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To cite this article: Pablo Beramendi & Melissa Rogers (2019): Fiscal decentralization and the distributive incidence of the Great Recession, *Regional Studies*, DOI: [10.1080/00343404.2019.1652895](https://doi.org/10.1080/00343404.2019.1652895)

To link to this article: <https://doi.org/10.1080/00343404.2019.1652895>



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Fiscal decentralization and the distributive incidence of the Great Recession

Pablo Beramendi^a and Melissa Rogers^b 

ABSTRACT

This paper argues that fiscal decentralization is one important explanation for variation in distributive outcomes following the Great Recession. Using a difference-in-differences approach, it examines how fiscal decentralization mediated the link between spatial distribution, redistributive effort and interpersonal inequality in 21 Organisation for Economic Co-operation and Development (OECD) countries in the years following the Great Recession. It is found that fiscally decentralized nations saw increased interpersonal inequality and lower redistribution, but lower interregional inequality. These results are attributed here to the weaker redistributive mechanisms in fiscally decentralized nations, which increased interpersonal inequality while preserving market-driven declines in high productivity areas that temporary increased regional convergence.

KEYWORDS

fiscal decentralization; interregional inequality; interpersonal inequality; redistribution; Great Recession

JEL H71, H72, H77, I38

HISTORY Received 8 August 2018; in revised form 11 July 2019

INTRODUCTION

The Great Recession has had profound effects on the economic position of citizens around the world. In some countries, redistributive policies hastened the economic downfall of many citizens. In other cases, government stabilizers were not so strong, resulting in rising interpersonal inequality. The world's democracies confronted the crisis from very different political and institutional settings. One relevant institutional setting is the (de)centralization of fiscal policy-making: the extent to which local governments have autonomy to tax and spend. Fiscal policy is an essential tool for automatic stabilization in times of crises. Accordingly, the extent to which polities allow for these instruments to vary within their territories is likely to have important distributional implications. The nature of these implications is the focus of this paper. In a country with strong automatic income stabilizers, the impact of economic crisis on interpersonal income inequality should be minimal. With well-developed welfare states to manage personal economic hardship, crisis should weigh heavily on government coffers, and increase economic indicators such as unemployment rates, but it should not translate into significantly rising inequality. If the system of redistribution is

weak, or is substantially decentralized, however, we may see crisis alter spatial distribution within the nation.


We present a systematic analysis of how fiscal decentralization has moderated the distributive consequences of the Great Recession. The multidimensional nature of both decentralization and inequality makes the task particularly challenging. We focus on the relationship between fiscal decentralization and three interrelated aspects of distributive politics and inequality: interregional inequality, capturing the relative distance in economic fortunes between subnational territories; redistribution, the capacity of the state to reduce the gap between market and disposable income inequalities; and, finally, the scope of post-tax, post-transfer disposable income inequality. These three aspects of inequality are related to fiscal decentralization in distinct yet deeply interconnected ways.

Third, we adopt a methodological strategy designed to circumvent pervasive identification challenges of studying the impact of political institutions on economic outcomes (Przeworski, 2007). As mentioned above, the correlation between inequality and decentralization has been the object of previous scholarly efforts. Taken together, these studies suggest that causality works both ways (Beramendi, 2012; Obinger, Leibfried, & Castles, 2005; Qian & Roland,


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 Supplemental data for this article can be accessed at <https://doi.org/10.1080/00343404.2019.1652895>

1998). In a field that relies mostly on observational data driven by historical selection, the Great Recession offers a promising opportunity to examine the link between fiscal decentralization, redistribution and inequality. We treat the Great Recession as a ‘natural quasi-experiment’ that changed the distributive environment of nations for reasons that were exogenous to existing decentralization structures. Using a difference-in-differences empirical strategy, we analyse how decentralization impacted changes in interregional inequality, redistribution and interpersonal inequality across countries after 2008.

The results suggest a heterogeneous impact of fiscal decentralization on different aspects of inequality. To preview of the main findings, after the Great Recession, fiscally decentralized nations saw reduced redistributive effort to equilibrate income and disproportionate increases in interpersonal inequality. On the other hand, fiscal decentralization was associated with lower levels of interregional inequality after the Great Recession. The Great Recession had its biggest productivity effects on relatively productive, higher income regions. Thus, interregional inequality in economic productivity in fact declined in this period as growth rates in higher productivity regions fell to meet growth rates in lower productivity regions. High levels of fiscal decentralization appear to have preserved this market-driven reduction in interregional inequalities because of the weaker redistributive mechanisms that would have done more to bolster those individuals struggling in high productivity areas. Analysing interregional inequality then provides a specific mechanism (weaker risk-pooling) whereby fiscal decentralization affects overall inequality. In most studies, we cannot discern whether this relationship between fiscal decentralization and distributive outcomes is due to endogenous adoption of fiscal decentralization. In this analysis, we can examine what these institutions actually do, separable from the conditions of their original adoption. We find that fiscal decentralization on both the expenditure and revenue sides is associated with lower redistributive effort and higher interpersonal inequality once we can isolate their effects.

The paper is organized as follows. It begins by developing the theoretical argument about the differential relationship between fiscal decentralization and, respectively, interregional and interpersonal inequality. The next section then discusses our empirical strategy as well as the measurement and estimation choices. Thereafter, the paper discusses the core findings and points to future lines of work.

THE LOGIC: FISCAL DECENTRALIZATION AND MULTIDIMENSIONAL INEQUALITY

Premises

The premises underpinning our theoretical approach follow directly from previous work in the political economy of decentralization and economic geography. Our analysis of the distributional impact of the Great Recession builds on and expands these contributions.

First, it is important to start with a brief reminder from the subfield of inequality decomposition. Interregional and interpersonal inequalities are not independent, separable phenomena. Rather, they are both part of the same overall distribution of resources (Cowell, 1985; Silber, 2012). The former concerns distances between groups’ (in this case, regions’) averages. The latter concerns distances among individuals around these averages. Overall inequality combines both sets of distances (Atkinson, 1983). A central tenet in the present argument is that the nature of the relationship between each dimension of inequality and fiscal decentralization is distinct.

Second, there is significant heterogeneity in the way fiscally decentralized regimes are actually designed (Brennan & Buchanan, 1980; Oates, 1993; Treisman, 2007). Political unions can have a high degree of expenditure decentralization but a low degree of revenue decentralization (such as Spain), or can have a relatively higher degree of both (such as the United States). These differences matter for both efficiency and distributional reasons. In terms of efficiency, fiscal systems in which regions spend what they do not tax may generate poorer macroeconomic outcomes as local units engage in fiscal irresponsibility for electoral gain (Rodden, 2006; Rodden & Wibbels, 2002; Wibbels, 2005b). In terms of distribution, fiscal systems in which both revenues and expenditures are decentralized and where the scope of interregional fiscal transfers is more limited, regional economic differences and larger levels of interpersonal inequality tend to correlate more tightly.¹

Third, and critical to our logic, a growing body of literature suggests that the scope and type of decentralization are themselves endogenous to patterns of territorial inequality (Bolton & Roland, 1997; Lee & Rogers, 2019a; Rodríguez-Pose & Ezcurra, 2010). It is precisely where interregional inequalities are larger that we are likely to see higher levels of both expenditure and revenue decentralization. The implications following from this result are important. In equilibrium, before any crisis hits a country, fiscally decentralized systems face potential external shocks from fundamentally different positions:

- Territorial inequality associated with economic geography is typically higher in decentralized systems.
- The fiscal state in decentralized nations, in equilibrium, is as concerned with redistribution between territories as it is with redistribution between people. Political conflict revolves as much around instruments and policies that reallocate resources between territories (e.g., *Finanzausgleich* in Germany or *Financiación Autonómica* in Spain) as around the progressivity of taxes and benefits (Beramendi, 2012; Rogers, 2015).

This contrast between centralized and decentralized regimes, we argue, provides the basis for the differential channels through which exogenous shocks shape distributive outcomes. We argue that they provide the key to a better understanding of the distributional impact of the Great Recession on both interregional and interpersonal inequality. Given the joint endogeneity between specific fiscal

designs, economic geography and inequality in its various dimensions, any analysis of the distributive implications of external shocks must consider how the shock affects both ends of the relationship. We provide such an analysis in turn.

