Effects of Subnational Heterogeneity on Fiscal Discipline: A Legislative Game

Autor: Daniel Habermacher

Legajo no. 31.686.556

Mentor: Prof. Mariano Tommasi

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Abstract

This article studies how differences in subnational financial strength influence legislative resolutions regarding fiscal matters in federal countries. Legislative coalitions give birth to institutions that shape subnational fiscal incentives. The approach works for particular early periods in federals countries’ history, which we define as “constitutional moments”.

Downsian-elected representatives from each region form the Senate, which must decide over a federal grant system. The grant bill will be passed depending on the regional distribution of its costs, given that there is a majority requirement. Some extensions regarding the inter-regional distribution of population, state-specific grants, and the incentives for blocking coalitions are analyzed. Finally, we explore the model’s empirical relevance with a brief survey on the early fiscal federalism in the U.S, Argentina, and Germany.
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1 Introduction

The literature of Fiscal Federalism has shown that similar political institutions can lead to very different fiscal incentives. For instance, the fact that Argentina’s Constitution has mimicked that of the U.S. did not guarantee comparable political nor economic development patterns, neither a similar institutional evolution. Beyond what political institutions have to do in the explanation of the divergence (Alesina and Perotti, 1995; Tommasi, 1998; among others) we try to shed light on the influence of endowments over the evolution of fiscal institutions.

Our approach is not new. Ziblatt (2004) studied the effects of subnational heterogeneity on the political dominance of fiscally and institutionally strong states. He argues that building a strong federation requires institutionalized, socially embedded, and highly infrastructural preexisting subunits, and supports this claim with the analysis of both the German and Italian unification processes. The more fiscally and institutionally homogeneous the subunits are, the more effective the implementation of the federal organization will be, because its costs will be shared among regions.

We claim that heterogeneity has fiscal consequences when the system of government is not endogenous, especially when subnational units have legislative voice. We aim to understand these effects on fiscal grounds, so as to assess their relevance the evolution of subnational fiscal incentives of three federations: the U.S., Argentina, and Germany.

Neither our argument is completely new. In his Ph.D dissertation, L. Llach arguments that income differences between Buenos Aires and the rest of the early Argentine Provinces eventually led to a coalition to federalize most of its fiscal revenue sources. However, some features of our model make it more general in scope: it considers an intra-regional distributive dimension that defines the subnational government’s preferences; it shows explicitly how the distribution of population among regions affects subnational fiscal incentives; and it gives some intuitions regarding more complex interactions between States.

As long as the Congress is the aggregation mechanism of States’ political and economic preferences, it will transform subnational income heterogeneity into federal fiscal institutions.

In this line, Wibbels (2003) analyzes regional politics as determinants of federal institutions that constrain subnational behavior. He states that the set of available coalitions between disciplined and prodigal states shapes federal institutions. His work also suggests the importance of “constitutional moments”, given that the subunits are not part of an well-defined institutional framework. Furthermore, both their own fiscal behavior and the federal decision-making process constitute the very foundations of the federation.

In our model the distribution of subnational fiscal strength determines the set of available legislative coalitions. However, whenever Senators behave strategically, over-representation of small states —malapportionment— will become relevant. We assume homogeneous legislators in the sense that we do not consider seniority or other measures of human capital (see Bercoff, Meloni, and Nougués, (2012)), because we take institutions as endogenous.

On the one hand, if weak states had binding budget constraints, malapportionment would make them willing to accept cheap offers from coalition builders.

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1We define as events in early history of countries (federations, in the context of this paper) that sets the foundations of fiscal institutions

2This can be associated with Ziblatt’s idea of institutional endogeneity, in this case, with a lower degree of freedom –i.e. not able to determine the system of government, but the fiscal institutions.

3In their paper, Bercoff et al. find that the distribution of quality among actual and potential legislators affects the effort put in each legislative bargaining process, with consequences for the aggregate result. Conversely, our analysis implicitly assumes that distribution is given, so the “aggregate legislative effort” in equilibrium will not vary.
On the other hand, bicameral legislative regimes may counterbalance the excessive power of small states, because the need to win in both chambers dilutes the importance of each chamber’s specific strategy (Ansolabehere, Snyder, and Ting (2003)). Notwithstanding, this result is constrained when the bill originates in the Senate.

In most federations the upper chamber has the initiative for fiscal matters, what increases the relevance of malapportionment in institutional development. Thus, the analysis of the fiscal decision-making process appears crucial to assess on the applicability of the results described above.

We develop a simple approach to fiscal institutions, mainly concerned with the incentives they provide to states. Our model focuses on the decision-making process for a nation-wide transfer system financed by federal taxes. At this point, the concept of constitutional moment becomes crucial because it is associated with the need to solve some kind of fiscal or financial issue –either national or subnational.

Claims for the second-best optimality of transfer systems ground on redistribution arguments (Sanguinetti and Tommasi, 2003; Besfamille and Lockwood, 2008) or public goods externalities (Crivelli and Staal, 2006). But in federal countries they rarely offset the pervasive effects of transfers on subnational fiscal discipline (Goodspeed 2005, Rodden 2000, Crivelli 2011), and most of the empirical literature supports this.

