

Inter-regional Inequality and the Dynamics of Government Spending

(Short Title: Inter-regional Inequality and Government Spending)

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Abstract: We examine the distribution of economic productivity across sub-national regions as a factor explaining the level and allocation of central government expenditure. As regional productivity becomes more dispersed, the preferences influencing national decision-making should diverge, thus impeding agreement to expand the central state. However, if regional productivity becomes more right-skewed, an increasing number of less productive regions may be able to press for greater central outlays. Dispersion and skew of inter-regional inequality also shape the allocation of centralized spending. With growing economic dispersion across regions, decision-makers are more likely to agree to fund policy categories that aid qualified citizens in all regions over those that are locally-targeted. By contrast, with the distribution of regional productivity skewing farther to the right, central expenditure is likely to become more locally-targeted. We find strong evidence for these propositions in error correction models using new measures of inter-regional inequality and government policy priorities for a sample of 24 OECD countries.

Keywords: Inter-regional Inequality, Government Finance, Policy Priorities, Distribution.

Supplementary material for this article is available in the appendix for the online edition. Replication materials are available in the JOP Data Archive on Dataverse and melissazrogers.com.

With Reunification in 1990, Germany realized a long-held goal to come together again as a national political whole. Simultaneously, the nation faced a distributive challenge in which merging West and East German *länder* meant combining political regions with very sharp disparities in economic productivity. The productivity of the Eastern *länder* approximated 40 percent of the average Western level prior to Reunification. In 1989, West Germany's inter-regional inequality was 16 according to the gini coefficient of per capita regional GDP (described below). With Reunification, that number jumped to 25, a 150% change in a relatively stable statistic. Under this new reality, Germany faced a challenge to its central state. Would the more productive *länder* of the West be willing to redistribute resources to the East as implied by existing federal arrangements? Could the less productive Eastern *länder* join together with the relatively poor Western *länder* to continue or increase the subsidization of the less productive regions in the German fiscal system?

The example of Germany highlights the relevance of sub-national regions to the political economy of inequality (Beramendi 2012, chap. 6). Inter-regional inequality, defined as unevenness in economic productivity among sub-national territorial units, is an under-examined but critical factor to how we evaluate the interests of individuals in funding the central state. In this analysis, we conceptualize inter-regional inequality as contributing to an endogenous centralization problem that may affect the resources delegated to the central state. We argue that dispersion in regional productivity is a source of preference heterogeneity that hinders national coalition-building to increase central government spending, especially on budget categories characterized as locally-targeted goods. On the other hand, if regional productivity is right skewed, implying a large number of less productive regions, these regions may have enough voting power to increase central government spending in their favor. Dispersion and skew are thus distinct distributive structures that we expect to have diverging effects on central government allocation (Lupu and Pontusson 2011).

Previous research on the political economy of inequality has focused primarily on the distribution of resources between individuals across the nation as the source of political preferences for redistribution. Sub-national regions are also relevant units in the political game in most nations, whether as electoral districts, as units of representation in the legislature, as administrative and governance units at the sub-national level, as strongholds for parties, or as a source of regional identities for voters. The

distribution of productivity across sub-national regions may thus influence preferences of political actors within regions (Bolton and Roland 1997). Spatial proximity and shared economic fate within regions may more easily translate into voting coalitions of regional cohabitants to influence national policy than will class interests across a diverse nation (Simmons et al. 2016).

These premises provide reasons to explore whether inter-regional inequality of economic productivity is an important predictor of government spending. When are political actors with regional constituencies willing to delegate resources to the central government? If sub-national groups have increasingly divergent preferences for government spending we expect that there will be greater division in the policy process that determines government spending. With greater conflict we should observe less agreement. This should lead to lower growth in government spending, and especially on budget categories that distribute resources specifically to regions.

However, heterogeneity of preferences will not automatically result in policy gridlock depending on the balance of power between the groups in favor of or opposed to centralization. For example, if a nation has only a few highly productive regions and a large number of less productive regions, the less productive regions may have voting power in the policy-making process that they can use to reallocate resources away from the productive regions. In the case of France, for example, the Paris capital region substantially outpaces the rest of the country in economic productivity. In 2011, the capital region's per capita GDP was on average 1.8 times larger than that of the other 21 regions. The regions outside of Paris could reasonably form a voting coalition to direct resources toward themselves. All else equal, an increase in the skewness of regional productivity may favor greater centralization. We contrast the likely theoretical impact of dispersion and skew, independently considered, on central government spending. Related research models regional conflict as taking place between two regions at different levels of productivity (Bolton and Roland 1997; Beramendi 2012; Giuranno 2009). Our theoretical focus on and measurement of the structure of the inter-regional economic distribution is thus a theoretical contribution to this topic.

To examine the potential avenues of regional distributive conflict, we relate inter-regional inequality to different allocations of government spending across policy categories. We argue, similarly to Milesi-Ferretti, Perotti and Rostagno (2002) and Levitt and Snyder (1995), that expenditure categories

have distinct spatial implications—some are more easily directed to qualified individuals regardless of location, such as welfare expenditures, and some are by necessity spent as locally-targeted goods, such as infrastructure. Critically, the agreement between regions to fund the central state should depend on how resources are allocated across individuals and regions within the nation. If inter-regional inequality implies a centralization problem whereby heterogeneous regions resist subsidizing the spending of others, then we should observe that spending for the (relative) mutual benefit of all regions will be favored by a majority of diverse regions, whether strongly (by more productive regions) or weakly (by less productive regions).

According to this logic, we expect high dispersion in regional productivity to be associated with a shift toward policy categories that are often considered highly redistributive, such as social insurance or health, because these resources are shared across heterogeneous regions and help to mitigate shared risks across the nation such as economic fluctuations and internal migration (Beramendi 2012; Rehm 2016). This does not suggest that regionally unequal nations spend more on these categories overall. Instead, within their budget allotment, resources are shifted toward categories allocated to qualified individuals irrespective of their region, and away from other categories targeted to specific regions. Again, we must consider other distributions of regional economic productivity. If the regional distribution is skewed to the right, less productive regions may have the voting power to adjust the allocation toward locally-targeted goods. Region-specific redistribution may be preferred by less productive regions because the benefits are more concentrated in their regions. We demonstrate these spending dynamics with a new comparative measure of government policy priorities adapted from research on U.S. state politics (Jacoby and Schneider 2001; 2009).

Using a sample of 24 Organization for Economic Cooperation and Development (OECD) countries from 1991-2011, we provide evidence that high dispersion of inter-regional productivity is a significant impediment to growth in central government spending. We further show that high dispersion is associated with shifts toward spending targeted to individuals regardless of region, over those allocated to geographic localities. We find the opposite (growth in central spending, shifts toward locally-targeted goods) as the national distribution of regional productivity skews farther to the right. These results provide strong evidence that the structure of the regional economic distribution is

important to political outcomes.

The remaining sections are organized as follows. We first offer theory that links inter-regional inequality to the size and allocation of government spending. We make the case that regions are relevant political units to both constituents and the politicians that represent them. Next, we describe the expected preferences of regions at different levels of productivity over the size and allocation of central government spending. Then we detail how the structure of inter-regional inequality is likely to reveal potential coalitions in support of central government spending. In the empirical sections, we introduce our measures of inter-regional dispersion and skew, and our adaptation of the government policy priorities indicator. Then we use panel data to show supporting evidence for our hypotheses, demonstrating robustness in the measurement, modeling, and sampling of our tests, and examining alternative hypotheses. Conclusions and policy implications follow our empirical analysis.

Regions as Relevant Political Units to Constituents

Regions, broadly or narrowly construed, are a central unit of economic organization. Companies and industries do not exist independently, but are characterized by agglomerations of mutually dependent industries and competitors (Krugman 1991). While competitors in the same industry may try to outpace each other in the business market, with regards to government services they tend to have similar preferences because they share economic needs and market risks. Depressions to the regional economy and failures of government provision also impact industries in the same region (Martin 1997). The same may be said broadly for individuals within those regions—they share the economic fate of their region’s economic sectors through such factors as employment and housing prices. Individuals within regions are particularly concerned with policies specific to their geographic area, including environmental regulation, infrastructure development, and other shared local goods. Thus we may reasonably argue that relevant political actors, including interest groups and voters, and the politicians that represent them, hold preferences for regional prosperity, regional security, and to maximize their region’s benefits from political centralization.

Shared economic fate is important as far as it enables collective action to press politicians to advocate for regional interests. Economic interconnectedness (and competition for resources with other

regions at varying levels of productivity) provides a motivation to vote together and organize to affect centralized policy. Spatial proximity and government organization provide the means by which these shared goals may translate into coalitions of regionally-informed political actors. In the domain of business lobbying, for instance, McGillivray (1997) has shown that geographically concentrated industries are more effective in lobbying for selective government goods. Decentralized actions to influence politicians' activities are more impactful when the organizers are geographically concentrated (Rickard 2012). Politicians, moreover, have incentives to target spatially concentrated groups because they share interests and have lower barriers to collective action (Bishin 2009). Intuitively, both the likelihood that economic ties are interconnected and that vested actors are able to coordinate to influence government in their interest should be positively related to geographic proximity.

Geographic concentration also appears to activate participation and increase the organization of like-minded voters. Cho, Gimpel and Dyck (2006) demonstrate residential-proximity effects on turnout that are independent of socioeconomic drivers of political participation. Similarly, Crisp, Olivella and Potter (2013) highlight the clear importance of common local interests in party system coordination across national territories. de Miguel (2017) shows that geographic concentration of income and identity affect the territorial distribution of national party support. Shared economic fate and the relative ease of coordination within common geography enable collective efforts to influence political outcomes.

Political Incentives to Represent Regions in the Central Government

The expression of regional preferences into central political outcomes results from politicians representing the preferences of constituents. If constituents have preferences to advance regional interests, and are better able to engage in collective action to achieve their goals, politicians have incentives to represent regional interests to maximize votes and political support. Importantly, political institutions may impact the articulation of regional interests at both the representation stage, through regionalization of electoral appeals, and the policy-making stage, through the formation of regional coalitions for public policies. While some institutions create more obvious incentives to represent regional interests, we argue that inter-regional inequality creates divergent policy preferences that can be expressed

across the full range of democratic electoral and constitutional institutions.

Regional economic preferences are likely to influence policy-making because geography is the organizing principle of representation and political authority in most nations. Regions serve as electoral districts in nearly every nation, providing politicians with incentives to target appeals based on district preferences (Weingast, Shepsle and Johnsen 1981). Regions are represented in policy-making directly through some nations' upper houses, and are the governing unit in decentralized systems, which shape the constituencies of politicians. Electoral institutions vary in the incentives they provide politicians to emphasize regional preferences in decision-making (Rehfeld 2005). Policy-making systems may be characterized as more regional (with powers reserved for individual regions) or more individual (with powers allocated to the majority) along a spectrum (Franzese and Nooruddin 2004).

Nonetheless, inter-regional inequality is expected to shape economic preferences of citizens even in centralized political systems because of economic geography. The dynamic of shared economic fate should encourage regional voting blocs across all systems. Regional preferences for economic policy emerge even within strong political parties. For example, Busch and Reinhardt (2005) have shown that geographic industrial concentration is crucial to voter turnout regardless of political geography, including in nations such as the Netherlands without spatially-organized political institutions.

From the parties' perspective, the geographic agglomeration of the economy impacts where they target their appeals. André and Depauw (2016) have shown systemically that centralized parties in proportional representation systems with high district magnitude, for example, are better off targeting viable spatially-concentrated sub-constituencies. Politicians have incentives to appeal to regions even in centralized parties because their votes cluster in particular geographic areas (de Miguel 2017).¹

In the Netherlands, the least likely case for regional representation, Latner and McGann (2005) find party economic appeals closely match the economic interests of locations where they receive the most votes. We suggest the spatial concentration of votes, and the corresponding incentives to

¹See Online Appendix (OA) Section 2 for correlations between our inter-regional inequality measures and spatial concentration of party votes. These correlations are stronger in more centralized political institutions.

appeal to those voters, encourage representation of regional economic interests. Thus inter-regional economic inequality may be politically relevant under any system of representation through the mechanism of constituency representation.

Regional Productivity Influences Central Policy Preferences

In the previous sections we established a theoretical basis for the relevance of regions in policy-making. In this section, we consider the likely distributive preferences of regions with different economic endowments. Centralized government brings together regionally-informed actors that have distinct distributive preferences. Centralization disproportionately benefits particular regions and citizens, depending on the nature of the tax and spending system (Bolton and Roland 1997). In particular, centralization is likely to entail redistribution from relatively affluent regions to less well off regions, whether the tool employed is welfare spending that goes disproportionately to poor regions or progressive inter-governmental transfers (Giuranno 2009). Productive regions are therefore likely to oppose increased centralization. Accordingly, the regional distributive implications of centralized spending are highly politicized concerns in nations such as Germany, with highly dispersed regions, or Spain where productivity is relatively concentrated in a small number of regions (Balcells, Fernández-Albertos and Kuo 2015).

Centralization does not simply or uniformly hurt the most productive regions, however. Productive regions may benefit from the provision of centralized policy, especially if they have substantial low income populations and high market risks. The most productive regions, economic beneficiaries of the process of economic development, are more often economically unequal and recipients of internal migration in affluent nations (Kuznets 1955).² Economic risks may also be higher in productive regions, strongly increasing support for social insurance in these areas (Rehm 2016). While highly productive regions may prefer to keep resources within their borders as inter-regional inequality grows, they

²According to OECD data collected for 225 regions across 19 countries between 2009-2014, the within region Gini index of disposable individual income is strongly correlated with per capita regional income ($r=0.65$, $p<0.05$).

can benefit from centralized provision of policies to share market risks and externalities (Beramendi 2012). Thus, even well-off regions have reasons to support centralized distribution, especially policies that aid qualified individuals and vulnerable sub-populations.

On the other hand, if central outlays are primarily locally-targeted, then more productive regions may lose out in a centralized system. Examples of this include within-region infrastructure projects, funds for local law enforcement, and inter-regional fiscal transfers. Productive regions would be better off if locally-targeted spending were funded locally by each region (Bolton and Roland 1997). Thus, as inter-regional inequality grows, we expect relatively productive regions that are net contributors to central expenditures to prefer allocations toward individuals, regardless of region, rather than locally-targeted goods from which they do not benefit directly.

All else equal, we expect less productive regions to prefer higher central government expenditure from which they should be net recipients.³ Less productive regions do not have straightforward preferences for the allocation of government spending, however. These regions ostensibly benefit from both distribution to qualified individuals and spending on locally-targeted goods. If productive regions prefer policies meant to pool market risks as inter-regional inequality grows, they should find allies in many less productive regions that also benefit from those allocations. Nonetheless, locally-targeted goods need not be shared across the nation and disproportionately benefit less productive regions in a progressive tax system. The most obvious allocations favorable to less productive regions are inter-regional transfers. These resources benefit all residents in the region and thus should bolster local coalitions that favor these goods. Accordingly, less productive regions can benefit relative to productive regions by shifting resources toward locally-targeted goods (Milesi-Ferretti, Perotti and Rostagno 2002).

³Important caveats are necessary for this assumed preference, including that local actors may have specific reasons to oppose centralization that can overshadow preferences for central spending, such as regional identity or threat to the local status quo (Alston and Ferrie 1999).

The Structure of Inter-regional Inequality Shapes Coalitions for Central Spending

In this section, we integrate the regional preferences outlined in the previous sections into theoretically-driven predictions of how the structure of inter-regional inequality (dispersion versus skew) is likely to shape voting coalitions in favor of increased or decreased spending, and individually- or locally-targeted spending.

To form our hypotheses, we assume the outcome of the centralized budget process is a reflection of the coordination of preferences of politicians with regional utility functions, which are determined by their region's economic productivity and the distribution of productivity across regions within the nation.⁴ We assume that the voting power of regions is proportional to their population, whether through institutional representation of regions or regional constituency bases within political parties. Our model of policy-making is clearly simplistic, but it allows us to focus on variation in the distribution of inter-regional economic productivity as the relevant parameter, and theorize that different structures imply distinct coalitions in favor of or opposed to central government spending.

As with most similar models of government spending and redistribution, we assume that the utility of government spending is determined by the costs and benefits of spending, and that tax resources are extracted disproportionately from the more productive regions (Baunsgaard and Keen 2010). If government spending is proportionally or progressively distributed across regions, government spending represents an income transfer from more to less productive regions. Accordingly, the value a region nets from the centralized budget is determined by its position within the economic distribution of all regions (Bolton and Roland 1997). Relative regional gains from the centralized budget are thus a function of inter-regional inequality.

Intuitively, because more productive regions are paying a larger share of public spending through taxes, their gain from public spending decreases as inter-regional inequality grows. Conversely, the gains from public spending increase for the less productive regions as inter-regional inequality grows.

⁴For the purposes of clarity, we hold intra-regional inequality constant in our theory (Bolton and Roland 1997; Beramendi 2012). We control for intra-regional inequality in OA Section 11.

Rising inter-regional inequality is therefore expected to increase polarization in preferences for expansion of public spending. As regional productivity becomes more dispersed, we expect this to limit potential coalitions to increase central spending, likely favoring the status quo level. However, if regional productivity becomes more right-skewed, we anticipate a growing coalition of less-productive regions to push to increase central spending. Our expectations thus contrast with Romer's (1975) and Meltzer and Richard's (1981) models linking individual income to redistribution. Interpreted in very simple terms, these models would anticipate growing inter-regional inequality would lead to higher levels of government spending (Giuranno 2009). We argue spending could be higher or lower, depending on what the structure of inter-regional inequality implies for policy-making coalitions.

Nations also make choices regarding how to allocate their central resources. By definition with a fixed budget constraint, increased spending to assist individual beneficiaries implies a net reduction in locally-targeted spending. Below we label this trade-off as the government's policy priority. Individually-targeted expenditure is distributed across regions according to specific characteristics of individuals within those regions. Locally-targeted expenditure is distributed to regions according to characteristics of those regions.

The gains from locally-targeted expenditure are region-specific and not shared (i.e., regions cannot gain utility from resources targeted to other regions).⁵ Locally-targeted spending by the central government thus implies an income loss for more productive regions as excludable resources are transferred from more to less productive regions.

Given that centralized spending is never zero, due to shared risks and benefits from economies of scale, regions must agree on some distribution of spending. As inter-regional inequality increases, more productive regions will increasingly value spending for qualified individuals, which minimizes losses to those regions relative to locally-targeted expenditure. Individually-targeted spending includes social insurance, which may benefit all regions, and smooths risks across the nation's geography (Beramendi 2012). Social insurance motivations encourage cross-class coordination, including

⁵There are regional spillovers in region-specific spending but we assume they are minimal.

on a regional basis, where economic risk is not tightly linked to income (Rehm 2016). Poor regions value both types of spending. As polarization increases as a function of inter-regional inequality, spending on individuals represents a shared preference across regions at all levels of productivity.

Whether the outcome of the budget process favors spending for qualified individuals or locally-targeted spending depends on the structure of inter-regional inequality. If regions are highly economically dispersed, we expect a coalition for individually-targeted spending to be more likely to emerge, as the type of allocation that benefits the largest number of regions. The scenario changes if the regional economic distribution is highly right skewed, because this implies growing voting power of less productive regions. Less productive regions likely benefit from both types of central spending, and thus should ostensibly support both types. Importantly, all individuals in the less productive regions benefit from locally-targeted spending on policy goods whose benefits are not widely shared with other regions. This should broaden the coalition for locally-targeted spending within the less productive regions, all else equal. In *relative* terms, therefore, support within less productive regions may be higher for locally-targeted spending than spending distributed to individuals.

Hypotheses: Inter-regional Inequality and the Level and Allocation of Central Spending

In sum, we argue that the level and allocation of central government spending should depend on the distribution of regional economic productivity which shapes the preferences of politicians who decide the budget. All else equal, if the distribution of regional productivity is highly dispersed we expect little agreement to expand the size of government, and we should see allocation shift toward spending for qualified individuals. This prediction emerges from our expectation that inequality increases heterogeneity of preferences across unequal regions, which render agreement to increase spending less likely. However, if the distribution of regional productivity is skewed toward regions below the median in productivity, they may form a coalition to press for the expansion of the central government. This configuration of regional interests should also favor shifts in spending toward locally-targeted spending.

