# Vote your region or your income? Decomposing variance in redistributive voting

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### ABSTRACT
We examine whether regional economic productivity predicts support for redistributive parties and voting cohesion across income levels. Using a European sample, we find rich and poor in productive regions vote significantly more for redistributive parties than their counterparts in less productive regions. Yet voters may be cross-pressured, some favouring policies that enhance regional productivity and others their pocketbook interests. Decomposing vote variance, we show high variability in rich voters in productive regions and poor voters in less productive regions. Rich voters in less productive regions vote cohesively. This research highlights the importance of place-based factors in vote choice and variance.

### KEYWORDS
Regional productivity; household income; party support; voting cohesion; variance decomposition

## 1. INTRODUCTION

Research in political geography has highlighted a number of puzzling findings from the perspective of traditional theories of the political economy of redistribution. Why do highly productive regions, home to many of the richest individuals in the nation, often support pro-redistribution parties (Rodden, 2019; Rueda & Stegmueller, 2016)? Why do poor regions, which would ostensibly benefit from government resources, frequently favour parties that seek to limit redistribution (Frank, 2013)?

In this article, we theorise and empirically examine the role of place-specific economic factors in shaping vote choice for parties in favour of or opposed to redistributive policies. Our conceptual framework explores potential sources of region-based differences in support for redistribution-oriented parties, building upon the models of Rueda and Stegmueller (2019) and Beramendi (2012). We assume that some voters consider their personal circumstances to be shaped by their region's economy and develop a set of hypotheses about the types of policies (and therefore types of party positions) those voters may prefer.

We provide an economic policy preference-driven explanation for why some voters in rich regions may favour redistribution-oriented parties, as advocates for the type of human capital and consumption-enhancing policies that may spur growth and provide social services in economically diversified regions that benefit themselves directly or indirectly. Similarly, some voters

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in poorer regions may prefer the types of programmes offered by parties opposed to traditional redistribution, policies such as less regulation and sector-specific support for business, that they may believe will enhance their regions' productivity and their own economic position. We then demonstrate these relationships for a sample of European nations. We focus on documenting potential place-based *economic* drivers of votes for parties favourable or opposed to redistribution, while also acknowledging the important role of social values and positions on issues such as immigration and European integration in shaping party support in the European context.

Voters may not only prefer policies that enhance their regions' productivity, but they may also want policies that maximise their individual income. For some voters these policies are aligned but for others, regional and pocketbook policy preferences may be a significant source of cross-pressure that complicates the relationship between income and vote choice. We measure an observable implication of this cross-pressure in our analysis – within-group variance in income groups, depending on their regions' level of productivity. To capture this within-group variability, we use a technique for variance decomposition developed by Western and Bloome (2009). This technique allows us to examine whether groups we expect to be cross-pressured exhibit greater variability in their vote choices. We anticipate more variation among rich voters in highly productive regions, as they weigh their desire to minimise their tax burden against support for policies will enhance prosperity for themselves and their neighbours. Similarly, some poor voters in less productive regions may want redistributive policies targeted to themselves while others support economic policies, such as business-friendly regulation, offered by parties opposed to traditional redistributive policies.

Take the example of two voters, one rich and one poor, in an economically less productive region, such as the coal-producing electoral district of Görlitz, Germany, or the agricultural region of Ávila, Spain. Less productive regions in advanced industrial democracies tend to concentrate economically on agriculture, extraction, or manufacturing, which has declined due to globalisation and technological change. Policies that voters may believe will help these regions' dominant industries include targeted business supports, like farm subsidies, reduced environmental regulation to bolster coal mining or tax incentives to lower manufacturing costs. Although these policies may be redistributed from consumers to business or from the service sectors to the primary sectors, they are not characteristics of traditional welfare policies. While the poor voter in that region might favour 'consumption oriented' policies to boost their household income (Beramendi et al., 2015), they might also want policies that bolster the economic sectors of their region, which they may believe will benefit themselves and their neighbours, which are typically offered by parties seeking to limit traditional redistribution. In both the cases of coal miners in Görlitz and farmers from Ávila, there have been recent protests pushing for favourable economic policies for their region.[1] Meanwhile, the rich voter in that region, perhaps a property owner or stakeholder in these industries likely support reduced market regulation and low taxes for their highly capitalised industries, as well as limited welfare policies. On the basis of regional economic interests, the rich and poor in the poor region would be more cohesive in their voting than their personal incomes would suggest.

Rich voters in rich regions may also face cross-pressure to support traditional redistributive policies that improve education for their children and their neighbours, for childcare policies that enable adults to work outside the home, unemployment insurance to smooth consumption across the life course, and healthcare policies that are both vital to the prosperity of their region and may also directly benefit themselves. They might vote more like their lower-income neighbours than would be expected according to traditional redistributive theories that insist their first preference is always a lower tax bill.

Empirically, we focus on measuring cross-pressure and its sources. Scholarly literature suggests that place-based factors may be relevant to voting, but less research has examined how to measure place-based economic effects beyond individual-specific factors, particularly in

comparative context. We see our approach using decomposition of variance in voting as an attempt at empirically identifying cross-pressure from individual and place-based economic motivations in research on the political economy of redistribution, such as Bolton and Roland (1997), Beramendi (2012), Jurado and Leon (2019), and Rodden (2019).

Our dependent variable is the survey respondent's party votes, which we match to that party's support for redistribution. We analyse three aspects of these vote choices. First, we show associations between the income quintile of the individual's household and the productivity quintile of that individual's geographic region on vote choice. Our results show that controlling for a battery of other socioeconomic, cultural and regional factors, living in a more or less productive place significantly impacts voting for redistribution-oriented political parties. Second, we find that place matters for income-based voting, with rich respondents voting differently in highly productive regions than in less productive regions on average, and poor voters also differing depending on their region. Third, we decompose the variance in vote choice, showing which groups vote most cohesively. Voting cohesion helps us discern whether regional economic variation may be a source of cross-pressure for voters. We see stark differences in within-group variance in vote choice, indicating possible differences in region and individual-income-based cross-pressure.

Our analysis contributes to a broader scholarly debate on the political economy and political geography of voting behaviour. Existing research demonstrates that individual income informs vote choice. However, the contribution of place-based factors to vote choice and voter variance in cross-national comparison is a relatively unexplored research area. For empirical identification, we analyse heterogeneity within voting blocs. Our focus on empirically identifying place-based cross-pressure is a contribution to research in comparative political economy. We extend and adapt the research of Gelman et al. (2007) to the European context, which has important differences in institutional settings, issue dimensions and issue salience. Finally, we integrate a range of data sets on party ideology (Comparative Manifesto Project), voting (Comparative Study of Electoral Systems), and the Organisation for Economic Co-operation and Development (OECD) regional productivity statistics into a common framework to piece together the connections between income, place and party vote choices.

