When Theory Meets Practice: Can We Implement the Optimal Fiscal Federal Structure?

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Abstract: We provide new insights into whether existing fiscal federal systems are achieving the best possible outcomes. Our new insights are based on the results of Calsamiglia, Garcia-Milà, and McGuire (2013). The authors introduce solidarity preferences into the standard model of fiscal federalism and find that a system with a common (countrywide) minimal level of spending combined with subnational revenue-raising authority dominates other typically considered systems. We use these results to develop a new lens through which to assess fiscal federal systems and we apply this new approach to the systems in Canada, Germany, Spain and the United States. We show that with fairly straightforward reforms, existing fiscal federal systems could be improved, resulting in higher social welfare.

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“Spain needs to review its system of decentralisation, recognising that a diverse country is best governed in the manner of federal Germany rather than … centralised France.”
The Economist, July 26, 2018

I. Introduction

In previous work with Xavier Calsamiglia, we argued that a fiscal federal system in which the central government sets and funds a common minimal level of spending across regions, and regional governments have revenue-raising authority to spend beyond the minimum, is more efficient than other typically considered systems (Calsamiglia, Garcia-Milà and McGuire, 2013). The theoretical findings provide a new lens through which to view decentralized fiscal federal systems. In the present paper, we apply the theoretical insights of Calsamiglia et al. to real-world fiscal federal systems. The goal is to demonstrate how existing systems deviate from the ideal and to provide guidance for policymakers embarking on reform of their fiscal federal systems.

The paper proceeds as follows. In section II, we describe the motivation for and results of Calsamiglia, Garcia-Milà and McGuire (2013). We follow with a section in which we flesh out the practical requirements of the ideal system, what we call the guaranteed minimum system, thereby developing a template for implementing the guaranteed minimum system. In section IV, we examine three well-established, decentralized fiscal federal systems – the systems in Canada, Germany and the U.S. – and analyze whether the systems are near or far from the ideal. In section V, we apply our template to Spain, a country that relatively recently devolved fiscal authority to subnational governments and whose fiscal federal system is experiencing maturation pains. We conclude in section VI.

II. An optimal structure for funding regionally provided goods and services in a federal system

The Decentralization Theorem (Oates, 1972, p. 35) states:

> For a public good – the consumption of which is defined over geographical subsets of the total population, and for which the costs of providing each level of output of the good in each jurisdiction are the same for the central government or for the respective local government – it will always be more efficient (or at least as efficient) for local governments to provide Pareto-efficient levels of output for their respective jurisdictions than for the central government to provide any specified and uniform level of output across all jurisdictions.

This theorem has been a touchstone for decades, providing the basis for economists to argue for subnational provision over centralized provision of goods and services in order to better accommodate differences across space in demand for publicly provided goods and services. However, as argued in Calsamiglia, Garcia-Milà and McGuire (2013), a purely decentralized system may no longer be the most efficient system if people have preferences for solidarity. The notion of solidarity, defined as a desire to provide some publicly provided goods and services less unequally than the ability of local governments to pay for them, relates closely to the concept of specific egalitarianism formulated in Tobin (1970). The idea is that certain publicly provided goods and services, for example, education or healthcare, are important to determining life chances and thus should be provided at some basic level regardless of ability to pay.

We demonstrate that in the presence of solidarity preferences, which we argue are plausible and pervasive, a system involving a centrally guaranteed minimum level of spending on some goods and services across all localities in the country coupled with local revenue-raising authority to spend in excess of the guaranteed minimum is more efficient than other standard decentralization systems. The guaranteed minimum system has aspects of centralization in that it ensures a common basic level of spending across the country thereby addressing concerns for solidarity. It also has aspects of a decentralized system in that local governments have the ability to tap their own resources in order to spend beyond the basic level should their resident-voters desire. We can think of this result as a modified decentralization theorem that applies as long as people have non-zero preferences for solidarity.