Rodden (2000) shows that the difference in German States’ response to external shocks has to do with subnational heterogeneity: fiscally weak states tend not to adjust expenditures nor revenues because they expect bail out from the Federal Government. The German case is an example of how fiscal institutions shape intergovernmental relationships and, thus, determine subnational fiscal discipline (von Hagen et al, 2000).

Moreover, the case for subnational fiscal prodigality is not limited to Germany. Rodden (2002) finds evidence supporting the association between States’ fiscal indiscipline, vertical fiscal imbalance, and subnational borrowing autonomy in four OECD countries. Ultimately, these relations depend on the Federal Government’s involvement on regional affairs, which has a very strong political component. We discuss some of these kind of political implications in section 3.

Espino (2005) describes another relevant channel by which transfer systems affects sub-units’ incentives. In a dynamic framework, he finds that a transfer system induces moral hazard on regions’ fiscal efforts, deviating the optimal grant allocation scheme to a second-best one that is pro cyclical –and, thus, does not work as an intertemporal shock smoothing scheme.

Although most of the above literature was developed in the early 2000s, the 2009-2011 Eurozone’s debt crisis increased the relevance of the topic. For instance, Bordo, Jonung, and Makiewicz (2013) argue that both a high degree of subnational fiscal autonomy and credible no-bailout commitment are necessary conditions for a successful Fiscal Union. Though these are met in EU’s present institutional configuration, the authors also mention the need for a well-designed transfer mechanism to deal with subnational fiscal distress. In this line, the present paper grounds on the foundations of the topic and focus on the causes of institutional design. These prospective institutions will define the degree of subnational financial autonomy, the existence of credible no-bailout promises, and both the implementation and the features of the transfer mechanism.

The paper is organized as follows: section 2 presents the basic framework: regions’ problem, the legislative game, and the optimal grant allocation scheme. Section 3 presents some extensions regarding the effects of population distribution, state-specific grants, and incentive of blocking coalitions. Section 4 briefly describes how the model helps to understand three federations divergent fiscal institutions. Section 5 concludes.
The model

We start defining a single-period game between legislative representatives ($S_i$) from the $M$ regions of the country, each of which has population $n_i$. Without loss of generality, we assume that $M$ is odd. Residents of each region have single-peaked utility functions ($W_i$) that depends on both public and private goods consumption.

Each period is divided into two sub-periods. In the first, every individual receives its income endowment $Y_i^j$ from a state-specific probability distribution function, $Υ_i$. A Downsian Election defines each region’s representative at the end of the first sub-period.

The policy platforms consist in a level of public good ($G_i$) and tax rate ($τ_i$), both of which are regional. At the end of this sub-period the election takes place in each State and one of the candidates becomes its representative in the Congress.

At the beginning of the second sub-period the Congress opens sessions and decides over a grant allocation bill. In particular, grants are nation-wide (they cannot be directed to specific regions) and the coalition of Senators voting affirmatively determines their per capita level. The majority requirement to implement the grant allocation is given by a number $ψ ≥ \frac{M+1}{2}$. In case the majority is not reached, $g = τ^{f} = 0$.

We assume perfect information, thus, regions’ first sub-period move takes into account the Congress decision and their tax levels include expectations of future grants. When the Congress session ends, regional and federal allocations are implemented –i.e. $τ_i$, $τ^{f}$, $G_i$, $g$.

Utility function for each individual in region $i$ depends on private and public good consumption: $C_i^j$ and $G_i$; then:

$$W_i^j = u_i(G_i) + w_i(C_i^j)$$

Where $u_i(.)$ and $w_i(.)$ satisfy all the traditional concavity and differentiability assumptions for single-peaked preferences over consumption. Average consumption in each region is given by:

$$C_i = (1 - τ_i - τ^{f})Y_i$$

The model rules out both public and private borrowing. Each region provides the public good, and it cannot be targeted to specific individuals but must be provided in the same, nonnegative amount to every individual in the State. Then, per-capita public good provision is:

$$G_i = \frac{1}{n_i} \sum_{j=1}^{n_i} τ_i Y_i^j + g$$

$$G_i = τ_iY_i + g$$

Where $g$ is the level of per-capita grants.

Finally, any grant allocation bill must satisfy the federal budget constraint:

$$\sum_{i=1}^{M} \sum_{j=1}^{n_i} τ^{f} Y_i^j = Ng$$

Where $N$ is the total population of the country.

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4 As a convention, we use subscript “$i$” to denote states and “$j$” to individuals
2.1 Regions’ Benchmark

If grants were ruled out, representatives would offer a level of $G_i$ in accordance to the region’s fiscal capacity. This would be efficient in the sense that regional decisions will not be distorted by grant expectations.