## 2. CONCEPTUAL FRAMEWORK

In this section, we provide a conceptual framework linking the economy of an individual's location to their vote choice. The premise of our analysis is that voters aim to maximise their economic position, whether the motivation is the income of the individual voter (Meltzer & Richard, 1981; Romer, 1975), or the economic productivity of the region in which they reside, which may directly or indirectly benefit them (Beramendi, 2012; Bolton & Roland, 1997). The logic of individual income shaping redistributive preferences and voting behaviour is well-established in existing research, so it is not our focus. Instead, we describe how individuals' vote choices may be shaped by the economy of their geographic region, and how voters may weigh the benefits of redistribution against policies that promote regional economic development.

The logic underpinning our theoretical expectations linking vote choice and its variance to individual income ($V$) and regional productivity ($W$) is visualised in Figure 1, which builds upon the core model of Rueda and Stegmueller (2019). Voters' level of support for redistributive parties ($S$) is on the y-axis, with higher values representing greater support for redistributive parties. In this diagram, we show the expected pull of high individual income ($V_i'$) away from support for redistributive parties relative to low income ($V_i$). We also see the higher expected average level of support for redistributive parties in high-productivity regions ($W_r'$) relative to low-productivity regions ($W_r$).

Figure 1 also visualises the expected vote choice variance for our focus groups around their average values. Determined by the different slopes of $W_r$ and $W_r'$, this figure also anticipates
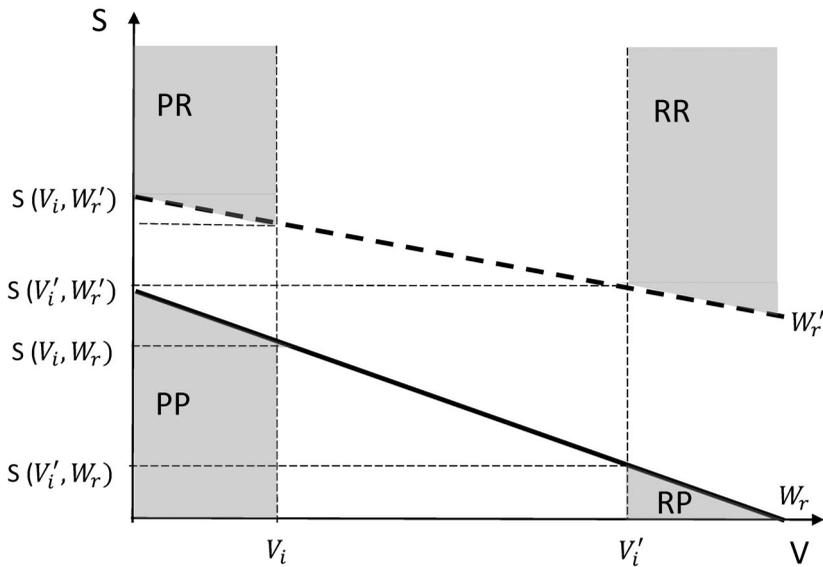
**Figure 1.** Household income, regional productivity, and vote choice variance.
Source: Authors' elaboration.

*within*-group vote variance – how cohesively our four place-based income groups (the rich in rich regions (RR), the poor in rich regions (PR), the rich in poor regions (RP), and the poor in poor regions (PP)) would vote, indicated by the size of the shaded area. We expect within-group variance to be an outcome of cross-pressure, with the rich in highly productive regions (RR) and the poor in low-productivity regions (PP) having larger variances and the rich in regions with low productivity (RP) the most homogeneous voting bloc. We also expect higher variability *between* individuals of different incomes in regions with low productivity (PP and RP) than in regions with high productivity (PR and RR). This difference in vote choice variability is reflected in the relative size of the shaded areas for PP and RP, i.e., |PP – RP| relative to |RR – PR|, underscoring greater between-income group variability in poor regions compared to rich regions, driven by the steeper slope of $W_r$ than that of $W_r'$. Our discussion below justifies the following claims highlighted in Figure 1: (1) voters in highly productive regions support redistributive parties more than less productive regions ($W_r' > W_r$) and (2) variability is higher in more cross-pressured groups in our framework – the rich in more productive regions (RR) and the poor in less productive regions (PP), and lower for groups for which cross-pressure is lower (PR, RP).

## 2.1. Why vote for your region?

Although most research on the political economy of redistribution focuses on individual income, there are strong theoretical reasons to believe that place-based economic preferences may also motivate vote choice on redistribution. It is often taken for granted that voters would find solidarity with those of similar incomes to themselves rather than those living near them and interacting with them regularly. Yet the strong geographic trends in voting around the world suggest that local factors may also influence voters' decisions, and that voters may perceive their own economic fates to be tied to their regions.

Voters evaluate the national economy based on the economic conditions of their local area (Ansolabehere et al., 2014; Gimpel et al., 2020; Martin & Webster, 2020). People tend to understand the national economy through their local experience, standards for wages, relative

purchasing power and poverty rates – which they experience more directly than national trends (Ansell & Cansunar, 2017; Gelman, 2009). Locational clustering in voting may result from geographic interdependencies and local market externalities, which may incentivise place-based socio-tropic voting (Krugman, 1991; Pittau et al., 2010). When the main industries in a region thrive, so too will its supporting industries. In this case, individuals may reasonably understand that their regional economy may directly or indirectly affect their own economic circumstances and those of their neighbours.

Research examining the geographic clustering of recent waves of right-wing populism in the United States and Europe, for example, has found strong predictors to be region-specific labour market factors (Colantone & Stanig, 2018b; Gordon, 2018). Voters experience 'common exposure' to economic trends because regions have strong clustering in occupational and educational opportunities. As Frank (2013) argues, it is reasonable for voters to evaluate the economy in local terms because critical elements of material comfort and upward mobility – from the size of their homes to access to high-quality schools for their children – are structured by economic conditions and economic positionality within the region. Thus, some voters may view the relationship between voting and the economy in similar terms as their neighbours, regardless of income.

In the next sections, we focus on linking policy preferences for redistribution to the nature of regional productivity and how voters may see these policies as important to their lives. We draw upon research that identifies the economic attributes of rich and poor regions to suggest possible explanations for the difference in slope between the lines $W_r'$ and $W_r$ in Figure 1 in redistributive party voting.

### 2.1.1. Policy preferences in highly productive regions

Casual observation of voting patterns in advanced industrial democracies today shows that highly productive regions tend to vote disproportionately for redistributive parties, while less productive areas have been less likely to support parties advocating traditional redistribution in recent years (Colantone & Stanig, 2018a; Rodden, 2019). This fact is often taken for granted, but it is not obvious why the richest places would be more likely to support redistribution rather than the poorer regions that could benefit from the infusion of resources into their areas (Bolton & Roland, 1997). In this section, we provide reasoning that may justify rich regions' voters' preferences for redistribution based on their support for policies that enhance their region's productivity, which may have positive effects on their own circumstances and those of their communities.

More diversified regional economies have higher productivity and growth rates. This in turn plausibly induces voters to support redistributive policies that sustain consumption and invest in human capital (education and health) that will continue or accelerate high growth rates.

