

Interregional Inequality and the Dynamics of Government Spending

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We examine the distribution of economic productivity across subnational 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 interregional inequality also shape the allocation of centralized spending. With growing economic dispersion across regions, decision makers are more likely to fund policy categories that aid 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 interregional inequality and government policy priorities for 24 OECD countries.

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% of the average Western level prior to Reunification. In 1989, West Germany's interregional 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 subnational regions to the political economy of inequality (Be-

ramendi 2012, chap. 6). Interregional inequality, defined as unevenness in economic productivity among subnational territorial units, is an underexamined but critical factor to how we evaluate the interests of individuals in funding the central state. In this analysis, we conceptualize interregional 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

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preferences for redistribution. Subnational 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 subnational level, as strongholds for parties, or as a source of regional identities for voters. The distribution of productivity across subnational 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 interregional 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 subnational 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 (Beramendi 2012; Bolton and Roland 1997; Giuranno 2009). Our theoretical focus on and measurement of the structure of the interregional economic distribution is thus a theoretical contribution to this topic.

To examine the potential avenues of regional distributive conflict, we relate interregional 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 interregional 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 US state politics (Jacoby and Schneider 2001, 2009).

Using a sample of 24 Organization for Economic Cooperation and Development (OECD) countries from 1991 to 2011, we provide evidence that high dispersion of interregional 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 interregional 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 interregional inequality is likely to reveal potential coalitions in support of central government spending. In the empirical sections, we introduce our measures of interregional 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 regard 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 maximizing 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 affects 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 interregional 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 Noruddin 2004).

Nonetheless, interregional 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 subconstituencies. 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 that party economic appeals closely match the economic interests of locations where they receive the most votes. We suggest that the spatial concentration of votes and the corresponding incentives to appeal to those voters encourage representation of regional economic interests. Thus interregional 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 intergovernmental 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 interregional inequality grows, they 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 subpopulations.

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 interregional fiscal transfers. Productive regions would be better off if locally targeted spending were funded locally by each region (Bolton and Roland 1997). Thus, as interregional 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

1. See appendix (OA) sec. 2 for correlations between our interregional inequality measures and spatial concentration of party votes. These correlations are stronger in more centralized political institutions.

2. According to OECD data collected for 225 regions across 19 countries between 2009 and 2014, the within-region Gini index of disposable individual income is strongly correlated with per capita regional income ($r = 0.65$, $p < .05$).

3. Important caveats are necessary for this assumed preference, including that local actors may have specific reasons to oppose centraliza-

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 interregional 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 interregional 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 et al. 2002).

THE STRUCTURE OF INTERREGIONAL 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 interregional inequality (dispersion vs. 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 that 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 interregional 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 interregional inequality.

Intuitively, because more productive regions are paying a larger share of public spending through taxes, their gain from public spending decreases as interregional inequality grows. Conversely, the gains from public spending increase for the less productive regions as interregional inequality grows. Rising interregional 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 that growing interregional inequality would lead to higher levels of government spending (Giuranno 2009). We argue that spending could be higher or lower, depending on what the structure of interregional 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

tion that can overshadow preferences for central spending, such as regional identity or threat to the local status quo (Alston and Ferrie 1999).

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

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

must agree on some distribution of spending. As interregional 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 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 interregional 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 interregional 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: INTERREGIONAL 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 re-

gional interests should also favor shifts in spending toward locally targeted spending.

H1 (Dispersion). As interregional 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 to 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 interregional inequality to impact preferences for government spending (Mahler 2002). Relative to developing countries, OECD nations have lower interregional 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 interregional 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: Interregional 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 interregional productivity, and (2) the mean to median ratio of population-weighted regional GDP per capita, to represent the skew of interregional productivity.

Our measures of interregional 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 subnational 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 shared fate and shared interests, we argue that this is the clearest locus of collective subnational 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 appendix (OA) section 1; appendix with sections OA1–OA12 is available online.

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 intracountry 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:

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

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:

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

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 subnational 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 the more

productive regions in these circumstances. Alternative measurements of both interregional inequality concepts are discussed in the section Additional Robustness Tests.