In this case, region $i$’s candidates try to conform residents with indirect utility function given by:

$$W^i_j = u(G_i) + w \left( 1 - \frac{G_i}{Y_i} \right) Y^j_i$$  \hspace{1cm} (4)

Then, the winning candidate platform satisfies:

$$\frac{\partial u_i}{\partial G_i} + \frac{\partial w_i}{\partial C_i} = \frac{Y^m_i}{Y_i}$$  \hspace{1cm} (5)

Where $Y^m_i$ is the median income. Then, the traditional Median Voter Theorem (MVT) applies:

$$\tau^b_i = \tau \left( \frac{Y^m_i}{Y_i} \right)$$
$$G^b_i = G \left( \frac{Y^m_i}{Y_i} \right)$$

Where $Y^m_i$ is the median voter income.

From (5) we see how the income distribution determines the relative level of regional taxes and public good provision. When the income distribution has negative skew ($Y^m_i > Y_i$) the level of both $\tau^b_i$ and $G^b_i$ will be relatively low. Conversely, when income concentrates in few rich individuals both $\tau^b_i$ and $G^b_i$ will be relatively high.

Equation (5) resembles the traditional result of Downsian Electoral Competition Model with one-dimensional policy vector –see Persson and Tabellini (2000), ch. 3.

2.2 The Legislative Game

Firstly, we state an important assumption regarding the decision-making process of Senators.

Assumption 1 Senator from region $i$ will vote affirmatively only if $\tau^f Y^m_i < g$, and vote negatively otherwise.

This statement is just the formalization of what we had stated previously. Given that the median voter represents the preferences of the electorate for each state, the decision over the bill depends on whether the median voter makes a net contribution or earns a net benefit from the grant system.

The fact that the tax and grant levels are determined by the winning coalition makes the previous problem endogenous. However, under the current set up we will claim that for any policy for which both $\tau^f \neq 0$ and $g \neq 0$, what determines each Senator’s vote is his income relative to the national average.

Claim 1 Senator $i$’s vote will be affirmative if and only if $Y^m_i < Y$.
Proof 1  By assumption (1), we know that an affirmative vote only happens if:

\[ \tau f Y^m_i < g \]
\[ g = Y^m_i < g \]
\[ Y^m_i < Y \]

Where the second inequality comes from stating (3) as \( \tau f Y = g \) (\( Y \) is national average). Q.E.D.

The above claim means that we only need to look at the “relative position” of regional median income with respect to the national average to figure out the decision on the Congress. Then, income distribution determines the existence of a winning coalition to pass the grants allocation bill. It does so in two levels: regional distribution across individuals and the contribution of each region as a whole to the national income.

For the sake of simplicity, let us divide the Congress into two subsets: \( S^+ \) and \( S^- \). The first subset corresponds to states that would vote affirmatively to any policy proposal different from zero, and the second to its complement. We can see that \( card(S^+) = M - card(S^-) \geq 0 \). Thus, given that \( S^+ \) and \( S^- \) are complementary partitions of the nonempty set \( M \), at least one of them will have cardinality different from zero.

The existence of a winning coalition depends on the number elements in each subset and the majority requirements (\( \psi \)).

Lemma 1  Given \( \Upsilon = [\Upsilon_1, ..., \Upsilon_i, ..., \Upsilon_M] \); if \( card(S^+) \geq \psi \), then the grant allocation proposal bill is passed in the Congress. Otherwise it is rejected.

We can investigate some intuitions of Lemma 1 by analyzing some extreme cases for both the regional and the national income distributions. Let us call intra-regional symmetry to the case in which \( Y^m_i = Y_i \) for all \( i \in M \), and inter-regional symmetry to \( Y^m_i = Y^m_k \) and \( Y_i = Y_k \) for all \( i, k \in M \).

2.2.1 Intra-regional Symmetry

This case allows us to analyze the effect of income differences across regions.

The equality between median and mean income for all states implies that both \( S^+ \) and \( S^- \) are nonempty sets, since the national average will be in between the lowest and the highest medians. If we represent inequality as the polarization of states’ income to the left (right) of the national average\(^6\), the number of regions that benefits from the system will be higher (lower) than those making a net contribution.

Consequently, regional inequality will increase the probability of coalitions either to pass the grant bill or to block it, depending on whether the poor states outnumber the rich ones or vice-versa. However, the final decision over the bill depends on the majority required.

In addition, for non-extreme cases of inequality\(^7\) it necessary for a coalition to pass the bill that the population of the few rich states is sufficiently large.

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\(^5\)Where \( card(X) \) is the number of elements of the set \( X \).

\(^6\)What means that there are few very rich states

\(^7\)Here extreme means all the poor states having the same very-low median income.
2.2.2 Inter-regional Symmetry

This case illustrates the effect of inequality among individuals any region. Here we have that either $S^+$ or $S^-$ is zero. The first case corresponds to an income pdf with a negative skew, while the second to a pdf with positive skew.

Here, a positive skew in regional income increases implies a representative that will vote affirmatively, *ceteris paribus* the national average. To see it clearly, let analyze an intermediate case.

2.2.3 An Intermediate Case

To simplify things let assume there are only three regions, having the same positive-skewed income pdf with different means and medians. The first three graphs in Figure 1 depict the income pdf for each of the three regions with their respective medians and means ($Y^m_i$ and $Y_i$, resp.). The fourth column shows the relative position of regional median and mean incomes in a hypothetical national distribution (not shown).

