Does the Winner Take It All? Redistributive Policies and Political Extremism

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Abstract

In this paper, we argue that regional heterogeneity of underlying fundamentals – such as economic history, geography or natural resources – can lead to extreme voting in federal systems of government. The outcome of higher-level (federal) policies often depends on these fundamentals, meaning some regions will always benefit from the policy whilst others lose out. In our model, voters have an incentive to stack this kind of redistribution in their favour, using the regional ties of politicians as a strategic link. The median voter therefore elects federal representatives that are extremely protective of their own region's interests. We find that the incentive to select such a tough negotiator survives the pressure to belong to the ruling coalition. We test our predictions by looking at the performance of parties at national and European Parliament elections since 1990. We indeed observe that such strategic voting behaviour is U-shaped on the "losing-winning from the policy" dimension. Our online survey provides further evidence.

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1 Introduction

A federal, or multi-level system of government, is a common and effective way to manage complex and diverse societies. When arranged properly, such a system can optimise scale advantages, minimise coordination failures and foster innovative policy solutions (Boadway and Shah, 2009). Over the last decade, however, it has not been immune to the kind of political instability which has increasingly put democratic institutions under pressure in all continents. Indeed, polarisation and extremism are on the rise across a varied range of federations such as the EU, the US, but also Brazil or India. In general, explanations for this political extremism have mostly focused on the economic and cultural insecurity of voters. If voters start feeling insecure – potentially for a combination of reasons – they will demand more short-term protection.[1] Now, even though sources of insecurity are certainly important drivers of this demand for protection, we will argue that more strategic motives may be at play as well, especially in a federal context.

We look for these strategic motives in the specific way a federal, or multi-level system of government is set up, and this for two reasons. First, voters have to cast their vote for different levels of government, which gives them more options to pick their battles strategically. Second, lower-level voting districts (henceforth, regions) are inevitably affected by nationwide policies introduced by the higher (federal) level. This gives voters good reason to think strategically to begin with, because the underlying heterogeneity in regional fundamentals is often brought to the surface by the federal policy. In other words, higher-level policies often imply a structural redistribution of costs and benefits across regions, which voters may want to stack in their favour. We develop a theory which explains why voters indeed have the rational incentive to elect extremely protectionist federal politicians, to defend their regional interests at the federal level. They do so even when their representative will not be part of the actual federal coalition, which sets our model apart from previous work. We test our results comparing the national electoral outcomes with results for European Parliamentary elections, and run a survey that shows that the theoretical channel we suggest is partially observable in voters' behaviour.

The fact that some regions will always gain from a given higher-level policy whilst others lose out, is true in many different contexts. If migrant workers partially finance public provision, for example, attractive regions with high inflows will be 'winners' of any federal policy organising free circulation of workers, whilst regions marked by outward-migration will be 'losers'. The same goes for an intergovernmental fiscal transfer scheme or a regional fiscal rule, if the federal level decides on its generosity. Regions which are historically lag-

[1] The reasons can range from economic shocks, to migration flows, austerity policies or automation. We discuss the relevant, and rapidly growing literature at length below.

ging in economic terms, and hence more in need of financial support, will be the 'winners' of a generous transfer scheme or a lax fiscal rule. What is crucial in both cases, is that the underlying reasons why certain regions are winners or losers from a given federal policy are highly persistent, and will at most only change in the long run. In the example given above, these fundamentals were economic and geographical, and hence would apply to any of the 'left-behind' rust belt areas as opposed to urban agglomerations, but they could also be related to regionally concentrated natural resources or other endowed amenities.[2]

The main innovation of our model is that we explicitly study this persistent heterogeneity in regional fundamentals, which drastically changes bargaining and coalition formation at the federal level, and in turn voting behaviour as well. Indeed, when the winners and losers from a given federal policy are always the same regions, federal negotiations on the policy are entirely centred on its intensity. Setting the size of the pie is what matters most, so to speak, instead of deciding how it is shared. Because of this, voters no longer need to maximise their chances of being included in the ruling federal coalition by electing a milder, more accommodating representative. Even if there were no chance of being included in the coalition, it would still be rational to elect extremely protectionist delegates. If they are selected by the formateur to become part of the coalition, far the better. If they are not, others with the same objectives will be selected, which neutralises the risk of expropriation.

Both in 'winning' and 'losing' regions, the median voter thus has an incentive to elect federal representatives that are extremely protective of their own region's interests. They do so to stake out a stronger bargaining position at the higher level, to make sure the other regions do not disproportionally gain from negotiations shaping the federal policy. In that sense neither the winning nor the losing regions gain much and are trapped in a kind of prisoner's dilemma: they keep each other in check once inside the coalition, serving as each other's counterweight. For 'winning' regions this comes in the form of more pronounced support of the federal policy in question, and vice-versa for the 'losing' regions. Anticipating the bargaining process at the heart of federal politics, voters then turn this behaviour to their advantage by voting for precisely those more supportive and extreme types. If they do not, moreover, the other side will gain at their expense.

More specifically, citizens in each district cast their vote both in regional as well as federal elections, in a "citizen-candidate" type of setting. The federal government is a coalition of regionally elected politicians, formed by a randomly picked formateur. Policy decisions are made in a cooperative way, so that coalition members have to reach a mutually advantageous

[2]There are many other situations in which the set of regions belonging to the 'winning' or 'losing' group is sticky. Aside from geography and (economic) history, this could also follow from a complex set of national laws and regulations, social capital endowments, or institutional drift. These are all factors which are very hard to change even in the medium run.

agreement, whilst also defending the interests of their respective regions. Bargaining in the federal legislation thus reflects regional considerations, which is often observed in real-world federations (Rodden, 2002; Rodden et al., 2003).[3] Indeed, whenever decisions taken on the federal level follow more from consensus than a simple majority voting rule, and when locally elected federal politicians start behaving as regional representatives, we can expect region-oriented bargaining to direct most of distributive federal policy-making.[4] Our setting also allows regions to tax and provide public services, which may be complementary to, or substitutive of the federal government's policy. Then, anticipating how this policy is negotiated, regional politicians and voters alike are in a position to take advantage of the higher-level policies. Hence, they make (socially) ill-considered decisions such as over-spending because it is in their strategic interest.