III. What are the necessary components of a guaranteed minimum system?

In Calsamiglia, Garcia-Milà and McGuire (2013) the authors develop a simple mathematical model of the guaranteed minimum system and other common fiscal federal systems that they trace through simulations. In this section, we attempt to bring some specificity and practicality to the simple model.

There are two necessary components to a guaranteed minimum system: there must be a minimum level of spending that is common across all regions; and the regions must have revenue-raising authority. It is possible to implement both of these components in a number of different manners, but any approach to implementation has to meet the following checklists.

For the common minimal level, the following must hold:

1. *Universal*. There must be one common minimal level, that is, the guaranteed level of spending must be the same in each of the regions.
2. *Limited in scope*. Generally, not all publicly provided goods and services would be covered by the common minimal level. In other words, the scope of coverage would typically be limited to goods and services that determine life chances.
3. *Unbreakable*. Regions cannot spend less than the common minimal level.
4. *Centrally funded*. A tax that is applied uniformly and countrywide funds the common minimal level of spending throughout the country. In other words, regions do not have to contribute own-source revenues to fund the common minimal level.
5. *Adequate level*. The common minimal level must be set at an economically meaningful level.

For revenue-raising authority, the following must hold:

1. *Independent taxing authority*. Regional governments must have taxing authority independent of the central government, in other words, they must have the ability to impose and collect taxes.
2. *Meaningful amount*. Regional taxing authority must be economically meaningful. Taxes and other revenues raised by the regional government (own-source revenues) must comprise a significant share of total revenues available to the regional government.
3. *Ability to spend in excess of common minimal level*. Regions must have the ability to use their taxing authority to fund spending in excess of the common minimal level.

IV. How do Canada, Germany and the U.S. stack up?

We turn our focus to Canada, Germany and the U.S. because they are three influential countries with well-established fiscal federal systems. Researchers have scrutinized these systems from the perspective of Oates's Decentralization Theorem (see, for example, Boadway and Watts, 2004, and the relevant chapters in Peterson and Nadler, 2014). Our innovation is to assess how the three systems fare in a world where, because people have solidarity preferences, the optimal fiscal federal system is the guaranteed minimum system. We begin by providing brief descriptions of each country's fiscal federal system.

Description of the Canadian system

The Canadian federal system is comprised of the federal government, 13 regional governments – ten provinces and three territories – and approximately 3,900 municipalities. Fiscal responsibility is shared between the federal government and subnational governments, with the federal government raising approximately 45 percent of total revenues in the country and being responsible for just over 30 percent of direct spending (Garcia-Milà, McGuire, and Oates, 2018).

The ten provinces have significant revenue-raising authority and spending responsibility. They impose taxes on income (both personal and corporate) and on sales, and they are responsible for spending on education, healthcare and other social services. Canadian provinces raise a substantial amount of revenue via the broad authority granted to them by the Canadian Constitution (section 92.2); own-source revenues comprised more than 80 percent of provinces' total revenues in 2015 (see Table 1).

The major grants from the federal government to the provinces take two forms: two grants support specific services and a third grant equalizes resources across provinces. The Canada Health Transfer is the largest of the grants and funds healthcare, ensuring "universality, comprehensiveness, portability, accessibility and public administration" as delineated in the Canada Health Act of 1984. The Canada Social Transfer is a block grant that provides support for all Canadians for post-secondary education, services for children, and social programs. The federal government distributes both grants on an equal per capita basis, so that in each province the federal government provides the same amount of funding support per person. The provinces are free to spend more than the amount of the CHT and CST on the associated services and programs and in fact, they do. Health spending at the provincial level is substantially higher than the size of the CHT grant in each province.

The Equalization grant is a federal grant that addresses fiscal disparities among the provinces. Provinces with below average fiscal capacity receive grants to ensure that they "have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation" (Subsection 36(2) of the Constitution Act, 1982). There are no constraints on how the provinces can spend these grant monies. In FY 2018-2019, six provinces, including Quebec and Ontario, the most populous provinces, qualified for equalization payments.