THE THEORETICAL LINK BETWEEN DECENTRALIZATION AND INEQUALITY

The next step is to analyse how the system of redistribution in place moderates the economic consequences of the shock, and how that in turn shapes different types of inequality, in particular the contrast between interpersonal and interregional inequalities. Fiscally decentralized systems, by the very political process that brings them about, have two central features. The first is that they are weaker at pooling risks across individuals located in different jurisdictions; and the second is that part of their fiscal effort is devoted to equalize the level of fiscal capacity among its constituent parts. Risk-pooling is critical to the fiscal and political foundations of redistribution (Rehm, 2016). In times of crisis, this aspect of the fiscal system becomes the object of intense political competition. In the event of an exogenous shock, the combination of these two features shape the distributional implications of crises in decentralized contexts.

We argue that in the event of an exogenous shock, decentralization weakens risk-pooling at the individual level, leading to lower levels of overall redistribution and higher levels of interpersonal inequalities even if the economic fundamentals across regions have converged due to the asymmetric nature of the crisis (hitting areas where more advanced sectors where concentrated). Importantly, we expect to find this effect across the two main types of fiscal decentralization, expenditure and revenue decentralization, despite existing research that suggests these types have broadly different effects.

How do shocks affect different dimensions of inequality?

A financial shock that leads to a current account crisis and ultimately to a sudden halt of the real economy has clear distributional consequences for individual economic actors. These consequences operate through different channels depending on what section of the distribution of income one analyses. At the top end, individuals derive their income from a combination of labour earnings and returns to financial capital investments. At the low end, wages are the primary source of income. Economic fortunes at the top suffer in the short run, reflecting the depth in the downturn of the stock market. Economic fortunes at the bottom, in turn, reflect the depth of the downturn in the labour market.²

Any given individual's risk profile reflects their position within a particular labour market sector and, more importantly, how exposed their sector is to the downturn. These two factors account for implications of economic crises at the individual level. An unskilled worker in an industry particularly affected by the downturn, such as construction

or real estate management, is more likely to suffer a severe shock in the form of a protracted unemployment spell. A financial manager in the city will face different fortunes depending on their portfolio of assets. If the portfolio rests primarily on real estate assets, he or she will face similar consequences to the real estate agent or the construction worker. If the portfolio is more diversified, he or she will suffer a temporary reduction of income, but the intensity of the economic consequences of the shock will be far less severe.

In the absence of spatial concentration of economic activities, the interplay between skill, occupations and sectors will be sufficient to predict the consequences of crises for the distribution of income. Yet, there is no gainsaying that sectors and economic activities are not neutral in space (Krugman, 1991). To the extent that sectors, and with them specific clusters of occupations, tend to be concentrated in space, so are the distributional implications of economic shocks. The key distinction here is whether the crisis brings regions/areas closer in terms of resources and risk profiles or, by contrast, generates asymmetric effects that exacerbate pre-existing differences within the polity. We assume all economies in the present study feature economic asymmetries due to some degree of economic concentration across regions (Crescenzi, Luca, & Milio, 2016; Groot, Möhlmann, Garretsen, & de Groot, 2011; Krugman, 1991; Martin, 2011). As a result, we reason from the premise that the economic influence of a common external shock may be stronger in some areas than in others. These shocks may increase interregional inequalities, should the shock disproportionately impact poorer areas. Alternatively, should the shock hit the most productive areas, interregional inequalities may decline even as economic conditions fall.

The broad scholarly consensus suggests that the impact of the Great Recession fell heavily on the more productive regions within a nation, at least in the short run (Bardhan & Walker, 2011; Groot et al., 2011; Martin, 2011). The crisis disproportionately hit certain sectors: financial services, housing and property, and manufacturing, which tend to cluster in more economically productive regions. Inequality increased the most in urban, high-productivity areas (Groot et al., 2011; Martin, 2011). Job loss and economic distress (e.g., housing loss) were most pronounced in high-productivity regions (Commission, 2013; Edmiston & Zalneraitis, 2007; Henderson & Akers, 2009). The general result of these factors was that territorial inequality in most cases fell after the Great Recession, especially in disparities in productivity and unemployment rates (Capello, Caragliu, & Fratesi, 2015; Crescenzi et al., 2016). In the US case, for instance, evidence from welfare programmes shows that the increases in food-assistance programmes following the Great Recession were not from high-poverty, low-productivity areas, but from relatively productive regions with large financial service and housing sectors such as California, Arizona, Florida and New Jersey in the United States (Slack & Myers, 2014).

For Spain, to take another example, we see a decoupling of economic fundamentals that typically drive gross

domestic product (GDP) per capita trends in the pre- and post-Great Recession era. Figure 1 shows that in the post-Great Recession period in Spain, a higher agricultural share of the economy is associated with higher levels of GDP per capita growth in comparison with the pre-Recession period. A higher share of the finance sector in the economy is associated with lower levels of GDP per capita growth than previous periods. The regions that were ‘thriving’ during the boom were also those that contracted faster, thus leading to a reduction of inequality between subnational units in the short run. These two experiences help illustrate a potential logic by which exogenous crises lead to a reduction in differences in average incomes between territories. However, this logic, as argued above, need not be general, but rather a function of the pre-existing composition of economic activities and their relative exposure to the shock.

To summarize, a common financial shock triggers, in the absence of state interventions, three effects: (1) an increase in wage inequality between workers able to preserve their employment in unaffected sectors and workers in more exposed sectors; (2) an increase in market income inequality as a result of the increase in unemployment; and (3) a change in market income regional disparities as a consequence of the interaction between the shock and pre-existing differences in regional labour markets’ skill composition, productivity and exposure to the shock.

Decentralization and response to shocks: expenditure versus revenue

Existing research on fiscal decentralization paints expenditure and revenue decentralization in different lights. Expenditure decentralization, the most common form of decentralization across the globe, entails subnational spending typically funded by transfers from the central government. In affluent nations, expenditure decentralization is often viewed in positive terms because it allows localities to tailor the administration of policy to the local levels. In other contexts, most often in middle- and lower income countries, expenditure decentralization is viewed as providing incentives for subnational governments to engage in profligate spending (Jin & Zou, 2002; Rodden & Wibbels, 2002). The key feature promoting poor fiscal management in expenditure-decentralized systems is whether those resources are collected locally or transferred from the central government (Wibbels, 2005b).

Revenue decentralization, on the other hand, is most often praised for encouraging fiscal solvency at the local level (Ebel & Yilmaz, 2002) and for allowing jurisdictions to provide their preferred level of services (Oates, 1993). However, revenue decentralization allows more affluent jurisdictions to keep their money within their borders, which may exacerbate interregional and interpersonal inequality (Beramendi, 2012).

Crucially, both expenditure and revenue decentralization limit risk-pooling across the national territory, which may increase inequality (Wibbels, 2005a). In the case of expenditure decentralization, revenue transferred to and spent by subnational regions may be employed to shore up political support rather than cushion the effects of

economic shocks on citizens (Beramendi, Oh, & Rogers, 2019; Beramendi, Rogers, & Díaz-Cayeros, 2017). Decentralization in Europe, for example, appears to be associated with more social policy provision in some cases, as local politicians seek to shore up support (Ferwerda, 2015). Yet, the concerns with risk-pooling remain. When nations experience a shock, the tax bases of revenue-decentralized nations are more isolated, which may create a mismatch between the needs of people and the location of the distribution of resources.

We argue that shock of the Great Recession reveals that these decentralization types have broadly similar effects on inequality. Decentralization takes away from central resources that may equilibrate resources across places and reduces resources that are commonly used to address inequality. What may be obscured in the endogenous relationship between decentralization and inequality is that both types have the effect of increasing inequality through their limitations on risk-pooling, specifically to use centralized resources to compensate those harmed by economic downturns.

The Great Recession and decentralization: hypotheses and empirical strategy

The previous sections have elaborated the two pillars guiding the analysis of the impact of decentralization on the distributive implications of the Great Recession. Economic shocks are bound to generate different distributive implications in decentralized contexts because (1) economic geography is more skewed to begin with; and (2) the nature of redistributive conflicts and the way the fiscal system prioritizes individuals versus territories are also different. In decentralized systems, risk-pooling is weaker and, as a result, so is the redistributive incidence among individuals. In addition, wealthier territories are in a stronger position to demand more resources for themselves (should they need them) or to block additional transfers to others (Giuranno, 2009).³

Accordingly, our analysis suggests the following empirical implications:

Premise: Given that fiscally decentralized countries begin with more polarized economic geography, we anticipate an exogenous crisis to lead to:

A: A reduction in interregional inequalities, if the shock disproportionately affects wealthier areas; or

B: An increase in interregional inequalities, if the shock disproportionately affects poorer areas.