To test the model we focus on the European Union (EU). The EU is the world biggest supranational federation, where representatives of member states continuously bargain over common policies in the European Parliament (EP), ranging from regulation of labour migration to a common budget – which in 2018 amounted to 160 billion Euros. The EP corresponds, in the analysis, to the federal layer of the model, whilst member states correspond to regions in the model. Following our theoretical predictions, we expect strategic voting behaviour to mark European elections but leave national elections unaffected. To proxy the strategic vote for an extremely protective representative as described in our model, we use Eurosceptic party support since such parties usually campaign on a platform of protecting the interests of the member state in question.

To test our prediction that both winning and losing jurisdictions vote for an extremely protective representative, we group EU member states into winners, losers and neutral. We approximate this using the net-contributions of each member state to the overall EU budget. This clusters the EU member states in three intuitive groups: the core countries (mostly early member states), the periphery, and those in between. We hypothesise that voters in each cluster of countries are more or less aware of their relative status in the union. We thus assume that voters in the core countries perceive themselves as overall contributors to EU policies, voters in the periphery as winners, and voters in the the middle group as unaffected.

Our empirical analysis first of all confirms our prediction that voters elect relatively more

[3]Carozzi and Repetto (2016); Fiva and Halse (2016) show (using Italian and Norwegian data, respectively) that indeed politicians care about their place of origin even beyond any electoral consideration.

[4]The direct representation of regions in any central government can also be seen as an automatic product of the electoral process. Nationwide political parties will always consist of candidates elected in all regions of the federation, hence any coalition formed on the federal level to a certain extent represents each region when it comes to making decisions on federal taxation and transfers. This also goes for countries with region-specific parties, such as Belgium, Spain or Canada. If such parties are part of the federal government their region is automatically represented as well.

Eurosceptic delegates for the European parliament, as compared to national elections. These results apply to both sides of the political spectrum, and are robust to different specifications, definitions of the key variables and a broad set of controls. Crucially, and fully in line with our predictions, we only find this Eurosceptic support differential in net receiving and net contributing member states, but *not* in countries where EU contributions and expenditures are more or less balanced. We thus uncover a U-shaped relationship between the degree of (perceived) benefits or gains from EU membership and the Eurosceptic vote. The question then remains whether this Eurosceptic voting gap occurs for the reasons we propose: are these in fact the same people voting for different parties, and are they doing so because of the strategic reasons we propose? Our online survey, rolled out in Italy, France and Finland, confirms our predictions on both accounts.

In what follows, Section 2 presents the theoretical model, whilst the empirical analysis findings based on the European Union elections are reported in Section 3, and the online survey results are set out in Section 4. Section 5 concludes. Appendices A to C extend the theoretical model in different ways, proofs are all in appendix D. Finally, appendices E and F complement and extend the empirical analysis. Before moving to the presentation of the model, we review the related literature and underline what differentiates our work from it.

Related Literature

Our model rationalises why we observe different, and more strategically protective voting behaviour in elections for higher levels of government as compared to lower levels: the existing literature on these issues is quite small. In the EU context for example, there is some evidence suggesting that voters vote for different parties at the national and European level. Studying empirical regularities first observed by Reif and Schmitt (1980), the "Second-Order" suggests that voters use elections that are of second-order relevance to them to send signals to their representatives and this should explain seemingly non-rational voting behaviour at supranational elections. Rohrschneider and Clark (2009), Hobolt and Wittrock (2011), Hix and Marsh (2011) empirically support such results. While they justify the results based on conjectures only, we propose a solid theoretical framework and empirical test which are able to explain why voters should act differently depending on the type of election. Moreover, in our empirical analysis we control for the tenets of the second-order theory and show that results are not driven by it.

A similar pattern has been observed in the US by Bafumi and Herron (2010), who show that voters, for federal elections, have a tendency to vote for more extreme parties than their own ideology would suggest. However, they neither relate their results to voters' attitudes with respect to the disconnect between regional and national elections, nor do they present

a justification for such voting behaviour. Krasa and Polborn (2018) theoretically explain the difference in extremism between local and national policy positions, where the end-goal of voters is securing a national majority at the possibly very high cost of electing extremely partisan candidates. Inversely, in our model the strategic reflex of voters is to mitigate the objectives of federal coalition partners which are in an opposite camp. The two driving forces could clearly complement each other. To the extent that stronger national parties undercut the regional ties of federal representatives, lastly, our predictions coincide with those of Enikolopov and Zhuravskaya (2007). This kind of stronger political centralisation would indeed better align local political incentives with national interests, as federal legislators in our model become less malleable to regional electoral pressures.

Second, our work is closely related to the rich theoretical literature on federalism,[5] legislative bargaining and strategic delegation.[6] Most of the previous (relevant-to-us) literature belongs to either of two strands: the bargaining-oriented papers that followed the seminal paper of Schelling (1956)[7]

2 The Model

We consider a federation where each region $r \in R$ is inhabited by a unit mass of citizens. Per-capita income Y_r is exogenous and homogeneous within each region r.[8] Agents care about private consumption C_r and about public provision, which has a regional component, G_r, and a federal one, X_r. Finally, agents' utility depends on M_r, which measures the cost of being represented by politicians that they may dislike.