As can be seen in Table 1, grants from the federal government to provinces contribute on average 19 percent to total provincial revenues. There is wide variation across the provinces in this share with federal grants comprising a much larger share of the revenues of the poorer provinces than the richer provinces. Federal grants make up the largest share of revenues in the poorer Maritime Provinces; in Prince Edward Island, they make up 37 percent of revenues. In the richer provinces, they make up a much smaller share of provincial revenues, just 15 percent in natural resource-rich Saskatchewan.

Description of the German system

The Federal Republic of Germany has three layers of government: federal, regional and local. The regional level is composed of sixteen Länder, of which three are city-states, while the local government level is composed of 402 counties, of which 107 are independent cities, and over eleven thousand municipalities. The federal system was initially set up within the German constitution or Basic Law approved in 1949, with the supervision and signature of the western Allies of World War II. The accession of the five eastern Länder to the Federal Republic of Germany and the unification of East and West Berlin in 1990 in what has been called the German unity resulted in the current composition of Germany as a federation.

The 16 Länder have significant spending responsibility, including education at all levels (primary, secondary and post-secondary), tax administration, public order and safety, welfare, and public infrastructure, but quite limited revenue-raising authority. Own-source taxes, for example the real property transfer tax and gambling taxes, contribute a very small fraction of the total revenues of the Länder. As can be seen in Table 1, own-source (tax and non-tax) revenues comprised only 23 percent of total revenues in 2015.

Intergovernmental grants comprise a significant share of the revenues of the Länder. One of the largest grants is the allocation of VAT revenues among the Länder. Slightly less than half of countrywide VAT revenues are captured at the Land level (with the remainder staying with the federal government) and these revenues are distributed in two parts. First, around 75 percent of the revenues are distributed across Länder on a per capita basis. The remaining approximately 25 percent of the VAT revenues assigned to the Länder are allocated in a redistributive manner inversely proportional to the fiscal capacity of the Länder, thereby reducing the gap with respect to the mean across Länder in total revenues per capita. Another grant administered by the Länder is the Länder financial equalization system, whose purpose is to further decrease the differences in total revenues per capita. In 2016 Bavaria, Baden-Wurttemberg, and Hesse transferred resources to the other thirteen Länder. A third layer of equalization occurs through general supplementary grants from the federal government. These grants transfer resources to Länder with per capita revenues below average fiscal capacity. After this sequence of distributions and transfers, in 2016, among the 13 Länder that are not city-states, the Länder with the lowest total revenues per capita had 98.6 percent of the average (Mecklenburg-Vorpommern, Saxony-Anhalt, Thuringia) and the Land with the highest total revenues per capita had 106.7 percent of the average (Bavaria). Thus, each Land ends up with total revenues per capita within a tight band around the average.

Finally, the federal government also provides supplementary grants for special needs: to the new Länder, to help the east Länder catch up with the west Länder; to the ten smaller Länder to cover disproportionally high administrative costs. As can be seen in Table 1, transfers to the Länder comprised on average 39 percent of total Länder revenue in 2015.

Unique to Germany among our three countries is a system of shared taxes. The three main taxes in Germany – income, corporate and VAT – account for approximately 70% of total tax revenues in the country. Of these, the income and corporate taxes are shared taxes in that the revenues are split between the federal government and the Länder. The shares of income and corporate taxes are established by the Basic Law, and therefore remain stable over time. For the income tax, the shares are 42.5 percent each for the federal government and the Länder, and 15 percent for local governments. The corporate tax is split in half by the federal government and the Länder. The Länder share of the income and corporate taxes collected in each Land remain where they were collected. The federal government designs and proposes the tax bases and tax rates for these taxes, which then need the approval of the Bundestag, the high chamber, and the consent of the Bundesrat, the lower chamber, representing the Länder. Because individually a Land has no autonomy to decide characteristics of these two taxes, we consider that the taxes do not constitute own-source revenues. Shared taxes comprised a large portion of total revenues in 2015 (see Table 1).