H1 (Dispersion): *As inter-regional economic dispersion increases, growth in central government spending is expected to decline and central allocation to shift toward individually-targeted spending.*

H2 (Skew): *As the regional productivity distribution grows more skewed toward the less productive regions, central government spending is expected to grow and central allocation to shift toward locally-targeted spending.*

Data Description

Our sample includes data from 24 OECD countries from 1991-2011. The constraints on our sample are the availability of both regional GDP and itemized spending data for enough years within this period to establish a reasonable country estimate. We maintain a consistent sample across all models. Although distinct in global comparison, the OECD nations are valuable to examine in isolation because they are “least likely” cases for inter-regional inequality to impact preferences for government spending (Mahler 2002). Relative to developing countries, OECD nations have lower inter-regional inequality and higher redistributive spending that can mask pre-fiscal-transfer inequality. Our arguments hinge upon differences in the shape of the regional distribution of economic productivity. Accordingly, to evaluate the effect of inter-regional inequality on centralized spending we show evidence suggestive of distinct latent distributive coalitions across our sample of OECD nations. Dispersed and skewed configurations imply different voting coalitions for government spending.

Independent Variable of Interest – Inter-regional Inequality: We aggregate region-level data into two indices to capture the structure of regional income inequality: 1) the gini coefficient of regional GDP per capita, to measure the dispersion of inter-regional productivity; 2) the mean to median ratio of population-weighted regional GDP per capita, to represent the skew of inter-regional productivity.

Our measures of inter-regional inequality are constructed with region-level GDP and population data drawn from the Cambridge Econometrics database, and government national accounts. The region concept is the state, province, or the OECD Nomenclature of Territorial Units for Statistics, Level 2 (NUTS2). NUTS2 is the largest sub-national unit in most of the sample countries (e.g., Italian regions). In nearly all nations this level serves as a basis for electoral districts and, typically, administrative services. While geographic units other than the region (such as cities or metropolitan areas) could feasibly fit our theoretic construct of share fate and shared interests, we argue that this is the clearest locus of collective sub-national political action in most countries. In the few cases that our

data do not match a relevant electoral district, our measures should introduce noise into the estimation that bias against our results (de Miguel 2017). Summary statistics for all variables are included in Online Appendix (OA) Section 1.

Our dispersion measure is the adjusted gini coefficient of regional GDP per capita (RDGINI). RDGINI is commonly used in research in regional studies and economic geography (Lessmann 2009). It allows for the intra-country variance in regional GDP per capita to be captured in a numerically continuous index (0-100). The value of zero denotes that a country's regions are equally productive; the value of 100 means that one region creates all productivity. RDGINI is constructed as:

$$RDGINI = \frac{2 \sum_{i=1}^n i y_i}{n \sum_{i=1}^n y_i} - \frac{n+1}{n} \quad (1)$$

where y_i is the GDP per capita for region i and n is the number of subnational units (Lessmann 2009, 2460). This variable ranges from 5.19 to 29.23, with a mean of 11.63.

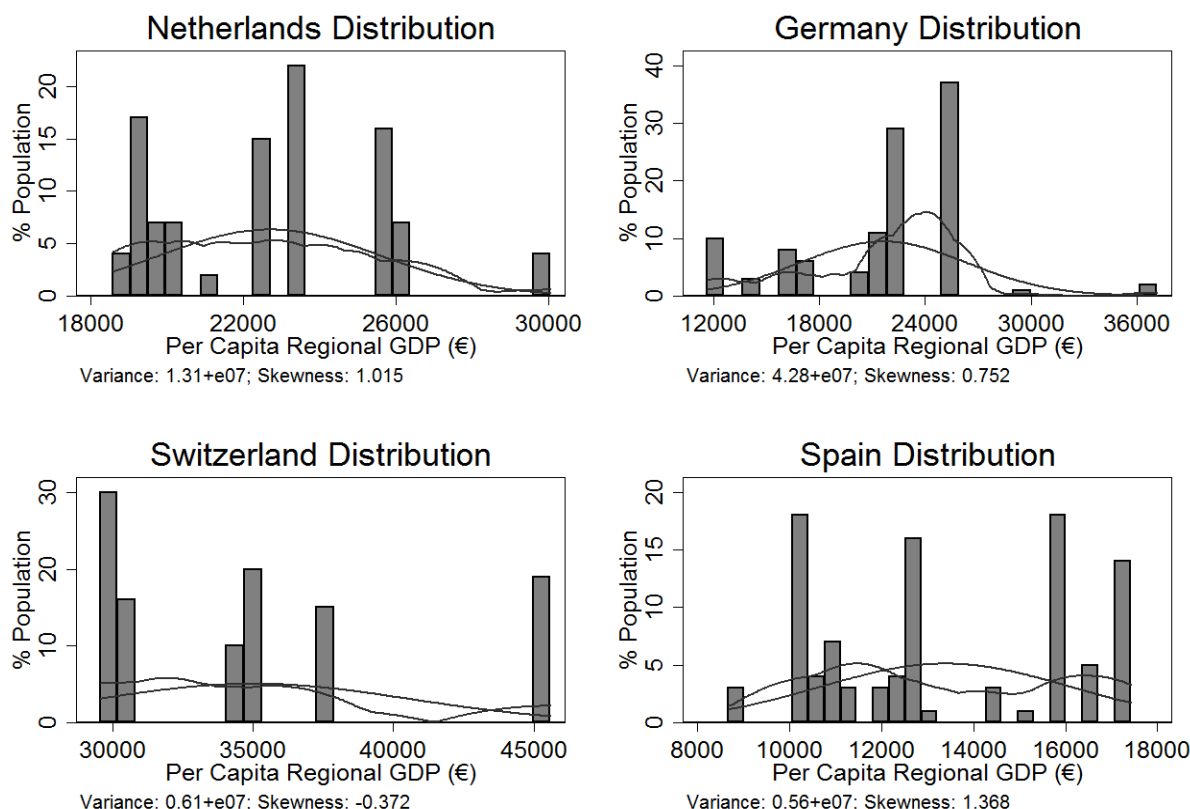
To quantify the asymmetry of the regional economic distribution, we calculate a ratio measure meant to capture the skew toward more or less productive regions:

$$MM_RATIO = \left(\frac{\text{Mean of regional GDP per capita}}{\text{Median of regional GDP per capita}} \right) \quad (2)$$

where each region's GDP per capita is weighted by its population share to reflect our assumption that representation is proportional to the national population. When this ratio is equal to 1, we expect a symmetrical bell-shaped curve representing the distribution of productivity across sub-national regions. However, if the ratio is greater than 1, this distribution will be positively (or right-) skewed such that the less productive regions outnumber their highly productive counterparts.⁶ A higher mean implies a smaller number of more productive regions. Although relatively infrequent in our cross national sample, the ratio may be smaller than 1. We expect a negatively skewed distribution toward

⁶The mean to median ratio is most precisely considered a measure of asymmetry in the distribution. We chose this measure to capture skew to match closely the theoretical concept of interest, and to relate to previous measures of right-skewed distributions (Meltzer and Richard 1981).

Figure 1. Dispersion and Skew: Mean Distributions of Inter-regional Productivity (1991-2011)



the more productive regions in these circumstances. Alternative measurements of both inter-regional inequality concepts are discussed in the section Additional Robustness Tests.

Figure 1 demonstrates variation in the structural configuration of inter-regional inequality in four countries in our sample: the Netherlands, Germany, Switzerland, and Spain. Each was chosen for having a relatively high or low value on the RDGINI or the MM_RATIO measures. For illustrative purposes, we use region-level GDP per capita and population data to present a hypothetical decisive 100 seat legislature in which regions' seats are determined by their population share. The region-seat data are overlain with their kernel density function and the normal distribution.

The two cases on the top of Figure 1, the Netherlands and Germany, show extremes in the dispersion of inter-regional productivity in our sample. The range of per capita GDP in the Netherlands is 18,000€ to 30,000€. Germany, in comparison, has a much larger range of regional productivity, from approximately 12,000€ to over 36,000€ per capita. This dispersion in regional productivity is reflected in the RDGINI statistic, which in Germany (18.7) is more than twice that of the Netherlands

(8.6). The difference across the two cases is also confirmed with the variance statistic (a measure of dispersion) in regional GDP per capita shown in Figure 1, which is over three times higher in Germany than the Netherlands.

The comparison between Switzerland and Spain highlights the skew concept that we measure with the MM_RATIO. These countries are near the bottom (Switzerland) and top (Spain) of the MM_RATIO.⁷ On the left we see that vote share is weighted toward the medium and high productivity Swiss regions, reflected in the skewness statistic of -0.37 (left-skewed) and the MM_RATIO mean of 0.96. The value of the MM_RATIO close to 1 suggests that the regional mean is nearly identical to the regional median in Switzerland. Accordingly, we expect the interests of highly productive regions to be represented in a decision-making coalition in this hypothetical Swiss legislature. In comparison, the majority of Spanish regions are concentrated in the relatively unproductive end of the spectrum, reflected in the skewness statistic of 1.37 (right-skewed), and a MM_RATIO mean of 1.66. The mean value for “population proportion weighted” per capita regional GDP in Spain exceeds the median value approximately by 72% (789€ vs. 458€).

The comparison across the dispersion and skew measures is also instructive. Germany is in the top quartile for both the RDGINI and MM_RATIO among the OECD sample countries. The Netherlands yields much lower values on those inequality measures. Spain and Germany, on the other hand, differ in comparative perspective. Spain is high on the MM_RATIO but moderate on the RDGINI statistic. In fact, Spain’s RDGINI level is quite similar to Switzerland’s. According to our conceptual framework, these different distributions should engender distinct coalitions for centralization in these countries. Throughout this research we treat dispersion and skew as independent factors. In future research, we intend to explore potential interaction between these two structures of distribution.⁸

⁷For Switzerland and Spain the variance and skewness statistics are based on population-weighted regional GDP per capita to match the MM_RATIO calculation.

⁸Analysis of the interaction between these dispersion and skew requires a strong assumption about the symmetry of interaction (Berry, Golder and Milton 2012). However, skew may vary even with a constant dispersion while variation in dispersion can affect variation in skew. The potential complexities

Regional GDP per capita is not directly equivalent to household income, as used in most studies of the effects of inequality on redistribution. We employ regional GDP for several reasons. Most importantly, regional economic productivity is expected to be very important to regional politicians and their constituents as a major determinant of preferences on matters of central allocation.⁹ Second, regional GDP is a reasonable proxy for market income data, which is not available by region for a large number of nations for a long period of time. For the sub-sample of countries available in Luxembourg Income Study data, the share of a region's GDP and the share of a region's market income correlate at $r=0.82$. Similarly, the share of regional GDP and the share of net household income per capita for a larger set of countries available from the OECD correlate at $r=0.91$.

A crucial concern with our measures is that regional GDP is plausibly endogenous to centralized spending. Thus, regional GDP is a “net” value (after taxes and transfers) and not the “market” value of inter-regional inequality. As discussed below, we address the endogeneity question directly in our statistical modeling. Fundamentally, we argue that to the extent that central government spending shapes inter-regional inequality, it should bias against our results. That is, centralized spending is expected to reduce inter-regional disparities, at least in the OECD cases. As Tanzi (2000) argues, “one of the major functions of a national government is precisely to redistribute income from richer regions and individuals to poorer regions and individuals through the broadly uniform provision of public goods and services” (13). Accordingly, we argue that using post-tax and transfer regional GDP data should be a “hard test” for our hypothesis because it mutes inter-regional inequality.

Dependent Variables – Size and Allocation of Central Expenditure: Our analysis examines two aspects of government spending: 1) how much governments spend; 2) how they allocate spending. The *size of government* is measured as the GDP share of total central government spending. We use spending data for OECD countries (both old and new entrants) from 1991-2011. We focus on central government spending as the locus of governments' regional redistribution, either directly through

of examining this interaction place it beyond the scope of this analysis.

⁹Other measures of regional economic conditions, such as regional unemployment levels, may also influence regional preferences. See OA Section 3.

regional transfers or indirectly through spending that should disproportionately affect rich or poor individuals. Our central expenditure data are measured by functions of central government expenditure (COFOG) from the IMF's Government Finance Statistics (GFS).

Policy priority scores specify relative weight in central government expenditure allocation. We analyze the complete range of government spending by employing a spatial model of expenditure developed by Jacoby and Schneider (2001; 2009). Policy priority scores use all expenditure categories to “construct a geometric model in which yearly...spending on policies is represented as distances between points within a space” (Jacoby and Schneider 2009, 1). The spatial unfolding technique separates policy areas that are least likely to occur together. The policy dimension identified as particularized benefits to sub-populations (what we call individually-targeted) versus collective goods (we identify as local public goods) was assessed by Jacoby and Schneider (2009) for the U.S. states using “recognizable patterns in the relative positions of the policy and state points”(6). We replicate this technique using expenditure data from 24 OECD countries from 1991-2011. The geometric model calculates a yearly estimate that summarizes each nation's expenditures across all major policy areas and portrays the trade-offs in allocations across categories. These scores may thus be considered an empirical representation of a country's expenditure priorities.¹⁰

We argue that this measure helps us to evaluate whether countries spend more, in relative terms, on policy categories targeted to individual recipients, regardless of region, or categories more directly targeted to geographic regions. Individually-targeted categories are typically distributed to qualified individuals or households through income subsidies such as social protection and health care. On the other hand, locally-targeted spending tends to be broadly applied across citizens within the relevant territory (Volden and Wiseman 2007). Given that most locally-targeted goods are not targeted specifically to a low income or vulnerable sub-populations, these types of spending have not been examined in most studies of inequality, apart from their contribution to total spending. However, locally-targeted goods are redistributive across territories as more affluent regions subsidize local resources (including

¹⁰For a more detailed explanation of the statistical and theoretical foundations behind policy priority scores, see Jacoby and Schneider (2001; 2009) as well as our R replication file.

through inter-regional transfers) in poorer regions.

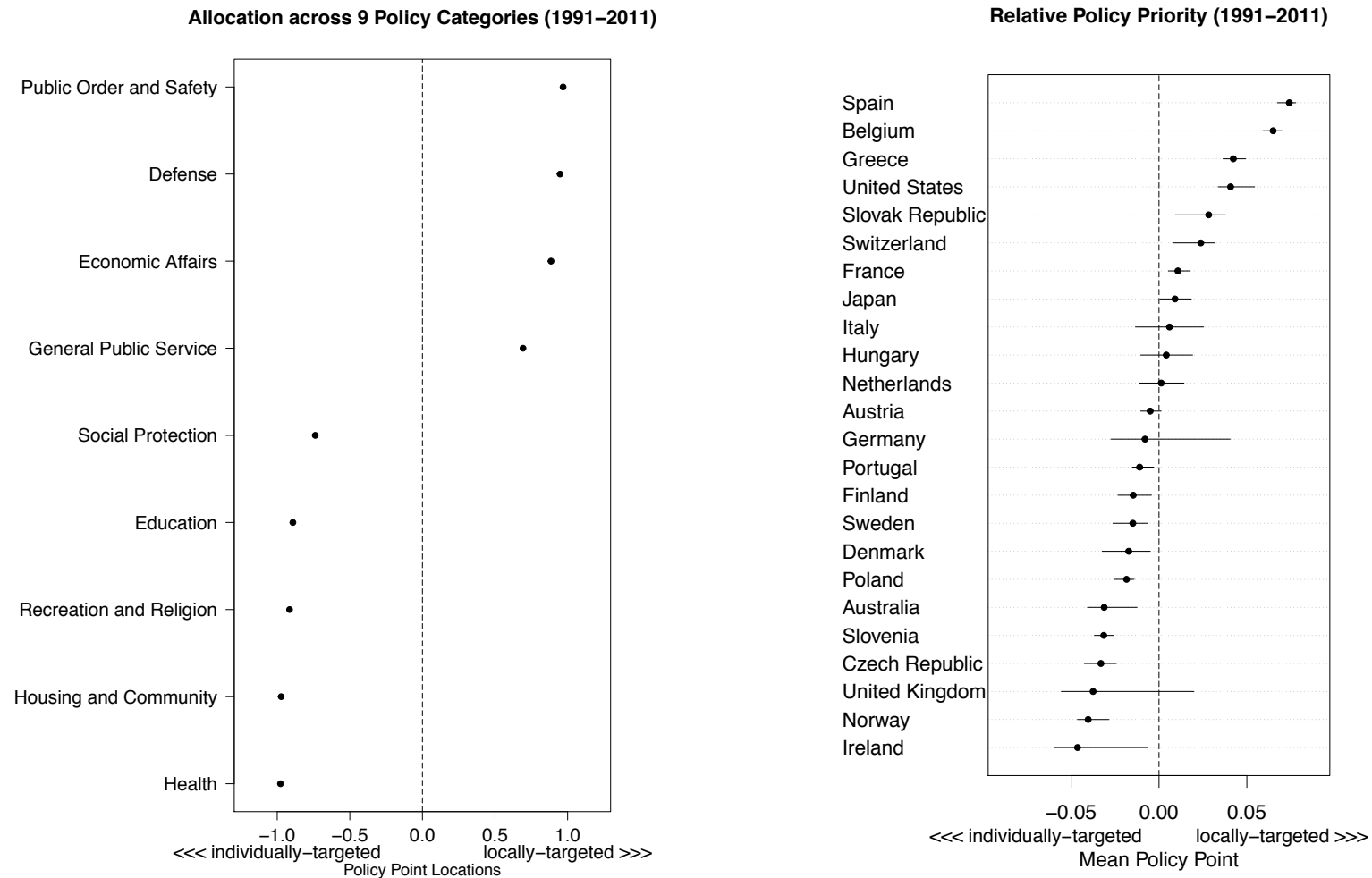
Most research on inequality and government spending has focused heavily on social expenditure allocations. We suggest that a narrow focus on a subset of spending may obscure important conflicts in central government spending that reflect not simply class-based but also region-based distributive concerns. Isolation of social spending may thus result in *ad hoc* or inaccurate assessments of the full range of (re)distributive policy in a particular nation (Kramon and Posner 2013).

Figure 2 summarizes our policy priority estimates. The left panel shows the policy point position across spending categories for the complete sample. Spending on locally-targeted goods such as public safety, defense, economic affairs, and general public service are shown to be more commonly high in the same jurisdictions and less associated with spending on individually-targeted categories such as social welfare and health care. The policy point location reflects the spatial association between each policy category and the other policy categories. For example, those countries that spend at high levels on public order and safety tend to spend less on health (shown as having the largest distance between those two policy points). Importantly, many of the spending categories that are typically considered redistributive are what we identify as spending directed toward individuals using this technique. Policy priority scores range from a negative value (relative emphasis on the categories we label as individually-targeted) to a positive value (locally-targeted).

Our calculations for the country policy locations are shown in the right panel of Figure 2. These values should be read as a country's placement relative to the sample average across all 24 OECD countries over time. Negative country scores suggest relatively more spending on policies identified on the left side of the policy category plot in Figure 2. Again, their placement on the right or left side of the chart does not mean these countries spend at a high level on these goods. Rather, they spend a lot in comparison to the other spending categories at the central government level. These are policies we characterize as more often distributed to qualified individuals, such as health, social protection, and housing subsidies. The United Kingdom's placement on the left side of the policy priority plot, for instance, is driven by its relative expenditure at the central level on health and social protection – two of its top three spending categories between 1991 and 2011.

Higher policy priority scores suggest that a country spends relatively more on the categories with

Figure 2. Country Policy Priorities, 24 OECD Nations



Notes: Data points calculated using Jacoby and Schneider's 2009 spatial unfolding analysis of policy priorities. Dots on the left panel indicate the mean (1991-2011) for all countries in the sample. Dots on the right panel are the mean policy priority value for each country across the 21-year time span. Horizontal bars indicate the minimum-maximum range of point coordinates of policy priorities for each country in the period.

positive policy point values on the left panel of Figure 2, including public order and safety, defense, economic affairs, and general public service. In the OECD, general public services refer to spending on commerce and labor, and sector-specific spending (agricultural and fishing, fuels and energy, mining, transport, and construction), including infrastructure. Most importantly, general public services contain inter-regional transfers. Economic affairs include national collective goods, such as service on the national debt, state run banks and industries, and spending on the central government administrative apparatus. These public allocations are broadly characterizable as collective goods, whether to national or local constituencies or both. In practical terms it can be difficult to separate national public goods from locally-targeted expenditure. For example, defense is often distributed to region-specific military bases and research institutions.

Spain and Belgium are at the extreme for providing local public goods in our sample. A significant percentage of both nations' central spending is allocated to inter-regional transfers, some of which is subsequently administered as social policies, such as housing subsidies or education. The United States also has high policy priority scores because it allocates the bulk of its central resources to defense and general public services, which includes infrastructure funding around the nation (such as highways) and transfers to the states for education and health. Belgium and Spain spend at high levels on social expenditure (% of GDP), when calculated across all levels of administration. The policy priority scores thus highlight how resources are delivered (nationally or locally) in addition to what resources are delivered. Yet, the policy priority score does not account directly for whether a policy reduces inequality (i.e., social policies could be redistributive whether administered at the national or local level), but how these resources are allocated within the expenditure patterns of nations.