The utility of voter j living in region r is defined as

$$U_r^j = c\left(C_r\right) + \theta_r^j x\left(G_r, X_r\right) + M_r, \tag{1}$$

with θ_r^j a relative preference parameter – which can be heterogeneous within and across regions and can follow any distribution with weakly positive support.

Both $c(.)$ and $x(.)$ are increasing and strictly concave functions. The former expresses utility from consumption, the latter captures utility derived from public provision. Consumption C_r is financed out of disposable income, so that

$$C_r = \left(1 - t_r\right) Y_r, \tag{2}$$

[5] See Alonso et al. (2008); Kessler et al. (2011); Luelfesmann et al. (2015); Gancia et al. (2020) and the literature therein.

[6] Strategic delegation has been studied in many different contexts. For instance, a parallelism exists between our results and Rogoff (1985) where, in the context of the selection of a central banker, the author finds a rationale to distort the selection of the banker in order to pre-commit to a given type of policy. The introduction in Coate and Milton (2019) provides an interesting overlook of the general literature on strategic delegation.

[8] Given the normalisation of regional population, public provision could entail a local public good, but also publicly provided private goods.

Regional taxation t_r funds the regional component G_r of public provision:

$$G_r = t_r Y_r. \tag{3}$$

Crucially, public provision in Eq. (1) has a federal component X_r as well, which complements regional public provision but is decided on at the federal level. For the sake of generality we remain agnostic as to the concrete nature of this federal policy. We only assume it has an intensive margin $P(\gamma)$ – capturing the size of the policy – and an extensive margin $\Delta_r \in \Re$ – defining whether the region benefits ($\Delta_r > 0$) or loses ($\Delta_r < 0$) from the policy, so that

$$X_r = P(\gamma)\Delta_r. \tag{4}$$

Parameter γ is endogenously selected and is, ultimately, the element that defines the intensity of the federal policy X_r. We assume that $P'(\gamma) > 0$.

Lastly, voters are averse to being represented by politicians with preferences different from their own. This enters the utility function Eq. (1) through M_r. Denoting by $\hat{\theta}_r$ the 'type' of the representative at the federal government elected in region r, we assume

$$M_r = -\eta_r \left(\hat{\theta}_r - \theta_r^j\right)^2. \tag{5}$$

It follows that M_r measures the disutility of the "political match": the distance between the voter's type θ_r^j and the type of their elected representative.[9] Parameter η_r can thus be thought of as a measure of political pragmatism: when η_r is small, voters are opportunistic, in the sense that they care mostly about policies, rather then who implements them. Conversely, when η_r is large, voters are ideological and dislike being represented by someone with whom they do not share the same political views. Logically, since regional policies are decided via direct democracy, Eq. (5) only captures the potential mismatch occurring at the federal level.

Timing Closing the model, we turn to the timing of electoral and policy decisions. Agents in each region act first: each region marks a constituency where every citizen directly votes over the local tax rate t_r, which determines both consumption C_r and the regional contribution to the local public good G_r. Every single voter is also a potential federal candidate, running to represent the interest of the region within the federal government. Agents in each region cast, together with the vote over t_r, also a vote over who should represent their region on the federal level. Candidates differ in their parameter θ_r^j and, as previously remarked, the elected agent in region r is denoted $\hat{\theta}_r$. The federal government moves second and chooses X_r. A coalition of federal representatives bargains on the level of γ, which defines the intensity $P(\gamma)$ of the federal policy X_r as expressed by Eq. (4).

[9] See also Krasa and Polborn (2018) and Buisseret and Bernhardt (2018) for similar modeling assumptions.

We denote by $k \in K \subseteq R$ the federal representatives that belong to the federal coalition, and allow for a randomly selected formateur to steer the formation process. Once the federal coalition is formed, decisions are taken cooperatively so that federal transfers maximise the joint utility of the coalition members. When $K = R$, a grand coalition forms that includes all regions. As mentioned earlier, such a coalition can be thought of as the result of a specified institutional arrangement or as the product of the political constellation at hand. Either way, cooperative bargaining is driven by a threat point which we conceive as the risk of re-election after a continued disagreement, with the eventual loss of power as a result. This translates into the disutility of losing political benefits, wages, or more generally, all possible kinds of (ego)rents enjoyed simply by staying in office.

Clearly, Eq. (1) meets all the requirements in Gans and Smart (1996) and therefore the median voter theorem applies. We solve the model backward, first computing the federal policy selected by the federal coalition, after which we analyse the decisions made by the median voter in each region r. Section 2.1 considers the two-region case.

2.1 Two-Region Setting

With two regions, we have that $|R| = 2$. In this scenario, we focus on the grand coalition, that is $K = R$, where both regions are represented in the federal coalition. We denote regions in the coalition as α and β, so that $K = \{\alpha, \beta\}$.

Now, with only two regions, the interesting policy to focus on is the one where if one region benefits from the policy ($\Delta_r > 0$), the other one necessarily loses out ($\Delta_r < 0$).[10] For the sake of simplicity, we assume that this is a zero-sum game, that is,

$$\Delta_r = \{-\delta, \delta\} \tag{6}$$

and $\Delta_\alpha = -\Delta_\beta$.

Solving the model backward, Section 2.1.1 analyses the second (last) period decisions, while Section 2.1.2 solves the equilibrium in the first period and discusses the findings.