Figure 1 demonstrates variation in the structural configuration of interregional 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 interregional productivity in our sample. The range of per capita GDP in the Netherlands is €18,000–€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 in 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

6. The 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).

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

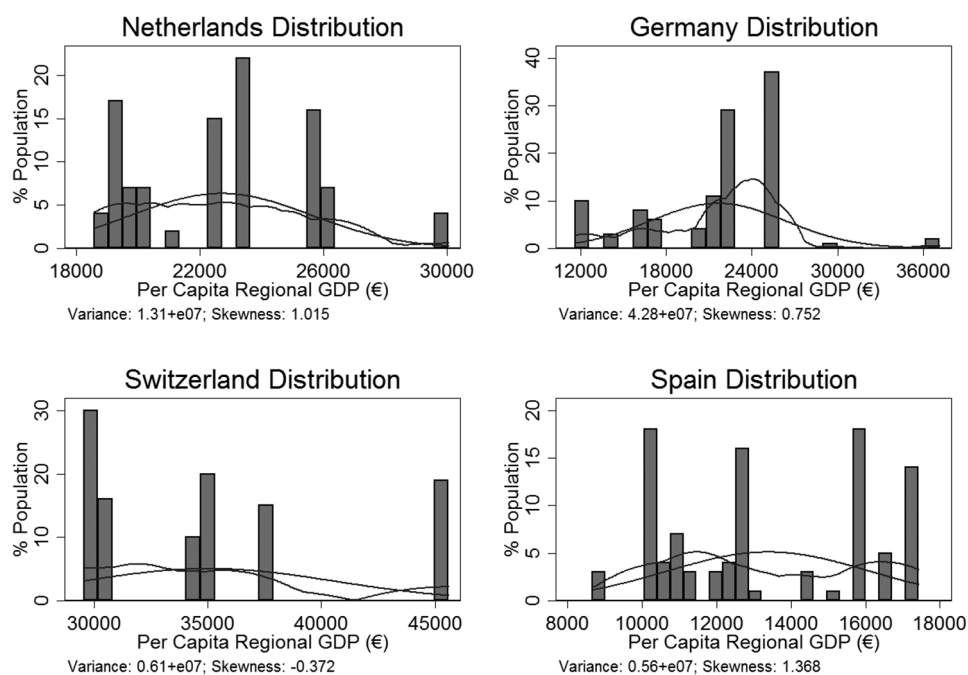


Figure 1. Dispersion and skew: Mean distributions of interregional productivity (1991–2011)

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

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 are

8. Analysis of the interaction between 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 of examining this interaction place it beyond the scope of this analysis.

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

not available by region for a large number of nations for a long period of time. For the subsample 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 interregional 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 interregional inequality, it should bias against our results. That is, centralized spending is expected to reduce interregional disparities, at least in the OECD cases. As Tanzi (2000, 13) 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." Accordingly, we argue that using post-tax and transfer regional GDP data should be a "hard test" for our hypothesis because it mutes interregional inequality.

Dependent variables: Size and allocation of central expenditure

Our analysis examines two aspects of government spending: (1) how much governments spend and (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 to 2011. We focus on central government spending as the locus of governments' regional redistribution, either directly through 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 International Monetary Fund'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 subpopulations (what we call individually targeted) versus collective goods (we identify as local public goods) was assessed by Jacoby and Schneider (2009, 6) for the US states using "recognizable patterns in the relative positions of the policy and state points." We replicate this technique using expenditure data from 24 OECD countries from 1991 to 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 low-income or vulnerable subpopulations, these types of spending have not been examined in most studies of inequality, apart from their contribution to total spending.