To understand the relative policy priority scores in Figure 2, consider the comparison between Ireland and Hungary. On average between 1991-2011, Ireland's public spending was relatively more oriented toward goods directed to qualified individuals, in comparison to Hungary, by 5% more of its total central expenditure. Symmetrically, Hungary allocates 5% more of its total central spending to locally-targeted categories, in comparison to Ireland. This type of relative comparison can be drawn across countries and across years (Jacoby and Schneider 2009).

The results of the unfolding analysis give us a picture of spending clusters across countries that

can be characterized according to the dichotomy laid out by Jacoby and Schneider (2009) and Volden and Wiseman (2007). That is, some spending categories are more commonly designated to qualified individuals, regardless of location and others more commonly targeted to specific places, such as the nation, a region, or a local government. However, it is also important to recognize the ambiguity in these categories, such as whether education should be considered a transfer to an individual recipient or a local benefit to the economic base of a region. We suggest that these values reflect broad trends in spending common to the affluent nations in our study and highlight the trade-off between distribution across people and distribution across places that puts inter-regional inequality squarely an area of concern for policymakers. This measure presents a quantification of this trade-off and offers a useful indicator for cross-national spending patterns that can capture the dynamics of “particularistic” and collective spending along the lines envisioned by Milesi-Ferretti, Perotti and Rostagno (2002).¹¹

Controls: We include standard controls that predict the size and nature of central government spending. *Population (logged)* has theoretically ambiguous effects on government spending. Population size may increase demands for spending in diverse populations or imply increasing returns to scale that would lower spending. We also include the *population dependency ratio*, measured as the percentage of individuals above the age 65 or under the age 15. A higher dependency ratio should be associated with higher government spending and more emphasis on socially-targeted allocation. We include a measure of *economic globalization* in both capital flows and policy restrictions (Dreher 2006). Globalization may invoke a race to the bottom on government expenditure or cause governments to protect constituents from losses. Similarly, openness may lead to relative spending on goods that create an efficient business environment such as infrastructure (locally-targeted goods), or compensation through social protection and investments in skill (individually-targeted allocations). We control for the level of development (*logged GDP per capita*). We expect higher GDP per capita to predict higher central spending and greater emphasis on individually-targeted allocations.

Our government spending models also take into account a range of institutional variables. We

¹¹We consider the relationship between policy decentralization and the construction of the policy priorities score in detail in OA Section 4.

include *leftist power* because partisan theories suggest leftist parties would seek to increase government spending and individually-targeted allocations in OECD nations. To capture leftist influence, we use a measure of the government seat share of social democratic and leftist parties (Armingeon et al. 2013). “Centripetal” constitutional institutions such as *PR electoral system, parliamentarism, and non-federal/non-bicameral system* (measures from Gerring, Thacker and Moreno (2005)), are likely to favor class-based coalitions and dampen regional coalitions. We expect these measures of centralized government institutions to be positively associated with the size of government (Persson and Tabellini 1994) and government spending more oriented toward individually-targeted goods.

There are a number of additional variables that could potentially impact central expenditure, especially inter-personal inequality. Our results are robust to the inclusion of the national-level gini coefficient and a range of other controls, discussed below in Additional Robustness Tests.

Modeling Approach and Estimation Techniques

The relationship between inter-regional inequality and central expenditure is a long-term, dynamic process. Rather than approaching the empirical analysis as a series of correlations relating inter-regional inequality to levels of spending, we demonstrate the importance of inter-regional inequality to changes in government expenditure through error correction models (ECM) (Rodden 2003). Our dependent variables should be interpreted as measuring deviation from the status quo levels of central spending and status quo policy priorities. Predicting short-term adjustments to long-term processes can elucidate causal mechanisms and help to isolate co-moving variables. Modeling policy change is the most appropriate way to analyze preference polarization (Franzese 2010).

Focus on the changes in expenditure also helps us manage concerns with an endogenous link between levels of inter-regional inequality and levels of government spending. We also address endogeneity through the time structure of our ECM. While levels of central allocation almost certainly affect regional productivity, the change in government spending in year t cannot plausibly cause inter-regional inequality in year $t-1$. We take steps to manage challenges of time-series cross-sectional data. Government spending data typically suffers from non-stationarity, which can bias results in traditional OLS estimations of yearly data. The ECM approach reduces problems of non-stationarity by

transforming the dependent variable into a stationary change term (Δ).¹² We estimate:

$$\Delta y_{i,t} = \theta y_{i,t-1} + \sum \beta_j X_{i,t-1} + \sum \beta_k \Delta X_{i,t-1} + \sum Country + \beta_0 + \varepsilon_{i,t} \quad (3)$$

where $\Delta y_{i,t}$ is a first-order change of central government spending or a change of policy priority score in country i (1, ..., 24). X is a vector of independent variables that predict the size and allocation of government spending. Country dummies are included to incorporate unmodeled country-specific factors such as political and institutional history. β_k is an estimated effect of transitory adjustment in the dependent variable ($\Delta y_{i,t}$). This β_k estimate is omitted for time invariant or slow moving variables such as inter-regional inequality, government ideology, and constitutional institutions.¹³ To capture these slow-moving causal processes, all the independent variables (except constitutional institutions) are calculated as five-year moving averages ($t=1991, \dots, 2011$) of the preceding 5 years (Lupu and Pontusson 2011). To reduce contemporaneous correlation with the error term ε , we adopt a 1 year lag of all of our independent variables X and ΔX . The long run effect caused by a one unit increase in the independent variable $X_{i,t-1}$ is estimated to be $(\beta_j / -\theta)$, where θ is the error correction rate captured by the coefficient estimate of the lagged level dependent variable $y_{i,t-1}$.

We estimate our ECM using OLS with Beck and Katz's (1995) panel corrected standard errors to correct panel level heteroskedasticity in our long panel. This adjustment also includes a Prais-Winsten correction for panel specific AR(1) processes because the first-order change variable can still be autocorrelated in the error term for Δy_t and Δy_{t-1} through a shared component of ε_{t-1} .¹⁴

Central Government Spending Results

Table 1 presents strong evidence for Hypothesis 1. Across 24 OECD countries sampled over the recent 20 years, holding relevant variables constant, high dispersion in inter-regional productivity is

¹²The null hypothesis of unit root, based on the Fisher-type test, is rejected at $p < 0.01$.

¹³The results are robust when we include the delta term for these variables.

¹⁴The Wooldridge test for no first-order autocorrelation is rejected at $p < 0.01$. We also tested our models with an AR(2) process and without adjustments for autocorrelation. Our results are consistent.

associated with a reduced rate of change in central government spending. To simplify the presentation, we show only the long-run dynamics of the independent variables (Kwon and Pontusson 2010). RDGINI is negatively and significantly correlated with changes in central government spending. Per a unit increase in RDGINI, the full model estimate in Table 1[Model 4] predicts a reduced growth rate in the GDP share of central government spending by 1.42%. Considering the real data range, if Sweden's dispersion at the mean (RDGINI = 6.42) increases to the level equivalent to that of the Slovak Republic (RDGINI=24.11), the expected policy impact should be a reduced growth rate in the GDP share of government spending by almost 25%.

We also find that skew of regional productivity matters. According to Hypothesis 2, the effect of inter-regional inequality on changes in government spending should depend on whether the less productive regions have a strong voice in central policy. Table 1[8] shows a positive and statistically significant relationship between MM_RATIO and changes in government spending. As MM_RATIO increases (in other words, moving from a bell shape curve to a right-skewed distribution toward the less productive regions), the model anticipates growth in government spending. If the mean is double the median distribution of regional GDP, the model predicts an increased growth rate in the GDP share of government spending by 16%.

Most of the control variables show anticipated results. We find the most significant predictors of changes in central government expenditure are economic globalization, per capita GDP, and unitary systems. The effect of leftist government is mixed and insignificant in the models. We link these inclusive findings to our sample period, which includes fiscal contraction due to the pressure of globalization along with the decline of organized labor (Kwon and Pontusson 2010). To minimize multicollinearity among the three centripetal democratic institutions (PR electoral rules, parliamentary forms of government, and unitary systems), we break down our regression estimates with each institution separately as well as together. Our results remain across specifications.

Policy Priority Results

Table 2 presents the results for the policy priority scores. Across models, we show two robust findings. First, the dispersion of regional productivity, as shown in Table 2[9-12], is significantly and

Table 1. Determinants of Change in Central Government Spending

	Dispersion of Inter-regional Productivity (RDGINI)				Skew of Inter-regional Productivity (MM_RATIO)			
	Base	Base	Base	Full	Base	Base	Base	Full
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Central Government Spending $t-1$	-0.244*** (0.063)	-0.253*** (0.064)	-0.264*** (0.065)	-0.260*** (0.065)	-0.399*** (0.084)	-0.400*** (0.085)	-0.398*** (0.084)	-0.400*** (0.084)
RDGINI $t-1$	-0.382*** (0.143)	-0.385*** (0.143)	-0.368*** (0.141)	-0.369*** (0.142)				
MM_RATIO (Population Proportion Weighted) $t-1$					6.473** (2.915)	5.997** (2.900)	5.974** (2.897)	6.497** (2.919)
Population (Logged) $t-1$	-3.422 (7.851)	-4.963 (8.072)	-7.539 (8.189)	-6.389 (8.164)	13.953 (9.944)	12.939 (10.076)	13.011 (9.990)	13.902 (10.032)
Dependent Population (% Total) $t-1$	-0.296 (0.217)	-0.207 (0.219)	-0.102 (0.208)	-0.177 (0.210)	0.259 (0.224)	0.376* (0.219)	0.377* (0.220)	0.258 (0.224)
Economic Globalization Index $t-1$	-0.242*** (0.038)	-0.233*** (0.038)	-0.244*** (0.039)	-0.250*** (0.039)	-0.208*** (0.060)	-0.194*** (0.059)	-0.194*** (0.059)	-0.208*** (0.060)
PPP Converted GDP Per Capita (Logged) $t-1$	11.427*** (2.516)	11.478*** (2.564)	12.800*** (2.654)	12.715*** (2.644)	9.637*** (3.689)	9.793*** (3.719)	9.798*** (3.703)	9.629*** (3.705)
Leftist Power in Government $t-1$	-0.004 (0.003)	-0.005 (0.003)	-0.004 (0.003)	-0.004 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
PR Electoral System $t-1$	1.571** (0.771)			1.236 (0.783)	1.297* (0.699)			1.297* (0.700)
Parliamentary System $t-1$		0.147 (1.126)		0.230 (1.142)		0.054 (1.040)		0.071 (1.042)
Non-federalism & Non-bicameralism $t-1$			5.060*** (1.566)	4.705*** (1.579)			10.142* (6.070)	19.896* (10.663)
No. of Observations	423	423	423	423	354	354	354	354
Countries	24	24	24	24	24	24	24	24
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.215	0.208	0.220	0.219	0.264	0.260	0.263	0.261
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. The subscript t captures the previous five-year averaged value (except centripetal democracy indicators).
3. Temporary adjustment effects (Δ term) of time-varying independent variables, country dummies, and the constant term are not reported.
4. In Models [5]-[8], MM_RATIO in five-year moving averages is unavailable before 1995.
5. Significant at *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$, for two-tailed tests.

Table 2. Determinants of Change in Central Government Policy Priority

	Dispersion of Inter-regional Productivity (RDGINI)				Skew of Inter-regional Productivity (MM_RATIO)			
	Base	Base	Base	Full	Base	Base	Base	Full
	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
Policy Priority $t-1$	-0.534*** (0.077)	-0.537*** (0.077)	-0.537*** (0.078)	-0.534*** (0.077)	-0.579*** (0.089)	-0.581*** (0.089)	-0.580*** (0.089)	-0.580*** (0.089)
RDGINI $t-1$	-0.094** (0.048)	-0.093** (0.047)	-0.093** (0.047)	-0.094** (0.048)				
MM_RATIO (Population Proportion Weighted) $t-1$					2.095** (0.892)	2.143** (0.925)	2.154** (0.930)	2.084** (0.886)
Population (Logged) $t-1$	1.217 (1.728)	1.386 (1.704)	1.367 (1.699)	1.237 (1.732)	4.808** (2.367)	4.929** (2.358)	4.888** (2.338)	4.849** (2.385)
Dependent Population (% Total) $t-1$	-0.267*** (0.085)	-0.295*** (0.081)	-0.295*** (0.082)	-0.268*** (0.085)	-0.258*** (0.076)	-0.270*** (0.077)	-0.270*** (0.077)	-0.258*** (0.076)
Economic Globalization Index $t-1$	0.004 (0.012)	0.002 (0.012)	0.003 (0.012)	0.004 (0.012)	0.014 (0.012)	0.014 (0.012)	0.014 (0.012)	0.015 (0.012)
PPP Converted GDP Per Capita (Logged) $t-1$	-1.958*** (0.670)	-1.997*** (0.671)	-1.995*** (0.669)	-1.960*** (0.673)	-3.516*** (0.876)	-3.567*** (0.883)	-3.552*** (0.874)	-3.530*** (0.884)
Leftist Power in Government $t-1$	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
PR Electoral System $t-1$	-0.227 (0.390)			-0.226 (0.390)	-0.107 (0.417)			-0.109 (0.418)
Parliamentary System $t-1$		-0.067 (0.204)		-0.072 (0.206)		-0.082 (0.186)		-0.086 (0.189)
Non-federalism & Non-bicameralism $t-1$			-1.205 (2.340)	2.019* (1.125)			5.521** (2.414)	2.521* (1.459)
No. of Observations	346	346	346	346	332	332	332	332
Countries	24	24	24	24	24	24	24	24
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.371	0.370	0.372	0.369	0.345	0.345	0.347	0.343
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. The subscript t captures the previous five-year averaged value (except centripetal democracy indicators).
3. Temporary adjustment effects (Δ term) of time-varying independent variables, country dummies, and the constant term are not reported.
4. Significant at *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$, for two-tailed tests.

negatively correlated with changes in policy priorities. As a reminder, the negative direction suggests that increased dispersion is associated with a (relative) policy shift toward individually-targeted policy categories. To be precise, this negative sign means a decrease in the rate of policy priority change, imposing a constraint on a shift toward locally-targeted goods. Since the policy priority measure is constructed on a trade-off basis, it is safe to assume that lower growth in the relative allocation of locally-targeted goods implies more weight given to individually-targeted goods. In Table 2[12], a unit increase in the index of RDGINI by 1 point out of 100 leads to a relative policy effort toward individual goods (and reduction of locally-targeted goods) by 0.17% more of the total central expenditure in the long run.¹⁵ The Netherlands provides an example of this process. In the period 2003-2005, the dispersion of the Dutch regions (RDGINI) increased 5.5%. In the years immediately following (2004-2006), the Dutch government increased the *proportion* of public spending dedicated to social protection, health care, and education by 1% of total central spending (2.3% increase in these categories). This shift toward individually-targeted expenditure categories explains its negative change in the policy priority score.

Table 2[13-16] also presents strong evidence that highly skewed regional productivity (measured with the MM_RATIO) is significantly associated with shifts in spending toward locally-targeted goods. The positive coefficient reflects changes in the direction of policy categories we label as locally-targeted. By doubling the distance of the mean and median regional GDP per capita, our model predicts a long-run 3.5% increase in locally-targeted spending relative to individual spending. In other words, as the group of highly productive regions grows smaller or pulls away from the majority of less productive regions, we observe a growing shift away from resources that are spread across the regions toward ones that are generally more regionally-specific. For example, in the period 1996-1998 in Spain, the MM_RATIO increased, as more regions grew less productive in relative terms. During that same period, Spain renegotiated its system of inter-regional transfers (a category within general public services) to increase them overall (explaining the positive change

¹⁵To make our interpretation easier, we recoded policy priority scores to percentage scales.

in the policy priority score). As part of that agreement, the formula to allocate the transfers was re-configured to place greater weight on (low) regional income and less weight on regional fiscal effort. Both changes were initiated by a coalition of less productive regions (Viñuela 2000).

Most of the control variables show the anticipated sign. In particular, the negative association between age structure and policy priorities (more dependent populations, more change toward individually-targeted categories), is confirmed across models. Per capita GDP is correlated with changes in policy priorities toward individually-targeted categories, consistent with arguments that demands for social protection rise along with economic development. As expected, the left is linked to greater emphasis on spending targeted to individuals but this result is not significant. Leftist parties may also have incentives to target spending to local constituencies in less productive areas.

Additional Robustness Tests

We take steps to ensure that our results are robust to consideration of alternative causal mechanisms, to different measures for inter-regional inequality and government spending, additional controls, alternative modeling specifications, and endogeneity concerns in our OA Sections. We also replicate results from a recent model of social expenditure to provide validity for our policy priority measure.

Robust to Regional Identity: A plausible alternative hypothesis is that regional representation based on shared economic interest is more easily attributed to shared regional identity, at least for certain countries in our sample. The regional linguistic cleavage in Belgium, for example, aligns with differences in productivity, with Flemish regions relatively more productive than Walloon regions. Similarly, the regions of Spain with clear identity claims are also very high productivity regions.

Regional identity is certainly relevant to preferences over centralization, and to the political expression of regional shared interests (Balcells, Fernández-Albertos and Kuo 2015). We took several empirical approaches to assure our results were not driven by identity concerns. First, our ECM modeling approach assesses change, rather than levels, of spending and allocation. Regional identity during this period in our sample is largely static. Identity may help to explain initial levels of spending or allocation, but would not easily explain changes in those values. Second, we include results in OA Section 5, Table G7, with three different controls for regional identity–linguistic heterogeneity

(Desmet, Ortuno-Ortín and Weber 2017), and ethnic segmentation and fractionalization (Alesina and Zhuravskaya 2011). We also tested our models excluding the two cases with the most salient regional identity—Spain and Belgium—and found consistent results (OA Table H8).

Robust to Alternative Measures of Inter-regional Inequality: In OA Section 6, we test alternative measures of our inter-regional inequality variables and find robust results. Previous research has revealed that regional dispersion measures (such as regional coefficients of variance) may fluctuate according to the number or size of regions (Lee and Rogers 2018). To address this concern, we adapted the RDGINI using the gini coefficient formula developed by Bochsler (2010) for standardized party nationalization scores. This indicator, INEQ_SPNS, corrects for potential bias created by the unequal number of units and variation in unit size across countries. This measure shows stable values whether the regional productivity is calculated at the NUTS2 or NUTS3 (subsets of NUTS2) level, thus increasing confidence that our unit of measure is not driving our results. We show in OA Table I9 that our results are robust to this new measure.

We also tested an alternative calculation of the MM_RATIO. This measure of skew is weighted by population density of the region (per km^2). By including population density this measure adds information about the potential for coordination within districts (assuming density implies greater opportunity for coordination) and shared fate in concentrated geographies. We include a correlation matrix of our primary inter-regional inequality measures and their alternatives in OA Figure J10.

Robust to Alternative Measures of Government Spending: In OA Section 7 we test alternative dependent variables. One plausible response to inter-regional inequality is fiscal decentralization to limit the redistribution from more productive regions by isolating their tax base. Accordingly, we also examine general government spending (central plus state and local spending) and state and local spending. The effect of inter-regional inequality should be dampened in general government spending relative to central spending. In OA Table K11, we show higher dispersion in regional productivity is also linked to lower growth in general government expenditure and state and local expenditure.

Sampling Specifications: In OA Section 8 we show our results are not driven by subsets of data in our sample. Our results are not sensitive to individual country-year outliers (OA Table L12). Our main results hold with each country excluded one by one (OA Figure M13). We also reestimated our

results with a country, legislative session panel structure and found consistent results (OA Table N14).

Level Results and Instrumental Variables: OA Section 9 shows our main specification modeled as a fixed effects regression with 5 year average data of the *level* of central expenditure. We find consistent results (OA Table O15). Also in OA Table O15, we show supporting results from an instrumental variables regression using two exogenous instruments: 1) the value of RDGINI for the nearest country; 2) the coefficient of variation in top-level soccer league scores within that country. Both instruments and their testing are discussed in OA Section 9.

Replication of Social Spending Data Analysis: We also present evidence that (1) inter-regional inequality is empirically relevant to previous studies of income inequality and social spending and; (2) the results of our policy priority analysis can be validated with an independent dataset, in OA Section 10. We argue that dispersion of regional productivity may induce a shift of a country's policy focus toward individually-targeted goods. Accordingly, we should observe a positive and significant correlation between our dispersion measure and social spending (a subset of the individually-targeted goods we identify above). We replicate Lupu and Pontusson's (2011) analysis of redistributive social expenditure with our RDGINI measure included. We report our replication results in OA Table P16, where we find strong evidence that inter-regional economic dispersion is significantly related to policy allocation, and in the anticipated direction.

