on salaries and pensions of state teachers, hospitals, long-term care (permanent)	Transfers according to predefined keys (permanent)
Transfer direction		Vertical	Vertical	Vertical
Size				
Formula/total available funds (% of GDP)	10.8%[1] (2017)	6.7%[1] (2017)	2.7% (2017)	1.5% (2017)
Realised transfers (% of GDP)[2]	0.3% (2017)	0.2% (2017)	0.1% (2017)	0.1% (2017)

Source: Own calculations based on national statistics and Ministry of Finance data.
1) This figure differs from national accounts, largely because we excluded the tax on property transactions (0.3% of GDP in 2017), which is collected by federal government but shared among municipalities according to locally generated revenue.
2) The sum of realised transfers is smaller than the sum of individual schemes as some provinces are net payers in the first scheme but net recipients in the second scheme.

The largest intergovernmental schemes are based on sharing federal tax revenue.

The federal government controls all major taxes and social security contributions in Austria, and also collects most of them. (Social security contributions are mainly collected by health insurance funds.) However, it automatically shares most taxes in

23 In 2016 it seemed likely that guarantees granted by the provincial government of Carinthia on the debt of a failing bad bank would be called in. As a full call would have put substantial strain on Carinthia's public finances, holders of guaranteed debt instruments of this bad bank were offered a deal under which only parts of their claims were honoured. The budgetary costs of this deal (i.e. the difference between the payouts to creditors and the receipts from the bad bank) were shared between the province of Carinthia and the federal government.

the narrow sense (i.e. excluding social security contributions) with provinces and municipalities according to predefined keys, with the latter two receiving about one-third of each of personal and corporate income tax, VAT, excise duties, insurance taxes and motor vehicle tax. The horizontal distribution among provinces and municipalities is mostly based on population size. The exact parameters are specified by a temporary law ("Finanzausgleichsgesetz") which is renegotiated every five years.

The federal government also provides substantial transfers for co-financing specific provincial spending.

On top of this revenue-sharing according to population size, the federal government also gives additional grants to provinces and municipalities according to their needs in specific predefined areas. Most importantly, the federal government funds the salaries and pensions of state-employed teachers. Furthermore, it co-finances expenditure for refugee accommodation and to a smaller extent also for long-term care and hospitals (including refunds of input VAT incurred in the latter two areas). In the late 2000s there was a reduction in these transfers (especially in the areas of transport and housing), which was compensated by a higher explicit share in tax revenue collected federally. Most of these transfers are also specified in the temporary law governing revenue-sharing. There are also small federal transfers (of about 0.01% of GDP per year) targeted at municipalities with particularly low revenue per capita.

Financing of provincial hospitals is also largely based on intergovernmental transfers.

In Austria, provincial governments are responsible for running and financing hospitals.[24] Both the federal government (see above) and the public health insurance funds grant transfers to provinces as compensation for this activity. The transfers by the health insurance funds are specified by law and far larger than those from the federal government. Their overall size depends on the development in revenue from health insurance contributions; and their distribution among provinces is largely based on predefined percentages, which broadly correspond to population shares from the 1990s.[25]

4.1.3 Macroeconomic structure and budgetary impacts

Differences in GDP per capita are sizeable while disposable incomes are relatively close.

Data on the macroeconomic structure of Austrian regions are available from regional economic accounts, where the nine federal provinces are classified as NUTS2 regions. Table 4a indicates that, in 2017, the discrepancies in regional households' primary incomes (coefficient of variation of 6%) are far smaller than in gross regional products (coefficient of variation of 16%), which is due in part to the large number of inter-province commuters. The coefficient of variation of regional disposable incomes is even smaller, as the provinces with lower primary per capita incomes tend to have a higher share of pensioners in the population.

Regional inequality has decreased since 2000.

Since 2000, the coefficients of variation have decreased for all income-related variables and increased for regional unemployment. This is largely due to relatively poor economic performance in the city-province of Vienna, where the unemployment rate rose from about 3 percentage points above the Austrian average in 2000 to

[24] In six of the nine Austrian provinces, there are also public hospitals operated by religious organisations, but these are also largely financed by provincial governments.

[25] This holds except for the three provinces covering the greater Vienna area. The city of Vienna receives higher transfers compared to its population share, while the two provinces covering Vienna's suburbs and exurbs (Lower Austria and Burgenland) receive lower transfers.

5 percentage points above average in 2017. Furthermore, while starting from a very high level in 2000, per capita economic growth in Vienna has been the lowest by a very large margin. Vienna had by far the highest income per capita in 2000, while per capita GDP has moved much closer to the Austrian average, and disposable and primary income are now somewhat below average.

Due to low inequality in provinces' primary incomes, redistribution via the intergovernmental schemes is small.

Variations in gross regional product per capita (see Table C) and the size of the intergovernmental schemes (about 11% of GDP)[26] are both relatively large. However, as tax collection has mostly been attributed to regions based on households' primary income (social security contributions and direct taxes by households, payroll taxes) and disposable income (consumption-related taxes), the amount of redistribution induced by the intergovernmental schemes (see Table B) is rather low (around 0.3% of GDP). One further reason for this is that there are some mechanisms leading to higher per capita transfers to high-income provinces. Most importantly, federal transfers related to revenue-sharing are partly based on negotiated percentages ("Fixschlüssel"), which tend to be above population shares for provinces with higher GDP per capita. Furthermore, federal transfers to municipalities are largely based on the "abgestufter Bevölkerungsschlüssel", which explicitly allows for relatively higher per capita transfers to larger municipalities.

[26] To date, no study on fiscal risk-sharing for Austria has been published. The data and analysis in this section are based on a companion paper by Reiss (forthcoming).

Table 4

Economic performance and fiscal risk sharing in Austria

a) Economic performance (interprovincial variation) in Austria

	2000			2017			2000-2017 (average)	
	Mean[4]	Range[5]	CV[6]	Mean[4]	Range[5]	CV[6]	Mean[4]	CC[7]
Nominal GDP per capita (EUR)	25,657	19,795	0.21	41,328	20,127	0.16		
Nominal primary income per capita (EUR)	17,742	4,500	0.08	26,468	5,512	0.06		
Nominal disposable income per capita (EUR)	15,715	3,021	0.06	23,491	2,358	0.03		
Real GDP growth per capita (%)[1]	1.2	3.5	0.88	2.2	4.1	0.58	1.1	0.82
Real private consumption growth per capita (%)[1]	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Unemployment rate (%)[2]	4.3	4.7	0.33	4.9	7.3	0.43	5.1	0.64

b) Share of GDP shocks smoothed by fiscal channel over the period 2000-2017 in Austria[3]

Total government	**8.0** (1.8)	***
Federal taxes/social contributions	**2.9** (1.2)	**
Federal social benefits	**2.4** (0.6)	***
of which: pensions	0.6 (0.7)	
of which: unemployment benefits	0.8 (0.6)	
Intergovernmental transfers	**1.6** (0.9)	*
Sharing of federal tax revenue	1.8 (0.7)	**
Other federal transfers to provinces and municipalities	-0.5 (0.7)	
Transfers by health insurance funds for hospitals	0.4 (0.1)	***

Sources: Statistics Austria, own computations.
[1] Calculations based on province-specific chain price indices. Real GDP growth available from 2001 only.
[2] As a % of dependent labour force.
[3] New calculations based on Asdrubali et al. (1996).
[4] Not population-weighted.
[5] Difference between largest and smallest value.
[6] Coefficient of variation (= standard deviation divided by mean).
[7] Mean of provinces' correlation coefficients 2000-2017 (correlation between individual province and total figures).

Fiscal risk-sharing is primarily driven by federal taxes and social benefits.

Table 4b shows that about 8% of GDP shocks are smoothed via fiscal channels, most importantly federal taxes and social benefits. Among the intergovernmental schemes, the federal revenue-sharing scheme contributes the most to risk-sharing because transfers remain relatively stable, while contributions to the common federal pool vary with income. While the city-province of Vienna still receives the highest transfers per capita out of revenue-sharing, renegotiations of these schemes in the 2000s have led to a weaker increase in per capita transfers to Vienna than to the other provinces. As economic growth has been much weaker in Vienna at the same time, econometric estimates of risk-sharing may underestimate the current amount of fiscal risk-sharing between the Austrian provinces.

Conclusion: Estimated fiscal risk-sharing is not particularly large, despite the very sizeable vertical fiscal imbalance.

The estimated extent of fiscal risk-sharing is not particularly large in Austria, but the vertical fiscal imbalance is very sizeable. This goes hand-in-hand with misaligned incentives for provinces and municipalities. However, the fiscal set-up is successful in

reducing regional inequality: while variations in regional GDP are about as large as in the United States, variations in disposable household incomes are far smaller.

4.2 Belgium

4.2.1 The federal structure

Belgium's regional structure consists of communities, defined by language, and regions, defined by territory.

Since 1970 the Belgian administrative system has evolved into a federal structure with three communities and three regions. The Flemish, Walloon and Brussels Capital Regions are territorially defined entities with powers in such spheres as town and country planning, housing, the environment, public works, supervision of lower level authorities and certain aspects of agriculture, energy, transport, employment and economic policy. The Flemish, French and German-speaking communities, comprising the population of the Dutch, French and German-language areas, mainly have powers relating to subjects concerning people, such as education, culture, welfare and certain aspects of health policy. In Flanders, the community and regional institutions have been merged.