Government redistributive investments in education, health, and social insurance are particularly important to service-based economies that tend to dominate highly productive regions, thus we may see more support for redistribution among individuals in rich regions, even among rich individuals. The rich may benefit directly from unemployment insurance when their skills are more specific and their industries are more subject to disruption (Rehm, 2011). Voters in rich regions may also enjoy childcare benefits, as both partners are working outside the home and they are less likely to have nearby family support. They may also see education policies as important for their children and themselves to compete in the global economy, and for their region. High costs of living in rich places may also lead some rich individuals to view themselves as less rich than their income would suggest, and thus see themselves as potential beneficiaries of welfare programmes. In the European context, many of these benefits are not means tested, so their perceptions of benefits may be accurate even when they are paying more in taxes than other beneficiaries (Goodin & Le Grand, 2018; Jacques & Noël, 2018; Korpi & Palme, 1998).

Consumption complementarities may lead voters in rich regions to prefer a set of policies that would typically be seen as distinct from their short-term pocketbook interests due to the economic needs of their region, and the social and economic interconnection of individuals in high-productivity regions. For example, support for higher taxes among wealthy residents in rich regions may stem from indirect self-interest, as high-quality public services help reduce social discontent and crime. Related research finds that individuals in rich regions may also consider their area in need of redistribution and public support for the needy. Citizens in rich regions with dense populations are more likely to directly observe social problems such as poverty, crime, and homelessness, and therefore approve of government actions to reduce them (Rueda & Stegmueller, 2016).

Support for higher taxation to fund public goods and social programmes may be more prevalent in richer regions because taxpayers in wealthier places may be more likely to observe positive policy outcomes from their contribution, such as well-maintained infrastructure, quality education, and accessible healthcare services. Consequently, they may be more inclined to recognise tangible benefits from paying taxes for broad-based social benefits.

### 2.1.2. Policy preferences in less productive regions

It is also not immediately obvious why poor places would not vote disproportionately for redistributive parties from the perspective of regional income differentials. Bolton and Roland (1997), for example, point out that rich regions subsidise poor regions in terms of national spending, and thus, all else equal, poor regions should favour more redistributive government spending. We might expect poorer regions to seek substantial support from the central government to improve their economic conditions. We argue that poorer regions may not oppose government spending in general, but may prefer spending in categories not typically considered redistributive, such as less market regulation, sector-specific spending that benefits business over consumers, or policies that shift resources away from agglomerated urban areas towards other parts of the nation.

In lower productivity regions with a disproportionate number of workers in the primary sector, we may see support for anti-redistribution parties that favour extractive industries and farming. Individuals who work in the primary sector vote less for redistributive parties than individuals in the service sectors (Hearl et al., 1996). Agricultural and extractive industries became highly capital-intensive in the mid-twentieth century due to technological advancements, fostering the rise of upwardly mobile individuals in the farming sector that increasingly identified with anti-redistribution parties (Dasgupta & Ramirez, 2020). Low business regulation, a tenant of anti-redistribution parties, may thus be attractive to some voters across income levels in poor regions.

More recently, lower productivity regions also include those with decaying manufacturing industries. These regions are not typically diversified or (yet) substantially invested in high-productivity industries in the service sector that are conditional on high levels of human capital. Across the advanced industrialised nations, some voters in these 'left behind' regions are rejecting traditional redistributive parties in favour of those that would refocus government resources toward growth models based on traditional manufacturing and extractive industries (Ford & Jennings, 2020). These individuals may see business-friendly policies to benefit themselves, if they result in better economic opportunities in their regions. Some individuals in these regions have reduced trust in government competency to improve the economy, and have shifted toward parties opposed to traditional redistribution that promise less government intervention that has been seen to favour rich areas (Kitschelt & McGann, 1997).

Taxpayers in poor regions (where government capacity and service effectiveness may be weaker) tend to be more sceptical about the benefits of the welfare state to them and the return on their taxes (Holland, 2017). In the European context, this scepticism may be less prevalent, as even the poor regions show relatively high capacity, but decentralisation efforts, compounded by the Great Recession, have increased territorial inequalities in service provision (Andreotti &

Mingione, 2016). Moreover, some less prosperous European regions are receiving regional redistribution at lower levels than comparable neighbours, heightening their view that the welfare state does not benefit them (Schraff, 2019). Whether the perceptions match reality or not, many individuals in poor regions view the welfare state as benefiting regions (and individuals) other than themselves (Attewell, 2021).

Overall, we expect some voters in less productive regions to favour parties that promise to reduce regulation, reduce government involvement in the economy seen to favour rich areas, and target benefits to sectors that might bolster their regions' economies (and themselves), rather than parties offering traditional welfare benefits to individuals. Thus they may be more likely to vote for parties other than those offering conventional redistributive programmes than traditional political economy theories of individual income would expect. The arguments in these two sections support our first hypothesis on how vote choice may be related to regional productivity:

> (H1) On average, voters in more productive (richer) regions vote more for redistributive parties than voters in less productive ('poorer') regions.

## 2.2. Cross-pressure

In this section, we offer possible explanations for differences in the levels of variance around the average voter positions within the groups depicted in Figure 1. We expect variance within region-income groups to be an observable implication of cross-pressure – distributive interests that pull voters in different directions. Typically, research on cross-pressure focuses on the tension between economic and non-economic issues for voters (Dassonneville, 2022; De La O & Rodden, 2008; Tavits & Potter, 2015). We argue that when voters' personal income leads them to different conclusions than what they perceive as the best economic vote for their region, we are likely to see high variance as individuals weigh these inputs differently.

Consider the preference of some rich individuals in rich regions for redistributive policies that benefit the economic productivity of their region and, in some cases, their own life circumstances. These policies may prompt a higher percentage to vote for redistributive parties than might otherwise be expected given their incomes. At the same time, we should also expect some of those affluent individuals to fall in line with the expected interests of their income class rather than voting closer to the regional average. The result would be variance around the mean of the individual income variables, which is predictable based on levels of regional productivity.

Poor individuals in poor regions may also be cross-pressured. We commonly see low-income individuals, particularly in lower productivity regions, vote for parties opposed to redistribution (Ferrari, 2021; Frank, 2013). These individuals may perceive their region's interests as better aligned with parties that emphasise economic growth or business-friendly policies seen to favour the poor regions. Of course, this does not exclude votes on an income basis for redistributively-oriented parties, which raises an expectation for relatively high variance for poor voters in poor regions.

> (H2a) Richer voters in rich regions and poorer voters in poor regions exhibit relatively high vote variance.

For poor voters in rich regions, preferences for redistribution on a regional and income basis generally align, thus leading to reduced within-group variance. On the basis of their income, poor individuals are expected to support redistribution – they stand to benefit the most from government welfare policies. Similarly, the rich in poor regions are likely to be the least cross-pressured and thus show the lowest within-group variance. For affluent individuals seeking low taxes to protect their incomes and help their region, votes for anti-redistributive parties is a logical choice (Ogorzalek et al., 2020).

> (H2b) Richer voters in poor regions and poorer voters in rich regions have relatively low vote variance.