Additional Controls: In OA Table Q17, we show that our results are robust to a broad range of controls discussed in OA Section 11. Our additional controls include: party system nationalization, natural resource rents, legislative malapportionment, intra-regional inequality, and regional cost of living. This table shows the coefficient estimates and standard errors for our main inter-regional inequality independent variables. Each model is estimated according to our full model specifications.

These results are robust to inclusion of a measure of inter-personal income inequality (the gini coefficient of household income before taxes and transfers). A relevant concern for our study is that inter-regional inequality simply captures differences in household income. We show models with and without inter-personal inequality to demonstrate the statistical independence of these concepts in the OECD sample. Adding this variable to the model does not substantively change the effect size of our inter-regional inequality estimates. Weak correlations between our inter-regional inequality measures

and inter-personal inequality are shown in OA Figure R18.

Robust to Models Including Dispersion and Skew: In OA Table S19, we show that our main results are robust to including both dispersion and skew in the same models. The correlation between these variables is not substantial (Spearman's correlation=0.16), indicating they will not likely impact the results for the other variables. Indeed, our results remain robust, with the directional effects, the significance and the size of the estimated coefficients consistent with the main models.

Discussion

In this article we stress the importance of inter-regional inequality to countries' choices to fund the central state. We show that dispersion of regional productivity is associated with stagnation in government spending and resistance to budget allocations directed toward specific regions. However, when the majority of regions grow less productive in relative terms, government spending rises and shifts toward policy areas targeted to regions. Our emphasis on the structure of inter-regional inequality is new to research on the political economy of inequality. Our results highlight the importance of region-specific interests in government spending and point toward region-based coalitions in central decision-making. These findings also bolster the empirical foundations of previous work in this field (Bolton and Roland 1997; Beramendi 2012).

We focus our analysis on the logic behind a relationship between inter-regional inequality and government distribution, including plausible mechanisms that link these two concepts, and on demonstrating a robust statistical link to changes in the level of spending and the allocation of spending. In our efforts to offer new theory, and introduce new data and concepts in both the explanatory and outcomes variables, we cannot do full justice to the political mechanisms that translate these tensions into policy outcomes. We emphasize that regional tensions may be politically relevant across the full range of political institutions. Future research can detail the diverse pathways through which constitutional and institutional structures amplify and dampen inter-regional inequality and the representation of regional interests. Politicians' incentives to make region-based appeals at the electoral stage are shaped by whether their districts are geographically-defined and hold distinct regional preferences. Even where elections are not strongly regional and parties are strong, we will likely see region-based

appeals and policy decisions where parties secure votes disproportionately from particular areas of the nation. This raises at least two questions for future research. First, are region-based representative institutional structures endogenous to initial conditions of inter-regional inequality? Beramendi (2012) argues this is the case for government fiscal structures and federalism at the very least. Legislative malapportionment (Samuels and Snyder 2001) and electoral rules (Calvo 2009), among others, have plausible connections to existing levels of inter-regional inequality and to the role of regions in political decision-making. Second, if we may assume institutions are exogenous to some degree, are the effects of inter-regional inequality conditional on institutions that emphasize regions or individuals?

Our research speaks to work on fiscal federalism and decentralization. The policy priority measure is one way to capture the regional incidence of centralized spending. Our conceptual frame and empirical analysis suggest the possibility of a trade-off in redistributive spending to individuals versus regions. In related research we explicitly examine the regional incidence of central policies. That is, which regions benefit the most from government policies? This redistribution is decomposed as the differential effect of individually-targeted versus locally-targeted allocation on net inequality and can tell us more about which efforts by the central government appear to advance regional convergence.

We envision several different routes of research to extend our analysis. We have presented our theory in an intuitive way, building upon existing arguments and presenting hypotheses that fit the theoretical conditions. Moving forward, this approach would benefit from formal modeling to specify more precisely the relationship between dispersion and skew and central government spending, and to consider additional relevant parameters, such as intra-regional inequality. Formalization would better pinpoint the decisive actors in coalitions for spending, and elucidate their trade-offs, to inform future theoretical and empirical research.

Much existing research suggests that regionalism is an important “second dimension” political concern. From this approach, regionalism is a source of identity that shapes preferences for government policies outside of the core distributive concerns for smaller or larger governments. Importantly, our research builds upon Bolton and Roland (1997) and Beramendi (2012) by arguing that understanding inter-regional inequality is critical to evaluating the preferences for and outcomes of first dimension politics as well.

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References

- Alesina, Alberto and Ekaterina Zhuravskaya. 2011. "Segregation and the Quality of Government in a Cross Section of Countries." *American Economic Review* 101(5):1872–1911.
- Alston, Lee J and Joseph P Ferrie. 1999. *Southern Paternalism and the American Welfare State*. Cambridge: Cambridge University Press.
- André, Audrey and Sam Depauw. 2016. "Looking Beyond the District." *International Political Science Review* (Forthcoming).
- Armingeon, Klaus, Christian Isler, Laura Knöpfel, David Weisstanner and Sarah Engler. 2013. "Comparative Political Data Set 1960–2013." *University of Berne*.
- Balcells, Laia, José Fernández-Albertos and Alexander Kuo. 2015. "Preferences for Inter-regional Redistribution." *Comparative Political Studies* 48(10):1318–1351.
- Baunsgaard, Thomas and Michael Keen. 2010. "Tax Revenue and (or?) Trade Liberalization." *Journal of Public Economics* 94(9):563–577.
- Beck, Nathaniel and Jonathan N Katz. 1995. "What to Do (and Not to Do) with Time-series Cross-section Data." *American Political Science Review* 89(3):634–647.
- Beramendi, Pablo. 2012. *The Political Geography of Inequality*. Cambridge: Cambridge University Press.
- Berry, William D, Matt Golder and Daniel Milton. 2012. "Improving Tests of Theories Positing Interaction." *The Journal of Politics* 74(3):653–671.
- Bishin, Benjamin. 2009. *Tyranny of the Minority*. Philadelphia: Temple University Press.
- Bochsler, Daniel. 2010. "Measuring Party Nationalisation." *Electoral Studies* 29(1):155–168.
- Bolton, Patrick and Gerard Roland. 1997. "The Breakup of Nations." *The Quarterly Journal of Economics* 112(4):1057–1090.
- Busch, Marc L. and Eric Reinhardt. 2005. "Industrial Location and Voter Participation in Europe." *British Journal of Political Science* 35(4):713–730.
- Calvo, Ernesto. 2009. "The Competitive Road to Proportional Representation." *World Politics* 61(2):254–295.
- Cho, Wendy K Tam, James G Gimpel and Joshua J Dyck. 2006. "Residential Concentration, Political Socialization, and Voter Turnout." *Journal of Politics* 68(1):156–167.
- Crisp, Brian, Santiago Olivella and Joshua Potter. 2013. "Party-System Nationalization and the Scope of Public Policy." *Comparative Political Studies* 46(4):431–456.
- de Miguel, Carolina. 2017. "The Role of Electoral Geography in the Territorialization of Party Sys-

- tems.” *Electoral Studies* 47:67–83.
- Desmet, Klaus, Ignacio Ortuno-Ortin and Shlomo Weber. 2017. “Peripheral Diversity.” *Social Choice and Welfare* (Forthcoming).
- Dreher, Axel. 2006. “Does Globalization Affect Growth?” *Applied Economics* 38(10):1091–1110.
- Franzese, Robert J. 2010. “The Multiple Effects of Multiple Policymakers.” *Rivista italiana di scienza politica* 40(3):341–370.
- Franzese, Robert J and Irfan Nooruddin. 2004. “The Effective Constituency in (Re) Distributive Politics.” Unpublished manuscript.
- Gerring, John, Strom Thacker and Carola Moreno. 2005. “Centripetal Democratic Governance.” *American Political Science Review* 99(4):567–581.
- Giuranno, Michele Giuseppe. 2009. “Regional Income Disparity and the Size of the Public Sector.” *Journal of Public Economic Theory* 11(5):697–719.
- Jacoby, William G and Sandra K Schneider. 2001. “Variability in State Policy Priorities.” *Journal of Politics* 63(2):544–568.
- Jacoby, William G and Sandra K Schneider. 2009. “A New Measure of Policy Spending Priorities in the American States.” *Political Analysis* 17(1):1–24.
- Kramon, Eric and Daniel N Posner. 2013. “Who Benefits from Distributive Politics?” *Perspectives on Politics* 11(2):461–474.
- Krugman, Paul R. 1991. *Geography and Trade*. Cambridge: The MIT press.
- Kuznets, Simon. 1955. “Economic Growth and Income Inequality.” *American Economic Review* 45(1):1–28.
- Kwon, Hyeok Yong and Jonas Pontusson. 2010. “Globalization, Labour Power and Partisan Politics Revisited.” *Socio-economic Review* 8(2):251–281.
- Latner, Michael and Anthony McGann. 2005. “Geographical Representation under Proportional Representation.” *Electoral Studies* 24(4):709–734.
- Lee, Dong Wook and Melissa Rogers. 2018. Measuring Geographic Distribution for Political Research. Technical report Claremont Graduate University.
- Lessmann, Christian. 2009. “Fiscal Decentralization and Regional Disparity.” *Environment and Planning A* 41(10):2455–2473.
- Levitt, Steven D and James M Snyder. 1995. “Political Parties and the Distribution of Federal Outlays.” *American Journal of Political Science* 39(4):958–980.
- Lupu, Noam and Jonas Pontusson. 2011. “The Structure of Inequality and the Politics of Redistribu-

- tion.” *American Political Science Review* 105(2):316–336.
- Mahler, Vincent A. 2002. “Exploring the Subnational Dimension of Income Inequality.” *International Studies Quarterly* 46(1):117–142.
- Martin, Ron. 1997. “Regional Unemployment Disparities and Their Dynamics.” *Regional Studies* 31(3):237–252.
- McGillivray, Fiona. 1997. “Party Discipline as a Determinant of the Endogenous Formation of Tariffs.” *American Journal of Political Science* 41(2):584–607.
- Meltzer, Allan H and Scott F Richard. 1981. “A Rational Theory of the Size of Government.” *Journal of Political Economy* 89(5):914–927.
- Milesi-Ferretti, Gian Maria, Roberto Perotti and Massimo Rostagno. 2002. “Electoral Systems and Public Spending.” *Quarterly Journal of Economics* 117(2):609–657.
- Persson, Torsten and Guido Tabellini. 1994. “Does Centralization Increase the Size of Government?” *European Economic Review* 38(3):765–773.
- Rehfeld, Andrew. 2005. *The Concept of Constituency*. Cambridge: Cambridge University Press.
- Rehm, Philipp. 2016. *Risk Inequality and Welfare States*. Cambridge: Cambridge University Press.
- Rickard, Stephanie. 2012. “Electoral Systems, Voters’ Interests and Geographic Dispersion.” *British Journal of Political Science* 42(4):855–877.
- Rodden, Jonathan. 2003. “Reviving Leviathan.” *International Organization* 57(4):695–729.
- Romer, Thomas. 1975. “Individual Welfare, Majority Voting, and the Properties of a Linear Income Tax.” *Journal of Public Economics* 4(2):163–185.
- Samuels, David and Richard Snyder. 2001. “The Value of a Vote.” *British Journal of Political Science* 31(4):651–671.
- Simmons, Joel, Allen Hicken, Ken Kollman and Irfan Nooruddin. 2016. “Party System Structure and Its Consequences for Foreign Direct Investment.” *Party Politics* (Forthcoming).
- Tanzi, Vito. 2000. “On Fiscal Federalism”. Presented at Conference on Fiscal Decentralization, Washington, D.C.
- Viñuela, Julio. 2000. “Fiscal Decentralization in Spain”. Presented at Conference on Fiscal Decentralisation, Washington, D.C.
- Volden, Craig and Alan E Wiseman. 2007. “Bargaining in Legislatures over Particularistic and Collective Goods.” *American Political Science Review* 101(1):79–92.
- Weingast, Barry R, Kenneth A Shepsle and Christopher Johnsen. 1981. “The Political Economy of Benefits and Costs.” *Journal of political Economy* 89(4):642–664.

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Inter-regional Inequality and the Dynamics of Government Spending

Online Appendix

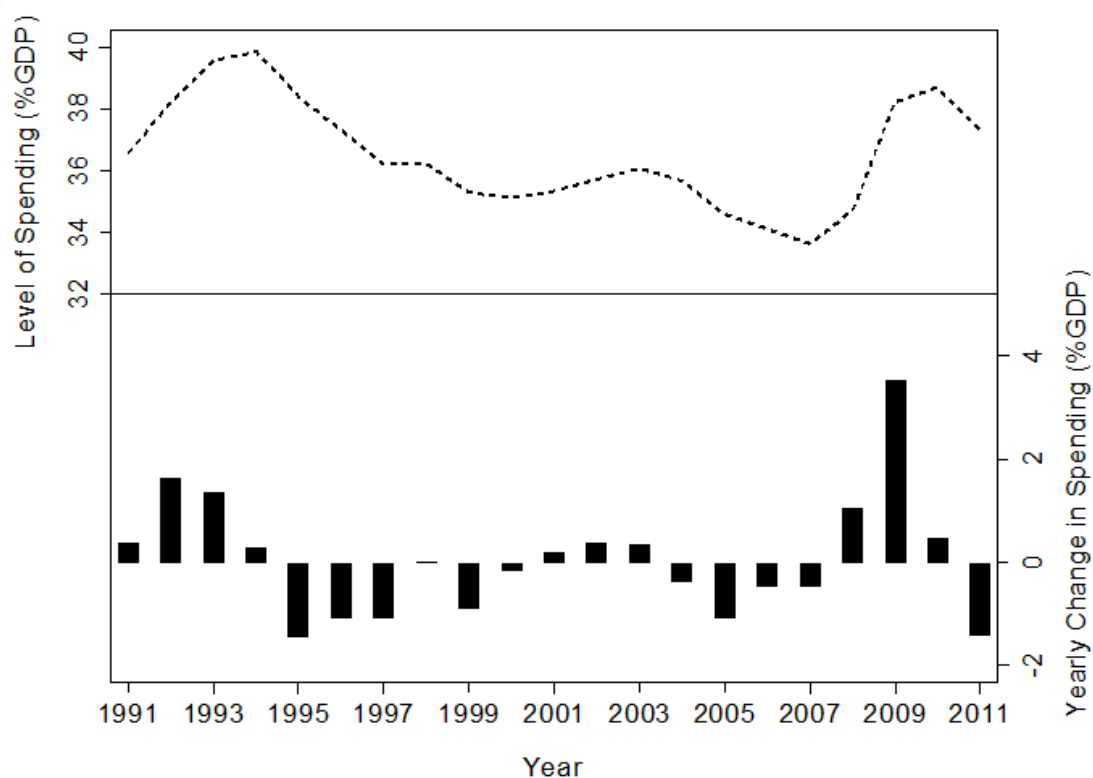
1 Summary Statistics and Data Description

In Figure A1 through Table C3 we show summary statistics for the variables used in our empirical analysis. Appendix A demonstrates time-series dynamics in both the level of central government spending (top section of the figure) and changes in central government spending (bottom section of the figure). These values represent overall sample means for each year. Below the figure is a list of the entry of each country into our dataset. Most countries have observations for the entire sample period 1991-2011. The Eastern European cases enter the dataset in different years. Our sample is constrained in particular by data availability for the policy priority scores. Complete policy spending categories for post-1960s OECD members are not available until 1991. Several of the newest OECD entrants, including Mexico (1994), and Chile, Estonia, and Israel (2010), are missing too much data on the dependent variables for reasonable estimates. Canada does not have complete policy category expenditure data to construct the policy priority scores.

Table B2 shows detailed summary statistics (minimum, maximum, and mean) by country for all of the primary dependent and independent variables under examination. Ireland clearly stands out as having high values for changes in government spending in the period. As shown below in Section 8 (Sample Selection and Sensitivity), our results are not sensitive to inclusion or exclusion of any particular country in the sample. The last column of Table B2 also shows the geographic unit used for each country and the number of these units for each country.

Table C3 provides variable descriptions, full sample summary statistics, and data sources for every variable used in the main text and the Online Appendix empirical analysis.

Figure A1. Mean Annual Change in Central Government Expenditure, 24 OECD Nations



<u>Data Availability</u>	<u>Countries</u>
Full Coverage	Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, the United States.
Partial Coverage	Czech Republic (1993-2011), Poland (1994-2011), Ireland (1995 -2011), Slovenia (1995-2011), Portugal (1995-2011), the Slovak Republic (1996-2011), Greece (2000-2011).

Source: IMF Government Finance Statistics (GFS) Online

Table B2. Central Government Expenditure, Policy Priority, and Inter-regional Inequality: Summary Statistics by Country

		Δ Central Government Spending			Δ Policy Priority			RDGINI			MM_RATIO (Population Proportion weighted)			Regional Units	
		Min	Max	Mean (Rank)	Min	Max	Mean (Rank)	Min	Max	Mean	Min	Max	Mean	Level	Number
3	Australia	-1.21	2.69	0.16 (11)	-0.76	0.61	-0.11 (19)	11.45	12.76	12.02	1.16	1.30	1.25	State	8
	Austria	-3.71	2.99	0.08 (12)	-0.62	1.16	0.01 (4)	10.56	13.04	11.62	1.07	1.66	1.27	NUTS 2	8
	Belgium	-3.54	2.81	-0.15 (13)	-0.35	0.40	-0.04 (9)	16.62	17.71	17.25	1.02	1.18	1.10	NUTS 2	11
	Czech Republic	-4.82	3.00	-0.36 (23)	-0.52	0.49	-0.04 (9)	8.42	18.44	13.89	1.01	1.20	1.16	NUTS 2	8
	Denmark	-1.87	5.51	0.21 (9)	-2.74	0.53	-0.06 (15)	7.44	9.08	8.30	0.93	1.00	0.98	NUTS 2	5
	Finland	-4.88	6.48	0.46 (4)	-0.43	0.10	-0.11 (19)	9.83	13.12	11.53	1.56	2.06	1.89	NUTS 2	5
	France	-1.99	3.21	0.34 (8)	-0.80	0.60	-0.07 (17)	6.59	7.36	6.93	1.51	1.63	1.55	NUTS 2	22
	Germany	-5.51	5.77	0.05 (13)	-2.90	1.89	-0.34 (23)	16.46	26.37	18.13	1.81	2.09	1.87	Lander	16
	Greece	-2.83	3.32	0.49 (3)	-0.91	0.53	-0.03 (6)	8.85	11.56	10.43	1.45	1.88	1.68	NUTS 2	13
	Hungary	-5.62	2.81	-0.31 (20)	-1.04	1.01	-0.06 (15)	9.62	20.82	16.19	1.37	1.63	1.47	NUTS 2	7
	Ireland	-19.80	18.79	0.43 (6)	-3.82	4.74	-0.03 (6)	8.70	13.15	11.19	1.00	1.00	1.00	NUTS 2	2
	Italy	-3.45	4.08	-0.22 (16)	-2.62	1.31	-0.05 (12)	13.15	15.21	14.06	1.80	1.91	1.85	NUTS 2	21
	Japan	-0.99	2.72	0.64 (1)	-1.29	0.27	-0.24 (22)	5.62	8.09	6.58	1.39	1.47	1.43	Region	10
	Netherlands	-3.51	4.84	-0.23 (17)	-0.54	2.05	-0.02 (5)	7.36	9.80	8.62	1.32	1.39	1.35	NUTS 2	5
	Norway	-2.45	5.49	-0.26 (19)	-0.95	0.67	-0.08 (18)	9.21	12.43	11.05	1.03	1.17	1.11	NUTS 2	7
	Poland	-4.47	3.67	-0.31 (20)	-0.31	0.36	0.11 (1)	7.56	12.19	10.33	1.24	1.47	1.35	NUTS 2	16
	Portugal	-1.93	4.74	0.49 (3)	-0.49	0.70	-0.03 (6)	9.79	13.80	11.25	0.99	1.07	1.00	NUTS 2	5
	Slovak Republic	-6.44	8.24	-0.44 (24)	-1.74	1.33	-0.05 (12)	16.89	29.23	24.11	1.04	1.12	1.07	NUTS 2	4
	Slovenia	-3.37	4.73	0.51(2)	-0.46	0.42	-0.05 (12)	8.26	9.68	9.02	1.00	1.00	1.00	NUTS 2	2
	Spain	-3.74	4.30	-0.15 (13)	-0.14	0.59	0.06 (2)	10.13	11.79	10.84	1.58	1.72	1.66	NUTS 2	19
	Sweden	-3.26	3.97	-0.32 (22)	-0.71	0.85	0.02 (3)	5.19	7.27	6.42	1.11	1.20	1.16	NUTS 2	8
	Switzerland	-6.85	1.80	-0.23 (18)	-1.29	1.88	-0.04 (9)	7.46	9.68	8.75	0.95	1.01	0.96	NUTS 2	7
	United Kingdom	-2.34	3.50	0.38 (7)	-3.15	0.62	-0.35 (24)	9.77	12.15	11.17	1.24	1.42	1.35	NUTS 2	36
	United States	-1.23	3.33	0.17 (10)	-0.81	0.30	-0.17 (21)	8.61	10.68	9.58	1.54	1.70	1.63	State	50

Notes:

1. Central government expenditure in Ireland in 2010 increased by 18 percent as a share of GDP. This increase can be explained by specific government support (in the form of capital injections) to banking sectors during the financial crisis.
2. NUTS (Nomenclature of Territorial Units for Statistics) is a geocode standard for referencing the subdivisions of countries. The associated data are available for the member states of the European Union and European Free Trade Association countries (Iceland, Norway, Lichenstein, and Switzerland) only.
3. NUTS level structures: Level 3 (Parish / Canton / Oblast / City and Residency / County / Municipality); Level 2 (Region / Province / State); Level 1 (Group of NUTS2).