The sixth reform of the Belgian State substantially increased regional spending and taxation powers.

In 2014 the federal Parliament agreed on the sixth reform of the Belgian State, which came into force in 2015. From an economic and budgetary point of view, the two most important aspects of this reform are the transfer of new powers from the federal level to the communities and regions and the revision of the Special Finance Act for the Communities and Regions. The transfer of new powers has an estimated size of around 4.4% of GDP. It mainly concerns family allowances and a substantial amount of health care and social support, including health care provided to the elderly, for the communities; the regions mainly received more control over specific wage subsidies and tax expenditures on housing. The new financing law resulted, among other things, in a substantial increase in tax autonomy for the regions, which gained control over about a quarter of personal income tax revenues (some 2.5% of GDP), in the form of "extended" regional additional percentages.

Table 5

Economic efficiency in Belgium

	1999	2017	Change
Fiscal decentralisation indicators (regional and local gov. consolidated)			
Revenue decentralisation (%)[1)]	14.5	23.6	9.2
Tax revenue decentralisation (%)[2)]	7.4	16.0	8.6
based on tax-setting autonomy (%)	6.5	15.4	9.0
Expenditure decentralisation (%)[1)]	35.3	46.0	10.7
Vertical imbalance (% of GDP)[3)]	10.9	12.0	1.1
Vertical imbalance (% of regional and local gov. expend.)[3)]	61.9	50.0	-11.9
Sub-national public finances (regional and local gov. consolidated)			
Debt (% of GDP)[4)]	18.1	18.4	0.3
Mean[5)]	16.0	20.6	4.6
Range[6)]	10.9	20.8	9.9
Coefficient of variation	0.31	0.47	0.16

Source: National statistics.
1) Share of consolidated revenue (expenditure) of regional and local government in total revenue (expenditure) of general government (incl. social security). Based on national accounts.
2) Share of regional and local government tax revenue in total federal, regional and local government tax revenue. Tax-setting autonomy: share of revenue from regional and local government taxes for which the tax rates are set autonomously. Based on OECD tax autonomy indicator categories a and b1 for 1995 (in 1999 column) and 2014 (in 2017 column).
3) Transfers received by consolidated regional and local government from central government and social security. Based on national accounts.
4) Debt of regional and local government incurred with the public and non-public sector. Based on national annual debt statistics. Local debt distributed according to regional GDP by assumption.
5) Not population-weighted.
6) Difference between maximum and minimum region.

Regional and local governments are responsible for almost half of public sector spending in Belgium.

The regions, communities and local government are together responsible for 46% of general government spending, half of which is financed by own revenues (see Table 5). On the revenue side, apart from their share in personal income tax revenues, the regions have tax (and tax-setting) autonomy over registration fees, inheritance taxes, motor vehicle duty, environmental levies and various other taxes. Local government has almost full tax-setting autonomy over its own tax revenues, which mainly consists of the additional percentages on personal income tax, which are levied at the federal and regional level, and percentages added to the property tax, which are levied at the regional level. Besides the own revenues, financing of regions and communities and the local government comes from transfers of tax receipts and current and capital transfers from central government (i.e. federal government and social security), amounting to some 12% of GDP. It should be noted that some of the transfers of tax receipts (some 3% of GDP) are distributed according to the regions' respective contributions (see below).

The budgetary framework requires the federal and regional governments to agree each year on the allocation of the general government budget target.

The cooperation agreement of December 2013 between the federal State and the communities and regions transposes the European Fiscal Compact into Belgian law and stipulates that the general government budget must be in balance or surplus. Each year, following advice from Belgium's High Council of Finance, the Consultative Committee of the federal government and the governments of the regions and communities must agree on an allocation of the annual general government budget target across the various levels of power.[27] The High Council of Finance is tasked with monitoring these decisions and assessing compliance with the commitments given by

[27] It should be noted, though, that no agreement has been reached in any of the years since 2013.

the governments. The regions, on their side, have the power to exercise control over local government finances. As a result of that regionalisation, different rules and standards apply to the municipal accounts in the three regions, but they have the equilibrium principle in common. Overall, the regions have strengthened the local government budgetary framework in recent years.

The share of sub-national governments in total public debt is limited.

The budgetary framework has resulted in limited shares of sub-national governments in general government public debt. In 2017 general government debt stood at 103.4% of GDP, 13 percentage points of which are liable to the regions and communities and 5.4 to local authorities. Among the regions, debt, expressed as a share of their own GDP, broadly stabilised in the Flemish Region and the Brussels Capital Region, but increased by some 10 percentage points in the Walloon Region since 1999, reflecting the poorer average annual budgetary performance in this region.

4.2.2 Mechanisms for macroeconomic stabilisation and convergence

Among transfers from central government to the regions, only the Solidarity Mechanism is meant to promote stabilisation and convergence.

Transfers from central government to the regions generally are not meant to contribute to macroeconomic stabilisation or convergence across regions, except for the Solidarity Mechanism (see Table 6). Federal government transfers of tax receipts out of federal personal income tax revenues, which were considerably reduced after the sixth State reform, are distributed according to the regions' shares in federal personal income tax revenues. As a result, these transfers are conceptually close to own tax revenue. Other central government transfers of tax receipts are distributed in part on the basis of parameters related to the competences they are supposed to finance (such as the number of students for the financing of education spending). Current and capital transfers from central government to the regions, communities and local government are also intended to finance decentralised competences. For the regions and communities, this concerns the transferred envelopes for the new community competences since the sixth State reform (such as family allowances and their share in health care); for the local governments, it concerns grants for social integration allowances and for police and emergency rescue districts. Furthermore, in the case of the regions and communities, current transfers statistically also contain notional transfers from the federal government for the payment of certain pensions. If the transfers from central government cause an unequal per capita distribution across regions, which is hardly the case (see Table 5), this does not necessarily contribute to interregional stabilisation or convergence.

The Solidarity Mechanism compensates regions with lower personal income tax per capita.

The Solidarity Mechanism concerns a vertical transfer in the form of a grant from the federal government to the regions where the personal income tax per capita is below the national average. The allowance, which was revised in the sixth State reform, compensates for 80% of the gap between a region's share in the population and its share in the personal income tax retained at the federal level; it is applied on the amount of transfers from central government for which the allocation across regions is based on the region's share in personal income tax[28]. The mechanism currently

[28] That basic amount is equal to the whole amount covered by the regions' fiscal autonomy with respect to personal income tax, and all or part of the regional and community grants allocated according to the personal income tax key.

results in an interregional transfer of 0.2% of GDP to the Walloon Region and the Brussels Capital Region.

The bulk of stabilisation and convergence across regions comes from interpersonal solidarity through central government taxes and social benefits.

By far the biggest contribution to macroeconomic stabilisation and convergence across regions comes from central government taxes and unemployment benefits.[29] The automatic stabilisers at the central government level are by far the main source of stabilisation and convergence across regions. The Flemish Region, which has relatively high income per capita, contributes more than the other regions in personal income tax revenues, social security contributions and indirect taxes. Regarding corporate income taxes, the Brussels Capital Region, whose central geographical location and capital status attract many businesses pursuing a wide range of economic activities, is the biggest per capita contributor. The Walloon Region is by far the largest recipient of the 1.9% of interregional transfers originating from federal taxes, coming from the Flemish Region. These transfers from the Flemish to the Walloon Region are seen as permanent, meaning that, besides stabilising the cycle, they also reduce income divergence across regions. Unemployment benefits, also organised at the central government level, play a similar role, albeit on a smaller scale.

Table 6

Overview of interregional transfers in Belgium

	Central government taxes	Central government unemployment benefits	Central government transfers - federal tax receipts (excluding Solidarity Mechanism)	Central government transfers - Solidarity Mechanism	Central government transfers - current and capital transfers
Distribution key	Differences in per capita financial capacities	Differences in unemployment	Partly regional contribution to federal tax, partly parameters related to regional competences	Differences in personal income tax per capita	Parameters related to regional competences
Transfer direction	Vertical	Vertical		Vertical	
Size					
Formula/total available funds (% of GDP)	37.2%	1.2%	6.6%	0.3%	1.3%
Realised net transfers (% of GDP)	1.9%	n.a.	0.1%	0.2%	n.a.

4.2.3 The macroeconomic structure

Household income is highest in the Flemish Region, thanks to a higher activity rate and lower unemployment.

The three Belgian regions feature significant and structural socioeconomic disparities (see Table 6). While the Flemish Region broadly represents the national average, nominal value added per capita was 70% above the average in the Brussels Capital Region in 2017 and 30% below it in the Walloon Region. The dominant position of the Brussels Capital Region was even more marked in the past. However, the distribution of value added per capita is not a good indicator for the distribution of income per

[29] Note that for Belgium – due to the limited number of sub-national jurisdictions – we do not provide estimates for the degree of interregional fiscal risk-sharing.

capita in the various regions. The concentration of economic activity in the Brussels Capital Region depends heavily on the contribution from commuters from the other regions, primarily the Flemish. Looking at primary income per capita of households, which accounts for cross-border factor incomes, disparities are much lower, though still substantial, with Flemish Region residents earning some 9% more than the average and Walloon Region residents 13% less. This income divergence has increased over time. Disparities between the regions are further eliminated in the disposable per capita income figures, with the help of fiscal policy at the central government level, due to differences between the regions in per capita contributions to federal taxes and per capita receipts of federal or social security transfers. The variations in the primary per capita income of households between the regions go hand–in-hand with differences in the labour market situation, as the employment rate in the Flemish Region is around 5 percentage points higher than in the Walloon Region and some 11 percentage points above the rate in the Brussels Capital Region. The Flemish Region has a considerably higher activity rate and much lower unemployment than the two other regions.