# 3. DATA DESCRIPTION

To prepare our analysis, we compiled variables from several different sources into a dataset linking individuals' household income, the economic productivity of their electoral district, and the redistribution policy position of their preferred party. Our baseline data come from repeated cross-sectional surveys of self-reported vote choices in parliamentary elections drawn from the Comparative Study of Electoral Systems (CSES). This dataset includes integrated modules 1 through 4 for nine European countries: Austria (2008, 2013), Czech Republic (2006, 2010, 2013), Finland (2003, 2007, 2011), Germany (2002, 2005, 2009, 2013), Greece (2009, 2012, 2015), Italy (2006), Poland (2001, 2005, 2007, 2011), Spain (2000, 2004, 2008) and Switzerland (2011). We include all surveys in which we can match the respondent's primary electoral district – the relevant unit of analysis – to available estimates of subnational region per capita gross domestic product (GDP) at a geographic coverage of Territorial Level 3 (TL3) or Level 2 (TL2 for Italy), and redistribution policy position of the respondents' preferred party from the Comparative Manifesto Project (CMP) (Krause et al., 2018). Summary statistics for all variables are presented in Table A in the Appendix in the online supplemental data.

## 3.1. Dependent variable: the redistribution policy position of the voter's preferred party

Our analysis is both time-series and cross-national, requiring us to standardise our variables in a way that is comparable over time and across different national contexts. Unlike single-country studies, we cannot rely on the selection of a particular political party as our dependent variable because parties change over time and differ across nations. To create a cross-nationally comparable dependent variable, we link the political parties in the CSES dataset to their economic ideological placement in the Comparative Manifesto Project (CMP) dataset (Budge, 2001; Klingemann et al., 2006). We link the 'IMD3002_LH_PL' variable (a list of party names for constituency vote choices in the current lower house election) from the CSES dataset to the CMP dataset and convert it into a standardised measure of policy position based on party manifestos, reflecting the extent to which that party favours state involvement in redistribution (Benoit & Laver, 2006, 2007).

$$\text{Party's economic policy position} = Log\left(\frac{\text{Positive statements on redistribution} + 0.5}{\text{Negative statements on redistribution} + 0.5}\right) \quad (1)$$

Following Lowe et al. (2011) and Rueda and Stegmueller (2019), we use Equation (1) for the dependent variable – a continuous measure of parties' positions based on positive and negative statements about redistribution, where a larger value indicates a more redistributive position. Positive statements include a party's stated preference for (1) market regulation, (2) long-standing economic planning by the government, (3) market protection, (4) government control over prices, (5) government ownership of industries, (6) expanded government funding for social welfare, (7) improvement of educational provision and (8) support for all labour groups. Negative statements include favourable mentions of (1) free markets, (2) assistance to business rather than consumers, (3) abolishing all means of market protection, (4) economically healthy government policy making and (5) against welfare expansion.

Using the CMP data, we calculate a ratio of additive values on eight positive statements to those on five negative statements and then take the logarithmic value of this ratio to ensure that more relative emphasis is assigned to extreme values. As suggested by Lowe et al. (2011), we add a constant number (0.5) to solve calibration problems with low values of a party's position statements. This method yields scores for the redistributive policies of European parties in the CMP dataset.

These categories and the CMP approach are standard in the literature for measuring party ideology favourable toward redistribution. Our goal is to understand how votes cast for or against redistributive parties relate to a voter's region's economic interests, as well as their pocketbook interests. For many voters who perceive their region's best interest as aligned with assistance to business and less regulation, votes against redistributive parties are well captured in this measure. Some voters may favour specific policy approaches to benefit their region such as targeted expenditure on sectors. In many cases these will be captured by 'assistance to business', but we are not able to fully capture this preference in traditional measures of redistributive party ideology. Instead, we capture these voters for what they are also voting for, which is anti-redistributive parties, and who they are not voting for, redistributive parties. It is well understood that voting is a blunt instrument for expressing voter preferences, and our approach of measuring variance amongst voter groups should help to uncover some of the 'noise' that we see in party vote choice that comes from regional economic interests.

The policy positions of the voter's self-reported preferred party may change over time and relative to other parties in that nation. Thus, party positions could be viewed as subject to country-election-specific circumstances. We address this possibility with a second measure of our dependent variable capturing a party's position on redistribution relative to the country-election-specific mean redistributive position. Following Rueda and Stegmueller (2019), we employ a binary coding scheme, assigning a value of one to a party if it holds a policy position (the score calculated from Equation (1)) above the country-election-specific redistributive policy mean. Therefore, the party above the mean value is characterised as more redistributive than the hypothetical average party. Additionally, taking the mean as a reference point is particularly useful because party policy preference may fluctuate '(endogenously) with each election in each country' (Rueda and Stegmueller, 2019, p. 204). This calculation of the dependent variable also helps us capture substantial variation among country-election-specific vote support for redistributive parties. For example, in Poland's 2011 general election, 81% of voters supported a party favouring more redistribution than the mean party position, whereas in Austria in 2008, only 8% of voters supported parties above the redistributive mean position.

## 3.2. Primary independent variables

Our focus is on economic factors – regional productivity and individual income – as key determinants of voters' party selection. We analyse the relationship between these economic factors and voting behaviour in two hierarchically integrated units – household income differences among individual income earners and regional economic productivity differences across those individuals' locations.

*Household Income (Household Income Quintile)*: Income disparities at the household level are measured as the respondents' before-tax household income quintile.[2] Scholars generally consider household income to be a preferable measure to individual income because household members share resources, making household income a better indicator of an individual's life circumstances. A quintile measure is more desirable than a direct measure of income because it can be compared cross-nationally.

It also accounts for the recognised importance of relative income in people's voting patterns (Margalit, 2012). The household income quintile measure is available from the CSES dataset. The quintile data distribution shows a mean of 3.04 with a standard deviation of 1.37.

*Regional Productivity (Regional Productivity Quintile)*. Our regional productivity measure is the per capita GDP of an electoral district, drawn from the OECD's Regional Economy Statistics. Given that we focus on a region's economic level and profile, GDP per capita is an appropriate indicator. It is important to note that GDP per capita is a macro indicator encompassing several factors of interest that we consider in our conceptual framework, especially sectoral composition and the underlying skills profile of the regional economy. As we discuss below in Section

7, we also examine economic and sociodemographic indicators that may underlie the relationship between voting and regional GDP per capita.

We group our districts into regional productivity quintiles[3] to be comparable to the household income quintile measure provided by the CSES. Quintiles also make the measure cross-nationally comparable and reflect the likelihood that regional productivity differences are evaluated relative to within-country standards. The regional productivity quintile measure has a mean of 3.34 with a standard deviation of 1.46.

Our main analysis includes only cases where the respondent's electoral district matches a regional unit with available data. See Section 1 in the Appendix in the online supplemental data for details. Calculating regional income requires the aggregation of data beyond the individual. With the aggregation of geographic data comes concerns with the modifiable areal unit problem (MAUP) – that our results may be affected by the geographic unit at which we have chosen to measure our data (Lee et al., 2025; Wong, 2009). We focus on the theoretical unit of analysis for voting – the electoral district – and restrict our sample for the main analysis to those cases in which we can calculate regional income at the electoral district level.