The first thing to note is that the national average income could be at any point in between the lowest and the highest regional average, as indicated in the figure (between $Y_1$ and $Y_3$ in this case). Under the current set up, the exact location of the national average will depend on the population of each region. As long as region 3’s population increases, the national average will move to the right, closer to $Y_3$. Therefore, if the population of region 3 is large enough the national average will be between $Y^m_2$ and $Y_3$, what means that the representative of region 2 will vote for the grant bill. Indeed, if the income pdf for region 3 were sufficiently skewed to the right we would find that there is unanimity in the Congress to pass the bill ($Y \in (Y^m_3, Y_3)$). In this case, the wealthiest individuals in 3 are both sufficiently rich and numerous to support by themselves the grant allocation system.

Conversely, it could be the case that the population of region 1 is so large that $Y \in (Y_1, Y^m_2)$. In this case Senator of region 2 would vote against the bill, blocking the grant system.

The example clarifies the two main points of this paper. In both statements below we interpret an higher inequality always as an increase of the poor counterpart (either states or individuals, depending on the case).

Inter-regional inequality increases the probability of a coalition supporting the grant bill. It has been shown for the intra-regional symmetric case, but if we shift the distribution of region 2 to the left in Figure 1, we will reach the segment in which $Y^m_2 < Y_1$ and $Y_1 < Y_2$ that defines a coalition for the grant system independent of the distribution of population among states.

Intra-regional inequality also increases the probability of a coalition supporting the grant bill, since it drives the median off the mean. For instance, consider a mean-preserving increase in inequality for the three regions in Figure 1. It is easy to see that all the median incomes will shift to the left, increasing the probability of an unanimous coalition supporting the bill.

2.3 The optimal grant allocation bill

As long as there were an allocation proposal, and independently from the existence of a winning coalition, the level of both grants and federal tax rate would be set by States in $S^+$. Then, their problem is:

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8The existence of an allocation proposal depends on $\Upsilon$. For instance, if all regions had the same $\Upsilon_i$, and it is given such that $Y_1 < Y^m_i$, then no Senator would propose the grant allocation bill.
Figure 1: An Intermediate Case: Intra- and Inter-regional inequality
\[
\max_{g,\tau} \sum_{i \in S^+} \left[ u_i(\tau_i Y_i^m + g) + w_i[(1 - \tau_i - \tau_f) Y_i^m] \right]
\]

Given that there is a non-negativity restriction for \(\lambda\), the FOC is:

\[
\sum_{i \in S^+} \frac{\partial u_i}{\partial G_i} - \sum_{i \in S^+} \frac{\partial w_i}{\partial C_i} Y_i^m = -\lambda
\]

(7)

The Complementary Slackness condition is \(\lambda g = 0\).

On the one hand, \(g > 0\) implies that \(\lambda = 0\) and (7) becomes a restricted Samuelsonian Rule to establish the grants level. We can see that (7) does not take into account the net marginal utility of states in \(S^-\), thus the level of \(g\) and \(\tau_f\) will be greater than what would be a hypothetical social planner’s optimal transfer system.

Additionally, (7) sets another effect of inter-regional redistribution, in this case on the level of grants and federal taxes. Given a level of \(Y\), the lower the median income of Regions within the coalition, the greater the per capita grant level, since these regions internalize little of the system costs.

On the other hand, \(g = 0\) implies that \(\lambda \geq 0\) represents the shadow consumption gain of poor \((S^+)\) states. In a broad sense, this can be interpreted as poor regions’ willingness to form a coalition against rich ones.

2.4 Fiscal discipline

The expectation of future grants makes candidates from \(S^+\) States take them into account when deciding their platforms. Those expectations are defined by the implicit function from equation (7).

\[g^* = g \left( \frac{\partial u_i}{\partial G_i}(\tau_i), \frac{\partial w_i}{\partial C_i}(\tau_i) \right)\]

(8)

Equations (1) and (2) make:

\[\frac{\partial g^*}{\partial \tau_i} = Y_i^m(u_{GG} + w_{CC})\]

(9)

Where \(u_{GG}\) and \(w_{CC}\) are the second partial derivatives of utility functions with respect to public and private consumption, respectively. Given our assumptions over the utility functions, both derivatives are negative. Then, (9) is negative for the States receiving net gains from the grant system.

The perfect information assumption makes candidates take into account equation (8) in their policy platforms.