In the past 20 years, average growth has been more subdued in the Brussels Capital Region than the other regions.

At the same time, the three regions largely follow the same economic cycle. This results in a high correlation in the growth rates of economic activity per capita. This cyclical convergence does not prevent the regions' economies from growing at different rates on average. AvDepoerage growth in economic activity per capita was more than 1 percentage point higher than in the Brussels Capital Region than in the Flemish Region between 1999 and 2017. Low per capita growth in the Brussels Capital Region can be explained by a relatively high increase in population, which is not efficiently integrated in the labour market.

Table 7

Economic performance (interregional variation) in Belgium

	1999			2017			1999-2017 (average)	
	Mean[4]	Range[5]	Coefficient of variation	Mean[4]	Range[5]	Coefficient of variation	Mean[4]	Correlation coefficient[6]
Nominal GDP per capita (EUR)	29,685	30,497	0.44	44,258	36,998	0.35	36,971	0.40
Nominal primary income per capita (EUR)[1]	17,116	3,473	0.08	23,122	5,253	0.10	20,119	0.09
Nominal disposable income per capita (EUR)[1]	13,839	1,853	0.06	18,914	3,113	0.08	16,377	0.07
Real GDP growth per capita (%)[2]	3.37	2.07	0.26	2.88	1.31	0.20	0.93	0.91
Unemployment rate (%)[3]	11.3	10.3	0.38	9.7	10.5	0.44	10.5	0.82

Source: national statistics.
[1] Regional data for primary/disposable income of households and private consumption only up to 2016.
[2] Calculations based on region-specific chain price indices.
[3] As a % of dependent labour force (unemployed aged 15 or over). Source: Eurostat.
[4] Not population-weighted.
[5] Difference between maximum and minimum region.
[6] Mean of regions' correlation coefficients 1999-2017 (correlation between individual region and total figures).

4.3 Germany

4.3.1 Fiscal-federal structure

Germany's federal system features large expenditure decentralisation, but very weak tax autonomy for the states.

In Germany's federal system, state and local government account for almost 40% of general government expenditure and 37% of revenue. The federal states ("Länder") have their own constitutions and large budgetary autonomy, being responsible for important areas like education, police, legal protection and public administration (including tax offices). Since most federal acts are implemented through state administrations and budgets, the states have a significant say in national law-making (via the Bundesrat). Their budgets are primarily funded by joint federal taxes – personal and corporate income, turnover and withholding taxes – which they share with central and local government. However, the individual states enjoy few tax-setting powers (only for real estate transfer tax), unlike local governments which have significant autonomy regarding property and business taxes (more than 50% of local tax revenue). Accounting for tax autonomy, tax revenue decentralisation in Germany reduces from 53% to just 10% (see Table 8).[30] Transfers received by state and local governments from upper government levels represent 1.6% of GDP or 9.3% of their consolidated expenditure (vertical imbalance). However, the transfer dependency rate (share of transfers from other levels of government in total expenditure) is clearly larger for local government (40%) than for state government (14%).

Table 8

Fiscal decentralisation in Germany

	1999	2017
Fiscal decentralisation indicators (state and local gov. consolidated)		
Revenue decentralisation (%)[1)]	34.3	36.7
Tax revenue decentralisation (%)[2)]	49.7	52.8
based on tax-setting autonomy (%)	7.5	10.2
Expenditure decentralisation (%)[1)]	37.1	39.6
Vertical imbalance (% of GDP)[3)]	1.74	1.65
Vertical imbalance (% of state and local gov. expend.)	9.64	9.35
Sub-national public finances (state and local gov. consolidated)		
Debt (% of GDP)[4)]	21.7	23.8
Mean (% of state GDP) 5)	28.4	31.5
Range (% of state GDP) 6)	32.4	63.3
Coefficient of variation	0.3	0.5

Source: National statistics.
[1)] Share of consolidated revenue (expend.) of state and local governm. in total revenue (expend.) of general government (incl. social security). Based on national accounts.
[2)] Share of state and local government tax revenue in total federal, state and local government tax revenue. Tax-setting autonomy: share of revenue from state and local government taxes for which the tax rates are set autonomously. Based on government finance statistics. Data for 1999 derived from Stegarescu (1999).
[3)] Transfers received by consolidated state and local government from central government and social security. Based on national accounts.
[4)] Debt of state and local government incurred to the public and non-public sector. Based on national annual debt statistics.
[5)] Not population-weighted.
[6)] Difference between maximum and minimum state values.

[30] For more details on the measurement of tax autonomy, see Stegarescu (2005) or more recently Kim et al. (2013).

Budgetary framework: federal bailout transfers and debt rules

The principle of common federal responsibility is defined in a Constitutional Court ruling and provides for implicit bailout for states in the event of extreme budgetary hardship. As a result, the highly indebted states of Bremen and Saarland were granted central government transfers from 1994 to 2004. State budget rules currently allow governments to incur debt to finance public investment or in the event of economic downturn. Yet, from 2020, new debt rules envisage structurally balanced budgets. In spite of federal aid and recent budget surpluses, differences in per capita debt are very large and have increased further. As for local governments, these are subject to supervision by state governments and are deemed to generally balance their budgets.

4.3.2 Mechanisms for stabilisation and convergence

Financial equalisation system broadly aligns states' per capita tax revenue.

The German Basic Law requires broadly equal living conditions to be provided and differences in the per capita financial capacities of the states to be balanced out in an appropriate manner. For this purpose, a multi-stage revenue-sharing system is in force.[31] There are large, persistent disparities in per capita tax revenues, mainly between the financially weak eastern German states and the financially strong city-states. The states' share in most joint taxes and receipts from other state taxes are allocated to the individual states according to the principle of regional tax incidence. The turnover tax, by contrast, is distributed according to population. In the first stage of the federal financial equalisation system (known as the FES), up to a quarter of the states' share in turnover tax is redistributed in order to adjust per capita tax revenues (2017: €8.4 billion). Then, transfers are paid from financially strong to weak states according to a progressive equalisation tariff to further balance out differences in financial capacities (€11.2 billion). Finally, differences are reduced further by supplementary central government grants to states with financial capacities still below average (€4.5 billion). Equalisation transfers reached a record amount of €24 billion in 2017, or 0.7% of GDP (see Table 9). After redistribution, each state reaches a minimum of 95% of the average financial capacity.[32] The 2020 reform abolishes interstate transfers, equalisation taking place through distribution of the (increased) states' share in turnover tax and larger central government transfers.

Regular special-needs and discretionary federal grants support economic convergence.

Supplementary central government transfers are also regularly granted for special needs, mainly to support economic convergence. The largest part covers costs resulting from the need to upgrade infrastructure in eastern Germany and is financed by a solidarity surcharge on national income taxes. These grants were be gradually phased out by the end of 2019 (down from €10.5 billion, or 0.5% of GDP, in 2005 to currently €2.1 billion, or 0.1% of GDP). Other minor special-purpose transfers address higher long-term unemployment in eastern Germany (€0.5 billion). Finally, central government provides funds to support macroeconomic stabilisation (investment and redemption fund, 2009-11), municipal investment in child care facilities and education

[31] For a description (available in German only), see Bundesministerium der Finanzen (2017 and 2019). A detailed analysis is provided by Deutsche Bundesbank (2014).

[32] After turnover tax allocation and interstate equalisation, the range in per capita tax receipts of the states (including local governments) falls from originally 100% to around 35% of the national average. Differences between the non-city-states narrow to only 7%.

(2015-22) and construction of universities and social housing on a discretionary basis. These earmarked grants are co-financed by state and local governments.

Table 9
Overview of intergovernmental transfer schemes in Germany

	Intergovern-mental transfers (total)	Federal fiscal equalisation scheme	Supplemen. federal gov. special-needs transfers	Federal investment grants (discretionary)
Distribution key	.	Differences/ changes in state per capita financial capacities (permanent)	Special structural or financial needs (partly temporary)	Specific municipal investment needs (temporary)
Transfer direction	.	Horizontal/ vertical	Vertical	Vertical
Size				
Formula/total available funds (% of GDP)	11.1% (2017)	10.7% (2017)[1)]	0.1% (2017)	0.2% (cumulative 2015-22)
Realised transfers (% of GDP)	0.8% (2017)	0.7% (2017)	0.1% (2017)	0.01% (2017)

Source: own calculations based on figures of the Federal Ministry of Finance.
[1)] Total state and local government financial capacity (as defined in the federal financial equalisation scheme) incl. supplementary federal transfers.

4.3.3 Macroeconomic and budgetary impacts

Economic performance differs considerably across German states in spite of strong interrelations.