We also include analyses in Section 4 in the Appendix in the online supplemental data for cases in which our measure of regional productivity does not precisely match the electoral district. For that, we link voters' location to two different regional income measures, TL2 (equivalent to the US state) or TL3 (equivalent to the US county), to account for the income of their administrative region. We do so, first, to demonstrate the robustness of our main analysis to a broader sample of countries and regional productivity measured at multiple levels of aggregation. Standard advice for addressing empirical concerns related to the MAUP involves, first, choosing the theoretical unit of interest (in this case the electoral district), and, if the theoretical unit is not known or data are not available, to demonstrate robustness across multiple levels of aggregation (Lee & Rogers, 2019).

*Control Variables*. We employ standard socioeconomic and demographic controls to predict vote choice. First, we account for the CSES survey respondent's ideological *Self-placement* on a scale from 0 (right) to 10 (left). We expect the respondents' partisan alignment on redistribution to be congruent with their ideological placement (Kitschelt, 1994). Second, respondents' age, captured in two integrated variables of *Voter's Age* and *Voter's Age Squared*, is expected to exhibit an inverted u-shape relationship with some age-related government services such as education spending and job-creation programmes (Busemeyer et al., 2009). Third, we include *Gender* due to extensive empirical evidence that men are more likely than women to vote for conservative parties (Inglehart & Norris, 2003). Fourth, voters' educational attainment, *Higher Education* (measured as a dummy variable), is expected to be negatively related to redistributive voting in our sample period (Stegmueller, 2013). The literature generally agrees that highly educated individuals tend to be more economically secure (with less to gain from redistribution) but disagrees on whether education tempers anti-redistributive preferences independently of financial security. Fifth, respondents' marital (or civil union) status, *Married*, is expected to be negatively related to an individual's demand for redistribution because marriage improves economic stability and may thus reduce risk aversion against negative economic shocks. Sixth, we incorporate the self-reported degree of religious belief, *Religiosity*. Related research argues religious affiliation may shield some voters from market insecurities (Scheve & Stasavage, 2006) or be linked to anti-redistribution voting through party platforms that combine these features (De La O & Rodden, 2008). Lastly, we also account for region-level voter turnout rates in each parliamentary election (*Regional Voter Turnout*). A high turnout rate may indicate that voters have high party allegiance, are politically more informed, or feel stronger regional attachment. Those factors suggest that such voters would have lower variance in vote choice.

## 4. EMPIRICAL APPROACH

The logic of our methodological approach is to examine whether different groups tend to vote more similarly or differently across contexts. This similarity can be assessed by analysing how much of the total variation in individual voting behaviour is attributable to: (1) their household income and (2) their region's productivity.

We measure this variation using a two-step approach. First, we use a least squares regression that captures the average differences between quintile groups. We then examine the between-group variance and the within-group variance of the residual of the regression. In most analyses, the residuals are treated as measurement error rather than a substantive component. However, we consider the residuals to potentially include theoretically relevant variation.

If our conceptual framework is valid, place-based factors, such as regional productivity, should account for a portion of the unexplained variance. For example, individuals in the same household income quintile are geographically dispersed, making regional productivity a plausible predictor of within-group variability among household income groups. By accounting for regional productivity, we can assess whether the heterogeneity in vote choice of a particular income group is associated with the regional productivity of those households' locations.[4]

Formalising this two-step method involves using the variance coefficients $\lambda$ in the following equation (Cook & Weisberg, 1983; Western & Bloome, 2009):

$$vote\ choice_i = x_i'\beta + e_i$$
$$\log(Var(e_i)) = \log(\sigma_i^2) = z_i'\lambda \tag{2}$$

where $i$ is an individual survey observation on vote choice for respondent $i$, operationalised as the redistributive policy position of the voter's selected party. $x_i'$ is a $1 \times k$ row vector of independent variables (household income quintile, regional productivity quintile, ideological self-placement, age, gender, education, marital status, religiosity and a set of dummies controlling for country fixed effects as well as election years).[5] $\beta$ is a $k \times 1$ vector of regression coefficients, where $\beta_k$ accounts for the average difference in vote choice associated with a unit change in an independent variable, $x_k$. $e_i$ is the error term to capture unobserved factors that influence the vote choice of respondent $i$. $z_i'$ denotes a $1 \times j$ row vector of covariates (household income quintile, regional productivity quintile and regional voter turnout) for the variance of $e_i$.

The estimation technique for this two-step method begins by fitting a linear regression of vote choice on household income and regional productivity quintiles, which provides the least squares estimate $\hat{\beta}$ and retains the residuals[6] $e_i = vote\ choice_i - x_i'\hat{\beta}$. Next, $\lambda$ is estimated by applying a gamma regression to the squared residuals, $\hat{e}_i^2$, using a log link function as part of a generalised linear model to address the positive, right-skewed dependent variable. This approach allows us to: (1) examine the average relationship between the variables of interest and (2) investigate the variance within those relationships.[7]

## 5. VARIANCE FUNCTION REGRESSION: FIRST AND SECOND STAGE RESULTS

In this section, we describe the results of our first stage ordinary least squares (OLS) regression, capturing the average association between our variables of interest and party vote choice. The coefficients of interest are shown in the top segment of Table 1. We find that *ceteris paribus*, a higher level of individual income is negatively correlated with voting for a party favouring more redistribution. Consistent with a large body of research in political economy, rich individuals vote less for redistribution than poor individuals. Individual income-based voting behaviour is consistent across all models in Table 1 with a negative, statistically significant coefficient for

*Household Income Quintile* (see *p*-values in brackets in Table 1). As income rises, so does anti-redistributive vote choice. Focusing on (between-group) vote choice differences in (household income quintile) group averages, our linear regression predicts the respondent's likelihood of voting for a party favouring traditional redistribution decreases by approximately 0.03 (Model 1) when going up one income quintile, which amounts to a 2.3% decrease below the sample response mean (1.32). This result remains robust in Models 2–3, with the continuous measure of pro-redistributive vote choice regressed against separate quintiles of regional income.

The average vote choice difference between *Regional Productivity Quintile* groups captured in our model estimates is positive and significant whether it is regressed as a quintile together in Model 1 or a set of separate dummies in Models 2–3. Consistent with H1, this suggests that as regional increase incomes, so does support for redistributive parties. We find the effect size for the top quintile regional group (i.e., the richest vs. the poorest) predicts an increase by about 0.03 (equivalently, a 2.3% increase from the response mean), which is similar to the predicted effect of the individual income variable on vote choice.

In the lower section of Table 1 (Models 1–3), we estimate within-group variation in vote choice as the second stage of our generalised linear regression. The coefficient signs refer to the level of variance within those groups (i.e., a positive coefficient implies higher variance), not their pro- or anti-redistribution vote choices. Model 1 shows the estimated effects of *Household Income Quintile* and *Regional Productivity Quintile* (with a separate test for five regional income groups divided in Models 2–3) on within-group variation in vote choice. *Household Income Quintile* is significantly and negatively correlated with the residential variance of vote choice. This is what we predicted in Figure 1 showing that the sum of poor people in all places differs from the sum of rich people in all places, meaning there is more variability for people with less income than those with higher individual income.