Description of the system in the United States

The fiscal federal system in the United States is composed of the federal government, 50 state governments and thousands of local governments, both general purpose (cities and counties) and specific purpose (school districts, library districts, etc.). The US system is quite decentralized in that subnational levels of government – both state governments and local governments – have significant revenue-raising authority and spending responsibility. The states have played a large role in the fiscal federal system since the beginning of the federation. Indeed, at the dawn of the country in the late 18th Century, the states were the predominant player (Dilger, 2018). It was not until early in the 20th Century, when the country adopted a federal income tax and the central government responded to the Great Depression with an array of federal programs, that the central government began to overtake the state and local sector in terms of size. Today, both the share of total (federal+state+local) revenues raised by state and local governments and the share of total spending undertaken by state and local governments is around 45 percent (Garcia-Milà, McGuire, and Oates, 2018).

State and local governments in the U.S. have significant spending responsibility, including responsibility for all three levels of education (primary, secondary and post-secondary), healthcare for low-income families, highways and public transit, and police and fire protection. The federal government provides funding in each of these areas, in some instances substantial funding, but subnational levels of government undertake the actual spending.

While state governments have significant revenue-raising authority, imposing a wide array of taxes including income and sales taxes as well as user charges and fees, they also receive meaningful support from the federal government in the form of intergovernmental transfers. As can be seen in Table 1, federal grants to state governments represent on average 27.5 percent of all revenues available to state governments. These grants come in a number of forms. The largest grant, representing nearly 16 percent of state revenues, is a grant in support of state Medicaid expenditures.[1] The Medicaid program provides healthcare insurance for low-income families. Funded jointly by the federal government and the states, the program is administered at the state level. The federal grant is a matching-grant program, providing a minimum matching rate of 50 percent (states with a matching rate of 50 percent receive a dollar of federal grant money for each dollar of state spending). The matching rate is higher for states with lower average per capita income (in FY 2018, for example, Mississippi had the highest match at 75.65 percent).

Other important grants from the federal government to state governments include grants for transportation, education, and income security. In FY 2018, total estimated federal grants to state and local governments were $728 billion, including well more than half of the total for health (largely Medicaid), 15 percent of the total for income security (largely cash assistance), nine percent for education and related services, nine percent for transportation (highways and public transit), and the remainder for a variety of other purposes.[2] (See Dilger, 2018.)

Let us look at these three systems through the prism of the guaranteed minimum system.

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[1] Source: U.S. Office of Management and Budget, *Budget of the United States Government, Fiscal Year 2019: Historical Tables*, Table 12.3, Total Outlays for Grants to State and Local Governments, at https://www.govinfo.gov/content/pkg/BUDGET-2019-TAB/pdf/BUDGET-2019-TAB.pdf

[2] In addition to direct grants-in-aid, the federal government provides indirect aid through the deduction for state and local taxes (SALT) on the federal individual income tax. In December 2017, the federal government passed a law that capped the SALT deduction at $10,000.

Canada

<u>Common minimal level</u>

The Canada Health Transfer and Canada Social Transfer provide per capita grants to support spending on health, welfare, children and family services, and post-secondary education for each of the provinces.

1. *Universal?* Yes. Because the CHT and CST are per capita grants, they provide the same support across the provinces.
2. *Limited in scope?* Yes. The per capita CHT and CST grants are earmarked for limited government programs and services.
3. *Unbreakable?* Yes, spending on health and education is well above the grant amount.
4. *Centrally funded?* Yes. Grants come from the federal government and are funded using general revenues.
5. *Adequate level?* Yes. On average the CHT and the CST combine to make up 12 percent of total provincial revenues.

<u>Revenue-raising authority</u>

1. *Independent taxing authority?* Yes. Provinces have access and ability to determine rates for several taxes.
2. *Meaningful amount?* Yes. As can be seen in Table 1, provincially determined (own-source) revenues represent 81 percent of total revenues.
3. *Ability to spend in excess of common minimal level?* Yes.