Economic performance varies considerably across states, due to income in eastern Germany still being widely below national average and the special position of the city-states. Differences are larger in terms of per capita GDP than primary or disposable income. This is mainly attributable to income redistribution through unemployment and social benefits. Despite the progress made in eastern Germany, disparity in per capita income and unemployment has only decreased slightly. However, there is almost perfect correlation in unemployment and real business cycles, while private consumption growth is correlated to a lesser extent. Evidently, federal taxes, fiscal equalisation and social security schemes even out regional economic shocks, but not interstate differences.

Empirical studies show the FES has only a marginal contribution to interstate risk-sharing.

The FES aims to broadly level out per capita tax revenue across states to ensure that public services are provided at similar levels. Since transfers are linked to the financial capacities of the states in relation to the national average, they largely absorb asymmetric regional tax revenue shocks. New calculations based on our approach which is similar to the one used by Hepp and von Hagen (2013) show that the government sector smoothed only 7.3% of shocks in state GDP in Germany, mainly through the social security system, while the FES had no significant effect (see Table 10b).[33]

Macroeconomic and regional stabilisation effects

Another strand of literature deals with macroeconomic and regional stabilisation effects of the FES. Baskaran et al. (2016) provide empirical evidence that equalisation

[33] Hepp and von Hagen (2013) estimate that in 1995-2006 the government sector smoothed 10% of regional shocks, while factor markets accounted for 50% and credit markets 17%, and 21% of shocks remained unsmoothed. See also Büttner (2002) for an earlier study.

transfers had an insignificant or negative effect on economic growth in western German states. This is attributed to the use of transfers to subsidise declining industries instead of financing growth-related investment. In a DSGE model, Matthaei et al. (2016) show that abolishing the FES would favour the transfer-paying region since income and wages grow, also increasing migration into this region. On aggregate, however, the average household's welfare would be negatively affected.

Table 10

Economic performance and fiscal risk sharing in Germany

a) Economic performance (interstate variation)

	1999			2017			1999-2017 (average)	
	Mean 4)	Range 5)	Coefficient of variation	Mean 4)	Range 5)	Coefficient of variation	Mean 4)	Correlation coefficient 6)
Nominal GDP per capita (EUR)	24,523	29,963	0.31	37,862	38,007	0.26		
Nominal primary income per capita (EUR)[1)]	17,131	10,272	0.20	24,571	12,789	0.17		
Nominal disposable income per capita (EUR)[1)]	15,060	5,933	0.12	21,092	6,122	0.09		
Real GDP growth per capita (%)[2)]	2.15	3.24	0.46	1.73	1.68	0.26	1.34	0.82
Real private consumption growth per capita (%)[1) 2)]	3.11	4.02	0.39	1.19	3.08	0.59	1.02	0.62
Unemployment rate (%)[3)]	13.7	14.4	0.33	7.3	7.6	0.28	11.2	0.96

Source: national statistics.
1) State data for primary/disposable income of households and private consumption only available until 2016.
2) Calculations based on state specific chain price indices.
3) In % of dependent labour force.
4) Non-population weighted.
5) Difference between maximum and minimum state values.
6) Mean of states' correlation coefficients

b) Share of GDP shocks smoothed by fiscal channel (%)[1)]

	1996-2016	
Total government	**7.3**	**
of which:	(3.3)	
Federal taxes and social contributions	**-4.7**	
	(5.1)	
Intergovernmental transfers to states	**2.4**	
	(2.1)	
VAT redistribution	0.6	
	(1.3)	
Interstate transfers	1.0	
	(0.8)	
Federal supplementary (general-purpose) transfers	0.8	
	(2.1)	
Federal transfers to households		
Social security benefits	**6.1**	***
	(1.1)	
of which: pensions	**2.2**	**
	(0.9)	

Source: National statistics.
[1)] Calculations based o Asdrubali et al. (1996).

Excessive revenue absorption rate of the FES creates negative fiscal incentives for financially weak states.

While automatically safeguarding against shocks in tax receipts, the FES creates negative fiscal incentives due to excessive revenue absorption rates: a rise in tax revenue (i.e. financial capacity) is almost entirely offset by a concomitant reduction in received transfers. Therefore, particularly weak states have no incentive to boost their tax generation capacity by enacting growth enhancing policies, for example. There is even some evidence for negative incentives in terms of tax collection and enforcement.[34]

The FES and implicit federal bailout provide for moral hazard.

The FES and potential federal bailouts also tend to induce states receiving transfers to incur higher debt and weaken budgetary discipline.[35] Heppke-Falk and Wolff (2008) identified financial market moral hazard for state government bonds, owing to investor expectations that distressed states would be bailed out. Stehn and Fedelino (2009) show that net-recipient states did not reduce primary expenditure in response to rising deficits and raised expenditure in good times instead, expecting higher transfers.

Conclusion: moderate risk-sharing and stabilisation effects of the FES counterbalanced by serious fiscal disincentives.

To sum up, the German FES aims primarily to secure similar per capita levels of public expenditure across states and turns out not to help smooth economic shocks or promote economic convergence. Empirical evidence supports the view that risk-sharing is instead mostly provided by federal transfers to households (pensions, social benefits), which are financed by central government tax revenue. Economic convergence and macroeconomic stabilisation are addressed by special central government transfers. Potential federal bailouts together with excessive revenue redistribution and weak tax autonomy tend to limit financial responsibility of the individual states. This results in negative budgetary incentives and higher indebtedness. With few exceptions, the FES consolidates differences in financial capacities over time. However, debt rules due to come into force in 2020 will contribute to sound state government finances.

4.4 Spain

4.4.1 The Spanish “non-federal” structure of autonomous communities

Spain is a highly decentralised unitary state, with large expenditure decentralisation and tax autonomy of the autonomous communities.

Spain is not a federation, but a highly decentralised unitary state comprising 17 autonomous communities (or regions) and two autonomous cities. The Constitution of 1978 established that the sovereignty is vested in the nation as a whole, represented in the central institutions of government. However, Chapter II states that the nation is formed by a plurality of nationalities, and it therefore allows the nation to devolve powers or competencies to the autonomous communities. This devolution process was not symmetric across regions. It started in the early 1980s with the historical regions (Basque Country, Catalonia, Galicia and in 1980 Andalusia), but was extended to all regions in 1992. This means that each community has its own set of devolved powers, typically with more competencies in the historical ones. On

[34] See Baretti et al. (2002) and Bönke et al. (2016). For a dissenting assessment based on tax auditing, see Troost (2016).

[35] See, for example, Rodden (2002).

the revenue side, the main taxes are levied and collected by the central government and then redistributed to all regions through transfers under the Funding System of the Autonomous Communities (FSA), the purpose of which in part is fiscal equalisation.[36]

As a result, the Spanish autonomous communities and local government currently account for almost 45% of general government expenditure and 28% of revenue (Table 11). The autonomous communities are responsible for important areas of spending like education, health, housing, environmental protection, culture and public administration. Their budgets are primarily funded through central government transfer payments (under the FSA), based on an adjusted measure of population.[37] The autonomous communities receive a significant proportion of several taxes collected centrally (50% of personal income tax and VAT, 58% of special taxes, 100% of electricity and hydrocarbon taxes and car registration taxes) and keep all the revenues from taxes collected locally (wealth tax, inheritance and donation tax, stamp duty and gaming tax), enjoying normative capacity over most of their resources. Local governments also have significant taxation powers – mainly over property taxes, tax on economic activity and car tax – which cover more than 50% of local tax revenue. Therefore, taking tax autonomy into account, the degree of tax revenue decentralisation in Spain remains fairly significant at 34%.[38] Transfers received by autonomous communities and local governments from upper government levels, mainly through the FSA, represent 8.5% of GDP or 44% (46%) of their consolidated revenues (expenditures) (vertical imbalance).

[36] An exception are the Basque Country and Navarre communities, recognised by the constitution as "chartered" territories, which allows them the ability to levy and collect all taxes. Since they collect almost all taxes, they transfer back to the central government a pre-arranged amount for the competences exclusive to the central government, which means they do not participate in "fiscal equalisation".

[37] The calculation of the adjusted population used to distribute transfers includes total population (30%), population of school age (20.5%), population over 64 (8.5%), population protected (in terms of health spending, 38%), size in km2 (1.8%), dispersion of population (0.6%) and insularity (0.6%).

[38] For more details on the Spanish tax structure, see López-Rodríguez and García-Ciria (2018).

Table 11

Fiscal decentralisation in Spain

	1999	2017	Change
Fiscal decentralisation indicators (regional and local gov. consolidated)			
Revenue decentralisation (%)[1)]	20.5	28.2	7.7
Tax revenue decentralisation (%)[2)]	26.0	38.0	12.0
based on tax-setting autonomy (%)	21.9	34.2	12.3
Expenditure decentralisation (%)[1)]	38.6	44.4	5.8
Vertical imbalance (% of GDP)[3)]	7.87	8.46	0.59
Vertical imbalance (% of own expenditure)[3)]	49.5	45.90	-3.64
Sub-national public finances (regional and local gov. consolidated)			
Total (% of national GDP)	9.60	27.20	17.60
Mean[5)] (% of regional GDP)	5.29	23.67	18.38
Range (% of regional GDP)	6.70	28.25	21.55
Coefficient of variation (% of regional GDP)	0.42	0.33	-0.10

Source: national statistics.
1) Share of consolidated revenue (expenditure) of regional and local government in total revenue (expenditure) of general government. Based on national accounts.
2) Share of regional and local government tax revenue in total federal, regional and local government tax revenue. Tax-setting autonomy: share of revenue from regional and local government taxes for which the tax rates are set autonomously. Based on government finance statistics.
3) Transfers received by consolidated regional and local government from central government and social security. Based on national accounts.
4) Debt of regional and local government incurred with the public and non-public sector. Based on national annual debt statistics.
5) Not population-weighted.