Hypothesis 1: Fiscally decentralized countries will provide lower levels of redistribution than centralized ones in response to an exogenous crisis.

Hypothesis 2: As a result, overall (interpersonal) inequality will grow more as a result of an exogenous shock in fiscally decentralized countries.

To test our premise and hypotheses, we adopt a coherent empirical strategy. Decentralization and decentralized fiscal structures are likely endogenous to the concerns about

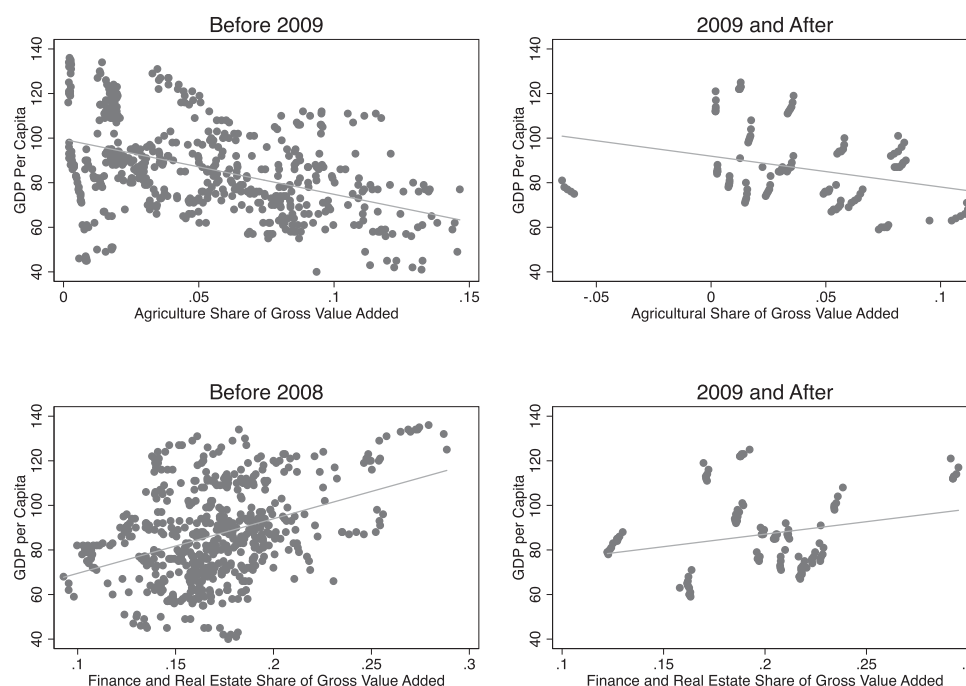


Figure 1. Sector trends and gross domestic product (GDP) growth in Spain, pre- and post-Great Recession.

Note: Correlations with gross domestic product per capita (GDPPC) (pre-2009, post-2009): Agriculture (−0.44, −0.28) and Finance (0.40, 0.24).

economic inequality and redistribution. Accordingly, it is not useful to conduct a standard regression analysis linking types of decentralization to inequality and redistribution. The common shock of the Great Recession offers a ‘natural quasi-experiment’ with which to evaluate the impact of endogenous institutions on redistributive outcomes. We use a difference-in-differences approach to see the divergent effects of fiscal decentralization after the Great Recession.

We present results in three sections to match our empirical implications. First, we show data establishing our premise: the relationship between decentralization, the Great Recession and interregional inequality. We examine interregional inequality as a mechanism to reveal how redistribution and interpersonal inequality are likely affected by crises in decentralized nations. We expect the Great Recession to have an uneven effect across the nations’ geography. In particular, because the Great Recession had its biggest impact on metropolitan areas (particularly on urban employment and housing prices in suburbs), we expect its effect to be to reduce the productivity gap between more affluent metropolitan areas and less productive regions (Mian, Rao, & Sufi, 2013; Midrigan & Philippon, 2011). Thus, interregional inequality, the uneven spatial distribution of economic productivity, would in fact decline due to the crisis. We expect no general effect of fiscal decentralization on interregional inequalities, which we assume to be intimately tied to the adoption of fiscal decentralization in the first place (Beramendi, 2012). After the Great Recession, we expect fiscally decentralized nations to preserve the market-driven equilibration in interregional income, resulting in lower interregional inequalities. If redistributive policies absorbed the entire inequality shock of the Great Recession, we would see no

effect on interregional inequality, as regions would maintain status quo productivity differences. We argue the rise in interregional inequality reflects the subsequent findings for redistribution and interpersonal inequality showing that fiscal decentralization reduces the redistributive role of government and preserves market distribution.

Second, we show the relationship between decentralization, the Great Recession and economic redistribution. Government redistribution is the true political mechanism linking the Great Recession to distributive outcomes in the population. We expect the results for redistribution to mirror those of interpersonal inequality. While efforts by governments to stabilize incomes were certainly activated during the Great Recession, governments’ ability to equilibrate income with rising market inequality could not keep up. Thus, redistribution, measured as governments’ ability to narrow the gap between market and net inequality, fell in this period.⁴ We expect decentralized expenditure to be associated with lower redistribution (Obinger et al., 2005) and local tax revenue to be associated with higher redistribution (Sokoloff & Zolt, 2007). Moreover, we expect redistribution to be lower in the post-Recession period in fiscally decentralized states.

Third, we show the ultimate outcome of interest: the relationship between decentralization, the Great Recession and interpersonal inequality. Consistent with other research on the financial impact of the Great Recession, we expect interpersonal inequality to rise in the period after 2008. We expect decentralization to be endogenously related to inequality, and thus the results to reveal more about conditions under which those institutions are adopted than their actual effects. Most importantly, we anticipate decentralization will exacerbate rising interpersonal inequality in the post-Recession period. Ultimately,

lower redistribution and relatively weak efforts to limit inequality in decentralized states, including in the relatively affluent parts of decentralized nations, increased economic inequality in those nations.

DATA

Dependent variables

We organize the analysis around the dependent variables interregional inequality (premise), redistributive effort (hypothesis 1) and interpersonal inequality (hypothesis 2). Summary statistics are shown in Table A1 in Appendix A in the supplemental data online. Figures plotting the data by year (Figure A1) and country (Figure A2) are shown in section A1 online.

Interregional inequality

We measure interregional inequality to capture the distributive dynamics relating the Great Recession to redistribution and interpersonal inequality. The primary measure of interregional inequality is the coefficient of variation (COV) in regional GDP per capita (Lessmann, 2009). This measure captures the dispersion of productivity across subnational regions within countries. COV is calculated as follows:

$$\text{COV} = \frac{1}{\bar{y}} \left(\frac{1}{n} \sum_{i=1}^n (\bar{y} - y_i)^2 \right)^{1/2} \quad (1)$$

where \bar{y} denotes the country's average GDP per capita; y_i is per capita GDP of region i ; and n is the number of regional units. The base data (GDP and population) come from Eurostat, Cambridge Econometrics and country national accounts. The COV is a widely used measure in the literature on regional economic growth and convergence (Barro & Sala-i-Martin, 1992; Sala-i-Martin, 1996). Section A2 in the supplemental data online shows the results are robust using alternative measures of interregional inequality, including the population-weighted COV in subnational GDP per capita, the Gini coefficient of subnational GDP per capita, and a scale and scope-independent measure of interregional inequality.

Regional GDP per capita is not directly equivalent to household income, as used in our measures of redistribution and interpersonal inequality. We employ regional GDP for several reasons. Most importantly, regional economic productivity is the best indicator of sectoral changes to capture the variation across regions that result from economic crisis. Second, regional GDP is a reasonable proxy for market income data, which are not available by region for a large number of nations for multiple periods of time. For the subsample of countries with region-level data available in Luxembourg Income Study (LIS) 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 Organisation for Economic Co-operation and Development (OECD) correlate at $r = 0.91$.