**Proposition 1** Whenever \(\Upsilon = [\Upsilon_1, ..., \Upsilon_1, ..., \Upsilon_M]\) determines that \(S^+ \geq \psi\), then states within \(S^+\) make a lower fiscal effort and offer a higher level of the public good than in the benchmark case –i.e. \(\tau_i^b \geq \tau_i^f\) and \(G_i^b \leq G_i^f\)

We use the Kuhn-Tucker formulation for this problem.
**Proof 2** Now the candidates’ problem is

\[
\max_{\tau_i} (W_i^m) = \max_{\tau_i} \left[ u(\tau_i Y_i + g^\ast) + w \left( 1 - \tau_i - \frac{g^\ast}{Y_i} \right) Y_i^m \right]
\]

(10)

The FOC is:

\[
\frac{\partial u_i}{\partial G_i} = \frac{Y_i^m}{Y_i} \frac{1 + \frac{g^\ast}{Y_i}}{1 + \frac{g^\ast}{Y_i}}
\]

(11)

Given that \( g^\ast = \frac{\partial g^\ast}{\partial \tau_i} < 0 \) for states in the winning coalition, then the difference between (11) and (5) is given by the relative amount of \( Y_i \) and \( Y \).

Finally, from the operation of the second term on the left of (11), from (9), and the fact that level of \( G_i \) is no lower than the benchmark case in states receiving positive grants10, then (11) is greater than (5), what means that the \( \tau^e_i < \tau^b_i \). Q.E.D.

Thus, proposition 1 establishes the main result of this paper: the way in which income heterogeneity in federal countries can lead to fiscal indiscipline.11

In the present model, a coalition of weak States can advance towards rich States’ wealth, leading to fiscal prodigality.

Another interesting point is how grants related to the public good allow increases in private good consumption via tax reductions. Then, though it is not the main purpose of our analysis, this “crowding out effect” of private to public good consumption can be taken as a redistribution mechanism.

3 Extensions

We analyze some relevant comparative statics of the main model, trying to shed some light into both its limitations and potential explanatory power.

3.1 Population distribution: effects on national average income.

The distribution of population among regions affects the how the grant system costs’ are distributed. Thus, we analyze the effects of different population distributions on equilibrium coalitions.

From (6) we know that the existence of a winning coalition depends on the relationship between regions’ median income and the national average. Given regional income distribution (\( \Upsilon \)), national population (\( N \)) and \( \psi \), then the national income average can be defined as a function of the population distribution:

\[
Y = \frac{\sum_{i=1}^{M} n_i Y_i}{N}
\]

Consequently, when population concentrates on weak states, a winning coalition becomes less probable since “intermediate median-income states” are less willing to vote for the bill –i.e. a greater number of \( Y_i^m \) will be higher or equal to \( Y \), given \( \Upsilon \).12

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10Given federal grants, the benchmark tax level would finance a higher level of \( G_i \) than the benchmark case; thus in the new equilibrium \( \tau^e_i \) should not be higher than \( \tau^b_i \) and \( G^e_i \) should not be lower than \( G^b_i \).

11Here in the form of a vertical fiscal imbalance.

12To visualize the effect, imagine all the \( Y_i^m \) ordered in a horizontal \( Y \) axis. Then, an increase in \( n_i \) in poor states shifts \( Y \) to the left, leaving some previously \( S^+ \) States to the right.
This effect comes directly from malapportionment and may be counteracted in bi-cameral legislatures whenever the lower chamber had proportional representation, since more populous states would have more representatives.

3.2 State-specific grants: the need to define the Agenda Setter selection mechanism and to cope with blocking coalitions.

A more realistic legislative bargaining game would consider a state-specific grant allocation system. Whenever the minimum number of Senator were not reached to pass the bill, the coalition of weak states might need to look for support of some medium-income states.

As long as we maintain the vote criteria results do not change much. In a Baron-Ferejohn legislative bargaining framework the agenda setter choice between all the Senators those who has a lower continuation value and, then, pays them to support her proposal.

However, in that case we need to define the agenda setter selection mechanism and it presents several modellistic difficulties. In the first place, a random selection would not work because in that case the existence of a winning coalition would depend on the agenda setter’s income. If, for instance, a poor State’s Senator were selected the transfer system would be implemented, otherwise not. In the latter case, indeed, some states receive grants in exchange to their vote against the bill.

Secondly, an endogenous agenda setter selection mechanism has some limitations. We may wonder that the State with the highest “shadow gain from grants” will have the greatest economic incentives to lead a legislative coalition. However, this may be counter-intuitive in connection with economic-power considerations, since a single poor State barely has ex-ante economic grounds to lead a negotiation –ceteris paribus– the specific political considerations of each country. Furthermore, the scenario of rich regions leading a coalition to reject the grant bill seems more plausible, since they could easily raise some revenues from own sources to buy $\psi - S^+$ states’ votes.13

Consequently, state-specific grants allows the possibility of the formation of blocking coalitions in benefit of rich states. A mechanism of this kind seems to have worked in the German unification process before Eastern states were incorporated to the Federal Fiscal System (Länderfinanzausgleich). In section (4) we explain the relationship between federal transfers to weak states and the need to maintain the system’s status quo before the fiscal unification in 1995.

3.3 Probabilistic voting in regional elections.

Finally, a Probabilistic Voting Model (PVM) replacing our simple Downsian Electoral Model would result in a greater weight of political ideology in the determination of both regional elections and the coalition-formation process.