Budgetary framework: fiscal rules and bailouts

The Law on Budgetary Stability and Financial Sustainability passed in 2012 includes a no-bailout clause (Article 8), under which the State will not be liable for the commitments of autonomous regions, local authorities or their dependent bodies.[39] In addition, autonomous communities are subject to the same budgetary rules as the general government, namely, to maintain a structurally balanced budget, an expenditure rule and a debt rule.[40] Local governments also face an expenditure and debt rule, while they have to maintain a balanced budget.

With respect to debt, before the 2008 crisis autonomous communities financed themselves mainly by directly issuing debt on the markets with no explicit central government guarantee. However, the central government provided them with extraordinary liquidity support mechanisms in 2012 in the form of bilateral loans in response to the deterioration of public finances during the crisis, which more than doubled the share of debt over GDP in the hands of autonomous communities. All these mechanisms were consolidated in 2015 to form the Autonomous Communities Financing Fund, which enabled the regions to exploit the low financing costs enjoyed by the Spanish Treasury, causing this to become their main source of funding. Although the law allows for these types of extraordinary mechanisms, it also imposes strict conditions on the regions' budgetary performance. Nevertheless, given relatively weak enforcement by the central government of these conditions since setting up the fund, keeping it indefinitely may create negative fiscal incentives and moral hazard issues as well as negative interactions with the framework of budgetary rules. In fact,

39 Without prejudice to any mutual financial guarantees given when carrying out specific projects jointly. This wording is similar to that describing relationships between Member States in Article 125 of the consolidated version of the Treaty on the Functioning of the European Union.

40 In addition, all government sectors are subject to a limit on the time taken to pay their suppliers.

these liquidity mechanisms have not helped to reduce the great dispersion in debt levels across regions, amounting to more than 28 percentage points of GDP in 2017.

4.4.2 Mechanisms for macroeconomic stabilisation and convergence

The FSA's main objective is to reduce disparities across regions, not achieve macro stability.

The main sources of funding for the autonomous communities and municipalities are their own taxes and transfers under the Funding System of the Autonomous Communities (FSA) and the Funding System of the Municipalities (FSM). Neither of the transfer systems have macroeconomic stabilisation as their main objective. Instead, the FSA aims to broadly level out per capita tax revenue across regions, by ensuring that essential public services are provided at a similar level and quality, while the FSM distributes the transfers from the central government according to population.[41] Since the latest reform of the FSA in 2009,[42] this has been implemented through two types of instrument (see Table 12).

Table 12
Overview over intergovernmental transfer schemes

	Guarantee Fund (GF)	Sufficiency Fund (SF)	Convergence Fund (CF)	All funds (GF+SF +CF)	Financial facility for the autonomous communities	Financial facility for local governments
Macroeconomic objective/effect	Convergence	Maintain status quo	Convergence		Macro stabilisation	Macro stabilisation
Activation trigger	Differences in regional tax revenues per capita	Differences from situation in base year	Differences in regional income per capita		Financial restrictions, no funding possible	Financial restrictions, no funding possible
Transfer direction	Horizontal/ vertical	Vertical	Vertical		Vertical	Vertical
Size						
Formula/total available funds (% of GDP)	7.2% (2016)[1)]	0.1% (2016)	0.4% (2016)	7.8% (2016)	2.4% (2017)	0.1% (2017)
Net realised transfers (% of GDP)	0.1% (2016)	0.3% (2016)	0.1% (2016)	0.4% (2016)		

[1)] Total autonomous community government financial capacity (as defined in the Funding System of the Autonomous Communities) incl. supplementary central government transfers.

41 Population is rescaled by size, with a scaling factor of 2.8 for municipalities with a population in excess of 0.5 million, 1.7 for those between 0.1 and 0.5 million and 1.32 for those between 0.05 and 0.1 million. In addition, the 2002 reform also granted the largest cities a proportion of the personal income tax (1.6875%), VAT (1.7897%) and excise duties (2.0454%)) generated in the region and distributed according to population.

42 Prior to 2009 the regional financing system was governed by the 2002 reform. The main difference is that the previous system funded all competencies instead of only basic public services. In addition, the share of centrally collected taxes distributed to regions has increased since 2009 (personal income tax from 33% to 50%, VAT from 35% to 50% and excise duties on alcohol, tobacco, etc. from 40% to 58%).

The Guarantee Fund significantly reduces regional differences in fiscal capacity.

First, the purpose of the Guarantee Fund for Fundamental Public Services is to ensure that each region receives the same resources per inhabitant to finance the public services related to the welfare state. Each autonomous community contributes 75% of its own tax revenues to the fund,[43] while the rest comes from the central government. The funds are then redistributed back to the autonomous communities according to adjusted population. Its implementation has resulted in a significant reduction in the differences in resources across areas (the standard deviation of the index of funding per inhabitant measured at homogenous competencies in 2016 falls from 24 to 7), while broadly respecting the initial ordering according to fiscal capacity.

The vertical funds increase regional fiscal differences and arbitrarily alter the initial ordering.

Second, there are two vertical funds. The purpose of the Sufficiency Fund is to maintain the initial status quo, as reflected in the level of funding enjoyed by each autonomous community in the base year (2007). This is achieved by assigning the difference between the total transfers received in that year, updated with the growth rate of the central government's tax revenues, and the amounts due from the Guarantee Fund.[44] As a result, this fund slightly reverses the reduction of differences achieved by the Guarantee Fund (increasing the standard deviation of the index of funding per inhabitant from 7 to 8 in 2016) and changes completely and arbitrarily the initial ordering of autonomous communities according to their fiscal capacity to such an extent that the correlation between the initial and the final ordering is close to zero.[45] This creates clear negative fiscal incentives, since some autonomous regions with below (above) the mean financial capacity are penalised (benefit) due to their relatively lower (greater) strength in the initial negotiating process. Finally, the vertical Convergence Funds are received by all regions, with the amounts being determined according to several criteria, including per capita income, population growth and relative transfers per inhabitant. However, since the dispersion of these funds across regions is much smaller than in the other cases, they do not significantly affect the relative positions.

4.4.3 The socioeconomic situation of Spanish autonomous communities

Economic performance differs considerably across Spanish regions in spite of strong interrelations.

The 17 autonomous communities have significant economic disparities, due mainly to historical differences in economic structure and specialisation (see Table 13a). Historically, the more agriculture-oriented southern, western and central regions of the country (excluding Madrid) have lower levels of nominal GDP (more than 20 percentage points below the mean) than the more industrialised or services-oriented Madrid, Catalonia, Basque Country and Balearic Islands regions (more than 20 percentage points above the mean). Over the period 1999-2017, some catching up is observed during the boom (until 2007), which is almost completely reversed during the crisis (2008-2012). These differences remain largely unchanged when looking at primary income per capita, which accounts for cross-border factor

[43] The region's tax revenues include a percentage of the revenues of the taxes generated in each region but collected centrally (50% of personal income tax and VAT, 58% of special taxes, 100% of electricity and hydrocarbon taxes and car registration taxes) and all the revenues from the taxes collected locally (wealth tax, inheritance and donation tax, stamp duty and game tax).

[44] The FS also includes funds to finance competencies only assumed by some regions.

[45] See Commission on the Reform of the Financing of Spanish Autonomous Regions (2017).

incomes, since the contribution of regional commuters is very small in Spain. On the contrary, these differences are smaller in terms of per capita disposable income. This is mainly the result of national fiscal policy instruments, due to differences between the regions in per capita contributions to national taxes and per capita receipts of central government or social security transfers, as well as to transfers through the regional financing system.

The variations in the primary per capita income of households between the regions are highly correlated with differences in the labour market situation, although some poor regions have lower unemployment rates due to the emigration of younger people. At the same time, there is a large degree of correlation in unemployment and real business cycles, while private consumption growth is correlated to a lesser extent.

Empirical results show that the greatest macro stabilisation comes from social transfers in cash at the central government level, while the FSA does not seem to play a significant role.

Our calculations indicate that the government sector contributes significantly to the smoothing of asymmetric regional shocks (see Table 13b). In particular, the government sector smoothed on average around 10.3% of a shock in autonomous community GDP in Spain during the period 2003-16.[46] Within the government sector, by far the biggest contribution to macroeconomic stabilisation and convergence across regions comes from the transfers in cash provided centrally – financed by central government tax revenues – which smooth 6.1% of shocks. Of these transfers, those involving pensions (3.3%) and unemployment benefits (2.6%) play a particularly relevant role. The richest autonomous regions, characterised by relatively high per capita income, contribute more than the other regions in personal and corporate income tax revenues, social security contributions and indirect taxes, which are then transferred by the social security system to the poorest regions in the form of unemployment benefits and pensions. In addition, the regional financing system also plays a significant role in consumption-smoothing (3.3%) because regions contribute less to the financing of the common pool in a downturn. It is important to note that the smoothing only happens through the advanced payments made during the current year.[47] This is a consequence of how the transfers from the regional financing system are distributed to the regions: advanced payments are made during the current year on the basis of the central government's revenue forecast for taxes collected centrally (as included in the Draft Budget Law), while the differences from the final outcome are settled two years later. Finally, the factor and credit markets each assumed a significant contribution (29%), while 35% of shocks remained unsmoothed.