We use the first-level administrative region as the subnational unit of focus for our sample. This variable refers to the Nomenclature of Territorial Units for Statistics (NUTS-2) level 2 designation in European Union countries, which is equivalent to the state or province level. We use this level for important theoretical and empirical reasons. Most critically for the research question, the first-level administrative region is typically the most important administrative and political unit for fiscal decentralization. The first level is also typically the crucial political subunit in most nations, serving as the relevant geography for upper houses in bicameral legislatures, and often as boundaries for lower house electoral districts. Moreover, these units are generally consistent over time, and are the only units upon which data are regularly collected for population and economic censuses. The results are also consistent when we use our interregional inequality measures at the NUTS-3 level (the European Union second administrative level; see Table A2 in the supplemental data online) and in the SSGINI measure (shown in Table A3 online), which is stable across data measured at the NUTS-2 and -3 levels (Lee & Rogers, 2019b).

Redistribution (difference between market and disposable Gini coefficients)

We measure redistribution as the relative change in the Gini coefficient of income inequality before (the Gini coefficient of market income) and after (the Gini coefficient of disposable income) government tax and transfer policies (Solt, 2009). Solt's data set is widely used in research in economic inequality because of its consistent coverage, methodology and clear sourcing, relying on the preferred LIS whenever possible. In the case of our OECD sample, Solt's data are primarily composed of LIS data.

$$\frac{\text{Gini net} - \text{Gini disposable}}{\text{Gini disposable}} \quad (2)$$

This measure captures the redistributive effort, on both the taxation and expenditure sides, to reduce the market income inequality. Table A4 in the supplemental data online also shows that the findings are robust to alternative measures of redistribution: social expenditure at the central level, available from Eurostat; and state- and local-level social spending, from the International Monetary Fund's (IMF) Government Finance Statistics.

Interpersonal inequality (net Gini)

We measure interpersonal inequality as the Gini coefficient of disposable income from Solt (2009). This indicator captures the level of interpersonal inequality after government tax and transfer policies and thus more accurately captures the 'real' inequality felt by citizens than market inequality.

Section A5 in the supplemental data online also shows the results with alternative measures of interpersonal inequality, including market inequality from Solt (2009), and the 90/10 income ratio, with data from Lupu and Pontusson (2011).

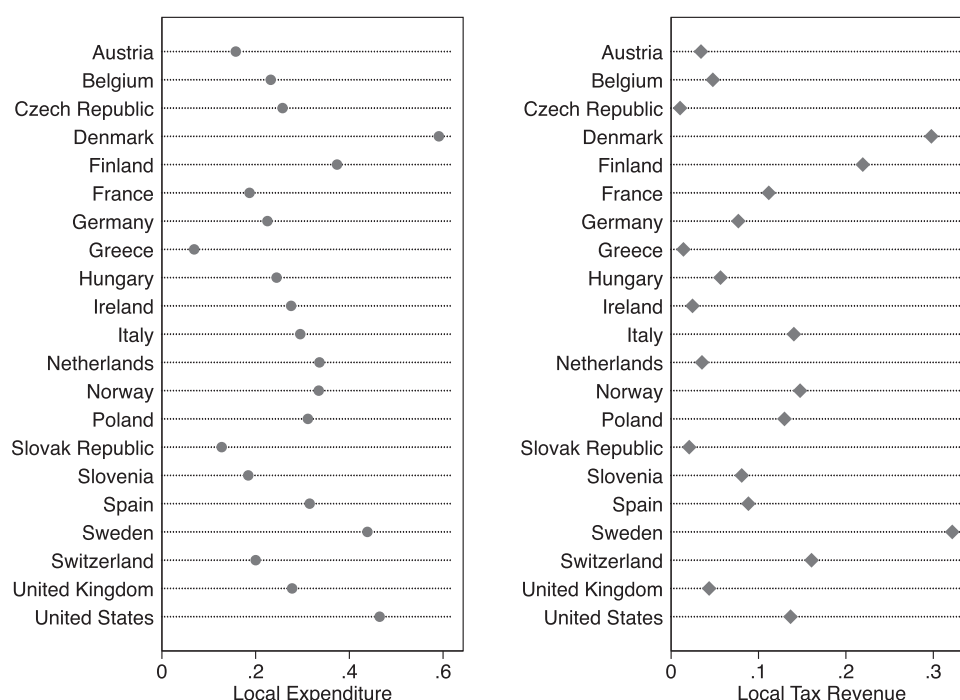


Figure 2. Descriptive statistics, fiscal decentralization.

Note: Local expenditure is measured as a percentage of total general government expenditure and local tax revenue as a percentage of total subnational revenue and grants. All values are country averages.

Independent variables

The primary results focus on interaction terms between two measures of fiscal decentralization and a dummy variable representing the years after the Great Recession. We code the post-Recession variable as 0 if the year is before 2009 and 1 if the year is 2009 or after.

Our measures of fiscal decentralization are observable outcomes of subnational expenditure and taxation, taken from the World Bank. Specifically, these include local expenditure (percentage of total general government expenditure) and local tax revenue (percentage of total subnational revenue and grants). As discussed below, these different decentralization measures may capture quite distinct fiscal structures, including whether subnational governments administer policies (expenditure), or are fiscally autonomous or more dependent on the central state to fund policies (local tax revenue). Figure 2 provides average country values for our sample. Within our sample of OECD nations, we see considerable heterogeneity in expenditure and tax revenue decentralization. Countries such as Denmark are highly decentralized on both the expenditure and revenue sides; countries such as Greece are substantially centralized in both categories, in comparative perspective.

Table A6 in the supplemental data online shows similar results for an alternative measure of fiscal decentralization, local revenue (percentage of total general government revenue).

Control variables

We include common control variables for economic redistribution that are consistent across our models. The level of economic development is a strong predictor of

government actions to reduce economic inequality. We include in our models the logged value of per capita GDP from Penn World Tables (Feenstra, Inklaar, & Timmer, 2015). Governments provide more resources and services for dependent populations – both children and the elderly. We include a measure of the working age population (percentage of the population > 15 or < 65 years) from the World Development Indicators. Trade may impact inequality, redistribution and the spatial distribution of income (Garrett & Rodden, 2003). We include the sum of imports plus exports divided by GDP from the World Development Indicators. Proportional representation is associated with more generous redistributive policies and lower net inequality (Iversen & Soskice, 2006). We include a measure of proportional representation from Armingeon, Isler, Knöpfel, Weisstanner, and Engler (2013). We add a measure of left government control (% of seats in the legislature) from Armingeon et al. (2013). Left governments are expected to press for increased redistribution, and thus reduced inequality. We control for levels of market inequality with the Gini market variable from Solt (2009). In all our main models, we also include the lagged dependent variable, as well as year and country fixed effects, to capture unobserved heterogeneity not accounted for in our set of control variables.

Section A4 in the supplemental data online also includes models that control for additional political variables that may influence inequality, including federalism (Armingeon et al., 2013), parliamentary systems (Armingeon et al., 2013), centrifugal political institutions (Gerring, Thacker, & Moreno, 2005), party system nationalization (Bochsler, 2010) and legislative

malapportionment (Samuels & Snyder, 2001). The results are not meaningfully changed when including these variables.

Model

We structure our empirical analysis as follows:

$$C_{i,t} = \alpha + \beta S_{i,t} + \beta K_{i,t} + \beta S_{i,t} * K_{i,t} + \gamma' X_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t}, \quad (3)$$

where i indexes each country and t indexes each year; $C_{i,t}$ is one of three distributive outcomes measures, interregional inequality, government redistribution or interpersonal inequality as described below; $S_{i,t}$ is one of the two fiscal decentralization measures described below; $K_{i,t}$ is the dummy variable for the post-recession period; $S_{i,t} * K_{i,t}$ is an interaction term between the fiscal decentralization measure and the post-recession variable; $X_{i,t}$ is a vector of controls for time-varying observable characteristics (GDP per capita, dependent population, trade, left government, political institutions, market inequality and lagged dependent variable); μ_i and λ_t are country and year fixed effects, respectively; and $\epsilon_{i,t}$ is a random error term. We maintain consistent samples across all models. All models are estimated using ordinary least squares (OLS) with panel-corrected standard errors to manage panel heteroskedasticity and spatial correlation (Beck & Katz, 1995). We also show results in section A5 in the supplemental data online with varying specifications, including the base model (no controls; Table A10), the base model with the lagged dependent variable (Table A11) and results with AR1-correlated errors (Table A12, all online).