2.1.1 The Federal Government

We assume this federal government will seek the weighted utilitarian bargaining solution to decide on the intensity γ of the federal intervention and, therefore, maximises:

$$\max_{\gamma} \sum_{k \in K} \omega_k \left(\hat{U}_k - F_k \right) = \sum_{k \in K} \omega_k \left(c\left(C_k\right) + \hat{\theta}_k x\left(G_k, X_k\right) - F_k \right), \tag{7}$$

[10] We could actually have a policy that negatively(/positively) affects both regions in the coalition. We do not analyse this trivial case in which the policy basically is Pareto inferior(/superior) to anything else, hence there would be unanimous consensus on how to set the policy at either extreme.

where $\hat{U}_k$ is the utility of the representative elected in region k, that is obtained by rewriting Eq. (1) for $\theta_k = \hat{\theta}_k$. The weight of region k in the bargaining process is ω_k, while F_k represents the cost, for an elected politician, of not being able to form a coalition and hence the threat of losing power and its associated benefits, with $F_k = \begin{cases} 0, & \text{if a coalition is formed} \\ \bar{F}_k, & \text{otherwise} \end{cases}$. We assume $\bar{F}_k$ to be sufficiently large for coalitions to always form. Should this not be the case, the solution of the model is isomorphic to the case of no federal government that is analysed at the end of Section 2.1.2.

How a specific candidate rose to power in region k in period 1, in other words why they were elected, will be dealt with in Section 2.1.2, where we discuss the local voting mechanism. For now, it suffices to see that the utility of an elected legislator $\hat{U}_k$ is defined by their appreciation of public and private consumption in their constituency, where $\hat{\theta}_k$ in Eq. (7) defines the relative weight assigned to the public good.

Deriving and rewriting the first order conditions of the optimisation problem defined by Eq. (7) and subject to Eqs. (2) to (4), the optimal intensive margin parameter γ is implicitly expressed by

$$\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha P'(\gamma) x_2' \left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta P'(\gamma) x_2' \left(G_\beta, X_\beta\right) = 0. \tag{8}$$

Since $\Delta_\beta = -\Delta_\alpha$, Eq. (8) becomes $\Delta_\alpha \left(\omega_\alpha \hat{\theta}_\alpha x_2' \left(G_\alpha, X_\alpha\right) - \omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right)\right) = 0$, which leads to

$$\begin{aligned} \phi_f &= 0, \\ \text{with } \phi_f &\equiv \omega_\alpha \hat{\theta}_\alpha x_2' \left(G_\alpha, X_\alpha\right) - \omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right). \end{aligned} \tag{9}$$

Eq. (9) implicitly captures how the (federal) intensive margin $P(\gamma)$ responds to regional decisions. This is an important relation: indeed, how agents are tempted to distort their decisions depends on their expectations on the federal government's behaviour, which in turns depends on whether regional and federal policies are strategic complements ($x_{1,2}''(\cdot) > 0$) or substitutes ($x_{1,2}''(\cdot) < 0$).[11] Lemma 1 precisely analyses how the federal choice reacts to changes in the local component G_α of the public policy.[12]

Lemma 1. *Given the optimal intensity of federal public policy $P(\gamma)$, defined by Eq. (9), we find that*

$$\frac{\partial \gamma}{\partial G_\alpha} = -\frac{\omega_\alpha \hat{\theta}_\alpha x_{1,2}'' \left(G_\alpha, X_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}'' \left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}'' \left(G_\beta, X_\beta\right)\right) \Delta_\alpha P'(\gamma)}, \tag{10}$$

[11] Federal and local policies may complement or crowd out each other (Knight, 2002).

[12] Without loss of generality, we consider the case of region α.

and

$$\frac{\partial \gamma}{\partial t_\alpha} = -\frac{\omega_\alpha \hat{\theta}_\alpha Y_\alpha x''_{1,2}\left(G_\alpha, X_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x''_{2,2}\left(G_\beta, X_\beta\right)\right) \Delta_\alpha P'(\gamma)}. \tag{11}$$

Notice that $\operatorname{sgn}\left(\frac{\partial \gamma}{\partial G_\alpha}\right) = \operatorname{sgn}\left(\frac{\partial \gamma}{\partial t_\alpha}\right) = \operatorname{sgn}\left(\frac{x''_{1,2}(G_\alpha, X_\alpha)}{\Delta_\alpha}\right)$*. Consider the case in which the regional and federal policies are strategic complements* ($x''_{1,2}(\cdot) > 0$)*: that means that the federal government increases the intensity of the policy* $P(\gamma)$ *if the benefiting region increases its contribution, while it decreases the intensity of the policy if the losing region increases its contribution. The opposite happens when the regional and federal policies are strategic substitutes* ($x''_{1,2}(\cdot) < 0$)*.*

Proof. See appendix D. □

We have thus uncovered a situation where the federal government finds it optimal to increase federal support to the net receiving region, whenever the latter spends additional funds to finance higher levels of the public good. Since regional spending will erode consumption and welfare in that same period, as shown by Eq. (2), the federal government compensates for this drop in consumption by increasing the intensity of the federal policy γ if it works complementary to the public good G_r, and vice versa. The opposite is true for the net contributing region: lowering the intensity of the federal policy compensates for utility losses of diminished consumption, which serves as a similar compensating measure if the federal and regional policies are complementary, and vice versa.

What we also learn from Eq. (9) and Lemma 1, is that the federal response to regional spending decisions depends on the preference types $\hat{\theta}_\alpha$ and $\hat{\theta}_\beta$ of the federal legislators elected respectively in regions α and β. This is where our model clearly diverges from previous approaches. If for example a region is represented by a legislator who for some reason puts more weight on public provision, this can be expected to have an effect on federal responses to regional choices. We elaborate in Lemma 2.