[46] The empirical analysis excludes the two "chartered" territories, Basque Country and Navarra, which do not participate in the fiscal equalisation system, since they collect almost all taxes and send to the central government a pre-arranged amount for the competences exclusive to the state. In addition, we start in 2003 to exclude the impact of the 2002 reform.

[47] Although the main aim of the regional financing system is not risk-sharing, it could help to absorb asymmetric regional shocks to tax revenues since the system's transfers are inversely related to the financial capacities of the individual states in relation to the national average.

Table 13

Economic performance and fiscal risk sharing in Spain

a) Economic performance (interregion variation) in Spain

	1999			2017			1999-2017 (average)	
	Mean[4]	Range	Coefficient of variation	Mean[4]	Range	Coefficient of variation	Mean[4]	Correlation coefficient[5]
Nominal GDP per capita (EUR)	14,620	10,183	0.21	24,483	16,560	0.20	19,552	0.20
Nominal primary income per capita (EUR)	14,845	10,764	0.21	20,573	15,230	0.20	17,709	0.21
Nominal disposable income per capita (EUR)	12,609	7,677	0.17	18,515	12,095	0.17	15,562	0.17
Real GDP growth per capita (%)[1]	4.2	5.1	0.32	2.7	3.3	0.28	3.4	0.30
Real private consumption growth per capita (%)[1] [2]	2.9	5.4	0.40	1.1	9.6	2.50	2.0	1.45
Unemployment rate (%)[3]	14.2	19.1	0.36	16.1	16.0	0.31	15.1	0.33

b) Share of GDP shocks smoothed by fiscal channel over the period 2013-2016 in Spain

Total government *of which*	**10.3%** (5.5)	*
Federal taxes/social contributions	-5.5% (3.9)	
Federal social benefits *of which*	**6.1%** (1.7)	***
Unemployment benefits	**2.6%** (1.4)	*
Pensions	**3.3%** (1.6)	**
Intergovernmental transfers *of which*	4.5% (3.9)	
Advanced payments of reg. financing system	**3.0%** (1.6)	*
Liquidation of reg. financing system (t-2)	0.9% (3.7)	

Source: national statistics.
[1] Calculations based on region-specific chain price indices. Regional data for private consumption are only available until 2016.
[2] 1999 data refer to 2001.
[3] As a % of dependent labour force.
[4] Not population-weighted.
[5] Mean of regions' correlation coefficients 1999-2017 (correlation between individual region and total figures).
[6] New calculations based on Asdrubali et al. (1996). Excluding the two "chartered" territories, which do not participate in the fiscal equalisation system.

4.5 United States

4.5.1 The US fiscal-federal system

The United States is characterised by a fairly decentralised fiscal-federal system, with pronounced expenditure decentralisation and tax autonomy at the state and local level.

The US constitution assigns considerable fiscal autonomy to state governments, allowing them considerable leeway to decide on their tax and expenditure structures and their system of local government (see, for example, Laubach (2005)). Regarding taxation, state governments have the right to levy taxes and regulate taxation at the local level. While there is no tax-sharing arrangement in the US system, the different levels of government to some extent co-exploit major revenue sources. Both the federal government and state governments levy personal income taxes, for example.

Nevertheless, a division of major tax bases has developed over time, with the federal government focusing on income taxes whereas state and local governments rely more strongly on sales and property taxation respectively. Most major public expenditure functions are performed at the state or local government level, including education spending and the provision of social services and public infrastructure, while the federal government budget mainly covers national defence spending, pensions, health insurance and grants to state governments.

Around one-third of tax revenues in the United States are raised at the state and local level while the ratio of sub-national-to-total spending amounts to around 50%.

In 2016 state and local governments in the United States received 42.4% of general government revenues, while the sub-national spending share amounted to almost 50% (see Table 14). State and local tax revenues accounted for around a third of total taxes in the same year. The degree of vertical imbalance – the gap between sub-national governments' own revenue and spending for the state and local governments – reached 3.3% of GDP or 23.3% of state and local government spending. This implies that around a quarter of sub-national spending is financed via intergovernmental transfers from the federal level (including social security). Despite the pronounced fiscal autonomy of sub-national governments in the United States, there is therefore a significant fiscal interconnection between different layers of government which has grown over time. Table 13 shows how vertical fiscal imbalances rose significantly between 1999 and 2016 in terms of both GDP and expenditure share.

In the absence of federal responsibility for sub-national government debt, state governments mostly operate under self-imposed balanced budget rules.

In the US system, there are no centrally imposed restrictions on state and local government public finances and therefore no explicit responsibility of the federal government for sub-national government debt. Due to the credible federal no-bailout policy, the fiscally autonomous states are subject to market-based surveillance (see, for example, Bayoumi et al. (1995)) and therefore operate under self-imposed fiscal constraints. On the ground, the vast majority of states abide by some form of balanced budget requirement (BBR) which, however, typically refers to the operating budget and exempts capital spending, which can be debt financed. The BBRs vary significantly in terms of stringency and design: in some states, the budget only needs to be balanced ex ante, at the stage of political adoption, while in others there is the requirement of ex post balance. The debt-to-GDP ratio at the state and local level amounted to around 16% in 2016 (in weighted terms), up from around 14% in 1999 (see Table 13). The mean (unweighted ratio) remained relatively stable over the period 1999-2016. State and local debt accounts for a relatively small portion of the general government debt ratio which stood at around 107% in 2016. At the same time, there is significant interstate variation in debt-to-GDP levels, considering the range of around 18% of GDP in 2016. The highest ratio in 2016, of around 23% of GDP, was recorded in the state of New York.

Table 14

Fiscal decentralisation in the United States

	1999	2016
Fiscal decentralisation indicators (state and local gov.)		
Revenue decentralisation (%)[1]	40.6	42.4
Tax revenue decentralisation (%)[2]	34.2	32.9
based on tax-setting autonomy (%)	34.2	32.9
Expenditure decentralisation (%)[1]	50.1	48.4
Vertical imbalance (% of GDP)[3]	3.2	4.3
Vertical imbalance (% of expenditure)	19.0	23.8
Sub-national public finances (state and local gov. consolidated)		
Debt (% of GDP)[4]	14.2	16.1
Mean	14.5	14.9
Range	21.9	17.8
Coefficient of variation	0.3	0.2

Sources: OECD fiscal decentralisation database, U.S. Census Bureau.
[1] Share of consolidated revenue (expenditure) of state and local government in total revenue (expenditure) of general government.
[2] Share of state and local government tax revenue in total federal, state and local government tax revenue. Tax-setting autonomy: share of revenue from state and local government taxes for which the tax rates are set autonomously.
[3] Transfers received by consolidated state and local government from central government and social security.
[4] Debt of state and local government incurred with the public and non-public sector.

4.5.2 Mechanisms for stabilisation and convergence

The US fiscal-federal system is characterised by fewer but more targeted intergovernmental grants.

In the United States, there are far smaller intergovernmental grants that redistribute central government revenue to the states. Redistribution across states mainly occurs via federal grants to states related to public welfare and social security. These include differentiated block grants under the federally provided Temporary Assistance for Needy Families (TANF) programme as well as state-specific federal matching rates for Medicaid (which provides medical insurance for low income households). Table 14 shows that federal grants to states amounted to around 3½% of GDP in 2016, of which more than half were related to public welfare while only a small fraction were linked to medical insurance.

The US unemployment insurance programme is administered and financed by the states under federal guidelines and oversight; during times of high unemployment, the federal government extends UI benefits and/or provides emergency compensation.

The US unemployment insurance (UI) system is a partnership between the federal government, which sets federal guidelines and oversees the UI system, and the states, which provide payments to eligible workers under the regular UI programme. The federal government supplements these state benefits during times of high unemployment via the permanent Extended Benefits (EB) programme and the temporary “emergency” benefit extensions that are enacted in specific circumstances, most recently following the 2008-09 recession (see, for example, Albrizio et al. (2017)). State UI systems vary considerably in the rules governing eligibility for benefits, benefit amounts and payroll tax rates. When a state’s unemployment rate is high and its benefit payments exceed its payroll tax revenues, the state can draw from its account in the federal trust fund to cover the benefit payments or receive federal loans. Transfers to households related to the UI system amounted to 0.4% of GDP in 2016. Following the last recession, these transfers peaked at around 0.7% of GDP in 2011, partly as a result of federal benefit extension and emergency benefits.

Federal transfers to households largely reflect social security and income maintenance payments.

In 2016 federal transfers to private households amounted to around 10% of GDP. The bulk of these transfers relate to social security, notably retirement and disability insurance and various income maintenance programmes such as the earned income tax credit.