DATA ANALYSIS

The empirical set-up includes multiple dependent and independent variables to establish an overarching comparative pattern. To aid the interpretation of the results, we plot the coefficients of the main independent variables and graph the conditional effects to examine the interactive relationship between fiscal decentralization and the Great Recession. These figures enable easy comparisons across the indicators. The full regression results for each model are shown in Table 1.

Premise results: interregional inequality

Figures 3 and 4 show the results for our interregional inequality dependent variable. Beside each (a) plot of coefficient estimates, we also include the conditional effects of (b) the marginal effect of fiscal decentralization in the pre- and post-Recession periods, and (c) the marginal effect of the Great Recession at different levels of fiscal decentralization.

Figure 3 plots the results for the impact of expenditure decentralization. The first coefficient estimate in Figure 3 (a), for the post-Recession period, reveals that the period after 2008 was associated with lower levels of interregional inequality than previous periods, on average. The impact of the Great Recession on the interregional inequality in our

sample was substantial, reflecting a drop of approximately 28% of the sample mean, but only 58% of 1 SD (standard deviation). The large value range for the interregional inequality variable in the sample accounts for this measurement.

The general relationship between expenditure decentralization and interregional inequality in our sample is positive. This implies that expenditure decentralization is linked to higher productivity differentials across regions. Local expenditure may be funded by local tax revenues (tested below), or more commonly, central expenditure transfers to local governments. We would see this relationship between expenditure decentralization and interregional inequality if, for example, higher productivity regions subsidized the spending of lower productivity regions via interregional transfers.

We expect expenditure decentralization to be endogenously linked to interregional inequality. Thus, the more informative result indicating the relationship between expenditure decentralization and interregional inequality is in the interaction between the Great Recession and local expenditure. With this ‘shock’ to distribution, we may see the ‘true’ effect of expenditure decentralization on interregional inequality. In this case, we see that fiscal decentralization is associated with a statistically significant decrease in interregional inequality. The effect in this case is modest. The mean COV of interregional inequality is 25 in the full sample. The average effect is a decrease in redistribution of close to 1 point, or a 4% reduction in interregional inequality in expenditure-decentralized nations.

The conditional effects plots in Figure 4 show in greater detail how interregional inequality was impacted by the Great Recession and expenditure decentralization. Figure 2 (b) shows that before the Great Recession the average local expenditure was associated with higher levels of interregional inequality. After the Great Recession, expenditure-decentralized nations saw a decline in interregional inequality of approximately 18% (from 2.2 to 1.8 points higher). Importantly, the conditional relationship still suggests expenditure is associated with higher interregional inequality in comparison with less decentralized nations. However, the differential between the more and less decentralized nations declined after the Great Recession. Figure 3 (c) shows the impact of the Great Recession on interregional inequality at varying levels of expenditure decentralization. The overall immediate impact of the Great Recession on interregional inequality was lower, but at a modest amount, as the level of expenditure decentralization increased.

Figure 4 plots the results of our tax revenue-decentralization models. Very similar to Figure 3, we see a large general impact of the Great Recession on interregional inequality. The relationship between interregional inequality and tax revenue decentralization is positive, but not significant. This implies no clear link between revenue decentralization and interregional inequality overall. After the Great Recession, however, interregional inequality fell, in relative terms, in revenue-decentralized nations. As Figure 4(b) shows, there was interregional inequality

Table 1. Full results.

Dependent variable:	(1) Interregional inequality	(2)	(3) Redistribution	(4)	(5) Interpersonal inequality	(6)
Post-Recession	−7.423*** (0.737)	−7.355*** (0.697)	−4.870*** (1.616)	−4.487*** (1.611)	1.384*** (0.498)	1.450*** (0.511)
Local Expenditure _{t−1}	1.862 (1.271)		−1.928 (2.020)		1.281* (0.757)	
Post-Recession*Local Expenditure _{t−1}	−0.901** (0.445)		−3.298* (1.890)		1.437** (0.565)	
Local Tax Revenue _{t−1}		0.866 (1.937)		15.450*** (4.142)		−5.048*** (1.308)
Post-Recession*Local Tax Revenue _{t−1}		−2.351*** (0.548)		−8.489*** (2.861)		2.681** (1.091)
ln (Per capita GDP) _{t−1}	1.491 (1.030)	1.614* (0.938)	4.230* (2.196)	2.887 (2.214)	−0.813 (0.656)	−0.386 (0.704)
Working Age Population _{t−1}	0.300** (0.149)	0.293** (0.144)	0.010 (0.123)	0.056 (0.121)	−0.180*** (0.033)	−0.200*** (0.033)
Trade Openness _{t−1}	0.0114 (0.009)	0.0137* (0.008)	−0.0345** (0.016)	−0.0374** (0.016)	0.015*** (0.004)	0.016*** (0.004)
Proportional Representation	0.530 (0.351)	0.547 (0.382)	1.279*** (0.331)	0.605* (0.365)	−1.114*** (0.173)	−0.891*** (0.133)
Leftist Government _{t−1}	0.001 (0.002)	0.000 (0.002)	0.011*** (0.004)	0.009** (0.004)	0.002 (0.002)	0.002 (0.002)
Market Inequality _{t−1}	0.096* (0.055)	0.074 (0.045)	0.655*** (0.126)	0.676*** (0.115)	0.096*** (0.021)	0.077*** (0.018)
Interregional Inequality _{t−1}	0.837*** (0.016)	0.832*** (0.016)				
Redistribution _{t−1}			0.202*** (0.026)	0.205*** (0.020)		
Interpersonal Inequality _{t−1}					0.412*** (0.025)	0.417*** (0.023)
Observations	363	363	363	363	363	363
R ²	0.989	0.989	0.975	0.976	0.992	0.992
Countries	21	21	21	21	21	21
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The estimation method is ordinary least squares (OLS) with panel-corrected standard errors using yearly data with the lagged dependent variable. All time-varying independent variables are lagged by one year. All regressions include country and year fixed effects. Robust standard errors are shown in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

decline in the post-Recession period relative to the pre-Recession period. However, this effect is not substantial.

The impact of the Great Recession on interregional inequality across different levels of revenue decentralization is shown in Figure 3(c). From the lowest levels of tax revenue decentralization to the highest, we see a decline of interregional inequality approximating 2.4 points, or 10% lower interregional inequality.

Overall, the results suggest that the Great Recession was associated with declining interregional inequality in fiscally decentralized nations. Importantly, we should not necessarily interpret this result as showing that fiscal decentralization in fact helped regions to equilibrate their income under conditions of fiscal crisis. Rather, we suggest this result shows that fiscal decentralization, adopted in the first place to preserve market conditions that produced inequalities across regions, acted as expected following

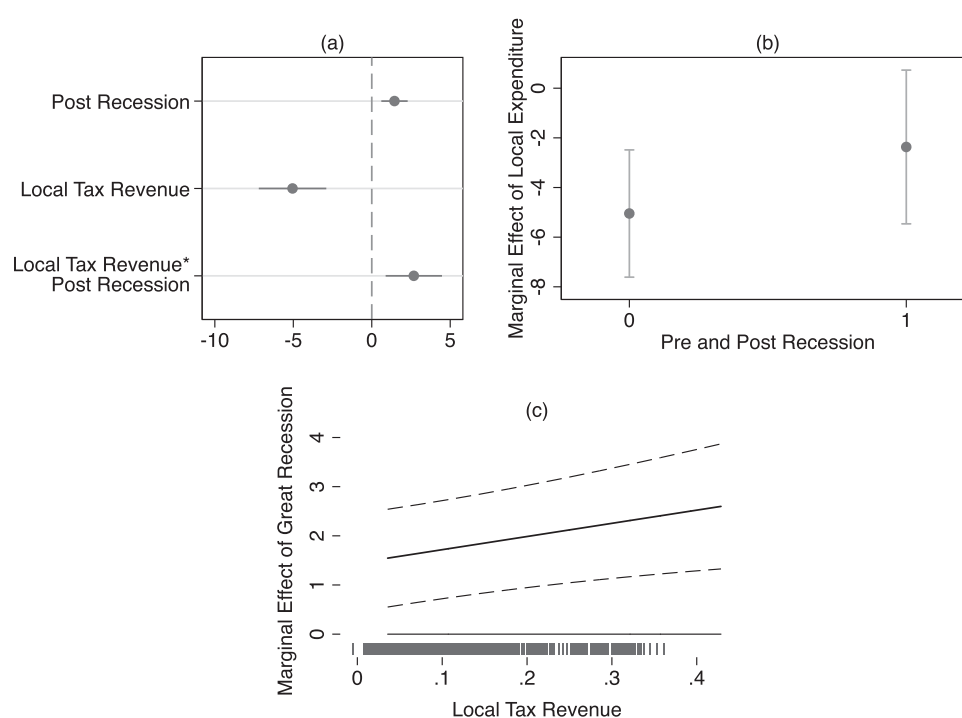


Figure 3. Impact of the Great Recession and local expenditure decentralization on interregional inequality.