Table C3. Data Descriptions, Summary Statistics, and Sources

Variables	Descriptions	Min	Max	Mean	Data Sources
<i>Government Spending Indicators</i>					
Central Government Spending	Sum of non-repayable payments by the central government for either cash or non-cash values.				IMF Government Finance Statistics (GFS) Online
(By Government Functions)	Expenditure by ten functional categories – General public services, national defense, public order & safety, economic affairs, environmental protection, housing & community amenities, health, recreation & culture & religion, education, and social protection. Measured as a share of GDP.	14.82	63.79	36.41	
(By Economic Characteristics)	Expenditure by eight transaction types – Compensation of employees, use of goods & services, consumption of fixed capital, interest, subsidies, grants, social benefits, and other expense. Measured as a share of GDP.	14.82	63.57	36.21	
General Government Spending	General government final consumption expenditures including all government current expenditures for the purchase of goods & services, compensation of employees, as well as national defense & security. Measured as a share of GDP.	10.37	29.79	20.05	World Bank's World Development Indicators
Local Government Spending	Expenditure by ten functional categories. Sample observations collected at the local and state government level. Measured as a share of GDP.	2.43	37.30	15.90	IMF GFS Online.
Policy Priority	Scores of relative spending priority over the functional categories of central government expenditures. Scores are set to a mean of zero. Units are proportions (rescaled to percentage points). Scores indicate the degree to which a country's policy spending is devoted to local public good policies (positive values) or individually-targeted policies (negative values) (Jacoby and Schneider, 2009).	-5.99	7.79	-0.03	Calculated by the authors; Jacoby and Schneider (2009)
Social Spending	"Total nonelderly government transfers (in percent GDP)." 17 OECD country samples are drawn from Lupu and Pontusson (2011).	7.11	25.03	14.42	Compiled by Lupu and Pontusson (2011) using the OECD Social Expenditure Database
Social Protection Spending	The total expenditure share by the regional governments on a set of insurance policies to protect against unemployment, sickness, disability, old age, etc.	0.38	58.76	16.33	IMF GFS. Control by local (state) governments over the total public budget (%)
Education Spending	The total expenditure share by the regional governments on an integrated account of pre-primary, primary, secondary, tertiary education, post-secondary non-tertiary education, subsidiary services to education, etc.	1.76	41.58	22.28	
Health Spending	The total expenditure share by the regional governments on policies entailing medical products, appliances, outpatient services, hospital services, public health services, etc.	0.04	47.89	17.08	

Continued.

Table C3. Continued.

Variables	Descriptions	Min	Max	Mean	Data Sources
<i>Inter-regional Inequality (Dispersion)</i>					
RDGINI	Measure of regional income disparity, using a country's average GDP per capita, the GDP per capita of subnational administrative regions. Regional levels specified with the geocode standard for referencing the subdivisions of countries (e.g., the NUTS2 level equivalent to state or province). Units are rescaled to 0 (equality) -100 (complete regional inequality).	5.19	29.23	11.63	Calculated by the authors using Cambridge Econometrics, Government national accounts, EUROSTAT. Lessmann (2009) includes mathematical formula.
Regional Variation in unemployment Risk (COV, WCOV)	Dispersion measures for the regional distribution of unemployment rates (% unemployed over labor force 15-64) at NUTS2 level across 22 OECD nations. Calculated index scale of 0-100 (0: Uniform Distribution). 1) Coefficient of variation (COV) 2) Population-weighted coefficient of variation (WCOV).	1.15 1.15	81.01 81.25	27.18 27.46	OECD regional statistics. Calculated by the authors using regional labor data.
INEQ_SPNS	Our modified version of RDGINI using regional GDP per capita following the "standardized party system nationalization scores, standardized by the number of territorial units" (Bochsler 2009). Units rescaled to 0-100.	4.67	37.15	15.34	Calculated by the authors using the mathematical formula created by Bochsler (2010)
<i>Inter-regional Inequality (Skew)</i>					
MM_RATIO (Population Proportion Weighted)	The mean-to-median ratio (taken from a country's regional GDP per capita weighted by the region's population proportion of the national population).	0.93	2.09	1.34	Calculated by the authors using regional statistics available from national accounts. OECD regional statistics.
MM_RATIO (Population Density Weighted)	The mean-to-median ratio (taken from a country's regional GDP per capita weighted by the region's population density per square kilometer).	0.89	13.82	3.17	
<i>Inter-regional Inequality Instrument</i>					
Dispersion of Soccer League Points	Points are calculated yearly for a soccer club's competitiveness in national leagues. The standardized rule for calculating points: 3 points for games won, 1 points for a draw, and 0 points for a loss. The dispersion (coefficient of variation) is measured as the standard deviation of points divided by average points (Goossens 2006).	0.14	0.45	0.30	Calculated by the authors. European teams (European club competitions and domestic leagues) http://www.webalice.it/claudioicoletti1 Non-European team: (the United States): us.soccerway.com .
RDGINI of Most Contiguous State	The RDGIN of the geographically closet country in the sample (determined by distance between capital cities)	0.05	0.29	0.13	Calculated by the authors. Distance data are drawn from google (the geographic distance between capitals)

Continued.

Table C3. Continued.

Variables		Descriptions	Min	Max	Mean	Data Sources
<i>Inter-regional Inequality Instrument</i>						
Party System Territorialization		A ratio measure for the relative size of the national party system to that of the average district level party system, using the effective number of parties (ENP) scores at the national level versus the average district-level. The (percentage) score range from 0 (a nationalized party system) to 100 (a territorialized party system).	0.43	69.84	14.46	de Miguel (2017)
<i>Inter-personal Inequality Indicators</i>						
By Income Level	(Gini Index)	Estimates of the Gini index of household market (pre-tax, pre-transfer) income inequality, using the Luxembourg Income Study data as the standard. Units are scales of 0-100.	22.83	54.79	41.55	The Standardized World Income Inequality Database (Solt 2009).
By Income Structure	(90-50 Ratio)	“Earnings of a worker in the 90 th percentile of the earnings distribution as a share of the earnings of the worker with a median income.”	1.42	2.29	1.78	Compiled by Lupu and Pontusson (2011) using OECD (2007).
	(50-10 Ratio)	“Earnings of the worker with a median income as a share of the earnings of a worker in the 10 th percentile of the earnings distribution.”	1.27	2.43	1.67	
	(Skew)	“Ratio of the 90-50 ratio to the 50-10 ratio”	0.74	1.34	1.06	
	(90-10 Ratio)	“Earnings of a worker in the 90 th percentile of the earnings distribution as a share of the earnings of a worker in the 10 th percentile of the earnings distribution.”	1.92	4.79	3.05	
<i>Intra-regional Inequality Indicators</i>						
(Theil Index from LIS)		Theil index within region household income inequality. Calculated using income surveys aggregated to the regional level. Rescaled to 1-100. Data are carried over to the following survey years.	18.56	52.55	33.83	Luxembourg Income Study (LIS), Limited samples.
<i>Socioeconomic Indicators</i>						
Population (Logged)		Log of the population.	14.48	19.56	16.60	World Bank’s World Development Indicators.
Dependent Population		Age under 15 or over 65 (% of total population).	27.43	37.90	32.83	
Economic Globalization		Index of economic globalization 1-100 (the most open economy). This index measure is constructed based on information regarding actual flows and restrictions: flows (trade, foreign direct investment, portfolio investment, income paid to foreign national), restrictions (hidden import barriers, mean tariff rates, taxes on international trade, and capital account restrictions).	38.06	96.83	75.80	KOF Index of Globalization. Dreher (2006) and online update at http://globalization.kof.ethz.ch/
GDP per capita (Logged)		Log of PPP-converted GDP per capita (Chain Series) at 2005 constant price.	8.91	10.86	10.16	Penn World Table 8.0.
Leftist Power in Government		Measure of the relative power position of social democratic and other left parties in government based on their seat share in parliament. Weighted by the number of days in office in a given year.	0.00	100.00	39.89	Comparative Political Dataset, 1960-2013 (Armingeon et al., 2013).

Continued.

Table C3. Continued.

Variables	Descriptions	Min	Max	Mean	Data Sources
<i>Socioeconomic Indicators</i>					
Linguistic Heterogeneity	The country's level of social effective antagonism measured in intermediate values between ethnolinguistic polarization and diversity, with the degree of dissimilarities between languages. Rescaled to 0-100.	0.60	18.00	5.79	Peripheral Heterogeneity (PH) index available from Desmet et al. (2017). Norwegian data are unavailable.
Ethnic Segregation	Ethnic diversity indices. Rescaled to 0-100 (with 100 being the most diversified community)	0.07	24.41	3.58	Indices calculated by Alesina and Zhuravskaya (2011). Data on Poland are unavailable.
Ethnic Fractionalization		1.77	54.43	19.28	
Regional Cost of Living	Housing cost deflator. 1) Measured as cost of living-adjusted RDGINI 2) Measured as cost of living-adjusted MM_RATIO	5.95 0.90	24.03 8.21	12.24 2.67	LIS (Limited Samples), Gennioli et al. (2014). Calculated by authors.
National Resource Rents	Sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Measured as a share of GDP. Rents are the differences between the value of resource production at world prices and total costs of production.	0.02	21.44	1.43	World Development Indicators
<i>Centripetal Democracy</i>					
PR Electoral System	Degree of proportional representation. 0 = majoritarian or preferential-vote, 1= mixed-member majority or blocked vote, 2 = closed-list PR.	0.00	2.00	1.16	Gerring and Thacker (2008), Data carried over from 2006.
Parliamentary System	0 = presidential, 1 = semi-presidential, 2= parliamentary	0.00	2.00	1.78	
Unitary Governance	Average of nonfederalism (the weak degree of separation between national and territorial units) and nonbicameralism (the more power of the center relative to the periphery).	0.00	2.00	1.37	
<i>Regional Authority Indicators</i>					
Tax Autonomy	The degree in which a regional government can independently tax its regional population. The larger the value, the greater the regional autonomy for setting the base and rate of major tax. Continuous values.	0.00	5.07	1.81	Hooghe et al. (2016), Country data for the Regional Authority Index (RAI).
Tax Revenue	Percentage share of the total general government tax revenue by the local governments.	0.76	36.20	10.72	OECD Fiscal Decentralization Database
<i>Other Institutional Conditions</i>					
Party System Nationalization	Standardized and weighted party system nationalization score (controlling for the number of units in a country and also weights for the size of the territorial units). 0-1(Party's full share of national votes) index.	0.39	0.99	0.80	CLEA – Effective Number of Parties and Party Nationalization Data (Version 20160523). Bochsler (2010).
Legislative Malapportionment	Index of the additive value of upper and lower house malapportionment. A score of x% in the index means that x% of upper and lower house seats are allocated to districts that would not receive those seats under perfect apportionment. Logged value	-4.74	-0.96	-2.51	Samuels and Snyder (2001)

2 The Articulation of Inter-regional Inequality within Political Institutions

As we argue in the main text, certain political institutions amplify regionalization of politics, and promote the articulation of regional interests in policymaking (Franzese and Nooruddin 2004). The most obvious institutions that fit this bill are federalism, territorial upper legislative houses, and single-member simple plurality legislative districts (Rogers 2015). Each of these institutions establish a specific regional constituency, and incentivize the representation of regional interests (Weingast, Shepsle and Johnsen 1981).

In contrast, we take unitary, unicameral systems with closed-list proportional representation as the least-likely case for articulation of regional economic preferences because they lack clear institutionalized regional political constituencies and are associated with strong, centralized political parties that should, in theory, advance broad national appeals (Caramani 2004). Very few cases in our sample are devoid of any region-enhancing electoral or policy-making institution. The case of the Netherlands should most closely fit this bill in our sample, as discussed in the main text, and even in that country scholars have observed strong evidence of territorial representation (Latner and McGann 2005). Similarly, Fiva and Halse (2016) show clear geographic connections of the parties in highly centralized Norway (which differs from the Netherlands because it has regionally-defined high magnitude electoral districts).

Our theoretical framework suggests inter-regional inequality is relevant to politics because: 1) individuals in common geography have shared interests that can be better organized in close distance; 2) politicians have incentives to appeal to organized collective actors to win elections. One straightforward way that regional interests may be pertinent to politicians' electoral interests even in centralized systems is through party territorialization. Parties are "territorialized" when their votes are not evenly distributed throughout the national territory, but are more concentrated in particular areas.

Inter-regional economic inequality is one known predictor of party territorialization (de Miguel 2017). Table D4 demonstrates that party territorialization is strongly correlated with our RDGINI and MM_RATIO measures, and particularly so in closed-list proportional representation (PR) systems. The concept of party territorialization is operationalized by the degree in which votes for parties are

distributed unevenly across electoral districts in a country. We use the measure for party territorialization from de Miguel (2017), which is the “Cox Inflation Score of the difference between the effective number of parties at the national level (ENPn) and the effective number of parties at the district level averaged across districts (ENPd)” (p.5). Using a correlation matrix analysis, we find that in closed-list PR systems, RDGINI is correlated with party system territorialization (PST) at $r=0.64$. This provides preliminary evidence that inter-regional inequality has a basis for expression even in centralized parties, and that it may be in the strategic interest of parties to represent geographic areas even in the absence of regionalized institutions (André and Depauw 2016).

Table D4. Summary of Correlation Matrix (All Election Years across 22 OECD Countries)

PST (Party System Territorialization)	Degree of Proportional Representation		
	Samples (n=obs.) PR = 0, 1, or 2	Samples (n=obs.) PR = 1, 2	Samples (n=obs.) PR = 2
Pairwise Correlation Coefficient:			
PST vs. RDGINI	0.378** (187)	0.586** (108)	0.636** (95)
PST vs. MM_RATIO	0.259** (144)	0.356** (86)	0.393** (73)
RDGINI vs. MM_RATIO	0.238* (147)	0.362** (88)	0.399* (74)
Spearman Correlation Coefficient†			
PST vs. RDGINI	0.240* (187)	0.443** (108)	0.454** (95)
PST vs. MM_RATIO	0.323** (144)	0.394** (86)	0.364** (73)
RDGINI vs. MM_RATIO	0.241** (147)	0.342** (88)	0.384** (74)
Election Years Available for PST	193	108	95

Notes:

1. PR(0) - Majoritarian or preferential vote; PR(1) – Mixed-member majority or block vote; PR(2) – Closed-list PR. Source: Gerring and Thacker (2008).
 2. The party system territorialization index ranges from 0 to 100, with a higher value being poorer cross-district coordination and therefore a more territorialized party system (de Miguel 2017) The data by the election years are not available for the Netherlands and the Slovak Republic.
 3. The pairwise correlation coefficients with the Bonferroni-adjustment (for a multiple comparison correction)
 4. Significant at **p<0.01, *p<0.05.
- †The Spearman correlation assumes non-normality in our data distribution, while the pairwise correlation assumes normality.

3 Alternative Measure of Regional Economy: Regional Unemployment Risk

We argue that divergent regional economic conditions encourage political representation of regional economic interests. Throughout the main text, we use economic productivity as a broad measure of regional economic conditions. In theory, other indicators, such as regional unemployment, may also divide regions on preferences for government spending. In this section, we provide evidence that other indicators of regional economic dispersion also predict changes in government spending.¹

We expect high regional dispersion in unemployment risk will escalate distributive conflict, thus putting downward pressure on increased government spending. Consistent with our expectations, we show in Table E5 that the coefficient of variation in regional unemployment is associated with lower growth in overall government spending and this result is significant at the 5 percent level. However, the available sample of regional unemployment is much smaller than our existing sample and includes fewer countries.

The regional distribution of unemployment is also a potentially useful measure to test the social insurance mechanism linking inter-regional inequality to increased emphasis on individually-targeted policy categories. Common risk of unemployment across regions should encourage cross-regional coalitions in favor of social protection that benefits all regions (Beramendi 2012). If unemployment risk is concentrated in highly productive regions or it is uniformly distributed across regions, then highly productive regions would likely favor social insurance and we would observe spending shift toward those categories (Rehm, Hacker and Schlesinger 2012; Rehm 2016). On the other hand, high regional dispersion in unemployment risk would be expected to divide regional preferences for social protection because these policies would benefit some regions at the expense of others. Thus we would expect high regional dispersion in unemployment to be associated with shifts away from social insurance. Table E5, Models [3]-[4], show a positive relationship between high variation in unemployment and spending that shifts away from individually-targeted goods. Of course, social protection is only one subset of individually-targeted goods in our policy priority measure, so this

¹The regional coefficient of variation in the unemployment rate and RDGINI are strongly correlated in our sample (Spearman's correlation of 0.48, $p < 0.01$).

would likely be a noisy indicator to test the social insurance mechanism. Evaluating differences in the type of regional economic conditions is an important issue for further exploration of regional coalitions for central government spending.

Table E5. Regional Variation in Unemployment Risk

	Δ Central Government Spending		Δ Policy Priority	
	[1]	[2]	[3]	[4]
Central Government Spending $t-1$	-0.276*** (0.070)	-0.283*** (0.068)		
Policy Priority $t-1$			-0.527*** (0.078)	-0.548*** (0.078)
<i>Inter-regional Variation in Unemployment Rates</i>				
COV (Coefficient of Variation) $t-1$	-0.040** (0.017)		0.008† (0.006)	
WCOV (Population-weighted COV) $t-1$		-0.040** (0.019)		0.006 (0.007)
Population (Logged) $t-1$	0.302 (6.494)	8.291 (7.772)	0.904 (1.638)	4.001 (2.471)
Dependent Population (% Total) $t-1$	-0.036 (0.190)	-0.036 (0.188)	-0.196** (0.082)	-0.235*** (0.089)
Economic Globalization Index $t-1$	-0.242*** (0.041)	-0.254*** (0.041)	0.014 (0.012)	0.016 (0.012)
PPP Converted GDP per capita (Logged) $t-1$	10.711*** (2.442)	10.680*** (2.496)	-2.312*** (0.641)	-2.929*** (0.710)
Leftist Power in Government $t-1$	-0.002 (0.003)	-0.004 (0.003)	-0.000 (0.001)	-0.001 (0.001)
PR $t-1$	0.358 (0.641)	1.295* (0.701)	-0.301 (0.391)	-0.208 (0.404)
Parliamentary $t-1$	-0.410 (1.092)	-0.349 (1.071)	0.129 (0.202)	-0.043 (0.212)
Non-federalism & non-bicameralism $t-1$	5.694*** (1.560)	5.395*** (1.581)	7.954 (12.768)	-18.492 (19.961)
No. of observations	390	382	319	315
Countries	22	22	22	22
Country FE	Yes	Yes	Yes	Yes
R-squared	0.305	0.321	0.448	0.453
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables as well as country fixed effect dummies are not reported. The constant term is suppressed.
3. Significant at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, † $p < 0.15$, for two-tailed tests.
4. COV and WCOV are calculated using the regional-level data on unemployment rates in years from 1991 to 2011 for 22 countries. Norway and Switzerland are dropped from the analysis because data are only available from 2009.
5. Both COV and WCOV measures for our data are significant, positively correlated with RDGINI (Spearman's correlation of 0.48 and 0.44 respectively). Each of these variables can take on any value between 0 and 100, with a higher value meaning more regional concentration of unemployment.