Although the present work explicitly aimed at exploring economic causes of regional fiscal indiscipline, a PVM could incorporate some insights regarding the aggregation of regional ideologies to the national legislative arena. This would raise the impact of regional politics on national outcomes, in line with Wibbels (2003).

In a broad sense, we can think of constitutional moments as the trade-off between fiscal Conservatism and Revisionism. Here, depending on the distribution of regional swing voters, the amount of grants needed to buy marginal states to vote affirmatively might be prohibitive if they were conservatives –and the inverse also could be true.

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13Lower than the burden of grants to $\psi$ states.
This extension may add some explanatory power to the model in the case of provincial coalition formation in early Argentine Republic, as we will see in section 4.

4 Case Studies

In this section we do not aim to make strict econometric tests of our hypothesis, but to explore the existing empirical literature on the topic and figure out how it suggests the relevance of our argument. However, a serious econometric approach for the ideas presented here is a proximate step in our research agenda.

We analyze three federal countries’ historical events that established the foundations of their fiscal federalism, showing how the degree of income heterogeneity compromised fiscal incentives.

This analysis enhance the importance of the constitutional moments. Paraphrasing Wibbels (2003), we can identify them as those events in which fiscal outcomes are not the result of a strong central government or the formal fiscal rules currently in vogue, but instead, the byproduct of the political interaction of relevant actors of the moment.

We begin with the U.S. States’ debt crisis of the 1840s and, following Wibbels, we aim to show how a coalition of wealthy and disciplined states blocked the advance of a movement for a federal bailout to heavily indebted states. The fact that some States expected an eventual financial rescue from the National Government, led them to over-borrow in international markets to finance infrastructural investment. That expectation was founded in the previous experience in times of the Independence War. But a majority of high-income States’ representatives prevailed in the Senate’s commissions and blocked the bailout movement.

Secondly, we develop Llach’s argument explaining the governing coalition in Argentina for the 1880-1890 period. A change in the ruling coalition changed the course of subnational finances in the 1880s. The emergence of an alliance of middle-low income provinces implied the advance over Buenos Aires’ fiscal resources, and was responsible of a generalized subnational fiscal profligacy in the period.

Finally, the model can also be useful to understand the German fiscal unification process of the first half of 1990s. The incorporation of East Germany States to the Federal Fiscal System threatened its stability, because those States were poorer than the West ones. The literature argues that the Bundesrat decided to bailout two Western States in financial distress in order to find the necessary additional support to sustain the system’s status quo. However, since the unification increased the number of weak states, it has enhanced their bargaining power and eventually their benefits raised (Hepp and von Hagen, 2011).

4.1 The U.S. State Debt Crisis of the 1840s

Wibbels (2003) describes the 1840s subnational debt crisis that followed a decade of fiscal profligacy as one of the most spectacular episodes of American public finance history. Two previous federal bailout episodes threatened the sustainability of the U.S. model of Competitive Federalism.

With these antecedents less-developed States borrowed far from their real financial possibilities to carry on infrastructure projects. The extraordinary expansion of expenditures in many States in the late 1830s–together with the weakness of their revenue bases and a confidence crisis

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14In the 1790s the National Government assumed subnational debts derived from the Independence War. In 1836, Washington DC was also bailed out by the Federal Government.
Table 1: U.S regional income per capita and Gini coefficient.

<table>
<thead>
<tr>
<th>Region</th>
<th>1840 Per Capita Income</th>
<th>1860 Gini Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>129.0</td>
<td>0.44</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>119.7</td>
<td>0.48</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>85.5</td>
<td>0.60</td>
</tr>
<tr>
<td>East North Central</td>
<td>71.5</td>
<td>0.39</td>
</tr>
<tr>
<td>West North Central</td>
<td>79.3</td>
<td>0.42</td>
</tr>
<tr>
<td>East South Central</td>
<td>85.5</td>
<td>0.58</td>
</tr>
<tr>
<td>West South Central</td>
<td>161.7</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Source: Lindert and Williamson (2012), pp. 29 and 32.

In Europe’s capital markets—caused the collapse of subnational debt. As a result, nine states defaulted and four repudiated part of their debt, and there was a strong movement toward the federal assumption of subnational debts.

However, this movement was stopped by a coalition of low-to-modestly indebted states, provided that they had the majority in both chambers in the Congress (82 and 62 percent of the seats of the House and the Senate, respectively). Wibbels explains the coalitions mainly in terms of States’ electoral competitiveness and their institutional entity as member of the Union.

The first of these arguments lies on the lack of effective democratic controls over state officials. He argues that corrupt state officials mismanaged subnational debt assumption that led to overborrowing.

The other lies on the fact that new states might have had higher bailout expectations due to the antecedents. As a result, Wibbels finds significant effects of his two main hypothesis.