Lemma 2. *Given the optimal intensity of federal public policy* $P(\gamma)$*, defined by Eq.* (9)*, we find that*

$$\frac{\partial \gamma}{\partial \hat{\theta}_\alpha} = -\frac{\omega_\alpha x'_2\left(G_\alpha, X_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x''_{2,2}\left(G_\beta, X_\beta\right)\right) \Delta_\alpha P'(\gamma)}, \tag{12}$$

with $\operatorname{sgn}\left(\frac{\partial \gamma}{\partial \hat{\theta}_\alpha}\right) = \operatorname{sgn}\left(\Delta_\alpha\right)$*. Hence, for representatives elected in the winning (losing) region, the more they have a taste for public provision, the more the federal government increases (reduces) the intensity of the federal intervention.*

Proof. See appendix D. □

The intuition here is that representatives that find public provision more important, will generally want to steer federal policy making in that direction. They will be tougher negotiators in the federal bargaining process, and hence intensify the federal policy if they represent a winning region, and the opposite if they were elected in a losing region. Clearly, the question at this point becomes which preference type will emerge from the local election process. Section Section 2.1.2 provides us with an answer.

2.1.2 Local Elections and Government

Local elections define the quantity of public good G_k to be produced in each region, as well as the local tax t_k that partially finances the public good. Voters also select the representative $\hat{\theta}_k$ who joins the federal government and negotiates γ in the name of region k, staying true to their preference type.

The voters' objective function, defined by Eq. (1), is optimised under constraints imposed by Eqs. (2) to (5). Lemma 3 presents the results of the maximisation.[13]

Lemma 3. *Eqs.* (13) *to* (14) *implicitly define the preferences of the median voter in region* α*, in terms of the local tax* t_α *(Eq. 13) and of the representative selected to join the federal legislature* $\hat{\theta}_\alpha$ *(Eq. 14).*

$$x_1'\left(G_\alpha, X_\alpha\right) - \frac{\omega_\alpha \hat{\theta}_\alpha x_2'\left(G_\alpha, X_\alpha\right) x_{1,2}''\left(G_\alpha, X_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, X_\beta\right)\right)} = \frac{c'(C_\alpha)}{\theta_\alpha^m} \tag{13}$$

$$-\frac{\omega_\alpha \left(x_2'\left(G_\alpha, X_\alpha\right)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, X_\beta\right)\right)} = \frac{2\eta_\alpha(\hat{\theta}_\alpha - \theta_\alpha^m)}{\theta_\alpha^m}. \tag{14}$$

Proof. See appendix D. □

Proposition 1 and its corollaries develop around the results in Lemma 3.

Proposition 1 (Strategic Voting)**.** *When a cooperative legislature of (regionally elected) representatives bargains over the intensity of federal policies* X_k *that affect public provision* $x(.)$*, voters strategically elect candidates with a stronger preference than their own for public provision. Therefore,* $\hat{\theta}_k \geq \theta_k^m$.

Corollary 1. *The strategic voting of the median voter is characterised by*

$$\frac{\mu(\theta_\alpha)}{\mu(\theta_\beta)} = \frac{\omega_\alpha}{\omega_\beta} \frac{\left(x_2'\left(G_\alpha, X_\alpha\right)\right)^2 / \eta_\alpha}{\left(x_2'\left(G_\beta, X_\beta\right)\right)^2 / \eta_\beta}, \tag{15}$$

[13] Notice that in Eqs. (13) to (14) both $\hat{\theta}_\alpha$ and θ_α^m appear. This comes from the fact that the median voter is decisive in the election, hence the presence of θ_α^m but they anticipate the strategic role of the federal politician at the federal level. Therefore, $\hat{\theta}_\alpha$ follows from the strategic and forward looking behaviour of the local median voter.

where $\mu(\theta_k) = {}^{(\hat{\theta}_k - \theta_k^m)}/_{\theta_k^m}$ *is the mark-up in terms of* θ_k*, that is, the percentage increase in* θ_k *from the median voter to the federal representative in region* k*.*

Corollary 2. *If a region neither wins nor loses from the federal policy* X_k *– or* $\Delta_k = 0$ *– then local elections will not be distorted by strategic voting.*

Proof. See appendix D. □

According to Proposition 1, hence, the elected federal representative always has a weakly-stronger preference for public provision than the median voter. This may be surprising at first, for it says that the median voter is bound to select a representative with preferences different from theirs. And this occurs despite the fact that the median voter's utility depends negatively on the distance between their type and the elected representative type. This is explained by the fact that the median voter anticipates the federal bargaining process and, hence, pre-commits to a more extreme stand to manoeuvre their representative in a – at least for them – more favourable bargaining position at the outset of negotiations.

By symmetry, median voters in both regions vote for candidates that are inclined to safeguard public provision in their own region, more than they would do themselves ($\hat{\theta}_k \geq \theta_k^m$). This evidences the *strategic* behaviour of both median voters, who make full use of the knowledge that if they vote for a candidate with preferences of this kind, their welfare will go up. The reason for the latter is given by Lemma 2, which states that the federal policy intensity γ – and thus the federal contribution $X_k(\gamma, \Delta_k)$ to public provision – is increasing in $\hat{\theta}_k$ for the winning region and vice versa for the losing one. From the median voter's perspective therefore, a more extreme representative will always bargain for more public provision $x(.)$, resulting in higher utility. Higher $\hat{\theta}_k$ types more gladly negotiate for higher, or lower federal intervention γ to bring public good consumption up. Knowing this in advance, voters turn this behaviour to their advantage by voting in precisely such types.

Importantly, this kind of strategic voting occurs both in winning and losing districts, but for different reasons. In the winning region voters will distort federal elections to guarantee more federal support through higher intervention, whilst the losing region strategically sends a representative keen on lowering federal support. The key channel here is the fact that there is some redistribution at the federal level, which is confirmed by Corollary 2. Indeed, when federal policy is conceived as strictly non-redistributive, the level of federal intervention loses its strategic appeal to voters who will then vote sincerely. When there is some redistribution organised at the federal level, however, the question becomes which region will distort the elections the most, and why.