*Regional Productivity Quintile* is also significant and negatively associated with the residual variance of vote choices. The negative coefficient should be interpreted to suggest that vote choices in rich regions are more homogeneous than those in poor regions (as predicted in H2a/b: |PP-RP| > |RR-PR|). With an increase in *Regional Productivity Quintile*, the residual variance of vote choices is reduced by about 1.5% (with a log variance factor of 0.02). While this portion may seem small, a direct comparison between the bottom 20% and the top 20% shows a more substantial reduction in variance, amounting to 14%.

Results from binary dependent variable (Models 4–6) affirm that more anti-redistributive party votes come from rich individuals and more pro-redistributive party voting is found in rich regions. The binary dependent variable for our logistic regression in the first stage is country-election-year-specific, providing high internal validity (Rueda & Stegmueller, 2019).[8] The estimated coefficients of our income variables are consistent in terms of their directional signs and statistical significance levels. Our odds ratio results reported in Model 5, Table 1, indicate that the likelihood of voting for a redistributive party increases by 24% between the bottom and top regional quintiles. This quintile group differential is similar in Model 6 (about 22%). The second stage results exhibit smaller variability (as expected given the construction of the variable) to what we obtained from Models 1–3, and in all cases, the results are consistent in direction and statistical significance.

To summarise, higher individual income is associated with increased voting for parties opposed to traditional redistributive policies and reduced vote choice variability. Regarding place-based voting, a higher level of regional productivity is correlated with more support for redistributive parties. We also find that higher regional productivity (and higher household income) is strongly associated with lower vote choice variability.

Reviewing the effects of control variables, we find anticipated patterns. Most apparently, pro-redistributive votes align with respondents' ideological self-placement (right-left) and the anticipated U-shaped effect of age. Our model prediction also shows that vote choice for a party in

**Table 1.** Economic effects on redistributive voting behaviour.

| | Model [1] continuous measure | Mode [2] continuous measure | Model [3] continuous measure | Model [4] binary measure | Model [5] binary measure | Model [6] binary measure |
|---|---|---|---|---|---|---|
| *First stage* | OLS Regression | | | Logistic Regression | | |
| Household income quintile | −0.028*** | −0.027*** | −0.029*** | −0.024** | −0.025** | −0.037** |
| | (0.004) | (0.004) | (0.005) | (0.012) | (0.012) | (0.018) |
| Regional productivity quintile | 0.007** | | | 0.033*** | | |
| | (0.003) | | | (0.010) | | |
| 2nd Quintile | | 0.029* | | | 0.200*** | |
| | | (0.015) | | | (0.053) | |
| 3rd Quintile | | 0.033** | | | 0.212*** | |
| | | (0.016) | | | (0.054) | |
| 4th Quintile | | 0.043*** | | | 0.110** | |
| | | (0.015) | | | (0.050) | |
| 5th Quintile | | 0.034** | 0.028** | | 0.215*** | 0.202*** |
| | | (0.014) | (0.014) | | (0.047) | (0.047) |
| Self-Identification: Right(0)-Left(10) | 0.019*** | 0.192*** | 0.174*** | 0.332*** | 0.334*** | 0.318*** |
| | (0.000) | (0.002) | (0.003) | (0.007) | (0.007) | (0.010) |
| Age (16–95) | 0.006*** | 0.006*** | 0.010*** | 0.019*** | 0.019*** | 0.022*** |
| | (0.002) | (0.002) | (0.002) | (0.006) | (0.006) | (0.008) |
| Age Squared | −0.000*** | −0.000*** | −0.000*** | −0.000*** | −0.000*** | −0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Male (1 = Yes, 0 = No) | 0.007 | 0.007 | −0.002 | −0.034 | −0.033 | −0.025 |
| | (0.009) | (0.009) | (0.013) | (0.030) | (0.030) | (0.044) |
| Higher Education (1 = Yes 0 = No) | −0.039*** | −0.042*** | −0.034** | −0.287*** | −0.289*** | −0.224*** |
| | (0.011) | (0.011) | (0.016) | (0.032) | (0.032) | (0.047) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Married (1 = Yes, 0 = No) | −0.040*** | −0.042*** | −0.031* | −0.138*** | −0.138*** | −0.092* |
| | (0.012) | (0.012) | (0.016) | (0.039) | (0.039) | (0.056) |
| Religiosity (1 = Yes, 0 = No) | −0.112*** | −0.110*** | −0.111*** | 0.036 | 0.026 | 0.025 |
| | (0.012) | (0.012) | (0.016) | (0.036) | (0.036) | (0.053) |
| Constant | 0.350** | 0.334*** | 0.335*** | −2.192*** | −2.239*** | −2.261*** |
| | (0.058) | (0.058) | (0.080) | (0.145) | (0.146) | (0.208) |
| *Second stage: variance estimation gamma regression* | | | | | | |
| Household Income Quintile | −0.060*** | −0.058*** | −0.064*** | −0.029*** | −0.029*** | −0.034*** |
| | (0.009) | (0.009) | (0.014) | (0.005) | (0.005) | (0.007) |
| Regional productivity quintile | −0.023*** | | | −0.008* | | |
| | (0.009) | | | (0.005) | | |
| 2nd Quintile | | −0.168*** | | | −0.130*** | |
| | | (0.044) | | | (0.024) | |
| 3rd Quintile | | −0.189*** | | | −0.066*** | |
| | | (0.045) | | | (0.025) | |
| 4th Quintile | | −0.044 | | | −0.086*** | |
| | | (0.041) | | | (0.023) | |
| 5th Quintile | | −0.176*** | −0.205*** | | −0.073*** | −0.074*** |
| | | (0.039) | (0.041) | | (0.021) | (0.020) |

*(Continued)*

**Table 1.** Continued.

| | Model [1] continuous measure | Mode [2] continuous measure | Model [3] continuous measure | Model [4] binary measure | Model [5] binary measure | Model [6] binary measure |
|---|---|---|---|---|---|---|
| Voter turnout (%) | −0.045*** | −0.046*** | −0.049*** | −0.012*** | −0.013*** | −0.014*** |
| | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) | (0.001) |
| Constant | 2.920*** | 2.967*** | 3.215*** | 0.939*** | 1.013*** | 1.110*** |
| | (0.082) | (0.082) | (0.122) | (0.045) | (0.045) | (0.060) |
| Log Likelihood | −14,543 | −14,497 | −6,590 | −21,359 | −21,394 | −9,999 |
| AIC | 29,094 | 29,007 | 13,188 | 42,726 | 42,802 | 20,005 |
| BIC | 29,126 | 29,062 | 13,217 | 42,758 | 42,858 | 20,034 |
| First Stage County Election Year FE | Yes | Yes | Yes | Country-Election Year Embedded | | |
| Sample | Full | Full | Selected | Full | Full | Selected |
| Observations | 20,595 | 20,595 | 9,646 | 20,789 | 20,789 | 9,718 |

Notes: The first-stage dependent variable is CSES respondents' party vote choice, ranging from pro-redistribution (positive) to anti-redistribution (negative). Models 4–6 use a binary outcome: 1 if voting for a party above the country-election-year redistribution average, 0 otherwise. Models 3 and 6 use only samples from the richest or the poorest regions. Two-tailed test significant at ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. *P*-values in brackets.

favour of less redistribution is significantly associated with being male, married, highly educated and religiously affiliated. A higher rate of regional voting turnout is associated with less voting variability, suggesting that more politically active regions have more consistent, predictable voting patterns.