4 Controls for Sub-central Spending Power

One concern with our central government policy priority measure is the decentralization of certain policy categories. For example, if a country spends the majority of its resources for education at the local level, we would underestimate that country's priority for education. Because our conceptual framework focuses upon barriers to centralization, we consider examination of central spending both appropriate and suggestive. The control of policy areas by the central government is itself indicative of that country's delegation to central decision-makers, and regional conflicts over policy priorities (Bolton and Roland 1997). Nonetheless, this incomplete picture of general government policy may still raise issues with the estimation of our policy priorities. There is no perfect way to address this concern given existing data, but we take several steps to ensure the soundness of our results by controlling for sub-national control of revenue and expenditure policy.

We added controls in our policy priority model for local financial responsibilities. First, we account for regional power on the revenue side. Hooghe et al. (2016) offer a measure of regional tax authority that takes on a continuous numeric value, using a coding scheme based on 0 (full central government control over all local taxes) to 4 (regional governments set bases and rates of at least one major tax). We also test a measure for local shares of total government tax revenue (from the OECD Fiscal Decentralization Database), which captures the extent of regional fiscal autonomy. We suggest that the larger the local tax revenue, the stronger the sub-central government discretionary power over the budget.

Second, we control for the sub-central share in the general public expenditure on various budget items. We include controls for the sub-national share of social protection, education, and health-care, which represent the largest budget categories, on average, and ones with the greatest variation in decentralization across countries (OECD 2016). We do not find a strong relationship between any of the sub-central spending shares and changes in the government policy priority.

Table F6 shows that our results are preserved when including controls for regional revenue and expenditure authority. We also found positive, significant correlations between regional tax authority, local tax revenue, and policy priority shifts towards local public goods.

Table F6. Regional Controls for Financial Responsibility for Policy

Dependent Variable: Δ Policy Priority	Revenue Side: Regional Authority on Taxation				Expenditure Side: Sub-central Spending Share					
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Policy Priority $t-1$	-0.558*** (0.076)	-0.603*** (0.084)	-0.526*** (0.076)	-0.544*** (0.083)	-0.377*** (0.053)	-0.396*** (0.058)	-0.432*** (0.058)	-0.417*** (0.056)	-0.285*** (0.046)	-0.273*** (0.055)
RDGINI $t-1$	-0.089** (0.045)		-0.102** (0.048)		-0.126*** (0.031)		-0.134*** (0.039)		-0.132*** (0.024)	
MM_RATIO $t-1$		2.291*** (0.850)		1.684* (0.894)		0.869* (0.451)		0.767* (0.428)		1.243* (0.729)
<i>Regional Authority</i>										
Tax Autonomy $t-1$	0.572*** (0.166)	0.608*** (0.175)								
Tax Revenue $t-1$			0.075*** (0.029)	0.073** (0.034)						
<i>Sub-central Spending Share</i>										
Social Protection $t-1$					0.011 (0.012)	-0.005 (0.012)				
Education $t-1$							-0.001 (0.009)	-0.018*** (0.006)		
Healthcare $t-1$									0.005 (0.010)	-0.002 (0.010)
No. of Observations	346	332	342	328	218	214	217	210	193	192
Countries	24	24	24	24	22	22	22	22	21	21
Missing Data on Sub-central Spending	No	No	No	No	Germany, Japan		Germany, Japan		Germany, Japan, UK	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.473	0.451	0.455	0.425	0.546	0.523	0.554	0.577	0.619	0.545
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables as well as country fixed effect dummies are not reported. The constant term is suppressed.
3. Estimates [5]-[10] are set within 1.5 standard deviations of residuals, which helps minimize outlier effects created by the unbalanced data structure and systematic missing values for sub-central spending on education and health.
4. Significant at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ for two-tailed tests.
5. Each model estimate is an extension of Table 2 with a full battery of control variables (e.g., population, dependent population, economic globalization, PPP-converted GDP per capita, leftist power, PR, parliamentary, unitary governance). The estimates of these controls are not reported.
6. Regional tax revenue is measured as a % of total general government tax revenue (Source: OECD Fiscal Decentralization Database). Sub-central spending share on social protection, education, and healthcare indicates the extent of control by local (and state) governments over the total public budget of those categories (Source: GFS).
7. Regional tax autonomy is measured by the degree in which a regional government can independently tax its regional population (Hooghe et al. 2016).

5 Regional Identity

A plausible alternative hypothesis is that regional representation based on shared economic interest is more easily attributed to shared regional identity. The regional linguistic cleavage in Belgium, for example, aligns with differences in productivity, with Flemish regions relatively more productive than Walloon regions. Similarly, the regions of Spain with clear identity claims (e.g., Catalonia and the Basque Country) are also very high productivity regions.

We took several empirical approaches to assure our results were not driven by identity concerns. First, our ECM modeling approach assesses change, rather than levels, of spending and allocation. Regional identity during this period in our sample is largely static. Identity may help to explain initial levels of spending or allocation, but would not easily explain changes in those values. Second, we include results with three different controls for regional identity—linguistic heterogeneity, ethnic segregation, and ethnic fractionalization.

In Table G7, we checked the robustness of our results with three added controls for identity. To control for linguistic heterogeneity, we include the Peripheral Heterogeneity (PH) index, an intermediate index between ethnolinguistic polarization and diversity, with the degree of dissimilarities between languages taken into account (Desmet, Ortuño-Ortín and Weber 2017). We also add country-level indices of ethnic segregation and fractionalization (Alesina and Zhuravskaya 2011). The fractionalization index estimates the probability that two individuals randomly drawn within the same country belong to different ethnic groups. The segregation index captures the probability that each ethnic group occupies a separate region. All diversity indices are rescaled to 0-100 (with 100 being the most diversified community). Our results are robust to these indices.

The effects of ethnolinguistic polarization are mostly insignificant (except Model [6] showing a positive association between ethnic segregation and spending shifts toward local public goods). These weak associations are expected given our model structure focused on change—static variables such as ethnicity and identity are not likely to explain a dynamic process. We also tested our models excluding the two cases with the most salient regional identity in our sample—Spain and Belgium—and found consistent results (Table H8).

Table G7. Additional Controls for Regional Identity

	Δ Central Government Spending				Δ Policy Priority			
	Linguistic Diversity	Ethnic Diversity	Linguistic Diversity	Ethnic Diversity	Linguistic Diversity	Ethnic Diversity	Linguistic Diversity	Ethnic Diversity
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Central Government Spending $t-1$	-0.297*** (0.070)	-0.282*** (0.069)	-0.467*** (0.092)	-0.467*** (0.090)				
Policy Priority $t-1$					-0.653*** (0.083)	-0.646*** (0.082)	-0.689*** (0.097)	-0.688*** (0.096)
RDGINI $t-1$	-0.273* (0.145)	-0.338** (0.154)			-0.150*** (0.046)	-0.144*** (0.046)		
MM_RATIO $t-1$			5.806** (2.800)	5.254* (2.857)			2.311*** (0.766)	2.332*** (0.787)
Population (Logged) $t-1$	-11.223 (7.481)	-11.152 (7.892)	2.170 (9.182)	4.018 (9.627)	-0.149 (2.188)	-0.084 (2.102)	2.964 (2.595)	2.905 (2.530)
Dependent Population (% Total) $t-1$	-0.078 (0.231)	-0.085 (0.271)	0.310 (0.242)	0.413 (0.289)	-0.353*** (0.101)	-0.339*** (0.100)	-0.309*** (0.093)	-0.298*** (0.092)
Economic Globalization Index $t-1$	-0.247*** (0.047)	-0.225*** (0.043)	-0.227*** (0.068)	-0.223*** (0.069)	0.012 (0.013)	0.010 (0.013)	0.020 (0.014)	0.019 (0.014)
PPP Converted GDP per capita (Logged) $t-1$	12.992*** (3.111)	11.463*** (3.018)	12.222*** (4.170)	11.565*** (4.072)	-2.306*** (0.658)	-2.268*** (0.659)	-3.804*** (0.829)	-3.769*** (0.827)
Leftist Power in Government $t-1$	-0.004 (0.003)	-0.002 (0.003)	0.003 (0.003)	0.005 (0.003)	-0.002* (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)
PR $t-1$	0.882 (0.723)	0.816 (0.748)	0.952 (0.673)	0.768 (0.688)	-0.032 (0.385)	-0.050 (0.387)	0.043 (0.403)	0.032 (0.405)
Parliamentary $t-1$	1.469 (1.245)	1.300 (1.207)	1.075 (1.165)	0.872 (1.121)	-0.060 (0.217)	-0.060 (0.217)	0.032 (0.193)	0.033 (0.193)
Non-federalism & non-bicameralism $t-1$	5.689*** (2.080)	5.110** (2.056)	-68.955 (62.985)	-24.911 (21.960)	23.950 (23.486)	8.135* (4.453)	-8.028 (27.760)	1.691 (5.273)
Linguistic Heterogeneity $t-1$	3.985 (5.763)		0.181 (0.574)		-0.418 (0.922)		0.784 (1.097)	
Ethnic Segregation $t-1$		0.453 (0.903)		-0.396 (0.249)		0.142** (0.060)		0.073 (0.071)
Ethnic Fractionalization $t-1$		2.844 (3.300)		-4.584 (4.230)		0.932 (0.855)		-0.214 (1.029)
No. of Observations	402	408	338	339	335	337	321	323
Countries (Country FE)	23 (Yes)	23 (Yes)	23 (Yes)	23 (Yes)	23 (Yes)	23 (Yes)	23 (Yes)	23 (Yes)
Adjusted R ²	0.175	0.159	0.227	0.229	0.390	0.384	0.353	0.352
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

- ECM estimates using OLS with panel corrected standard errors and AR1-adjustment.
- Temporary adjustment effects (Δ term) of time-varying independent variables as well as country fixed effect dummies are not reported. The constant term is suppressed.
- Significant at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ for two-tailed tests.
- To control for linguistic heterogeneity effects, we include the Peripheral Heterogeneity (PH) index calculated by Desmet et al. (2017), an intermediate index between ethnolinguistic polarization and diversity, with the degree of dissimilarities between languages taken into account. Country-level indices of "ethnic" segregation and fractionalization are calculated in Alesina and Zhuravskaya (2011). All diversity indices are rescaled to 0-100 (with 100 being the most diversified community). Norwegian data on the PH index are unavailable, while Poland has missing observations on ethnic segregation and fractionalization indices.

Table H8. Robust to Omitting Samples from Spain and Belgium

	Δ Central Government Spending		Δ Policy Priority	
	[1]	[2]	[3]	[4]
Central Government Spending $t-1$	-0.257*** (0.069)	-0.418*** (0.091)		
Policy Priority $t-1$			-0.541*** (0.078)	-0.578*** (0.091)
RDGINI $t-1$	-0.386** (0.161)		-0.098** (0.049)	
MM_RATIO $t-1$ (Pop. Proportion Weighted)		7.160** (3.560)		1.737* (0.968)
Population (Logged) $t-1$	-5.270*** (1.799)	-8.012*** (2.467)	2.061*** (0.466)	2.142*** (0.528)
Dependent Population (% Total) $t-1$	-0.244 (0.251)	0.481** (0.243)	-0.328*** (0.094)	-0.275*** (0.086)
Economic Globalization Index $t-1$	-0.235*** (0.038)	-0.204*** (0.065)	0.001 (0.013)	0.009 (0.015)
PPP Converted GDP per capita (Logged) $t-1$	12.051*** (2.741)	12.902*** (4.007)	-2.233*** (0.730)	-2.962*** (0.935)
Leftist Power in Government $t-1$	-0.008** (0.004)	-0.003 (0.004)	-0.000 (0.001)	0.000 (0.001)
PR $t-1$	1.379 (0.935)	0.605 (0.924)	-0.017 (0.416)	-0.050 (0.433)
Parliamentary $t-1$	0.114 (1.124)	0.234 (1.095)	-0.115 (0.214)	-0.085 (0.190)
Non-federalism & non-bicameralism $t-1$	3.946** (1.930)	8.506*** (2.004)	1.323*** (0.312)	-1.861*** (0.370)
No. of Observations	381	322	314	300
Countries	22	22	22	22
Country FE	Yes	Yes	Yes	Yes
R-squared	0.298	0.333	0.448	0.419
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables and country fixed effect dummies are not reported. The constant term is suppressed.
3. Significant at ***p<0.01, **p<0.05, *p<0.1, for two-tailed tests.

6 Alternative Measures of Inter-regional Inequality

Existing research in the fields of economic and political geography have raised some concerns about the stability of cross-national indicators of inter-regional inequality (Spiezia 2002). These measures (which include RDGINI, similar dispersion measures such as the coefficient of variance, and population-weighted coefficient of variance in regional GDP per capita) should be independent of the number of regions considered, should not be sensitive to differences in average national GDP, and should satisfy the "Pigou Principle" (Lessmann 2009, 8). Moreover, the RDGINI is adjusted to minimize differences across regions (Spiezia 2002). However, these measures may still be sensitive the size or number of regions involved (Bochsler 2010). To ease any lingering concerns with the validity of our RDGINI measure, we calculated a new standardized dispersion indicator based on the formula developed by Bochler (2010) to measure party system nationalization independent of number of electoral districts.

Our standardized adjusted gini coefficient of regional GDP, called INEQ_SPNS, is:

$$\text{INEQ_SPNS} = \left(\sum_{i=1}^{n-1} \left(\frac{P_{i+1}}{\sum_{j=1}^i P_j} - \frac{Y_{i+1}}{\sum_{j=1}^i Y_j} \right) \right)^{1/\log \frac{(\sum_{i=1}^n P_i)^2}{\sum_{i=1}^n P_i^2}} \quad (1)$$

where a country with n territorial units (1, ..., n), y_i is GDP of a region i , and P_i is the size of the population in that region. We subtract this "party nationalization" equivalent portion of regional equality from 1, because our intent is to measure inequality rather than homogeneity.

We ran the full model specifications for both the central government expenditure and policy priority dependent variables with INEQ_SPNS. Table I9 shows that our results are similar with this new measure. Appendix I also includes the results of our MM_RATIO weighted by population density instead of population share (described in Additional Robustness Tests from the main text). Again our results are robust to this alternative calculation.

Figure J10 shows a correlation matrix of the two primary inter-regional inequality measures RDGINI and MM_RATIO, with INEQ_SPNS and the population density-weighted MM_RATIO.

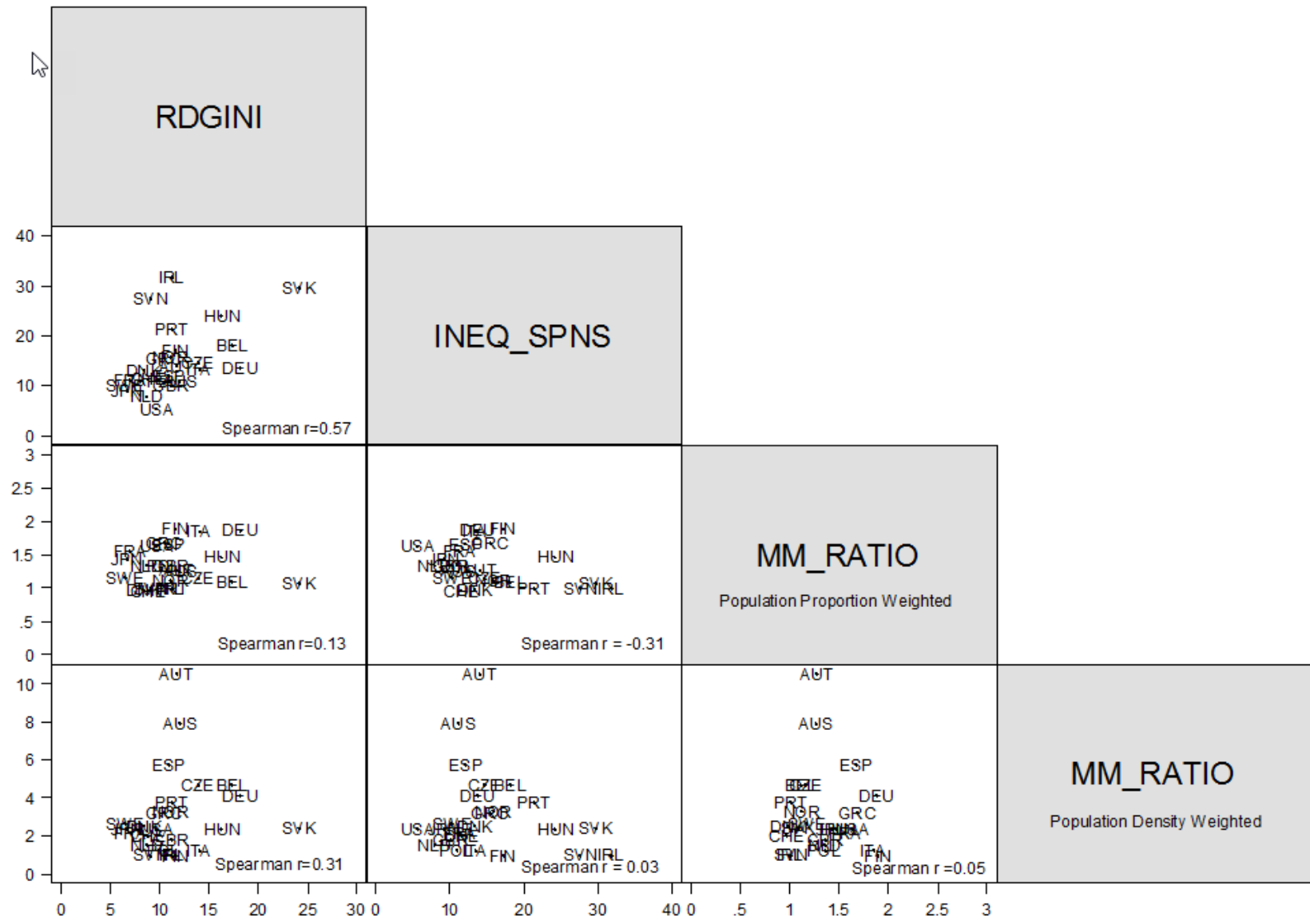
Table I9. Robust to Alternative Measures of Inter-regional Inequality

	Δ Central Government Expenditure		Δ Policy Priority	
	[1]	[2]	[3]	[4]
Central Government Expenditure $t-1$	-0.261*** (0.065)	-0.387*** (0.084)		
Policy Priority $t-1$			-0.536*** (0.075)	-0.565*** (0.091)
INEQ_SPNS $t-1$	-0.250** (0.122)		-0.080** (0.037)	
MM_RATIO (Population Density Weighted) $t-1$		0.835** (0.374)		0.213** (0.093)
Population (Logged) $t-1$	-6.864*** (1.824)	-9.367*** (2.126)	1.479*** (0.464)	1.518*** (0.390)
Dependent Population (% Total) $t-1$	-0.116 (0.201)	0.451** (0.221)	-0.260*** (0.078)	-0.180** (0.085)
Economic Globalization Index $t-1$	-0.265*** (0.043)	-0.263*** (0.062)	-0.001 (0.013)	0.002 (0.011)
PPP Converted GDP Per Capita (Logged) $t-1$	14.210*** (3.041)	15.798*** (3.295)	-1.551** (0.787)	-2.184*** (0.636)
Leftist Power in Government $t-1$	-0.005* (0.003)	0.004 (0.003)	-0.001 (0.001)	0.001 (0.001)
PR Electoral System $t-1$	1.407* (0.800)	0.757 (0.714)	-0.137 (0.399)	-0.346 (0.418)
Parliamentary System $t-1$	0.246 (1.135)	0.162 (1.108)	-0.087 (0.204)	-0.059 (0.187)
Non-federalism & non-bicameralism $t-1$	5.241*** (1.523)	11.879*** (2.347)	1.864*** (0.442)	1.914*** (0.469)
No. of Observations	423	354	346	332
Countries	24	24	24	24
Country FE	Yes	Yes	Yes	Yes
R-squared	0.286	0.322	0.445	0.413
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables and country-fixed effect dummies are not reported. The constant term is suppressed.
3. Significant at ***p<0.01, **p<0.05, *p<0.1, for two-tailed tests.

Figure J10. Correlation Matrix, Sample Mean



7 Alternative Measures of Government Expenditure

Central government expenditure is the most appropriate locus of analysis for examining the challenges to government centralization. However, the dynamics we analyze may also be relevant to other levels of government expenditure, with important implications for the size of the state. In particular, related theories (Beramendi 2012; Bolton and Roland 1997) suggest that high levels of inter-regional inequality may not necessarily inhibit government expenditure overall, but limit the willingness of regions to delegate resources to the central government. Accordingly, inter-regional inequality might be associated with decentralization in government spending. Inter-regional inequality might also indicate that many regions have limited tax bases, which may reduce state and local allocations in the absence of inter-regional transfers.