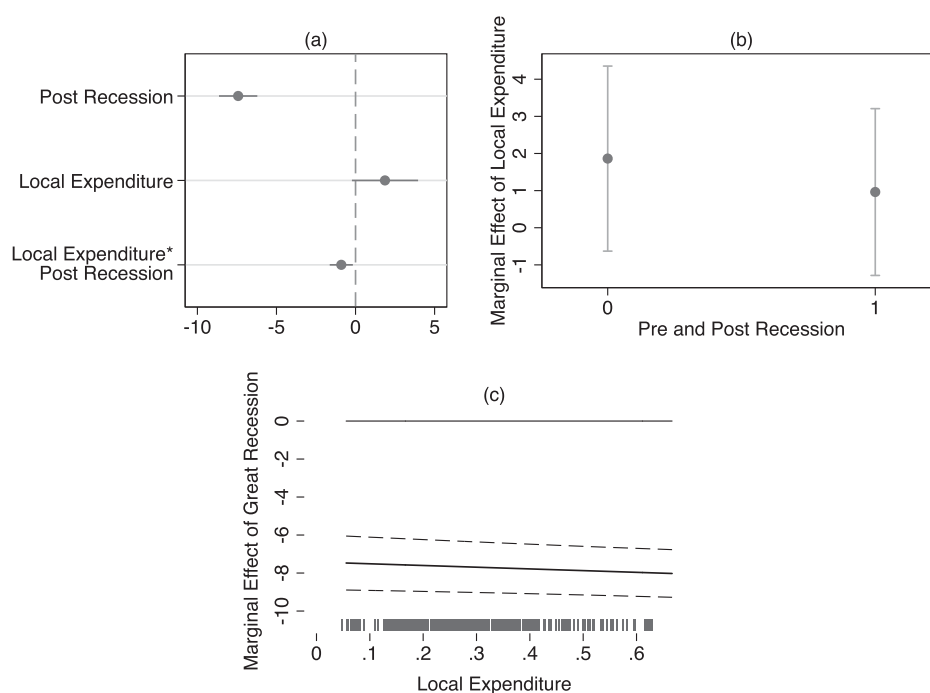


Figure 4. Impact of the Great Recession and local tax revenue decentralization on interregional inequality.

the Great Recession. With the Great Recession having the general effect of dampening productivity, in relative terms, of the most productive regions, we saw fiscally decentralized nations preserve that market-driven distribution. The results for interpersonal inequality and redistribution show that fiscally decentralized systems do less to reduce inequality. With regard to interregional inequality after the Great Recession, had economic stabilizers been as extensive in fiscally decentralized nations, we would have

seen little change in interregional inequality as central welfare states picked up the slack in the more impacted regions. Thus, a decline in interregional inequalities in this case does not represent an unequivocally positive result for economic redistribution.

Hypothesis 1 results: redistribution

Figures 5 and 6 show the results for the redistribution dependent variable. The first coefficient estimates, for

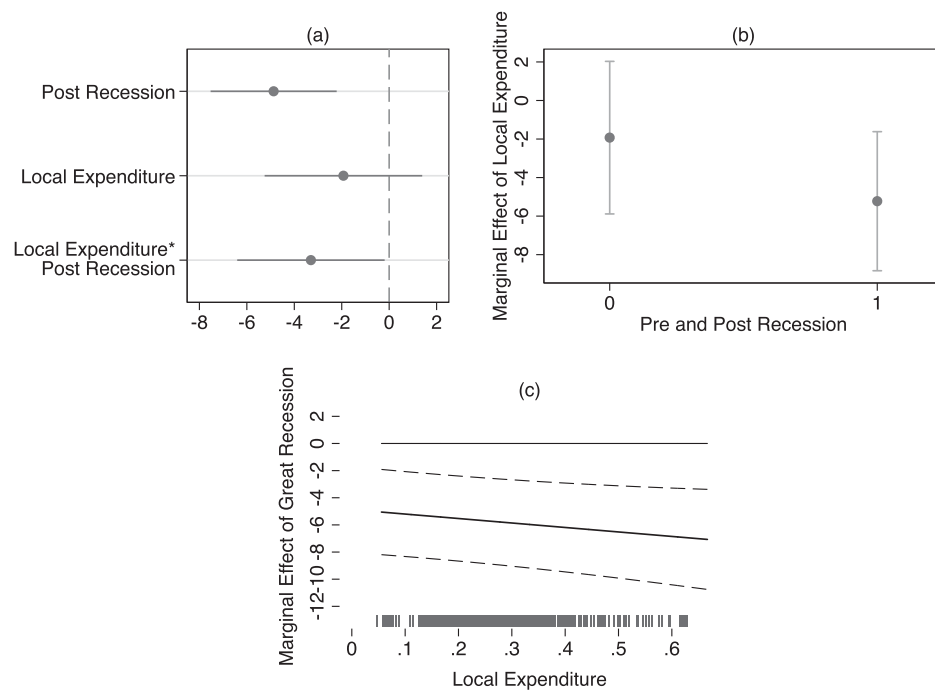


Figure 5. Impact of the Great Recession and local expenditure decentralization on redistribution.

the post-Recession period, reveals the period after 2008 was associated with lower levels of government redistribution than previous periods, on average. Across the two models, the decline in redistributive effort was around 11%. Importantly, this does not imply that governments spent less on redistribution in the post-Recession period – they spent more (see Table A4 in the supplemental data online) – but that these efforts were not able to reduce market inequality as effectively as they did in previous periods. This result is consistent

with the rise in overall interpersonal inequality shown in Figures 7 and 8.

The general (endogenous) relationship expenditure decentralization and redistribution is negative, but not significant, in our sample. After the Great Recession, we see a significant negative relationship between expenditure decentralization and redistribution. Figure 5(b) shows that while expenditure-decentralized nations were statistically indistinguishable from less decentralized nations before the Great Recession, they revealed

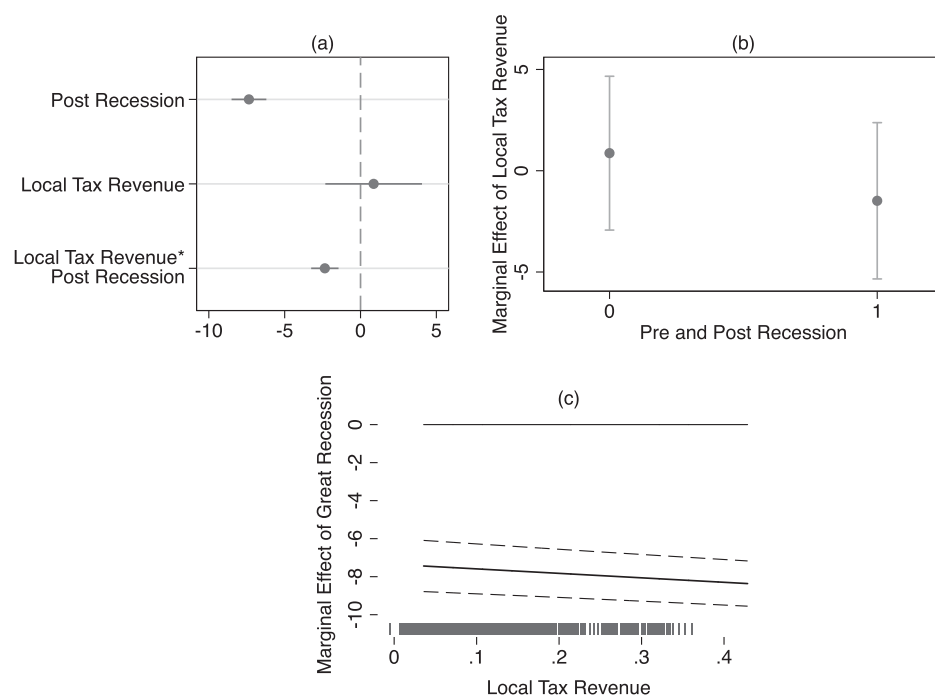


Figure 6. Impact of the Great Recession and local tax revenue decentralization on redistribution.