Germany

<u>Common minimal level</u>

Through shared taxes and transfers, total revenues per capita for the Länder sit in a tight band around the mean for the Länder. While not a true common minimal level, the system ensures all Länder have very similar revenues per capita.

1. *Universal?* Yes. The system guarantees that all Länder have total revenues per capita very near the mean.
2. *Limited in scope?* No. The resources received by each Land can be spent on any good or service for which the Länder have responsibility.
3. *Unbreakable?* Yes.
4. *Centrally funded?* Yes. Allocated funds come from countrywide taxes.
5. *Adequate level?* Yes. The allocations cover essentially the entire budget.

<u>Revenue-raising authority</u>

1. *Independent taxing authority?* Yes, but very limited.
2. *Meaningful amount?* No. As can be seen in Table 1, Länder determined (own-source) revenues represent 23 percent of total revenues, which is a much smaller share than in Canada or the U.S. Also, as we point out in the notes to the table, we back into our estimate of the share of own-source revenues and believe our estimate is likely an overestimate.
3. *Ability to spend in excess of common minimal level?* TBD

United States

<u>Common minimal level</u>

The federal government in the U.S. does not provide for a common minimal level of state spending on any category of spending. (Instead, it provides significant funding support via block and matching grants, some of which are equalizing, to support various categories of spending, including but not limited to Medicaid, cash assistance, and transportation.)

1. *Universal?* NA
2. *Limited in scope?* NA
3. *Unbreakable?* NA
4. *Centrally funded?* NA
5. *Adequate level?* NA

Revenue-raising authority

1. *Independent taxing authority?* Yes. States have access to and the ability to determine tax rates and tax bases of many different taxes.
2. *Meaningful amount?* Yes. As can be seen in Table 1, state determined (own-source) revenues represent 73 percent of total revenues.
3. *Ability to spend in excess of common minimal level?* NA

To summarize, Canada has both a common minimal level and provinces have revenue-raising authority; Germany has a common minimal level but Länder have only limited revenue-raising authority; and the U.S. does not have a common minimal level but states have revenue-raising authority. As can be seen in Table 2, the systems result in predictable degrees of variation in spending across regions. For example, the variation in spending per capita (both overall and for two major categories of spending) is the highest among regions in the U.S., where regional revenue-raising authority is high and intergovernmental transfers are not explicitly equalizing. Germany has the least variation in spending per capita in both total spending and education spending, reflecting the limited degree of regional revenue-raising authority and the high degree of equalization both in intergovernmental transfers and in shared taxes.

Of the three systems, only for the Canadian system can we check all the boxes necessary for implementation of the guaranteed minimum system. For countries devising new systems or revising existing systems, we would suggest they consider Canada as a potential role model.

In the next section of the paper, we apply the template developed herein to the fiscal federal system in Spain and provide our prescription for how to reform the Spanish system.

V. A guaranteed minimum system for Spain?

In 1978, when Spain transitioned from dictatorship to democracy, the creation of a fiscal federal system with a new level of regional government – 17 autonomous communities – helped ease the transition and win broad support from all quarters. However, the system from the beginning lacked transparency and predictability. These problems were not properly addressed in periodic revisions of the system. Furthermore, the system did not fulfill the expectations of regions that aimed for a higher degree of autonomy, thus thwarting regions' desire to respond to the needs and preferences of their residents. The system today results in regions being seriously unsatisfied with the outcome and presenting challenges to the system's very roots.

Description of the Spanish system

Spain has three layers of government, central, regional and local. The regional government is composed of 17 autonomous communities, established in the 1978 democratic constitution and deployed in the early 1980s. The local government is comprised of more than 8,000 municipalities. Two of the autonomous communities, the Basque Country and Navarra, are under a special regime, the *foral* regime, with a high level of fiscal autonomy and no responsibility for contributing to funding the equalization system that applies to all others. We focus our analysis on the remaining 15 regions under the so called "common regime" of fiscal federalism, which is characterized by limited fiscal autonomy and a high degree of redistribution.