Eq. (15) helps us to analyse the determining factors driving the strategic voting defined in Proposition 1 and to be able to compare these factors between regions. Results imply

that the strategic pre-commitment of the median voter (measured by the left-hand side of the equation) depends on both the relative size of the disutility η_k from being 'misrepresented' as well as the relative marginal utility of federal intervention. Clearly, for the symmetric case in which $\eta_\alpha^m = \eta_\beta^m$ and $\omega_\alpha = \omega_\beta$, Eq. (15) simplifies to $\frac{\mu(\theta_\alpha)}{\mu(\theta_\beta)} = \left(x_2'(G_\alpha, X_\alpha)\right)^2 / \left(x_2'(G_\beta, X_\beta)\right)^2$, which means that the distortion is relatively larger in the region in which the marginal impact of federal policy is larger. In particular, take the case where regional provision G_k and the federal policy X_k are strategic complements (i.e. $x_{1,2}''(G_k, X_k) > 0$) and assume that $x(\cdot)$ is symmetric. Should the local tax t_k be the same in both districts, then the richer region would have an incentive to distort more. Conversely, under the same setting but with strategic substitutes (i.e. $x_{1,2}''(G_k, X_k) < 0$), the poorer region would distort more when it comes to selecting its federal representative.[14]

Myopic, naive and sophisticated voters In our model agents are sophisticated (they are able to fully understand and anticipate the mechanism). We now compute two benchmarks that we will use for comparison with our equilibrium characterised by Lemma 3.

The first benchmark corresponds to the case of myopic voters. Here, voters ignore completely all mechanisms at work at the federal level and act as if γ were fixed. This case is particularly interesting because it coincides with the case of no federal intervention or if federal policies are set in stone in the constitution.

The second benchmark represents naive voters, who understand how local taxation (t_r) affects the choice of γ, yet they don't anticipate that the choice of the elected politician ($\hat{\theta}_r$) is also affecting γ. This could happen if voters, for example, misunderstand the competence of different federal boards.

For that, we first rewrite Eq. (13) for $k = \alpha$.

The "sophisticated" tax rate t_α^s is set implicitly at:

$$c'(C_\alpha) - \theta_\alpha^m x_1'(G_\alpha, X_\alpha) = -\frac{\omega_\alpha \hat{\theta}_\alpha x_2'(G_\alpha, X_\alpha) x_{1,2}''(G_\alpha, X_\alpha)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''(G_\alpha, X_\alpha) + \omega_\beta \hat{\theta}_\beta x_{2,2}''(G_\beta, X_\beta)\right)} \theta_\alpha^m \tag{16}$$

Similarly, the "naive" tax rate t_α^n is set implicitly at:

$$c'(C_\alpha) - \theta_\alpha^m x_1'(G_\alpha, X_\alpha) = -\frac{\omega_\alpha \theta_\alpha^m x_2'(G_\alpha, X_\alpha) x_{1,2}''(G_\alpha, X_\alpha)}{\left(\omega_\alpha \theta_\alpha^m x_{2,2}''(G_\alpha, X_\alpha) + \omega_\beta \hat{\theta}_\beta x_{2,2}''(G_\beta, X_\beta)\right)} \theta_\alpha^m \tag{17}$$

Finally, the "myopic" tax rate t_α^m is set implicitly at:

$$c'(C_\alpha) - \theta_\alpha^m x_1'(G_\alpha, X_\alpha) = 0 \tag{18}$$

[14] As an example, we can think of a federal policy that simply consists in a transfer of money from one region to another. In this case, local and federal funds are strategic substitutes. Then, the model suggests that the poorest region will be more aggressive and choose a more extreme federal politician.

Proposition 2. *Taking the myopic agent as a benchmark, also equivalent to the case of exogenous federal policy, the distortion in terms of local taxes is always more pronounced with sophisticated voters than with naive ones.*

Corollary 3. *When local and federal policy are strategic complements ($x''_{1,2}(G_r, X_r) > 0$), local taxes are inflated by sophisticated voters more than by the naive ones: $t^s_\alpha > t^n_\alpha > t^m_\alpha$. Conversely, when local and federal policy are strategic substitutes ($x''_{1,2}(G_r, X_r) < 0$), sophisticated voters choose to under-tax locally, again to a larger extent than naive voters: $t^m_\alpha > t^n_\alpha > t^s_\alpha$.*

Proof. See appendix D. □

The intuition is: the marginal benefit of distorting the outcome is larger for sophisticated voters and, hence, use it more heavily.[15]

Three-region setting In appendix A we extend the analysis by adding one region to the federal constellation studied above ($|R| = 3$). We focus on the most interesting case when a coalition of two forms ($K = \{\alpha, \beta\} \subset R$), with one contributor and one recipient. We denote z the region that is left out of the coalition.[16]

Comparing the federal policy with two and three regions, we find (Proposition 3) that it is more generous with three regions when the excluded one is a contributor while the opposite is true when z is a recipient. This simply occurs because the federal government is not internalising the costs and benefits of region z. Furthermore, we can conclude (Lemma 4) that the marginal impact of a change in locally-defined parameters t_k and $\hat{\theta}$ is more pronounced with three regions if the excluded region is a contributor ($\Delta_z < 0$), while the opposite is true when z is a recipient ($\Delta_z > 0$). Fig. 1 illustrates Proposition 3 and Lemma 4.

The presence of region z provides different incentives to regions, depending if their interests are aligned with or opposed to z. In particular, (Proposition 4) we show that in equilibrium a region's mark-up ($\mu(\theta_k)$) is larger in the 3-region case for the region of type opposite to z ($\text{sgn}(\Delta_k) \neq \text{sgn}(\Delta_z)$) while it is larger in the 2-region case for the region with type equal to z ($\text{sgn}(\Delta_k) = \text{sgn}(\Delta_z)$), as summarised in Fig. 2.