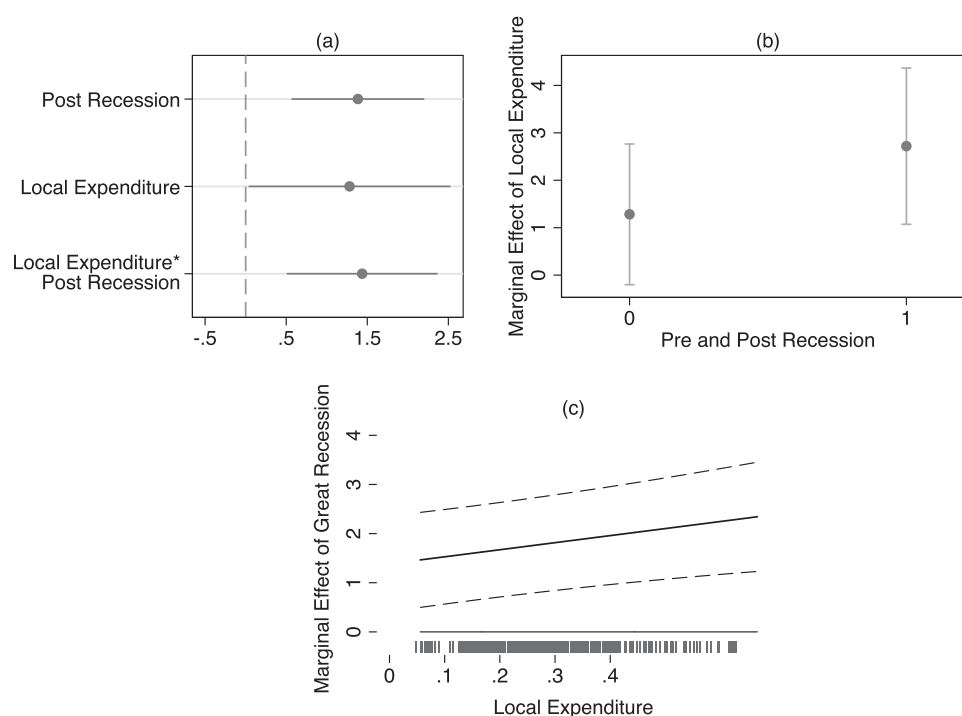


Figure 7. Impact of the Great Recession and local expenditure decentralization on interpersonal inequality.

significantly lower levels of redistribution in the post-Recession period. In the post-Recession period, expenditure-decentralized nations were associated with approximately 15% lower redistribution. Figure 4(c) shows the impact of the Great Recession across the full range of expenditure decentralization. At the lowest levels of decentralization, the Great Recession was associated with declines in redistribution of approximately 4.5 points, or 12% of average redistribution. At the highest levels of expenditure decentralization, redistribution

measures at approximately 16% lower after the Great Recession.

Figure 6 shows the link between tax revenue decentralization and redistribution. Overall, tax revenue decentralization is associated with higher levels of redistribution. Figure 6(b) demonstrates that revenue-decentralized nations had substantially higher levels of redistribution. However, in the period after the Great Recession, revenue-decentralized nations had levels of redistribution that were not distinguishable from more revenue-

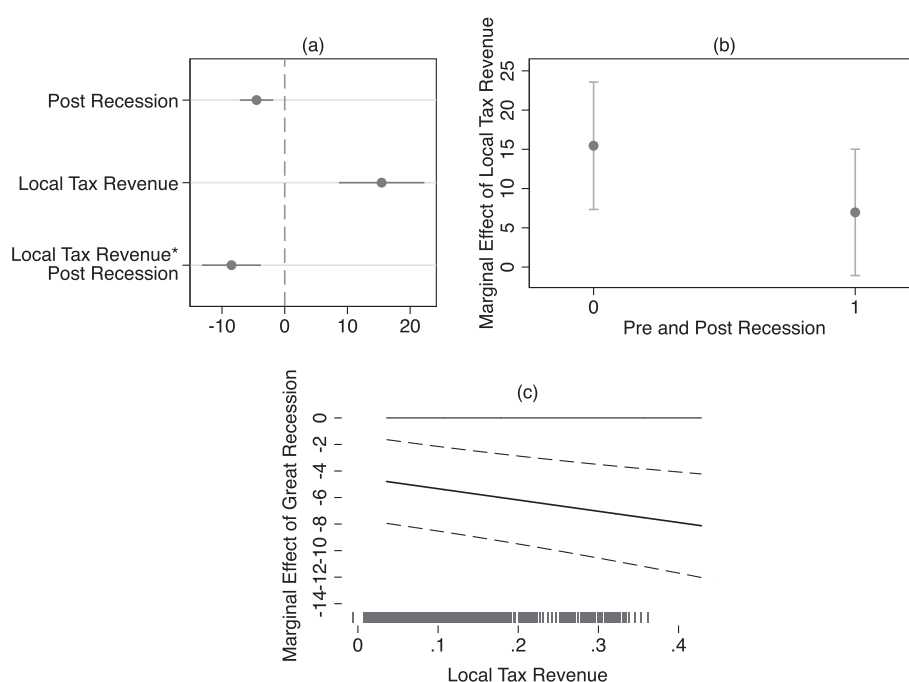


Figure 8. Impact of the Great Recession and local tax revenue decentralization on interpersonal inequality.

centralized nations. Figure 6(c) shows a large drop in redistribution at increasing levels of revenue decentralization. While redistribution fell around 4 points (10%) in the most revenue-centralized nations, redistribution fell double that in the most revenue-decentralized nations in comparison with the pre-Recession period.

Hypothesis 2 results: interpersonal inequality

The results of the estimates for interpersonal inequality are shown in Figures 7 and 8. The first coefficient estimates in both models, for the post-Recession period, reveal that the period after 2008 was associated with higher levels of interpersonal inequality than previous periods, on average. The mean interpersonal inequality is 28.4 in the full sample. The average effect is an increase in interpersonal inequality of around 1.4 points, or a 5% increase.⁵

The general relationship between the fiscal decentralization measures and interpersonal inequality again depends on the type of fiscal decentralization. In countries with high levels of expenditure decentralization, we see a positive and significant association with interpersonal inequality (Figure 7). This may reflect a structure of governance whereby fiscal responsibility is delegated to local levels to avoid centralized redistribution, or to reward local politicians (Rodden & Wibbels, 2002). After the Great Recession, we see an exacerbation of this positive relationship between expenditure decentralization and interpersonal inequality (Figure 7b). Before the Great Recession, expenditure-decentralized nations had, on average, disposable Gini levels approximately 2 points higher, or 7% higher. After the Great Recession, inequality was close to 14% higher in expenditure-decentralized nations. Figure 7(c) shows the climb in interpersonal inequality driven by the Great Recession at varying levels of expenditure decentralization. At the lowest levels of expenditure decentralization, interpersonal

inequality rose around 1.5 points. At the highest levels of expenditure decentralization, the Great Recession increased interpersonal inequality nearly 50% more than the lowest level of expenditure decentralization, to 2.2 points.

The overall relationship between tax revenue decentralization and interpersonal inequality is negative. This implies that inequality is lower in revenue-decentralized nations, perhaps because countries with high levels of local tax collection tend to be those with economically productive regions and relatively strong local governments. In these countries, such as Germany, local tax collection reflects strong state capacity and redistributive effort in the country overall. This relationship between revenue decentralization and lower inequality appears quite strong and substantively important in the post-Recession period.

However, once we observe the shock of the Great Recession, revenue-decentralized nations are not distinguishable from revenue-centralized nations with regard to interpersonal inequality. As shown in Figure 8(b), the association goes from a significant, negative 5 points in the pre-Recession period to an insignificant, negative 2 points in the post-Recession period. In the absence of a research design to identify a shock to the existing distributive arrangements, we may attribute a negative effect of revenue decentralization on interpersonal inequality. These results suggest the ‘true’ effect of revenue decentralization may be to increase inequality.