10. For 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.

However, locally targeted goods are redistributive across territories as more affluent regions subsidize local resources (including through interregional 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 is 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 positive policy point values on the left panel of figure 2, including public order and

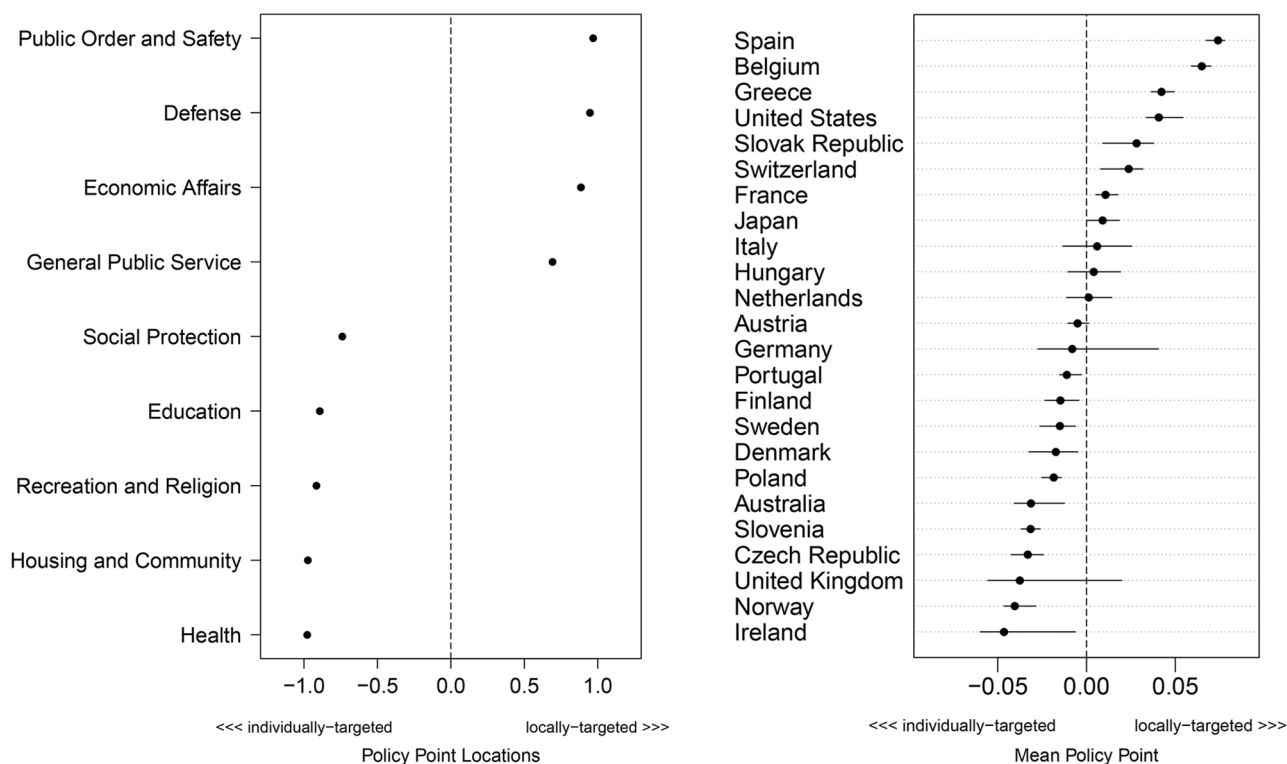


Figure 2. Country policy priorities, 24 OECD nations. Data points calculated using Jacoby and Schneider’s 2009 spatial unfolding analysis of policy priorities. Dots on the left panel indicate the mean (1991–2011) for all countries in the sample. Dots on the right panel are the mean policy priority value 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.

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 interregional 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 interregional 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 and 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 interregional inequality squarely into an area of concern for policy makers. 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 et al. (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 of 65 or under the age of 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 include Leftist Power because partisan theories suggest that leftist parties would seek to increase government spending and individually targeted allocations in OECD nations. To capture leftist influ-

ence, 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 Nonfederal/Nonbicameral 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 interpersonal 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 interregional inequality and central expenditure is a long-term, dynamic process. Rather than approaching the empirical analysis as a series of correlations relating interregional inequality to levels of spending, we demonstrate the importance of interregional 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 interregional 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 interregional inequality in year $t - 1$. We take steps to manage challenges of time-series cross-sectional data. Government spending data typically suffer from nonstationarity, which can bias results in traditional ordinary least squares (OLS) estimations of yearly data. The ECM approach reduces problems of nonstationarity by transforming the dependent variable into a stationary change term (Δ).¹² We estimate:

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

12. The null hypothesis of unit root, based on the Fisher-type test, is rejected at $p < .01$.

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

where Δy_{it} is a first-order change of central government spending or a change of policy priority score in country i ($1, \dots, 24$). We denote X as a vector of independent variables that predicts the size and allocation of government spending. The key parameter estimates are expressed as a series of β with the subscript j or k that refers to the particular independent variable, respectively. The country dummies denoted by the subscript m are also included to incorporate unmodeled country-specific factors such as political and institutional history. Note that an estimated effect of transitory adjustment in the dependent variable ($\Delta y_{i,t}$) is captured by the β_k estimate whereas it is omitted for time-invariant or slow-moving variables such as interregional 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 five years (Lupu and Pontusson 2011). To reduce contemporaneous correlation with the error term ε , we adopt a one-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 interregional productivity is associated with a reduced rate of change in central government spending. To simplify the presentation, we show only the long-run dynamics of the inde-

pendent 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 interregional inequality on changes in government spending should depend on whether the less productive regions have a strong voice in central policy. Table 1, column 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-shaped 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 that 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, columns 9–12, is significantly and 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

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

14. The Wooldridge test for no first-order autocorrelation is rejected at $p < .01$. We also tested our models with an AR(2) process and without adjustments for autocorrelation. Our results are consistent.

Table 1. Determinants of Change in Central Government Spending

	Dispersion of Interregional Productivity (RDGINI)				Skew of Interregional Productivity (MM_RATIO)			
	Base (1)	Base (2)	Base (3)	Full (4)	Base (5)	Base (6)	Base (7)	Full (8)
Central government spending _{t-1}	-.244*** (.063)	-.253*** (.064)	-.264*** (.065)	-.260*** (.065)	-.399*** (.084)	-.400*** (.085)	-.398*** (.084)	-.400*** (.084)
RDGINI _{t-1}	-.382*** (.143)	-.385*** (.143)	-.368*** (.141)	-.369*** (.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}	-.296 (.217)	-.207 (.219)	-.102 (.208)	-.177 (.210)	.259 (.224)	.376* (.219)	.377* (.220)	.258 (.224)
Economic globalization index _{t-1}	-.242*** (.038)	-.233*** (.038)	-.244*** (.039)	-.250*** (.039)	-.208*** (.060)	-.194*** (.059)	-.194*** (.059)	-.208*** (.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}	-.004 (.003)	-.005 (.003)	-.004 (.003)	-.004 (.003)	.001 (.003)	.001 (.003)	.001 (.003)	.001 (.003)
PR electoral system _{t-1}	1.571** (.771)			1.236 (.783)	1.297* (.699)			1.297* (.700)
Parliamentary system _{t-1}		.147 (1.126)		.230 (1.142)		.054 (1.040)		.071 (1.042)
Nonfederalism and nonbicameralism _{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 fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	.215	.208	.220	.219	.264	.260	.263	.261
Prob > chi-squared	.000	.000	.000	.000	.000	.000	.000	.000

Note. ECM estimates using OLS with panel corrected standard errors and panel specific AR(1) adjustment. The subscript t captures the previous five-year averaged value (except centripetal democracy indicators). Temporary adjustment effects (Δ term) of time-varying independent variables, country dummies, and the constant term are not reported. In models 5–8, MM_RATIO in five-year moving averages is unavailable before 1995. PPP = purchasing power parity.

* $p \leq .1$, for two-tailed tests.