[15] Taking the naive behaviour as a benchmark, we implicitly suggested that this is the neutral behaviour and that any deviation represents a distortion. Nonetheless, other distortions may also materialise (Harstad, 2007), in which case it may well be that the distortion due to strategic voting partially offsets other distortions, leading to a superior equilibrium.

[16] When the grand coalition forms, the equilibrium is isomorphic to when $|R| = 2$ and its study does not bring new insights. The case of a coalition of regions of the same kind is trivial and inevitably leads to a corner equilibrium: when both regions in the coalition are recipients, they set the largest possible federal policy and extract all surplus from the excluded region. When both regions are contributors, they repeal the policy and set it to the lowest possible level.

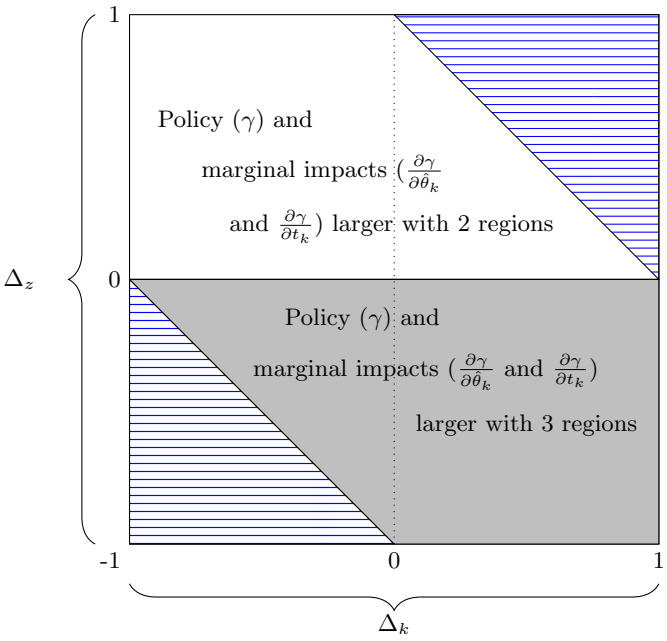


Figure 1: Size of the policy (γ) and marginal impacts ($\frac{\partial \gamma}{\partial \hat{\theta}_k}$ and $\frac{\partial \gamma}{\partial t_k}$) in the $(k-z)$ space

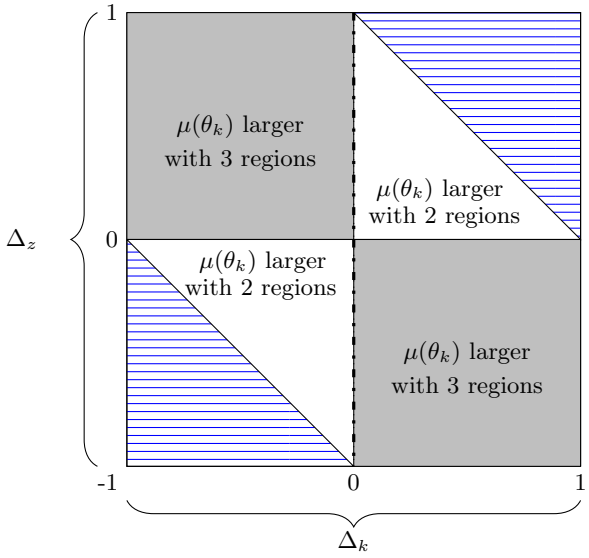


Figure 2: Mark-up $\mu(\theta_k)$ in the $(k-z)$ space

Strategic Behaviour and Beliefs Our main framework assumes that elected delegates have a certain say in federal negotiations, and that agents are fully rational, in the sense that they perfectly understand the institutional setting and act strategically, thus taking advantage of the system as much as possible. In appendix B we relax both assumptions and assume that agents assign a region-specific probability p_k to the fact that their elected politician will be able to impact federal policy-making, and thus the federal policy intensity γ as previously described. With probability $1 - p_k$, instead, they will not influence the federal government's decisions at all and the federal policy will is exogenously set at $\hat{\gamma}$.

There can be several ways to rationalise such beliefs. Amongst others, voters may believe that $1 - p_k$ is the probability that a coalition forms, but with their own representative kept out of the formation process.[17]

While this has no impact on the choice made at the federal level, it impacts how decisions are made at the local level. If agents believe that their choice doesn't always have an impact, their expected benefit from manipulating their behaviour is reduced and, following Lemma 5, they distort t_k and $\hat{\theta}_k$ less.

Coalition formation In appendix C we add more structure and study the coalition-formation process. This serves two purposes. On the one hand, we show that the coalition of two regions of opposite types, studied in appendix A, is a plausible equilibrium outcome. On the other hand, we provide a micro-foundation for the setting in appendix B: voters have to make conjectures for the likelihood of their representative being the formateur that shapes the federal minimum winning coalition.

We show that all possible combinations collapse into a formulation where p_k relates to endogenous federal decision-making and $1 - p_k$ to a setting where γ is exogenously set ($\hat{\gamma}$), hence we can directly apply all results from appendix B. In particular, we conclude that the coalition formation process introduces some uncertainty on the side of voters, which translates into being more cautious when it comes to the choice of the local tax t_k and the type of the federal representative $\hat{\theta}_k$.

Strategic Voting and Gerrymandering Our results show that multi-level governments can – at least partially – explain the rise of political extremism in the form of strategic protectionism at higher levels of government. Several components determine the proportion of this phenomenon: 1) the relative bargaining power of regions within the federal government (ω) is a primitive of the model that can hardly be modified by the legislator; 2) the level of interregional redistribution (Δ) depends on the institutional setting and can be modified by

[17] We work out this micro-foundation of beliefs in appendix C.

the legislator but often it is a politically very costly task; 3) several attributes of the median voter in each jurisdiction (their preferences θ, the slope and concavity of their preferences over the publicly provided good, their income and their disutility from political diversity).