The 15 autonomous communities have significant spending responsibility, including the provision of universal health, education at all levels (primary, secondary and post-secondary), and the delivery of some social services related to housing and social protection. The autonomous communities have ample authority to design their expenditure policies within the basic framework established by the central government.

Revenue authority, on the other hand, is effectively quite limited. Own taxes are of two types. The first type of own taxes are created individually by regional governments on tax bases that are not established countywide, like an environmental tax or a tourist tax; these taxes in 2015 accounted for 2.2 percent of the regional budgets. The second type of own taxes are defined countrywide; on these taxes the autonomous communities have (with the exception of the electricity tax) normative autonomy and full revenue benefit. The most important are taxes on wealth, inheritance and donation, and on property transfers, which amounted all together to about 12 percent of total revenues in 2015 (Comisión de Expertos, 2017).

The largest sources of revenue for the autonomous communities are the taxes administered by the central government and shared with the autonomous communities. The personal income tax and the VAT are shared 50 percent each, and the special excise taxes on tobacco, alcohol and hydrocarbons have 58 percent allocated to the regional governments. The territorial allocation of revenues of the income tax is according to residency, while VAT and excise taxes are allocated according to location of consumption. On the personal income tax the autonomous communities have the ability to establish their own tax rates (as far as it is a progressive scheme and within a set range) as well as some deductions and exemptions from the base.

Intergovernmental grants play an important role in the final allocation of revenues to the autonomous communities. For each autonomous community the government calculates a fiscal capacity value that takes into account all regional revenues with minor exceptions. Seventy-five percent of this calculated fiscal capacity is pooled into an equalization fund (Fund for the Guarantee of Essential Public Services), which also receives additional resources (about 8.5 percent of its total) from the central government. The fund is distributed on a per capita basis, where the population is adjusted by geographic and demographic factors that mainly take into account the age bands that generate differential demand for health, education and social services.

The central government provides three additional funds – sufficiency, cooperation and competitiveness – that are distributed based on several criteria, the most important being the preservation of the status quo, meaning the amount of funding that existed at the time of the last revision. These three funds are very controversial, and end up distorting the equalization accomplished by the Fund for the Guarantee of Essential Public Services. These adjustments to total regional revenues can be large. For example in 2014 revenues were adjusted up 20 percent for Extremadura and down ten percent for Madrid (Comisión de Expertos, 2017)

Analysis of the Spanish system

Let us look at the Spanish system through the prism of the guaranteed minimum system. Recall, there are two key components to the guaranteed minimum system. How does Spain stack up?

<u>Common minimal level</u>

The Fund for the Guarantee of Essential Public Services (FGEPS) provides a grant per capita (population adjusted) to each autonomous community.

1. *Universal?* No. The three central government funds (sufficiency, cooperation, competitiveness) adjust the allocations for some regions below the FGEPS level.
2. *Limited in scope?* No. The resources received by each autonomous community can be spent on any good or service for which the autonomous communities have responsibility.
3. *Unbreakable?* Yes.
4. *Centrally funded?* Yes. Allocated funds largely come from countrywide taxes
5. *Adequate level?* Yes. The allocation covers about 80 percent of the budget.

<u>Revenue-raising authority</u>

1. *Independent taxing authority?* Yes, but very limited.

2. *Meaningful amount?* No. Regionally determined tax revenues comprised 14.2 percent of total revenues in 2015.
3. *Ability to spend in excess of common minimal level?* Yes.

In sum, the Spanish system does not guarantee a common minimal level (because the three central government funds undo the FGEPS) nor do the regional governments have meaningful revenue-raising authority.

A reform proposal for Spain

The flaws of the Spanish system that we have identified as preventing it from fulfilling the requirements of the guaranteed minimum system could be overcome with some reforms of the present financing system. Although it has been claimed that a meaningful reform of the financing system in Spain would require changes to the Spanish Constitution – a major legal and political hurdle – in fact changes in the Organic Law of the Financing of the autonomous communities (LOFCA in its Spanish acronym) would suffice to achieve a model that meets the guaranteed minimum conditions.