Table 15

Overview of federal fiscal transfers in the United States

	Federal grants to states	*of which:* **welfare grants**	*of which:* **medical grants**	**Federal/state unemployment benefits**
Macroeconomic objective/effect	.	Redistribution	Redistribution	Risk sharing
Activation trigger	.	.	.	Unemployment rate beyond certain threshold
Transfer direction	Vertical	Vertical	Vertical	Vertical
Size				
Total funds (% of GDP)	3.4	1.8	0.2	0.4
Realised transfers (% of GDP)	0.4	0.3	0.0	0.0

Source: U.S. Census Bureau.

4.5.3 Macroeconomic performance

GDP and income levels vary significantly between US states; disposable income levels less so, implying some degree of interstate redistribution.

Table 16a shows that while GDP per capita levels in US states have increased significantly over 1999-2016, the range (i.e. the difference between the highest and lowest income) remains high at around 80% of the mean. The degree of heterogeneity is similar when looking at primary income levels per capita. Disposable income, on the other hand, shows lower coefficients of variation together with ranges which suggest income redistribution between states.

The degree of business cycle correlation among US states has been high, especially when considering unemployment developments.

Business cycles in US states have been fairly synchronised in the period 1999-2016, based on standard indicators covering the correlation of per capita growth rates of real GDP and real private consumption and of unemployment rates. Labour market developments appear to be particularly synchronised with a correlation coefficient of more than 90%. There has been less co-movement in GDP growth rates than in private consumption growth, which points to interstate smoothing of GDP shocks.

Around 11% of the cross-state volatility in real GDP growth has been smoothed via the federal budget, in particular through federal social security and income maintenance payments.

Applying the fiscal risk-sharing framework described in Section 3.1 shows that, between 1999 and 2016, 11.3% of the interstate variation in real GDP growth per capita was stabilised via federal grants to states and transfers to private households (Table 16b).[48] The bulk of interstate stabilisation was related to federal social security and income maintenance payments. Pension payments accounted for around 40% of the stabilisation via federal transfers to households, while unemployment payments via the regular state system only explained around 18% of the federal transfer channel. Federal unemployment benefits did not contribute to interstate risk-sharing, which suggests that these transfers mainly help to support shocks to GDP that are common to all US states.

[48] Similarly, Asdrubali et al. (1996) estimated a total federal smoothing of 13% for the period 1964-1990.

Intergovernmental transfers only play a limited role in interstate risk-sharing in the United States.

Only around 2½% of the state-specific shocks to real GDP were smoothed by intergovernmental transfers that states received from the federal budget. The biggest share of this stabilisation happened via earmarked transfers for public welfare transfer payments, such as the block grants to support the TANF programme. Medical grants, including the matching grants to states related to the Medicaid programme, explain only a minor share of the interstate risk-sharing via federal grants to states.

Conclusion: The US fiscal-federal system combines effective fiscal institutions and market incentives for sustainable public finances at the state level with federal fiscal risk-sharing.

The fairly decentralised US fiscal-federal system is typically assessed to feature sound fiscal institutions and effective disciplining via financial markets, supporting sustainable public finances at the state level (see, for example, Bayoumi et al. (1995), Poterba and Rueben (1997) and Rodden (2002)). At the same time, balanced budget rules at the state level tend to limit the scope for stabilisation in economic downturns, implying that the federal budget has a role in smoothing (idiosyncratic) cyclical fluctuations (see, for example, Leiner-Killinger and Nerlich (2019)). In line with earlier empirical work (e.g. Asdrubali et al. (1996)), the estimates in this case study suggest that the federal budget provides for significant interstate risk-sharing, mainly via transfers to households.

Table 16

Economic performance and fiscal risk sharing in the US

a) Economic performance in the United States

	1999			2016			1999-2016 (average)	
	Mean	Range[1]	CV[2]	Mean	Range	CV	Mean	CC[3]
Nominal GDP per capita (EUR)	30,486	27,710	0.18	49,445	37,877	0.19	36,903	.
Nominal primary income per capita (EUR)	22,531	18,019	0.17	36,043	30,875	0.19	26,659	.
Nominal disposable income per capita (EUR)	22,382	12,896	0.13	38,621	23,625	0.14	28,040	.
Real GDP growth per capita (%)	3.00	9.37	0.59	0.29	9.50	6.19	1.09	0.63
Real private consumption growth per capita (%)	4.15	4.97	0.24	1.84	3.85	0.48	1.47	0.75
Unemployment rate (%)	4.07	3.89	0.24	4.64	4.01	0.21	5.69	0.93

b) Share of GDP shocks smoothed by fiscal channel in the United States[4]

	1999-2016	
Total government *of which:*	**11.3** (1.9)	***
Federal taxes/social contributions	**0.2** (1.8)	
Federal grants to states	**2.1** (0.6)	***
Public welfare grants	0.9 (0.3)	**
Medical grants	0.2 (0.0)	***
Federal transfers to households	**7.6** (1.2)	***
Federal pension benefits	3.2 (0.4)	***
State unemployment benefits	1.1 (0.6)	*
Federal unemployment benefits	0.0 (0.0)	**

Sources: U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, U.S. Census Bureau, national statistics, own computations.
[1] The range is defined as the difference beteern the smallest and largest value across US states.
[2] The coefficient of variation (CV) is defined as the standard deviation divided by the mean across US states.
[3] The correlation coefficient (CC) is defined as the mean correlation of US state and US average values.
[4] Calculations based on Asdrubali et al (1996).

5 Cross-country assessment

US and European fiscal-federal structures differ considerably with regard to degree of sub-national revenue autonomy.

The US type of federalism is characterised by significant revenue autonomy at each layer of government together with credible no-bailout policies by the federal government. Fiscal discipline at the sub-national government level is therefore imposed by a combination of strong own financial responsibility, market discipline and self-imposed balanced budget rules. In the United States, there are far fewer intergovernmental grants that redistribute central government revenue to sub-national entities. European countries typically feature higher intergovernmental transfers, while the grants in the United States are targeted more at the most needy.

European federal countries typically have a significantly higher degree of transfer dependency, which may undermine incentives for sound sub-national public finances.

High transfer dependency for the financing of sub-national spending, meaning large vertical imbalances, tend to undermine incentives for sound fiscal policymaking, especially where there are expectations of federal bailouts (which occurred in Germany, for example). Sub-national spending in European federal countries is often largely financed by intergovernmental transfers. As shown in Section 4, vertical fiscal imbalances reach levels of around 70%, as seen in Austria. Levels of around 50% can also be observed in Belgium and Spain. At the same time, it is important to consider the specific institutional provisions in a given country. Germany, for example, shows relatively small vertical fiscal imbalances, of around 10%, which reflect the extensive sharing of tax revenues among the different government layers. In Belgium, on the other hand, a quarter of the intergovernmental grants are distributed according to regions' contributions to personal income tax. Furthermore, European federal countries are typically characterised by limited sub-national tax-setting powers, as suggested by the relatively low degrees of tax revenue decentralisation when considering actual rate-setting autonomy. The case of Austria is striking in this context, given that sub-national governments only set rates for 1.5% of their share in total tax revenues. In the case of the United States, around a quarter of state spending is financed by federal transfers. At the same time, state governments have full tax autonomy for the taxes that are collected at the state level.[49]

Sub-national debt levels and their dispersion tend to be lower in the United States than in major European economies.

In the United States, average state debt amounted to around 16% of GDP in 2016, with maximum levels of around 34% of GDP. In Germany, by contrast, despite aggregate indebtedness remaining below a moderate 24% of GDP at the sub-national level in 2017, there are states that have accumulated debt ratios of almost 90% of their GDP. In recent decades, rates of change in sub-national debt have also been significant in the Spanish regions, where the debt ratio almost tripled since 1999.

The degree of interregional fiscal risk-sharing in the United States has been relatively similar to some euro area federal countries.

The empirical estimates of the degree of fiscal risk-sharing presented in the case studies suggest relatively similar cross-regional fiscal smoothing effects in the United States and the European federal countries, notably Austria, Germany and Spain. We find that between 1999 and 2016, around 11% of the interstate variation in GDP has been smoothed via the fiscal channel in the United States. For the Spanish regions, we observe a very similar level of fiscal risk-sharing since 2003. The estimated degree

[49] Revisions to sub-national tax arrangements may have important implications for the degree of interregional risk-sharing which therefore may vary over time.

of interregional fiscal stabilisation was somewhat smaller in Germany and Austria between 1999 and 2016 (7-8% of the variation in regional GDP was smoothed via the fiscal channel).

In both the United States and European federal countries, fiscal risk-sharing mainly occurs via transfers to households rather than intergovernmental transfers.

According to the estimation results presented above, around 75% of the fiscal risk-sharing provided in the United States resulted from transfers paid to private households, including pension payments and transfers received from the state unemployment insurance scheme, which are financed by central government taxes and social security contributions. This pattern is very similar in some of the European federal states, notably Germany and Spain, where cash transfers to households account for large parts of cross-regional stabilisation in the event of asymmetric shocks. In Austria, there is also significant fiscal risk-sharing via the redistribution of taxes and social security contributions. Intergovernmental transfers, on the other hand, do not play a quantitatively important role for cross-regional income stabilisation. In the United States, such transfers explain around a quarter of the interstate fiscal risk-sharing. The fairly strong statistical significance results from the fact that the federal government provides matching grants for cyclically sensitive state expenditures related to health and public welfare for needy families and low income households. In the European federal states, the effects of intergovernmental grants are often found to be small or not statistically significant. In the case of Germany, which maintains a large-scale, formula-based fiscal equalisation scheme, the vertical and horizontal intergovernmental transfers do not provide significant fiscal smoothing in the event of asymmetric macroeconomic shocks to the states. Some cross-regional fiscal smoothing takes place in Austria and Spain via the sharing of tax revenues.