7.1 General and Local Government Expenditure

In Table K11, we examine these propositions by using our full model specification to predict changes in general government expenditure (central plus state and local expenditure) and local expenditure (state plus local expenditure). We find that inter-regional inequality (RDGINI) is associated with lower growth in both general government expenditure and state/local expenditure. The significance level is robust ($p < 0.01$) for state/local government expenditure but weaker ($p < 0.15$) for general government expenditure. This weaker result for general government expenditure is potentially compatible with arguments suggesting inter-regional inequality encourages more productive regions to spend within their own region. Thus, the effects of inter-regional inequality on general spending would be muted because the polarization effect works primarily through central government expenditure.

7.2 Changes in Government Spending by Economic Transactions

When publishing central government spending data, the GFS breaks government expenditures into two types of expense transactions: by the functions of government expenditure (COFOG), e.g., health care, education, and defense, or by the economic characteristics of government expenditure (ECOG), e.g., goods and services vs. transfers. The COFOG method classifies government expenditure by the policy purpose served while the ECOG approach identifies government spending by current or capital

transactions.² In the main text we use COFOG calculations. We show that our results hold in the ECOG specification in the right side panels of Table K11.

²Spending data available after the GFS's major data revision in 1986 are formatted in cash or non-cash values. When a country reported both cash and non-cash values, although rare in our data, the cash value was taken.

Table K11. Robust to Alternative Measures for Change in Government Expenditure

	By Government Functions		By Economic Transactions	
	Δ General [1]	Δ State/Local [2]	Δ Central [3]	Δ Central [4]
General Government Expenditure $t-1$	-0.233*** (0.036)			
Local Government Expenditure $t-1$		-0.121*** (0.019)		
Central Government Expenditure by Economic Transaction $t-1$			-0.247*** (0.039)	-0.289*** (0.046)
RDGINI $t-1$	-0.040† (0.027)	-0.105*** (0.032)	-0.294*** (0.096)	
MM_RATIO (Population Proportion Weighted) $t-1$				3.290** (1.670)
Population (Logged) $t-1$	-0.778 (0.945)	-3.717** (1.670)	-1.967 (3.825)	10.848** (4.243)
Dependent Population (% Total) $t-1$	0.134*** (0.039)	0.164*** (0.040)	-0.100 (0.120)	0.030 (0.120)
Economic Globalization Index $t-1$	-0.025*** (0.009)	0.016* (0.009)	-0.262*** (0.029)	-0.198*** (0.033)
PPP Converted GDP Per Capita (Logged) $t-1$	2.027*** (0.453)	1.195*** (0.399)	13.858*** (1.995)	9.704*** (2.096)
Leftist Power in Government $t-1$	0.001 (0.001)	-0.001 (0.001)	-0.001 (0.002)	0.004* (0.002)
PR Electoral System $t-1$	0.122 (0.155)	-0.365* (0.203)	1.560*** (0.565)	0.833** (0.414)
Parliamentary System $t-1$	0.042 (0.182)	1.041*** (0.198)	0.433 (0.751)	-0.084 (0.709)
Non-federalism & Non-bicameralism $t-1$	0.518 (0.359)	1.393*** (0.458)	5.409*** (1.258)	8.825*** (2.499)
No. of Observations	403	379	383	326
Countries	24	24	24	24
Country FE	Yes	Yes	Yes	Yes
R-squared	0.457	0.399	0.469	0.500
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables as well as country fixed effect dummies, along with the constant term, are not reported.
3. For all models, observations with residuals greater than 1.5 standard deviations from the sample mean are excluded from the estimates.
4. Significant at ***p<0.01, **p<0.05, *p<0.1, †p<0.15, for two-tailed tests.

8 Sample Selection and Sensitivity

Coefficient estimates and statistical significance can be affected by influential individual observation outliers or outlier country cases. In our sample, certain countries during and after the Great Recession (2008-2009), especially Ireland, dramatically changed their government spending levels to adapt to fiscal crisis. Accordingly, we ran our models by excluding influential individual observations in Table L12. Influential observations are defined as having residuals greater than two standard deviations from the sample mean. We also excluded each country one by one in a panel jackknife analysis in Figure M13. We find that our results are robust to both specifications.

In Table N14, we reorganized our data into a country, legislative session panel structure. The unit of country-years is transformed into country-specific intervals of national legislative assemblies. We identified these country-specific intervals using national parliamentary (lower house) election dates that we obtained from the Comparative Political Data Set (Armingeon et al. 2013). We found a total of 162 parliamentary assemblies across 24 OECD countries in the period between 1991 and 2011. All measures including policy priority and inter-regional inequality (as well other controls included in the models) are collapsed to an average value per legislature for each country. In these models, the dependent variable is the change in the policy priority between legislative sessions. The reported table shows results very consistent with those found for our country year panel. We demonstrate the result across a range of different assumptions about the error structure.

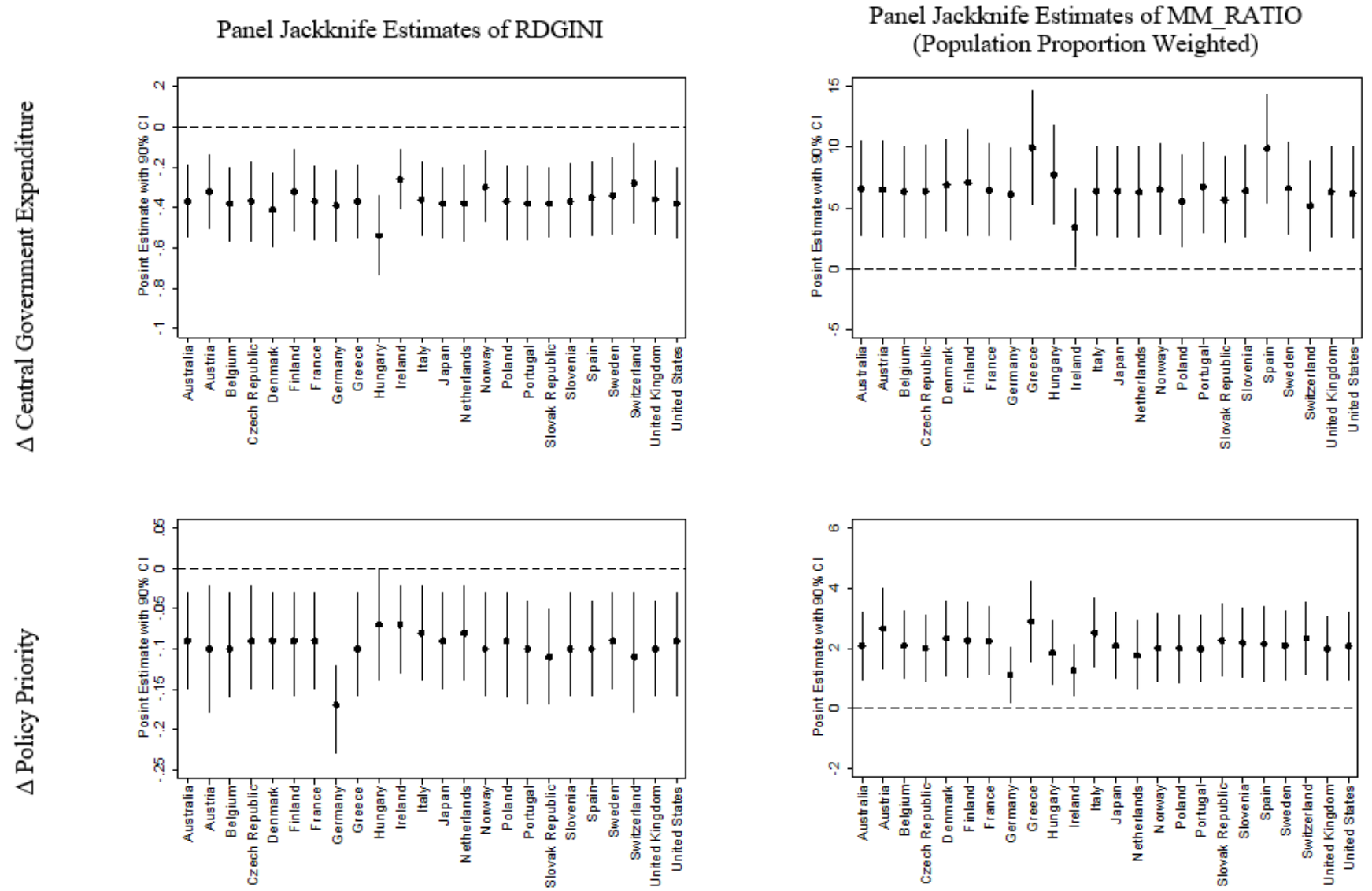
Table L12. Robust to Individual Country-Year Outliers

	Δ Central Government Expenditure		Δ Policy Priority	
	[1]	[2]	[3]	[4]
Central Government Expenditure $t-1$	-0.181*** (0.031)	-0.255*** (0.041)		
Policy Priority $t-1$			-0.464*** (0.033)	-0.470*** (0.043)
RDGINI $t-1$	-0.237** (0.099)		-0.079*** (0.023)	
MM_RATIO (Population Proportion Weighted) $t-1$		3.974** (1.823)		1.115** (0.451)
Population (Logged) $t-1$	-7.808** (3.612)	9.009** (4.455)	-0.284 (1.038)	2.829** (1.147)
Dependent Population (% Total) $t-1$	-0.042 (0.105)	0.287*** (0.111)	-0.110*** (0.042)	-0.115*** (0.043)
Economic Globalization Index $t-1$	-0.180*** (0.025)	-0.099*** (0.031)	0.014*** (0.005)	0.020*** (0.006)
PPP Converted GDP Per Capita (Logged) $t-1$	9.520*** (1.725)	6.381*** (1.804)	-1.668*** (0.413)	-2.842*** (0.497)
Leftist Power in Government $t-1$	-0.002 (0.002)	0.003 (0.002)	-0.000 (0.001)	0.000 (0.001)
PR Electoral System $t-1$	0.742 (0.598)	0.753 (0.489)	-0.828*** (0.166)	-0.504** (0.230)
Parliamentary System $t-1$	0.639 (0.776)	-0.206 (0.689)	-0.027 (0.178)	-0.015 (0.162)
Non-federalism & Non-bicameralism $t-1$	4.063*** (1.125)	-3.027 (2.599)	0.626 (0.664)	-2.202*** (0.662)
No. of Observations	384	329	317	302
Countries	24	24	24	24
Country FE	Yes	Yes	Yes	Yes
R-squared	0.383	0.450	0.627	0.591
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment.
2. Temporary adjustment effects (Δ term) of time-varying independent variables as well as country fixed effect dummies, along with the constant term, are not reported.
3. Significant at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ for two-tailed tests.
4. Limited samples (residuals greater than 1.5 standard deviations are excluded from the analysis). The results remain robust when estimates are adjusted for two standard deviations.

Figure M13. Robust to Country Sample Section Bias



Notes: Estimates based on the full model specifications: Table 1 (Models [4], [8]) and Table 2 (Models [12], [16]). All coefficient estimates are statistically significant at the $p < 0.1$ level for one-tailed tests. Panel jackknife analysis repeats model estimation by omitting countries one by one.

Table N14. Robust to Country, Legislative Session Panel Data

Dependent variable: Δ Policy Priority (first difference by averaged value per legislature)	Robust standard errors		Robust standard errors, contemporaneously cross-sectionally correlated, PSAR(1)		Robust standard errors, cross-sectionally dependent	
	[1]	[2]	[3]	[4]	[5]	[6]
Policy Priority $t-1$	-0.670*** (0.051)	-0.752*** (0.052)	-0.738*** (0.074)	-0.812*** (0.066)	-0.744*** (0.046)	-0.822*** (0.049)
RDGINI $t-1$	-0.103*** (0.030)		-0.114* (0.060)		-0.124* (0.071)	
MM_RATIO $t-1$		1.148** (0.546)		1.728*** (0.621)		1.975*** (0.665)
Population (Logged) $t-1$	-0.696 (1.207)	1.859 (1.208)	-0.273 (1.892)	4.079*** (1.449)	-0.747 (1.463)	3.695*** (0.901)
Dependent Population (% Total) $t-1$	-0.299*** (0.054)	-0.302*** (0.055)	-0.302*** (0.088)	-0.347*** (0.080)	-0.307*** (0.040)	-0.358*** (0.049)
Economic Globalization Index $t-1$	0.017** (0.007)	0.029*** (0.009)	0.012 (0.013)	0.026** (0.011)	0.015 (0.017)	0.029* (0.017)
PPP, GDP per capita (Logged) $t-1$	-1.439*** (0.421)	-2.716*** (0.576)	-1.280 (0.886)	-3.469*** (0.757)	-1.462* (0.869)	-3.766*** (0.700)
Leftist Power in Government $t-1$	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.002 (0.001)
PR $t-1$	-0.127 (0.606)	0.147 (0.610)	-0.125 (0.496)	0.322 (0.542)	-0.076 (0.398)	0.399 (0.415)
Parliamentary $t-1$	36.592** (16.923)	7.016 (15.824)	14.072 (14.159)	-17.085 (10.645)	17.906* (10.090)	-9.095 (6.611)
Non-federalism & non-bicameralism $t-1$	-19.595*** (7.262)	-8.140 (6.753)	0.813 (2.250)	6.636** (2.643)	-1.297 (1.014)	-2.771*** (0.598)
No. of Observations	98	97	98	97	98	97
Countries	24	24	24	24	24	24
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel Specific AR1	No	No	Yes	Yes	No	No
R-squared	N/A	N/A	0.836	0.846	0.7444	0.768
Prob > Chi-squared (F-statistics)	0.000	0.000	0.000	0.000	(0.000)	(0.000)

Notes:

1. We report the linear panel model estimates (using “xtgls,” “xtpcse,” and “xtsc” in Stata commands).

2. Significant at ***p<0.01, **p<0.05, *p<0.1 for two-tailed tests.

3. The constant terms are suppressed to avoid more than one country dummies being collapsed into the common reference group.

9 Level Results and Instrumental Variables Analysis

In our empirical modeling we test the effects of inter-regional inequality on *changes* in government spending as the best way to manage concerns with endogenous correlation of errors between these two variables. Analysis of change is also the best way to capture the effects of preference polarization (Franzese 2010).

Nonetheless, some readers may wonder whether the results hold for the level of central expenditure as well as the change. In Table O15[1] we show a fixed effects regression with 5 year non-overlapping periods averaged data predicting levels of government spending with the RDGINI variable. We find a negative effect on the level of central expenditure consistent with our main finding.

The fixed effect regression may suffer from endogeneity because central government expenditure may affect levels of inter-regional inequality. Accordingly, we also estimate the model from the fixed effects regression using exogenous instrumental variables. These instruments include the dispersion of points earned by region-based clubs in the top-level national soccer league (data sources listed in Table C3). We argue that inter-regional inequality should be reflected in differences in the relative success of region-based soccer clubs as measured by their points (a calculation based on wins, points scored, and win differentials). The lower the dispersion in points among the soccer clubs, the more competitive is the play within the league.

This variable is associated with regional productivity through localized funding. A long tradition in sports economics has shown that team success is linked to the regional tax base (Vrooman 1995). Moreover, these soccer points should be theoretically unrelated to central government spending except through inter-regional inequality.³ To strengthen our instrument, we include a measure in which we substitute the inter-regional inequality scores of the geographically closest country in our sample (measured in distance between capital cities). We suggest that nearby countries are likely to

³Region-level government expenditure is possibly related to soccer team success, such as region-based funding for stadiums that attract fans and revenue that can be invested in the team. The direct differential effect of *central* government expenditure on specific region-level soccer teams is less plausible.

have comparable economic geography that should result in similar regional economic profiles, and accordingly, similar inter-regional inequality scores. Government expenditure of a nearby country is not expected to directly affect inter-regional inequality scores of the other country.

Our first stage results show both the coefficient of variation in soccer league points and our proximate country instrument measures are jointly significant ($p\text{-value} < 0.05$) in the first-stage model predicting effects on the level of central government spending measured in non-overlapping 5 year averages (between 1991 and 2010). This shows that our instruments are not weak by this estimate but slight inflation of the coefficient estimates suggest the measures are weak overall. Accordingly, we use the JIVE estimator that limits bias in instrumental variables estimations with weak instruments (Hahn, Hausman and Kuersteiner 2004). The coefficient estimates should be read with caution, but the statistical significance and direction are expected to be accurate. In the second stage results, as shown in Table O15[2], we find again that inter-regional inequality (instrumented) is significantly and negatively correlated with government spending.

Table O15. The Level of Central Government Expenditure in 5-year Averages

	Fixed Effect Regression	IV-Regression (JIVE Estimator)
	[1]	[2]
RDGINI	-0.741* (0.411)	-1.043** (1.205)
Population (Logged)	27.076 (26.738)	18.356 (26.081)
Dependent Population (% Total)	-0.016 (0.542)	-0.350 (0.439)
Economic Globalization Index	0.206 (0.152)	0.202*** (0.185)
PPP Converted GDP Per Capita (Logged)	0.544 (6.499)	-18.295*** (6.324)
Leftist Power in Government	0.004 (0.009)	0.021 (0.035)
5-year dummy (1996-2000)	-4.786*** (1.460)	-3.690 (4.011)
5-year dummy (2001-2005)	-6.275** (2.516)	-3.818 (4.299)
5-year dummy (2006-2010)	-5.942* (3.325)	-1.480 (4.523)
Constant (1991-1995)	-421.063 (447.929)	215.856*** (75.514)
No. of Observations	93	88
Countries	24	24
R-squared	0.368	0.922
Wald (joint)	6.09***	2.33**
Weak Identification (Frist Stage F-test Statistics)		2.83*
LM Statistics (Under Identification Test)		7.094**
Hansen J Statistics (Instrument Validity Test)		1.260
<i>H₀: The instruments are uncorrelated with the error terms</i>		(p-val = 0.262)
Instrumented Variable		RDGINI
Number of Instruments for Regional Disparity		2

Notes:

1. The Fischer-type unbalanced panel unit root test against five years averaged values on central government spending is rejected at the significant level 1%.
2. Country-specific time periods= {1,...,4}, averaged over 1991-1995, 1996-2000, 2001-2005, and 2006-2010, respectively.
3. Instruments (exogenous): the coefficient of variation in points earned by regional teams in the top soccer league in that country, the RDGINI of the geographically closest country in the sample (determined by distance between capital cities).
4. Coefficient estimates shown in Model [2] use JIVE estimator (Stata code jive).
5. Controlling for heteroskedastic-consistent robust standard errors.
6. Significant at ***p<0.01, **p<0.05, *p<0.1 for two-tailed tests.

10 Social Spending Model Replication

As described in the Additional Robustness Tests section of the main text, we replicated Lupu and Pontusson's (2011) recent results predicting social expenditure in 17 OECD countries. We show in Table P16 that our RDGINI measure is associated with increased social expenditure (% of GDP) according to the four base model specifications in Lupu and Pontusson (2011).

The replication of the social spending finding serves several purposes. First, it shows the importance of the RDGINI variable to the broader literature on the political economy of redistribution that focuses on inter-personal inequality and social expenditure. Second, it demonstrates the reliability of our results by testing the performance of the RDGINI variable under alternative modeling approaches. Third, it provides external validity for our policy priority variable. The results in Table 2[13-16] suggest that greater levels of inter-regional inequality should be associated with higher individually-targeted expenditure, relative to locally-targeted spending. Social expenditure is the most prominent individually-targeted category. Thus, results showing that increased RDGINI is associated with increased social expenditure is consistent with the policy priority score results.

Table P16. Robust to Replication of Social Spending Model (Lupu and Pontusson 2011)

<i>Dependent Variable: Social Spending</i>	[1]	[2]	[3]	[4]
<i>Regional Income Inequality</i>				
RDGINI_{t-1}	0.226*** (0.071)	0.199*** (0.060)	0.218*** (0.070)	0.161*** (0.052)
<i>Household Income Inequality (Structural Dimensions)</i>				
90-50 Ratio	5.818* (3.014)	7.096*** (2.549)		
50-10 Ratio	-3.737** (1.738)	-3.381** (1.322)		
Skew (90-10 Ratio divided by 50-10 Ratio)			10.490*** (3.780)	11.387*** (3.339)
90-10 Ratio			0.947 (0.659)	1.179** (0.549)
<i>Control</i>				
GDP Growth	-0.109 (0.033)	-0.110*** (0.026)	-0.109*** (0.033)	-0.114*** (0.025)
Constant	4.988 (4.260)	2.594 (3.885)	-4.726 (5.345)	-5.630 (4.805)
Country Fixed Effects	Yes	Yes	Yes	Yes
No. of Observations	278	245	278	248
Outlier Removed†	No	Yes	No	Yes
R-squared	0.966	0.979	0.961	0.977
Countries	17	17	17	17

Notes:

1. We replicate Lupu and Pontusson's (2011) model estimates using OLS with panel corrected standard errors and the addition of our regional inequality measure.
2. Significant at ***p<0.01, **p<0.05, *p<0.1 for two-tailed tests.