## 6. VARIANCE DECOMPOSITION ANALYSIS

In this section, we analyse the variation within regions to see whether different income groups have more or less variance in their voting within their regions. To do so, we decompose the variance in the vote choice regression into two parts expressed in the following weighted sum proposed by Western and Bloome (2009):

$$
\begin{aligned}
Weighted\ Total\ Variance = \sum_{c=1}^{5} \pi_c(\widehat{Vote\ Choice_c} - \overline{Vote\ Choice}) \\
+ \sum_{c=1}^{5} \pi_c(Variance\ of\ Vote\ Choice\ Residuals_c)
\end{aligned}
\tag{3}
$$

where $\pi$ denotes the sample ratio of one of the five household income quintile groups at the same quintile of regional income. The between-group variance component, $\widehat{Vote\ Choice_c} - \overline{Vote\ Choice}$, is a deviation of the household income group-specific mean from their regional productivity group overall mean (across incomes within regions in the same income quintile). The within-group variance component, *Variance of Vote Choice Residuals_c*, is the variance of vote choice residuals for each specific group. The variance function regression coefficients reported in Table 1 provide the variance values for us to calculate relative variance contributions of between-group and within-group differences.

Figure 2 depicts the variance decomposition results expressed as a percentage of the country-specific total variance estimated in Table 1. We plotted the four groups shown in Figure 1 to demonstrate our results: (1) people in the bottom 20% of household income in places at the bottom 20% of regional income (PP), (2) people in the top 20% in places at the bottom 20% (RP), (3) people in the bottom 20% in places in the top 20% (PR) and (4) people in the top 20% in places in the top 20% (RR).[9]

This relative voting behaviour variability is calculated from the weighted sum of the between-group mean differences and the within-group variability for each selection, as expressed in Equation (3). The greater this weighted total variability, the larger the portion of overall vote choice variability in that group. As shown in Figure 1, rich people in poor places (RP) have the least variation in all cases with about 12% of overall vote choice sample variability, meaning they are the most cohesive voting bloc. These findings are consistent with the observation by Ogorzalek et al. (2020) and Gelman et al. (2007) that income matters more in poor places, especially among the rich. To contribute to those studies, we find rich people in rich places (RR) are the most variable with 27% of overall vote choice sample variability, suggesting significant intra-upper class heterogeneity in the most productive places. Consistent with our predictions, we also find that the estimated degree of variability for cross-pressured PP (20%) is higher than PR (16%). Overall, the results meet our expectations from Figure 1, that cross-pressured voters RR and PP exhibit the most variation, reflecting differences in how voters respond to preferences based on individual and regional income.
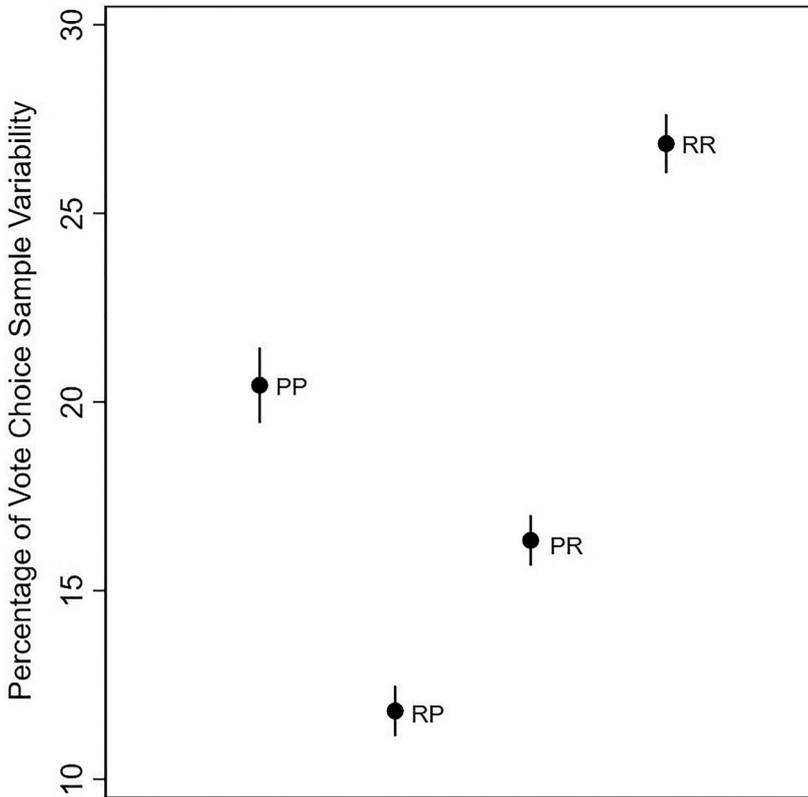
**Figure 2.** Weighted total vote choice variance of selected groups.
Notes: Each dot with its 95% confidence intervals represents the weighted sum of the between-group and within-group variance drawn from Table 1, Model [1]. The weighted sum is then calculated as a percentage of vote choice variability in the sample.
Source: Authors' elaboration.

## 7. ROBUSTNESS

We took several steps to ensure our results are not driven by our empirical approach:

- *Alternative estimation techniques to address small sample bias.* The sample size of our merged data varies across countries and survey years and the maximum likelihood (ML) estimator may not be appropriate for small samples. To address this concern, we use a restricted maximum likelihood (REML) estimation for $\lambda$ (see Equation (2)), which reduces small sample bias (Smyth et al., 2001). Our key findings remain consistent and robust in Table B in the Appendix in the online supplemental data. We also use Bayesian modelling analysis for causal heterogeneity (Western & Bloome, 2009), which is robust to inference based on skewed distributions. See Section 3.2, Table C and Figure A in the Appendix in the online supplemental data for details.
- *Geographic unit.* We also examine our findings at different geographic units. As discussed above, we restrict our main sample to countries where we can measure the productivity of the electoral district. However, other notions of place may be in the minds of voters. Accordingly, it is plausible voter preferences cluster on the basis of other units of geography, in

addition to, or instead of, the electoral district. Tested across a larger sample of countries, all measured at the TL3 and TL2 levels (whether or not the electoral district matches TL3 or TL2), the results are robust. See Table D in the Appendix in the online supplemental data for details.

- *Sensitivity analysis with party system differences.* Our estimates of vote choice variability may be influenced by the number of parties in a given country's election year. Multiparty systems could exhibit greater variance due to the larger number of parties. To account for this vote choice uncertainty at the second stage of our variance function regression, we include the number of effective parties (ENP) from the Comparative Political Dataset (Armingeon et al., 2020). This party system variable does not substantively alter our findings (see Table F in the Appendix in the online supplemental data for details).