Although his evidence does not support the claim for the influence of state’s income, the coefficient on States’ GDP per capita does present a negative sign—in line of our model prediction. The GDP per capita may have limitations as measure of fiscal strength, since it does not take into account intra-state income distribution. For instance, in states where Slavery was not (at least) formally abolished, GDP per capita would be a biased indicator of fiscal strength because income was highly concentrated. Thus, medium-to-high-GDP southern states would be fiscally profligate because tax rates were very low and the needs for infrastructure were high.\textsuperscript{15}

Table 1 shows U.S. regional real product per capita in 1840 and the Gini coefficient for household incomes in 1860 (as a proxy of 1840 income distribution), based on data from Lindert and Williamson (2012). In addition, Table 2 shows Wibbels’ classification of states regarding both their indebtedness level and their tentative position in the federal bailout debate.

From the analysis we can see that the coalition against the federal bailout was compounded of all states of the New England region, and most of both the Middle- and South-Atlantic regions. On the contrary, fiscal profligate States mostly belonged to central regions, with the exemption of Maryland and Pennsylvania.

Our model predicts that NE and MA states would vote against the bailout proposal because they were relatively rich and their income was better distributed. On the contrary, States from ENC and WNC regions would support the proposal, since they were relatively poor and their income distribution worse. As we can see in Table II, our claim match almost perfectly for these regions, with the exemption of Missouri, Ohio, and Tennessee belonging to the austere states coalition, and Pennsylvania supporting the bailout.

\textsuperscript{15} Investment in communication, for example, to transport their production from farms or towns to ports.
Table 2: 1840 debt status of U.S. states.

<table>
<thead>
<tr>
<th>Modestly Indebted</th>
<th>Region</th>
<th>Heavily Indebted</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecticut</td>
<td>NE</td>
<td>Alabama</td>
<td>ESC</td>
</tr>
<tr>
<td>Delaware</td>
<td>SA</td>
<td>Arkansas</td>
<td>WSC</td>
</tr>
<tr>
<td>Georgia</td>
<td>SA</td>
<td>Illinois</td>
<td>ENC</td>
</tr>
<tr>
<td>Maine</td>
<td>NE</td>
<td>Indiana</td>
<td>ENC</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>NE</td>
<td>Kentucky</td>
<td>ESC</td>
</tr>
<tr>
<td>Missouri</td>
<td>WNC</td>
<td>Louisiana</td>
<td>WSC</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>NE</td>
<td>Maryland</td>
<td>SA</td>
</tr>
<tr>
<td>New Jersey</td>
<td>MA</td>
<td>Michigan</td>
<td>ENC</td>
</tr>
<tr>
<td>New York</td>
<td>MA</td>
<td>Mississippi</td>
<td>ESC</td>
</tr>
<tr>
<td>North Carolina</td>
<td>SA</td>
<td>Pennsylvania</td>
<td>MA</td>
</tr>
<tr>
<td>Ohio</td>
<td>ENC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>NE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>ESC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermont</td>
<td>NE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>SA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Moreover, the intra-regional distribution claim supports the explanation of the prevailing position of all south States, given the high need for infrastructure investment of all them.

South regions —SA, ESC, and WSC— at first sight do not follow our model’s prediction, especially WSC states, which were the richer in per capita terms and, at the same time, the leading profligate governments. However, we must take into account some elements:

- the small share that WSC states represent into national population (approx. 2.5 percent according to 1840 U.S. National Population Census);
- their productive structure (mainly agricultural) and the income distribution derived from it;
- the period they were members of the Union.

Then, we can infer that the interaction between their tax preferences (toward low taxes) and their need for infrastructure investment (high need of roads, among other things) implied a binding budget constraint. This budgetary stringency might have been relaxed with the easy access to foreign capital markets and the expectation of a eventual federal bailout.

Finally, the model presented gives the correct insight behind regional incentives to fiscal discipline in this particular case.

4.2 Argentina’s League of Governors of 1880s and the Baring Crisis

Argentina’s constitutional moment marked a divergent evolution of its fiscal institutions than that of the U.S.. In his Ph.D dissertation, Lucas Llach describes in detail that process and builds an argument very similar to ours: the over-representation of fiscally weak provinces in the presidential electoral college allowed the emergence of a winning coalition that advanced over the strong provinces’ wealth.
The 1880 coalition supporting Roca’s candidacy (the “League of Governors”) was headed by Cordoba and supported by most of the low income provinces. In Llach’s words, “... the governments of Roca and Miguel Juarez Celman both had unfettered political incentives to indulge in a program of lavish national expenditures, sustained monetary expansion, extension of unprofitable railways to every corner of the country and inducement to fiscal profligacy in the provinces.” (“The Wealth of the Provinces, Dissertation for the Ph.D in History, Harvard University, pp. 3).

The fiscal profligacy that predominated in this decade led to the massive provincial default on international loans in 1890. This scenario undermined the confidence of capital markets on Argentina and led to the Baring Crisis – i.e. the inability of the Baring Bros. to sell Argentina’s bonds on the London market, which required the intervention of the Bank of England to avoid bankruptcy.

Graph 2 is extracted from Llach’s paper and shows the provincial origin of presidential electors regarding their position in the coalition and per capita GDP. The relationship between each region’s fiscal strength and its electoral position becomes apparent.

The coalition of poor Provinces makes sense not only because of the huge income differences between Buenos Aires and the rest of the provinces, but also because of the population concentration in the former.