11 Additional Controls

In the main text we focus on parsimonious models of government expenditure with a limited number of control variables widely identified as important in related literature. In this section we demonstrate the robustness of our key results to additional controls. As shown in Table Q17 controlling for *inter-personal inequality*, *party system nationalization*, *natural resource rents*, *legislative malapportionment*, *intra-regional inequality*, as well as *regional cost of living*, our key findings remain intact. In each row, we list the coefficient estimates and standard errors for our inter-regional inequality indicators, the number of observations, and number of countries included. The additional control variables in many cases reduce the sample size, in some cases dramatically, and in two cases limit the sample too much to calculate reasonable estimates.

Inter-personal Inequality: As discussed in the main text, some readers may worry that inter-regional inequality simply captures variation in inter-personal income inequality that happens to be regionally dispersed. We argue that, theoretically, regional dispersion of productivity represents an important political challenge to centralization if regions are relevant political units. Nonetheless, it is important to specify how our measures relate to inter-personal income inequality, and whether our results are robust to models including this variable.

In Table Q17 we show that all of our main results are robust to adding the gini coefficient of “market” household income inequality to the models. The coefficient estimates are not meaningfully changed by adding this variable, and the direction and levels of significance are stable.

Figure R18 diagrams the correlation of inter-personal inequality with the RDGINI ($r = -0.15$) and MM_RATIO ($r = 0.30$), based on cross-sectional data averaged by country from 1991-2011. Even with the full use of the cross-sectional time-series observations ($N=502$), neither variable is highly correlated with inter-personal inequality ($r = -0.12$, $r = 0.27$). The RDGINI, in particular, is correlated at a very low level in the OECD sample. This figure suggests that inter-regional inequality is a distinct distributive concept.

Party System Nationalization: Inter-regional inequality may matter for central government expenditure through its effects on coordination within the party system (Beramendi 2012). If inter-regional

inequality creates heterogeneity within the national parties that encourage party territorialization or regionalization, we may see limitations on expansion of central government expenditure. We do not dispute that this is a potential causal pathway by which inter-regional inequality influences government spending (Simmons et al. 2016; Crisp, Olivella and Potter 2013). However, we demonstrate that our results are robust even when controlling for levels of party system nationalization in Table Q17.

Natural Resource Rents: Inter-regional inequality in economic productivity may be caused by some regions having access to natural resources. Natural resource extraction may alter the centralization challenge, especially if national governments take the bulk of profits. We show that our results are robust to including a calculation of natural resource rents.

Legislative Malapportionment: Our conceptual framework assumes that legislative votes are proportional to population. However, many countries veer substantially away from the population proportionality we assume. Legislative malapportionment is high in some nations, especially in territorial upper chambers (Samuels and Snyder 2001). Legislative malapportionment is very relevant to political decision-making on government spending because it influences the relative weight of regions' and individuals' voices. In particular, most legislative malapportionment disproportionately increases the value of the votes for less populated regions, many of which are less productive. Legislative malapportionment may under these circumstances increase the possibility that we see policy priorities that are redistributive across regions (especially local public goods categories such as inter-regional transfers). Malapportionment may be a causal pathway through which inter-regional inequality influences political outcomes. We demonstrate in Table Q17 that our main results are robust to including a measure of legislative malapportionment (combined upper and lower houses). These results should be read with some caution because malapportionment data is mostly static and is not available for all countries in the sample. This limits the sample, particularly for the policy priorities dependent variable.

Intra-Regional Inequality: As described in Bolton and Roland (1997) and Beramendi (2012), regional preferences may also be shaped by individuals' economic position relative to the median within their region and their region's internal distribution of income. We calculated Theil's T statistic of household market income at the regional level using the sub-sample of our countries available from the Luxembourg Income Study (LIS). The sparse data distribution required us to use the previous

value carried over from the most recent available year (technique described in Lupu and Pontusson (2011)). We find a negative relationship between intra-regional inequality (Theil statistic) and changes in central government spending; this relationship is significant in the model including the MM_RATIO variable but insignificant in the larger sample model that includes the RDGINI variable. Our main results for the central government expenditure dependent variable for RDGINI and MM_RATIO are robust to the inclusion of this additional control. The coefficient estimates and standard errors, sample size, and number of countries are listed in Table Q17. The sample was not large enough to reasonably estimate results for the policy priority dependent variables.

Cost of Living Adjusted Inter-regional Inequality: A relevant concern is that population-weighted regional GDP overestimates inequality because rich regions also have high costs of living, thus their standards of living are not so divergent from poorer regions. In the first place, we are concerned with the broader concept of economic productivity (in addition to standard of living) so GDP is not obviously affected by cost of living in the same way as income. We recalculate the RDGINI using region GDP per capita adjusted by a housing cost deflator available from the LIS (Gennaioli et al. 2014). The cost of living-adjusted RDGINI shows very similar results to our main findings, shown in Table Q17.

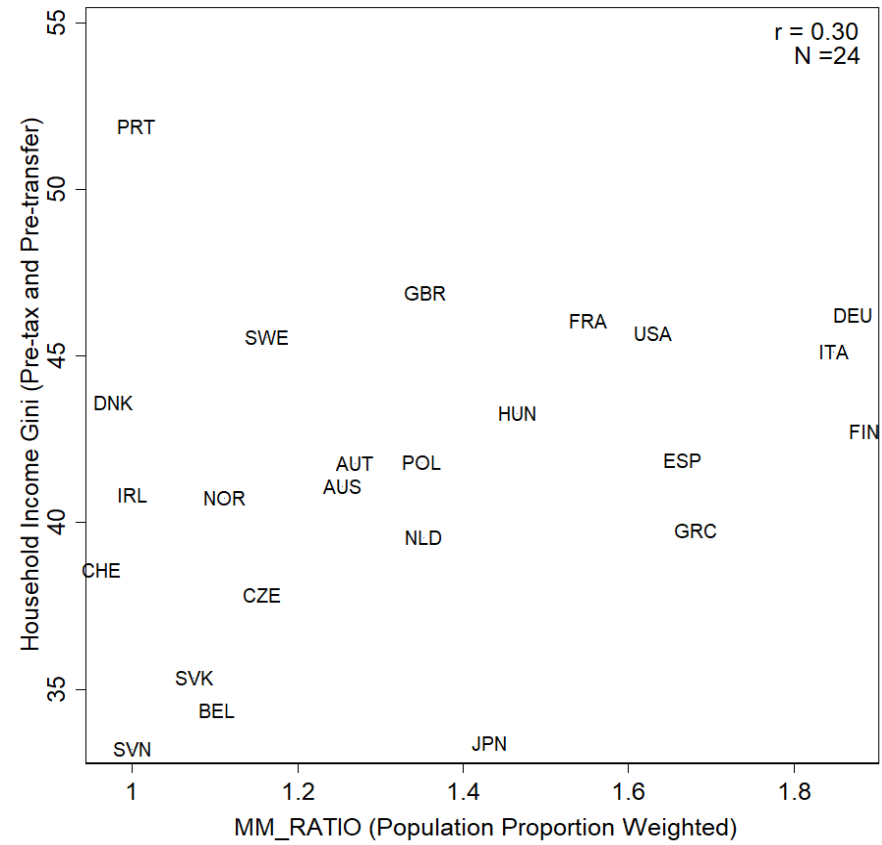
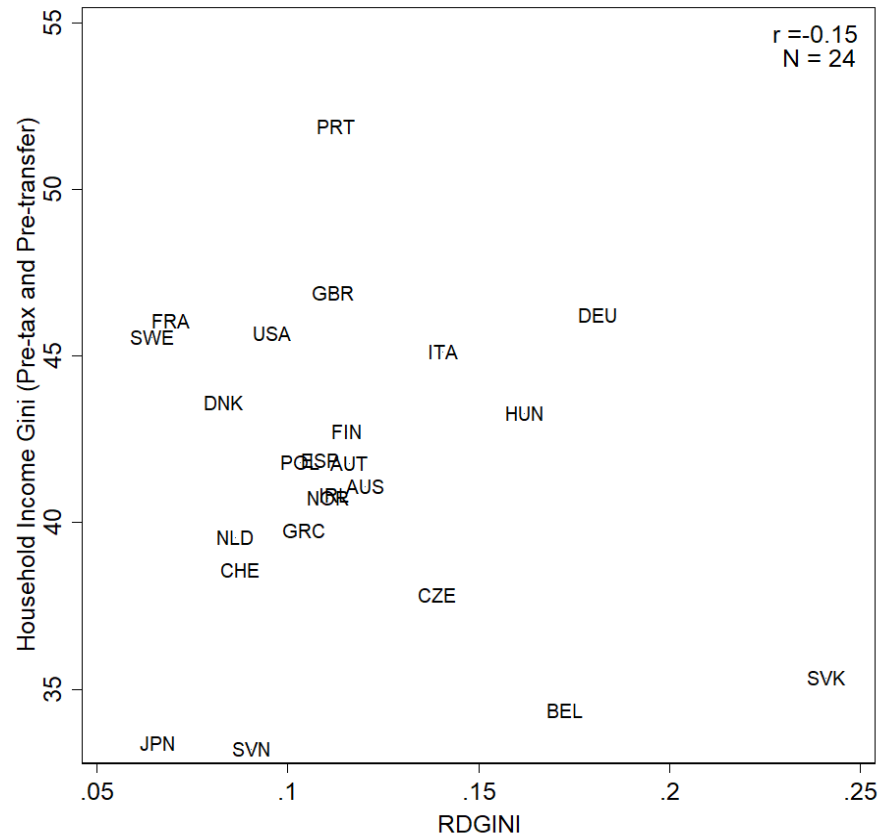
Table Q17. Robust to Additional Controls, OECD Nations (1991-2011)

	Effect of Inter-regional Inequality on Δ Central Government Spending		Effect of Inter-regional Inequality on Δ Policy Priorities	
	RDGINI	MM_RATIO (Population Proportion Weighted)	RDGINI	MM_RATIO (Population Proportion Weighted)
<i>Additional Control:</i>				
Household Income Gini (Pre-tax and pre-transfer)	-0.364** (0.145)	5.820** (2.928)	-0.096** (0.049)	2.255*** (0.898)
	N=423 Countries=24 R ² =0.30	N=354 Countries=24 R ² =0.34	N=346 Countries=24 R ² =0.44	N=332 Countries=24 R ² =0.42
Party System Nationalization (Country level)	-0.334** (0.141)	4.585[†] (2.825)	-0.106* (0.055)	2.287** (0.975)
	N=398 Countries=22 R ² =0.29	N=329 Countries=22 R ² =0.34	N=323 Countries=22 R ² =0.43	N=309 Countries=22 R ² =0.41
Natural Resource Rents (% GDP)	-0.349*** (0.141)	6.470** (2.969)	-0.097** (0.048)	2.130** (0.903)
	N=406 Countries=24 R ² =0.29	N=342 Countries=24 R ² =0.34	N=335 Countries=24 R ² =0.44	N=321 Countries=24 R ² =0.42
Legislative Malapportionment (Upper + Lower House, Logged)	-0.594*** (0.170)	7.436** (3.327)	-0.059 (0.056)	1.673* (0.902)
	N=353 Countries=20 R ² =0.29	N=294 Countries=20 R ² =0.35	N=287 Countries=20 R ² =0.44	N=273 Countries=20 R ² =0.42
Intra-regional Inequality (Theil Index from LIS)	-0.336* (0.174)	8.339** (3.467)	Insufficient Data	Insufficient Data
	N=319 Countries=18 R ² =0.34	N=268 Countries=18 R ² =0.36		
Regional Cost of Living (Housing Cost Deflator from LIS)	-0.433** (0.181)	1.480** (0.579)	Insufficient Data	Insufficient Data
	N=270 Countries=16 R ² =0.15	N=221 Countries=16 R ² =0.19		

Notes:

1. All models based on full specifications from Table 1 (Models [4], [8]) and Table 2 (Models [12], [16]).
2. Due to data availability, we use an unrestricted model for the regional cost of the living specification and cannot estimate the policy priorities score. Regional cost of living is an adjusted measure of the RDGINI or MM_RATIO.
3. The number of countries varies across models depending on data availability. Due to sparse data distribution on the Theil index, we did not have enough observations to estimate changes in the policy priorities values.
4. Significant at ***p<0.01, **p<0.05, *p<0.1, [†]p<0.15, for two-tailed tests.

Figure R18. Inter-regional Inequality and National Household Income Inequality(Pre-tax, Pre-transfer)



12 Models Including Dispersion and Skew

In our main empirical specifications, we focus on the independent relationship between dispersion and skew, and government spending. In this section we include specifications that include both dispersion and skew in the same models. As stated in the main text, dispersion and skew are not highly correlated in our sample (Spearman's correlation = 0.16). Thus, we do not expect our results to be meaningfully affected by including both variables in the same model. In Table S19, we show that the direction and significance of our estimates for each independent variable are maintained in these models, and the size of the coefficient is not substantially changed.

Table S19. Robust to Models Including Dispersion and Skew

	Δ Central Government Spending		Δ Policy Priority	
	Full	Full	Full	Full
	[1]	[2]	[3]	[4]
Central Government Spending $t-1$	-0.397*** (0.068)	-0.399*** (0.068)		
Policy Priority $t-1$			-0.566*** (0.067)	-0.565*** (0.067)
RDGINI $t-1$	-0.324** (0.153)	-0.335** (0.153)	-0.087* (0.045)	-0.086* (0.045)
MM_RATIO (Population Proportion Weighted) $t-1$	5.514* (3.079)	6.024* (3.079)	2.003** (0.788)	1.938** (0.778)
Population (Logged) $t-1$	-7.944*** (1.651)	-7.652*** (1.668)	2.078*** (0.490)	2.028*** (0.484)
Dependent Population (% Total) $t-1$	0.264 (0.210)	0.152 (0.231)	-0.304*** (0.073)	-0.288*** (0.073)
Economic Globalization Index $t-1$	-0.224*** (0.062)	-0.238*** (0.063)	0.008 (0.013)	0.008 (0.013)
PPP Converted GDP Per Capita (Logged) $t-1$	14.210*** (3.210)	14.154*** (3.208)	-2.707*** (0.854)	-2.671*** (0.850)
Leftist Power in Government $t-1$	0.000 (0.004)	0.001 (0.004)	-0.000 (0.001)	-0.000 (0.001)
PR Electoral System $t-1$		1.164 (0.842)		-0.129 (0.411)
Parliamentary System $t-1$		0.191 (1.087)		-0.038 (0.211)
Non-federalism & Non-bicameralism $t-1$		5.991*** (1.686)		2.373*** (0.604)
No. of Observations	354	354	332	332
Countries	24	24	24	24
Country FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.255	0.253	0.350	0.346
Prob > Chi-squared	0.000	0.000	0.000	0.000

Notes:

1. ECM estimates using OLS with panel corrected standard errors and panel specific AR1-adjustment. Panel-level heteroskedastic errors are controlled.
2. The subscript t captures the previous five-year averaged value (except centripetal democracy indicators).
3. Temporary adjustment effects (Δ term) of time-varying independent variables, country dummies are reported. The constant term is suppressed.
4. MM RATIO in five-year moving averages is unavailable before 1995.
5. Significant at *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$, for two-tailed tests.

References

- Alesina, Alberto and Ekaterina Zhuravskaya. 2011. "Segregation and the Quality of Government in a Cross Section of Countries." *American Economic Review* 101(5):1872–1911.
- André, Audrey and Sam Depauw. 2016. "Looking Beyond the District." *International Political Science Review* (Forthcoming).
- Armingeon, Klaus, Christian Isler, Laura Knöpfel, David Weisstanner and Sarah Engler. 2013. "Comparative Political Data Set 1960–2013." *University of Berne*.
- Beramendi, Pablo. 2012. *The Political Geography of Inequality*. Cambridge: Cambridge University Press.
- Bochsler, Daniel. 2010. "Measuring Party Nationalisation." *Electoral Studies* 29(1):155–168.
- Bolton, Patrick and Gerard Roland. 1997. "The Breakup of Nations." *The Quarterly Journal of Economics* 112(4):1057–1090.
- Caramani, Daniele. 2004. *The Nationalization of Politics*. Cambridge University Press.
- Crisp, Brian, Santiago Olivella and Joshua Potter. 2013. "Party-System Nationalization and the Scope of Public Policy." *Comparative Political Studies* 46(4):431–456.
- de Miguel, Carolina. 2017. "The Role of Electoral Geography in the Territorialization of Party Systems." *Electoral Studies* 47:67–83.
- Desmet, Klaus, Ignacio Ortuño-Ortín and Shlomo Weber. 2017. "Peripheral Diversity." *Social Choice and Welfare* (Forthcoming).
- Dreher, Axel. 2006. "Does Globalization Affect Growth?" *Applied Economics* 38(10):1091–1110.
- Fiva, Jon H and Askill H Halse. 2016. "Local Favoritism in At-large Proportional Representation Systems." *Journal of Public Economics* 143:15–26.
- Franzese, Robert J. 2010. "The Multiple Effects of Multiple Policymakers." *Rivista italiana di scienza politica* 40(3):341–370.
- Franzese, Robert J and Irfan Nooruddin. 2004. "The Effective Constituency in (Re) Distributive Politics." Unpublished manuscript.
- Gennaioli, Nicola, Rafael La Porta, Florencio Lopez De Silanes and Andrei Shleifer. 2014. "Growth in Regions." *Journal of Economic growth* 19(3):259–309.
- Gerring, John and Strom C Thacker. 2008. *A Centripetal Theory of Democratic Governance*. Cambridge: Cambridge University Press.
- Hahn, Jinyong, Jerry Hausman and Guido Kuersteiner. 2004. "Estimation with Weak Instruments:

- Accuracy of Higher-order Bias and MSE Approximations.” *The Econometrics Journal* 7(1):272–306.
- Hooghe, Liesbet, Gary Marks, Arjan H Schakel, Sandra Chapman Osterkat, Sara Niedzwiecki and Sarah Shair-Rosenfield. 2016. *Measuring Regional Authority: A Postfunctionalist Theory of Governance*. Vol. 1 Oxford: Oxford University Press.
- Jacoby, William G and Sandra K Schneider. 2009. “A New Measure of Policy Spending Priorities in the American States.” *Political Analysis* 17(1):1–24.
- Latner, Michael and Anthony McGann. 2005. “Geographical Representation under Proportional Representation.” *Electoral Studies* 24(4):709–734.
- Lessmann, Christian. 2009. “Fiscal Decentralization and Regional Disparity.” *Environment and Planning A* 41(10):2455–2473.
- Lupu, Noam and Jonas Pontusson. 2011. “The Structure of Inequality and the Politics of Redistribution.” *American Political Science Review* 105(2):316–336.
- OECD. 2016. *Fiscal Federalism 2016: Making Decentralisation Work*. Paris: OECD Publishing.
- Rehm, Philipp. 2016. *Risk Inequality and Welfare States*. Cambridge: Cambridge University Press.
- Rehm, Philipp, Jacob S Hacker and Mark Schlesinger. 2012. “Insecure Alliances.” *American Political Science Review* 106(2):386–406.
- Rogers, Melissa Z. 2015. *The Politics of Place and the Limits of Redistribution*. New York: Routledge.
- Samuels, David and Richard Snyder. 2001. “The Value of a Vote.” *British Journal of Political Science* 31(4):651–671.
- Simmons, Joel, Allen Hicken, Ken Kollman and Irfan Nooruddin. 2016. “Party System Structure and Its Consequences for Foreign Direct Investment.” *Party Politics* (Forthcoming).
- Solt, Frederick. 2016. “The Standardized World Income Inequality Database.” *Social Science Quarterly* 97(5):1267–1281.
- Spiezia, Vincenzo. 2002. “Geographic Concentration of Production and Unemployment in OECD Countries.” Unpublished manuscript.
- Vrooman, John. 1995. “A General Theory of Professional Sports Leagues.” *Southern Economic Journal* 61(4):971–990.
- Weingast, Barry R, Kenneth A Shepsle and Christopher Johnsen. 1981. “The Political Economy of Benefits and Costs.” *Journal of political Economy* 89(4):642–664.