Figure 8(c) shows the impact of the Great Recession as revenue decentralization goes from the highest to the lowest levels. At the lowest levels of revenue decentralization, the Great Recession was associated with an increase in interpersonal inequality of approximately 1.5 points, or 5%. At the highest levels of revenue decentralization, interpersonal inequality increased 8% on average.

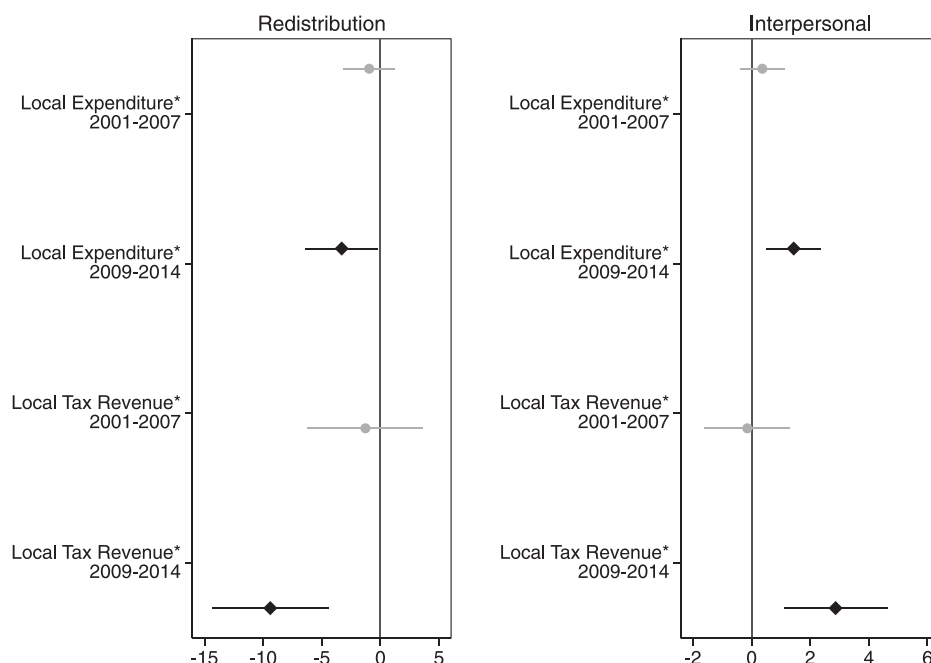


Figure 9. Parallel trends analysis, hypotheses 1 and 2.

Note: Results from a previous window (2001–07) are shown in black; post-Recession results are shown in grey.

PARALLEL TRENDS ANALYSIS

Difference-in-differences analyses depend on an assumption that the observed outcomes reflect a change in the period under examination. Stated otherwise, in the absence of treatment, the difference between the ‘treatment’ (post-Recession) and ‘control’ (pre-Recession) groups would be constant over time. To assess this parallel trends assumption, we repeat the analysis with a different ‘window’ of treatment (Malesky, Nguyen, & Tran, 2014). Specifically, we code a new dummy variable to reflect the five-year window before the examination period (2001–07). If the two groups were on parallel trends, we should observe that coefficients of the interaction term for the decentralization measures and the alternative window are not significantly different from zero. We should see no clear impact of this arbitrary five-year period on the outcomes of interest.

Figure 9 shows the results of this analysis for the primary dependent variables of interest, redistribution and interpersonal inequality, to assess the substantive distributive impact of the fiscal decentralization. The results in black are those from the main analysis of the post-Great Recession period. We expect those to be significantly associated with interpersonal inequality, redistribution and interpersonal inequality, as seen in Figures 3–8. The results shown in grey are the coefficient estimates from the artificial window for the 2001–07 period. We expect those results to be not significantly different from zero. In every case we find the artificial window provides insignificant results. Figure 9 provides strong support for the parallel trends assumption for those variables.⁶

CONCLUSIONS

This paper has presented a systematic effort to evaluate the distributional impact of the Great Recession in advanced industrial democracies. We have focused on two channels: (1) the spatial impact of the contraction, and its associated effect on interregional and interpersonal inequality; and (2) the capacity of centralized versus decentralized redistributive systems to curb the increase in inequality. The findings suggest that the recession in more fiscally decentralized contexts was associated with a reduction in the scope of interregional inequalities, which helps to explain the associated reduction in the overall levels of redistribution, and a significant increase in the levels of interpersonal income inequality and associated reductions in redistribution.

This research contributes to existing debates on fiscal federalism and its implications for inequality and social welfare. While federalism has been linked theoretically and empirically to reduced distributive effort and higher inequality, this research has struggled to isolate the direction of causality. The findings confirm the anti-redistributive inclination of fiscal federalism. Importantly, we find that both expenditure and revenue-side fiscal federalism are associated with lower redistributive effort. Local expenditure has long been known to be associated with less redistributive states. While local tax revenue is correlated with

higher redistribution and lower inequality in general, once we examine the effects of the shock, local tax revenue is associated with lower redistribution and higher inequality. Thus, both main forms of fiscal federalism appear to limit redistributive effort, by limiting risk-pooling, when we examine their effects after a shock.

Moving forward, we see three potential lines of research that speak to the scope conditions of the analysis in this paper. First, we plan to examine the role of fiscal decentralization and the Great Recession on distributive outcomes in less developed nations. We consider the OECD sample to reflect a best-case scenario for both decentralization and redistributive outcomes. For decentralization, we have long known that the design and effect of decentralization in developing nations appears to differ from those observed in advanced industrial democracies (Beramendi et al., 2017; Rodden & Wibbels, 2002). Thus, we may expect the effects of decentralization in the post-Recession period to be much worse on redistribution in developing nations. Similarly, we know that countries outside of the OECD in general have much weaker automatic stabilizers that result from smaller governments. We anticipate a clearer effect of the Great Recession on redistributive outcomes in nations with far weaker welfare states and more individuals likely to dip into poverty.

Second, we see potential gains in unpacking the evolving patterns of regional disparities in response to the Great Recession with more disaggregated data. Which regions suffered relatively more will provide more nuanced clues to understand how shocks interact with heterogeneous economic geography, and the political implications thereof. Finally, in the same context, it is pressing to move beyond the study of short-run effects and study which areas, sectors and regions can bounce back relatively faster than others, and with what distributional implications. The more productive regions have been the quickest to recover from the Recession, shown in studies of regional ‘resilience’ (Brakman, Garretsen, & van Marrewijk, 2015; Fröhlich & Hassink, 2018; Lee, 2014; Martin & Sunley, 2015; Sensier & Artis, 2016). Introducing a more sophisticated time dimension into the focus of this study will help uncover important underlying mechanisms behind the patterns of inequality associated with decentralization around the world.

ACKNOWLEDGEMENTS

An earlier version of this paper was presented at the workshop ‘Decentralisation after the Great Recession: Fine-Tuning or Paradigm Change?’, Santiago de Compostela, Spain, October 2017. The authors greatly benefited from the comments of André Blais, Miriam Hortas, Ignacio Lago, Santiago Lago, Jorge Martínez, Oriol Roca and Andrés Rodríguez-Pose.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

FUNDING

The authors acknowledge financial support from the National Research Foundation of Korea [grant number NRF-2017S1A3A2066657].

NOTES

1. To capture the potential effect of specifics of the design of fiscal decentralization, and to ensure that the results do not depend on one particular aspect of fiscal decentralization, the empirical analyses use measures of both expenditure and revenue decentralization.
2. On the effects of economic shocks on interpersonal inequality, see, for example, Lovell, Travers, Richardson, and Wood (1994), Ravallion (2001) and Williamson (2005). On the effects of shocks on interregional inequality, see Rodríguez-Pose and Gill (2006), Rodríguez-Pose (2012) and Bouvet (2011).
3. In those decentralized contexts in which wealthier regions are not in a position to defend their interests effectively in the context of an exacerbated competition for scarce resources, as in Catalonia recently, the very institutional stability of the federation comes into question.
4. The overall level of government spending to reduce inequality increased. The level of government spending to reduce inequality is distinct from redistribution conceptualized as the government's effort to reduce the market and disposable income gap.
5. This estimate is likely conservative because it includes extensive control variables, the lagged dependent variable, and year and country fixed effects. Base model results excluding the lagged dependent variable are closer to 4 points, or 14%.
6. We are primarily focused on the outcome variables of redistribution and interpersonal inequality. The parallel trends results also hold for our premise, interregional inequality, but we are less concerned with pre-existing trends in regional convergence before the Great Recession.

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