** $p \leq .05$, for two-tailed tests.

*** $p \leq .01$, for two-tailed tests.

assume that lower growth in the relative allocation of locally targeted goods implies more weight given to individually targeted goods. In table 2, column 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 pro-

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

Table 2. Determinants of Change in Central Government Policy Priority

	Dispersion of Interregional Productivity (RDGINI)				Skew of Interregional Productivity (MM_RATIO)			
	Base (9)	Base (10)	Base (11)	Full (12)	Base (13)	Base (14)	Base (15)	Full (16)
Policy priority _{t-1}	-.534*** (.077)	-.537*** (.077)	-.537*** (.078)	-.534*** (.077)	-.579*** (.089)	-.581*** (.089)	-.580*** (.089)	-.580*** (.089)
RDGINI _{t-1}	-.094** (.048)	-.093** (.047)	-.093** (.047)	-.094** (.048)				
MM_RATIO (population proportion weighted) _{t-1}					2.095** (.892)	2.143** (.925)	2.154** (.930)	2.084** (.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}	-.267*** (.085)	-.295*** (.081)	-.295*** (.082)	-.268*** (.085)	-.258*** (.076)	-.270*** (.077)	-.270*** (.077)	-.258*** (.076)
Economic globalization index _{t-1}	.004 (.012)	.002 (.012)	.003 (.012)	.004 (.012)	.014 (.012)	.014 (.012)	.014 (.012)	.015 (.012)
PPP converted GDP per capita (logged) _{t-1}	-1.958*** (.670)	-1.997*** (.671)	-1.995*** (.669)	-1.960*** (.673)	-3.516*** (.876)	-3.567*** (.883)	-3.552*** (.874)	-3.530*** (.884)
Leftist power in government _{t-1}	-.001 (.001)	-.001 (.001)	-.001 (.001)	-.001 (.001)	-.000 (.001)	-.000 (.001)	-.000 (.001)	-.000 (.001)
PR electoral system _{t-1}	-.227 (.390)			-.226 (.390)	-.107 (.417)			-.109 (.418)
Parliamentary system _{t-1}		-.067 (.204)		-.072 (.206)		-.082 (.186)		-.086 (.189)
Nonfederalism and nonbicameralism _{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 fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	.371	.370	.372	.369	.345	.345	.347	.343
Prob > chi-squared	.000	.000	.000	.000	.000	.000	.000	.000

Note. ECM estimates using OLS with panel corrected standard errors and panel specific AR(1) adjustment. The subscript t captures the previous five-year averaged value (except centripetal democracy indicators). Temporary adjustment effects (A term) of time-varying independent variables, country dummies, and the constant term are not reported. PPP = purchasing power parity.

* $p \leq .1$, for two-tailed tests.

** $p \leq .05$, for two-tailed tests.

*** $p \leq .01$, for two-tailed tests.

cess. In the period 2003–5, the dispersion of the Dutch regions (RDGINI) increased 5.5%. In the years immediately following (2004–6), 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, columns 13–16, also present 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 1996–98 in Spain, the MM_RATIO increased, as more regions grew less productive in relative terms. During that same period, Spain renegotiated its system of interregional transfers (a category within general public services) to increase them overall (explaining the positive change in the policy priority score). As part of that agreement, the formula to allocate the transfers was reconfigured 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 interregional inequality and government spending, additional controls, alternative modeling specifications, and endogeneity concerns in our appendix. 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 et al. 2015). We took several empirical approaches to assure that 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, Ortuño-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 interregional inequality

In OA section 6, we test alternative measures of our interregional 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 2019). To address this concern, we adapted the RDGINI using the Gini coefficient formula developed by Bochsler (2010) for standardized party nationalization scores. This indicator, SSGINI, 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 square kilometer). 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 interregional 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 interregional 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 interregional inequality should be dampened in general government spending relative to central spending. In OA table K11,

we show that 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 that 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 fig. 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 five-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 and (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) interregional 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 data set, 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 interregional 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 interregional inequality independent variables. Each

model is estimated according to our full model specifications.

These results are robust to inclusion of a measure of interpersonal income inequality (the Gini coefficient of household income before taxes and transfers). A relevant concern for our study is that interregional inequality simply captures differences in household income. We show models with and without interpersonal 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 interregional inequality estimates. Weak correlations between our interregional inequality measures and interpersonal 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 that 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 interregional 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 interregional 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 (Beramendi 2012; Bolton and Roland 1997).

We focus our analysis on the logic behind a relationship between interregional 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 interregional 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 interregional inequality? Beramendi (2012) argues that 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 interregional 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 interregional 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 intraregional 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 interregional inequality is critical to evaluating the preferences for and outcomes of first dimension politics as well.

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