- *Socio-economic controls.* We follow Tucker (2006) in incorporating region-specific demographic and market pressures including population growth, population density growth, annual GDP per capita growth, labour participation rate, value added in agriculture, and employment in manufacturing. As presented in Figure B and Section 7 in the Appendix in the online supplemental data, these additions do not alter our main results. Table G in Section 8 in the Appendix in the online supplemental data also presents the variance function regression results weighted by urban-rural residence, with our key findings intact.

- *Socio-cultural controls.* In our efforts to identify the economic sources of voting behaviour and to maintain the parsimony of our models, we do not focus directly on the impact of 'non-economic' factors on vote choice, such as 'values voting' (Kriesi, 2010), identity politics (Börzel & Risse, 2018) or critical issues in Europe, such as opinions on immigration (Mudde, 1999) or EU integration (Hobolt & De Vries, 2016). We do so to provide coherence to our conceptual framework, and to analytically and empirically identify the economic sources of place-based vote choice. In our robustness analyses, we control for a range of socio-economic and socio-cultural factors at the individual and region levels, and for party appeals based on Euroscepticism, anti-multiculturalism and nationalism. We also control for Euroscepticism, nationalism, and anti-multiculturalism at the party level to account for the possibility that voters' choices are mainly driven by these cultural factors rather than economic conditions. We explain our variable constructions in Section 9 in the Appendix in the online supplemental data and summarise our results, showing that our key findings remain intact.

## 8. CONCLUSIONS AND IMPLICATIONS

Our analysis shows that the relationship between individual household income and vote choice may be shaped by the economic conditions of that individual's place of residence. Specifically, we find that living in a less productive region is associated with voting for a party opposed to redistribution, and living in a more productive region is associated with more voting for parties in favour of redistribution. The decomposition of variance regression allows us to disentangle how different groups behave, both in terms of voting preference and in voting variance, depending on their income and the economic productivity of their location. In addition to being the most anti-redistribution voting group, the rich in poor places are also the most homogeneous voters. Rich regions are the most consistent voting regions, largely driven by stability in the vote choice of the poor and middle classes in those regions. The rich in rich regions appear the most cross-pressured, with relatively high levels of heterogeneity in vote choice.

The empirical approach and the findings of this research have a bearing on diverse literature in political behaviour, political economy and political geography. First, the decomposition of variation technique allows scholars to explore the heterogeneity of voting blocs. Scholars have long pointed out that rich and poor voters are not monolithic, and that poorer regions are far

more heterogeneous than common accounts suggest (Gelman et al., 2007; Rodden, 2019). Examining the average effect of individual or regional income on voting choice would thus obscure important information about the motivations behind vote choices and whether and how voting patterns might change. Examining heterogeneity in voting groups also has implications for political strategy. Our results suggest that campaigns of persuasion may be most effective for the rich in rich regions and the poor in poor regions. Efforts to target the most loyal constituents would focus on the rich in poor regions (rightist) and the poor in rich regions (leftist). Arguably, this is the type of political targeting we already consistently see in advanced industrial democracies – with anti-redistribution parties orienting their efforts toward less regulation and the traditional social values that are more popular outside of the largest urban agglomerations, and pro-redistribution parties focused on redistributive policies and progressive social values favoured in many of the richest regions. Broadly speaking, these results may have important implications for whether parties have incentives to provide policy benefits to the entirety of the nation or focus more narrowly on geographically concentrated interests (Menendez, 2016; Rickard, 2018).

Our vote choice variance results may also relate to discussions of district homogeneity versus heterogeneity and political representation. Gerber and Lewis (2004) argue that legislators' behaviour differs between homogeneous and heterogeneous districts. In homogeneous districts, voters are more consistent and thus their expectations from representatives are more predictable. In those circumstances, legislators are held more accountable and they tend to vote more consistently with the district median voter. We are among the first to employ an empirical tool to account for this district-level homogeneity or heterogeneity in a cross-nationally comparable way. Our results suggest that politicians will better represent the rich among the poor and the poor among the rich because they are more predictable constituencies. Whether those groups have dominant voices in their districts may be a function of electoral systems.

We see several possible ways for future research to extend our analysis. First, researchers can expand our sample to include countries with different political institutions and levels of development. In our concern to avoid unit mismatch, we have focused on a limited sample of countries. Europe, the region with the lowest levels of regional economic disparity and where regional conflict is perhaps least salient, provides a 'hard test' for our analysis. This sample likely obscures much larger effects of region on vote choice outside the richest countries.

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## DATA AVAILABILITY STATEMENT

Replication data are available at https://doi.org/10.7910/DVN/SPUGZK.

## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author(s).

## NOTES

1. See Oltermann (2019) for Germany and a report from the Associated Press (2019, 23 January) for Spain.

2. The CSES dataset assigns household income quintiles based on the survey sample distribution rather than the population distribution. This approach is plausible since surveys use sampling weights to reflect population demographics. Moreover, given the variation in income distribution across different countries, regions or subpopulations, population-based quintiles could obscure important within-sample variability.

3. Regional productivity quintiles are calculated for all regions using data from the OECD regional database and then subsampled to include only those regions with observed respondents.

4. Studying heterogeneously distributed unexplained errors is not new in political behaviour research. Gelman et al. (2007) used a similar multilevel approach in the US context to examine vote choice within clustered data. Our variance decomposition builds on this but focuses instead on partitioning total variance into specific groups to identify sources of regional vote choice variability. Applying Gelman's approach in Section 3 of the Appendix in the online supplemental data reaffirms our key predictions.

5. Country fixed effects are applied in the first-stage regression to control for unobserved, time-invariant characteristics specific to each country unit repeated in cross-sectional surveys.

6. We account for the potential influence of outliers, stemming from the (repeated cross-sectional) data limitations due to the country-survey year observations, by excluding residuals greater than 1.5 standard deviations for Models 1–3 (Lupu & Pontusson, 2011). As a sensitivity check, we re-estimate the main model with outliers included. Details of this analysis are provided in Section 11 of the Appendix in the online supplemental data. The significance of the key indicators from Table 1, (the baseline) Model 1, remains intact. Models 4–6 (binary outcome) include all observations.

7. For technical details on the two-step approach, see Section 2 of the Appendix in the online supplemental data. Following Western and Bloome (2009) and Aitkin (1987), we ensure the model suits our data structure, addressing heteroskedastic errors (diagnosed with the Breusch–Pagan/Cook–Weisberg test) and variable distribution. We avoid ordinary least squares (OLS) in the second stage of the regression, despite its ease of interpretation over a generalised linear model, because OLS assumes an inappropriate distribution of variance in the residuals. Given that our data is right-skewed and non-negative, generalised least squares (GLS) is a common approach to address this data structure.

8. For our binary outcome data, we calculated Pearson residuals using Stata. The Pearson residuals should be approximately normally distributed.

9. The estimates of overall household and region income group estimates in Table 1 reflect all 25 individual and regional income groups. Therefore, the total variation in the rich region is greater than just PR + RR and the total variation in the poor region is greater than just PP + PR because it would also include variation from the 2nd to 4th quintiles in those regions, which are not shown in Figure 2.

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