The first and most important change would be to establish that the autonomous communities (AC) have significant revenue-raising authority. They should have authority to determine tax bases and set tax rates. Additionally, the tax collection should be done by the tax agency of each AC (some ACs already have a tax agency, and for others it would have to be created). The AC tax agencies should be coordinated among themselves and with that of the central government, establishing a system that would share information and be efficient. In the case of the value added tax (VAT), all territories need to comply with the homogeneity restrictions established by the European Union, and therefore the tax rate of the AC part of the VAT will necessarily be identical across regions. Nevertheless, the tax agencies of each AC would have incentives to reduce tax evasion (known to be quite pervasive with respect to the VAT in Spain) to obtain greater revenues. Some reasonable exceptions to regional autonomy would be established, such as taxes related to exports and imports that should be centrally decided and administered.

The second element of the reform would aim at ensuring a common minimal level. The current Spanish system has an equalizing fund, the above-mentioned FGEPS, which is in spirit very close to a common minimal level. The main problem, as has been explained, is that it is accompanied by three additional funds that undo an important part of its equalizing effort. These three funds would be eliminated. There should be a political agreement that establishes a minimum level of goods and services that all regions would be able to reach. This would translate into a certain adjusted per capita amount that would be guaranteed to each region. The adjustment of the per capita values would consider variables that affect the cost of the provision of similar goods and services given the characteristics of the population. An independent committee of experts would be designated for this task. Each autonomous community would contribute to the equalizing fund according to its fiscal capacity.

VI. Conclusion

We provide new insights into whether existing fiscal federal systems are achieving the best possible outcomes. Our new insights are based on the results of Calsamiglia, Garcia-Milà, and McGuire (2013). The authors introduce solidarity preferences into the standard model of fiscal federalism and find that a system with a common (countrywide) minimal level of spending combined with subnational revenue-raising authority dominates other typically considered systems. We use these results to develop a new lens through which to assess fiscal federal systems and we apply this new approach to the systems in Canada, Germany, Spain and the United States. We show that with fairly straightforward reforms, existing fiscal federal systems could be improved, resulting in higher social welfare.

Table 1: Regional Government Revenue Sources, 2015

	Canada	Germany*	United States
Number of Regional Governments	10 provinces	16 Länder	50 states
$\frac{intergov.\ transfers\ to\ regional\ governments}{total\ regional\ government\ revenue}$	0.188	0.3943	0.275
$\frac{L\ddot{a}nder's\ portion\ of\ shared\ taxes}{total\ regional\ government\ revenue}$	N/A	0.3794	N/A
$\frac{own\text{-}source\ regional\ revenues}{total\ regional\ government\ revenue}$	0.811	0.2263	0.725

* Our source for revenue data for Germany (German Federal Ministry of Finance, 2018) did not have all the information we needed so we had to undertake some back-of-the-envelope calculations and we had to define one of our categories (own-source revenues) as a residual. We thus consider our figures for Germany to be provisional. The sources for revenue for Canada and the United States were Statistics Canada, Table 10-10-0017-01 and the U.S. Census Bureau, Annual Survey of State Government Finances, respectively.

Table 2: Major Expenditures (PPP-adjusted USD, 2015)

	Canada	Germany	United States
Total subnational spending per capita	11,443	7,575	10,613
Coef. of Variation across regions in spending/pop	0.1099	0.0557	0.2456
Total subnational K-12 spending per capita	1,392	1,767	1,900
Coef. of Variation across regions in K-12/pop	0.15	0.079	0.28
Total subnational health spending per capita	3,374	232	1,840
Coef. of Variation across regions in health/pop	0.104	0.133	0.30

Data sources: for Canada, Canadian Institute for Healthcare Information and Statistics Canada; for Germany, Destatis, the federal statistical office; for the United States, U.S. Census Bureau.

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