In addition, the effect of malapportionment here differs from our model’s, since it affects proportional elections. Llach points out that it derives from the deliberate postponement of the Population Census that was planned for 1870. He calls it the “Census Effect”, and argues that the governing coalition aimed at blocking the increase in Buenos Aires’ political representation that would result from a new Census. This over-representation of weak states lasted until 1895, when the Population Census that followed that of 1860 took place.

Finally, all this period of subnational fiscal profligacy ended with a massive federal bailout in the early 1890s. This not only marked an antecedent that may justify future bailout expectations, but also allowed the Nation to advance over Provinces’ revenues sources. Given that Argentina’s

16 Since Buenos Aires had been the main recipient of the immigration flows.
present fiscal federalism deals with huge vertical fiscal imbalance problems, then understanding how previously autonomous States became dependent on Federal Resources for the first time seems to be crucial.

4.3 German fiscal unification process (1992-1995) and the bailouts of Bremen and Saarland.

By the mid-1980s the governments of Bremen and Saarland were claiming for financial assistance from the federal government, in response to a longstanding decline in their main industries. These demands turned to the German Constitutional Court in 1988, but it was not until 1992 that the Court resolved to support both states. However, the permanent resolution of the issue finally arrived in the form of permanent federal transfers to both in 1994, casually a year before the incorporation of East Germany’s states to the Federal Transfer System (Länderfinanzausgleich, LFA).

The effects of malapportionment on intergovernmental transfers received by German states have been studied by Pitlik, Schmid, and Strotmann (2001); Pitlik, Schneider, and Strotmann (2005); Hepp and von Hagen (2011), among others. A common fact of these papers is the incentive to buy smaller states’ vote, since the federal government’s policy depends on a majority in the Bundesrat.

In particular, Pitlik et al (2005) find evidence of the relative gains of smaller states on LFA due to over-representation in the upper house. Moreover, this association has become more important over time, especially after the fiscal unification in 1995.

Additionally, they suggest that the bailout to Bremen and Saarland was a political movement of West states to maintain the coalition supporting the system status quo (especially regarding the distribution of the VAT revenues). They claim that both the huge differences on per capita GDP between West and East states and the lack of regulations regarding intergovernmental fiscal relations in the Contract of German Unification, threatened the system stability.

The literature on federalism considers the selective bailout experience in Germany a clear example of perverted fiscal incentives for subnational units (Rodden 2002; Bordignon et al 2000, Rodden 2002). Moreover, these incentives may have spread to many eastern states after the unification, since Hepp and von Hagen (2011) find evidence of a new legislative coalition in the Bundesrat that increased the bargaining power of weak German states.

They show that the improvement in the redistributive features of the German Federal Fiscal System after the addition of eastern states have mostly benefited Western weak States, and conclude that the relatively poor West German states have benefited greatly from the inclusion of the East German states into the system. The deterioration of the System’s revenue stabilizing constitutes evidence for their claim of the increased western poor states’ bargaining power in the Bundesrat.

In terms of our model, the bailout episode was an attempt of strong states to buy a blocking coalition, in a context of state-specific grants and endogenous selection of the agenda setter. However, the repetition of the game aligned similar incentives of weak western states and eastern states to form a coalition to advance over the richer states’ wealth.

17Coal mining and steel for Saarland and shipbuilding for Bremen.
5 Conclusion

The present paper used the institutions-as-equilibrium approach to analyze how federal institutions emerge and shape subnational fiscal incentives.

We modeled a simple legislative game in which States’ representatives have very different policy preferences. After that, we analyzed the way in which these differences may lead to divergent fiscal institutions. Our main result had to do with the effect of both inter- and intra-regional income distribution on the implementation of a grant system leading to fiscal indiscipline. The more concentrated income is (both across and within regions), the greater the incentives for fiscal profligacy are.

In addition, we discussed three plausible extensions that support the empirical relevance of the model. Firstly, we showed that the distribution of population among regions alters the allocation of the burden, affecting the existence of winning coalitions. Secondly, we exposed the importance of state-specific grants on the strategic behavior of Senators, which led us to think on a more complex legislative game. Finally, we briefly discussed the limitations of our model regarding the agenda-setter selection mechanism, given that it represents a crucial question to solve in a more realistic formulation.

Last section studied the empirical relevance of our theoretical results. To explain the U.S subnational debt crisis of the 1840s both the inter- and intra-regional income distribution mattered, since it confronted the wealthy East against a coalition of both poor and rich Central States. On the contrary, in the Argentine case only the inter-regional dimension mattered because the income difference between Buenos Aires and the Interior made clear the incentives for the latter to eventually collude against the former. For Germany we required a more complex framework with state-specific grants and agenda setting prerogatives for wealthy states. However, the intuitions of the basic model seem to have prevailed in the long run.

In the future we aim to extend the present formulation to build a more realistic model. On the one hand, it will allow a better understanding of the foundations of federal fiscal institutions for a broad range of countries. On the other hand, with a more realistic formulation we will be able to present a proper empirical approach to test the main results of the model.

References