6 Conclusion

Intergovernmental transfers are only effective for risk-sharing if triggered by cyclical variables and transferred immediately.

The results from our case studies of existing fiscal-federal systems suggest that present intergovernmental transfers contribute little to cross-regional stabilisation because most of them are not triggered by variables related to the business cycle. Most of the proposals for a euro area fiscal capacity discussed in this paper envisage a dedicated mechanism for macroeconomic stabilisation which relies on intergovernmental transfers that are triggered by variables related to the business cycle. This implies that when activated, for example on the basis of an increase of unemployment in a certain Member State, the central European stabilisation instrument would pay out transfers to the government of the country concerned. These transfers would then be used to finance and/or maintain national public investment, for example, or to support the national unemployment insurance scheme. Whether the central transfers swiftly contribute to macroeconomic stabilisation would then depend on various factors, such as procedural lags or the availability of shovel-ready investment projects at the national level.

Intergovernmental transfers may entail moral hazard.

Reliance on intergovernmental transfers may also result in moral hazard, especially if such transfers are granted without conditionality. As highlighted in this paper, reliance on centrally provided transfers could result in weakened incentives for sound economic and fiscal policymaking at the Member State level and possibly reduce national economic resilience as a result. Therefore, it appears important that a prospective central stabilisation instrument for the euro area would be integrated in an overall fiscal policy framework that ensures proper incentives for national policymakers. Many of the proposals for a euro area stabilisation instrument therefore feature a certain fiscal conditionality, for example in the form of compliance with the European fiscal rules. In this context, the US fiscal-federal system may serve as a benchmark, given its high degree of fiscal autonomy at all levels of government, effective fiscal constraints at the state level and credible federal no-bailout policies (see, for example, Leiner-Killinger and Nerlich (2019)).

Ideally a euro area fiscal capacity would operate as an automatic fiscal stabiliser.

The empirical risk-sharing analyses for different federal countries presented in this paper suggest that effective cross-regional stabilisation of asymmetric shocks tends to work via direct cash transfers to households, such as unemployment benefits, which are financed by cyclical central government revenue sources like payroll taxes and social security contributions. Automatic stabilisers – such as unemployment benefit schemes – are generally assessed to provide timely support to the economy, given that they are not subject to political implementation lags and are typically targeted at households with a high marginal propensity to consume. This would suggest that– to the extent possible – a euro area budgetary instrument for stabilisation should be designed to enhance the automatic stabilisation capacity in the single currency area. A European unemployment scheme that reinsures national schemes in the event of severe recessions is a prominent proposal in this context. However, our analysis of existing fiscal-federal systems speaks in favour of financing a European budgetary instrument for stabilisation purposes via central taxes or social security contributions similar to the US state-federal unemployment insurance. In the euro area setting, this

would certainly require far-reaching institutional and political changes towards a deeper fiscal and political union, in part to ensure proper democratic legitimation and nullify disincentives to national economic policymaking.

Data appendix

Table A.1

Austria

	Variable	Description	Source
	Province income		
=	HH primary income	Provincial household primary income	NSI/Eurostat
+	Other taxes generated in province	Corporate taxes allocated via provincial operating surplus; property-related taxes based on administrative data; wage-related indirect taxes via wages received by households; consumption taxes via provincial households disposable income	Own calculations based on MoF and NSI data
	Disposable province income		
=	Province income	See above	
-	All taxes and social contributions contained in province income	See above	
+	Own taxes	Property-related taxes and municipal payroll tax	MoF
+	Transfers from federal government and social security funds	See schemes a.1-a.3 below	MoF, NSI, own calculations
+	HH social benefits	Social benefits other than in kind received by households (regional accounts)	NSI/Eurostat
	Fiscal sub-items		
	a Intergovernmental fiscal transfers		
	a.1 Sharing of federal tax revenue	About 1/3 of income taxes, VAT, excise duties and insurance taxes collected by federal government is distributed to provinces and municipalities	MoF
	a.2 Other federal transfers	Co-financing of certain expenditure (esp. for schools and hospitals)	MoF
	a.3 Transfers by health insurance funds for hospitals	Hospitals are run by provinces, health insurance funds partly co-finance expenditure via lump-sum transfers	Own calculations based on NSI data and social security law

Table A.2
Germany

	Variable	Description	Source
	State income		
=	HH primary income	Income from employment and wealth of private households	Volkswirtschaftliche Gesamtrechnung der Länder (VGRDL)
-	HH direct taxes	Taxes on income and wealth paid by private households	VGRDL
+	State taxes before redistribution	Sum of federal, state and local taxes collected at state level	German Statistical Office (Destatis)
	Disposable state income		
=	State income		
-	State taxes before redistribution	See above	Destatis
+	State taxes after redistribution	State taxes after federal/state fiscal equalisation	Destatis
-	HH social contributions	Sum of social welfare contributions paid by private households	VGRDL
+	HH social benefits	(Monetary) social transfers received by private households	VGRDL
	Fiscal sub-items		
	a Federal/state fiscal equalisation		
	a.1 VAT redistribution	Interstate redistribution of the state share in value-added taxes based on population and relative fiscal capacity	Destatis
	a.2 Interstate transfers	Interstate redistribution based on per capita differences in fiscal capacity	Destatis
	a.3 Federal supplementary transfers	Supplementary federal transfers to state based on per capita differences in fiscal capacity and special needs	Destatis
	b Federal transfers to households		
	b.1 HH social benefits	(Monetary) social transfers received by private households	VGRDL
	b.1.1 Pension benefits	Benefits received by HH from the public pension system	VGRDL

Table A.3

Spain

	Variable	Description	Source
	Region income		
=	HH primary income (B5)	Income from employment and wealth of private households (including taxes and SSC)	Regional Annual Accounts (Spanish Statistical Office (INE))
-	HH direct taxes (D5)		Regional Annual Accounts (INE)
+	State taxes before distribution	HH direct taxes (D5), corporate taxes (NA) allocated via regional operating surplus (INE); property-related taxes derived from RLNA; indirect taxes (GGNA) allocated using regional private consumption	Regional Annual Accounts (INE) and own calculations based on General, Regional and Local Governments National Accounts (GGNA, RGNA and LGNA) (General Intervention of the State Administration (IGAE)) and INE data
	Disposable region income		
=	Region income	See above	
-	All taxes (D5) and social contributions (D61) contained in region income	See above	Regional Annual Accounts (INE)
+	Own taxes	State & municipal taxes (NA) within taxes on products excl. VAT and imports (D214), other taxes on production (D29) and capital taxes (D91)	RGNA & LGNA (IGAE)
+	HH social benefits (D62)	Social benefits other than in kind, received by households	Regional Annual Accounts (INE)
+	Transfers from federal to regional & local governments	transfers mainly related to the regional and municipal financing system	RGNA & LGNA (IGAE)
	Fiscal sub-items		
	a Regional financing system		Ministry of Finance data in cash terms
	a.1 Advanced payments (in current year)	During current year based on federal budget revenues forecast	Ministry of Finance data in cash terms
	a.2 Final payment (t-2)	Final payment of the remaining balance of the regional financing system from two years before	Ministry of Finance data in cash terms
	b Federal transfers to households		
	b.1 HH social benefits (D62)	Social benefits other than in kind received by households	Regional Annual Accounts (INE)
	b.1.1 Pension benefits	Benefits received by HH from the public pension system, distributed using (cash) data on average pension by region	IGAE and Social Security Administration
	b.1.2 Unemployment benefits	Benefits received by HH from social security, distributed using (cash) data on average unemployment benefits by region	IGAE and Social Security Administration

Table A.4

United States

	Variable	Description	Source
	State income		
=	State personal income		U.S. Bureau of Economic Analysis (BEA)
+	Federal non-personal taxes and contributions	Corporate/indirect taxes and social welfare contributions collected by the federal government	BEA
+	State and local non-personal taxes	Non-personal taxes collected at state and local government level	OECD/BEA
-	Direct transfers	Direct government transfers to individuals (and non-profit institutions)	BEA
	Disposable state income		
=	State income		
-	Federal non-personal taxes and contributions	See above	BEA
-	Federal personal taxes	Income taxes collected by the federal government	BEA
+	Federal grants to state governments		U.S. Census Bureau
+	Federal transfers to individuals	Various federal transfers	BEA
	Fiscal sub-items		
	a Intergovernment fiscal transfers		
	a.1 Public welfare grants	Federal intergovernmental transfers for public welfare	U.S. Census Bureau
	a.2 Medical grants	Federal intergovernmental transfers for health & hospitals	U.S. Census Bureau
	b Transfers to HH		
	b.1 Federal pension benefits	Retirement and disability insurance benefits	BEA
	b.2 State unemployment benefits	State unemployment insurance compensation	BEA
	b.3 Federal unemployment benefits	Federal unemployment insurance compensation	BEA

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