Now, politicians in power often have the authority to, quite arbitrarily, modify the geographical boundaries of jurisdictions. This is usually done in order to modify the composition of the electorate within a jurisdiction and, hence, enhance the chances of being re-elected. Such practice is known as gerrymandering. Common wisdom suggests that gerrymandering may increase polarisation because districts become safer and hence there is less need to attract the moderate voters. By realigning the electoral base, gerrymandering may affect the identity of the median voter who, in turn, is the ultimate cause of the undesired distortions.[18] This leads us to conclude that, should indeed gerrymandering cause a change in the identity of the median voter, who becomes more extreme, then the effects highlighted in our model may be amplified. At the same time, a benevolent legislator may also use gerrymandering to instead reduce the distortion produced by strategic delegation. Either way, should one be willing to estimate the costs and benefits of gerrymandering, we claim that our channel, that operates through strategic delegation, should not be ignored.

3 Empirical Analysis: European vs National Elections

In this section, we provide evidence on some of our key predictions. The model shows that citizens prefer candidates with more extremely protective preferences than their own, when casting their vote for federal elections. Conversely, we do not expect such distortion to characterise elections at lower levels of jurisdiction, in which case citizens will vote more sincerely. An important corollary is that the strategic effect occurs only in benefiting and losing regions and not where the benefit and cost of the federal policy are of similar magnitude.

3.1 Hypothesis

We assess these predictions focusing on elections in the European Union (EU). This is an ideal setting for our model as: i) the EU is the world's largest supra-national federation, enveloping the fiscal policy of 27 different countries with respect to justice, home affairs, trade, agriculture and regional development and ii) EU citizens are called to elect national as well as European delegates, where the former correspond to regional politicians while the latter match federal politicians in our model. As a proxy for the extremely protective political type in the model, we consider the aggregate performances of Eurosceptic as compared to

[18]The empirical tests in McCarty et al. (2009) suggest that the impact of gerrymandering on the identity of the decisive voter are quite small. Krasa and Polborn (2018) suggests that results in McCarty et al. (2009) may be downward biased and that the effect may be larger.

non-Eurosceptic parties. Specifically, following Proposition 1, our main hypothesis is that voters will anticipate the bargaining over EU policymaking taking place in Brussels, and consequently favour Eurosceptic parties relatively more at the European (federal) than at the national (regional) level: this reasoning implies that voters consider Eurosceptic politicians better at striking good deals for their own country in the European political arena.

Our measure of extremely protective political parties strictly resembles the one adopted by Colantone and Stanig (2019) which discuss the recent surge in economic nationalism across Europe. Specifically, we match their interest for isolationist and nationalist parties.[19]

The European setting thus forms an ideal testing ground for our predictions. As discussed in Section 1, previous studies have focused on differences in party performances between national and supranational elections. The most established approach is based on the idea that European elections represent a "Second-Order" election, in which citizens cast their vote based on domestic preferences. Its tenets are: i) turnout is lower in European than in national elections; ii) citizens prefer smaller parties at the European level, and iii) they tend to penalise parties leading their respective national government. This leads to a general punishment of the leading parties, especially when the European elections take place during the mid-term of the national election cycle. In the empirical analysis, we include covariates to exclude the possibility that our findings might be driven by this "Second-Order" theory.

A peculiarity of the EU setting is the presence of Eurosceptic parties, which in some cases are openly advocating the dissolution of the EU. Therefore, voting for Eurosceptic parties might be considered as casting a preference for politicians who aim to demolish the European integration project as a whole, rather than bringing about more favorable conditions for their constituencies – which is our interpretation here. This would not be in contrast with our interpretation, if we consider that the most extreme parties are pursuing such a hard (and potentially fatal for the federation) bargaining strategy just to obtain more favorable conditions for their countries. Indeed, many analysts would argue that most Eurosceptics are not out to destroy EU institutions and funding mechanisms, but rather want to turn these to their advantage (Henceroth, 2017; Vasilopoulou, 2011, 2013).[20]

[19] Differently from Colantone and Stanig (2019), our definition does not include economic conservative parties, as this dimension is not part of the model.

[20] The UK clearly represents an exception to this reasoning. Interestingly, after the Brexit referendum, continental Eurosceptic parties have generally shifted their position away from advocating the dissolution of the EU.

3.2 Data

First, we create a dataset including the vote share of all parties at national and European elections, for parties running at least at one national and one European election.[21] The data are based on the "Election and Referendum Database", which provides election results for European countries, starting from 1990. Second, based on Algan et al. (2017), we classify parties in Eurosceptic or not-Eurosceptic ones. Algan et al. (2017) is based on the Chapel Hill Expert Survey, an established source, which estimates party positioning on European integration and ideology[22]. Algan et al. (2017) extends it including some brand-new and small parties. As European and national elections very often do not take place in the same year, we consider a time window of 5 years for each political party. Then, we calculate the difference between a party vote share at the European and at the national elections within this period (*DiffEU-Nat*). Therefore, positive (negative) values imply that a party gets higher vote shares at the European (national) elections. While European elections take place every 5 years, national elections do not have the same schedule across EU countries. If more than one national election took place in a specific time window, we consider a party average vote share. If a party runs only for one national or one European election in a specific 5-year time period, we would have a missing observation. We consider the first 5-year period starting from the first European election in our dataset (in 1994). Therefore, the periods are 1990-1994; 1995-1999; 2000-2004; 2005-2009; 2010-2014. Different definitions of these 5-year time windows do not affect our findings. In the Appendix, we also consider a 10-year time window: our results are very similar to the ones based on a 5-year time window. We prefer the 5-year one as this maximises the number of observations in our sample. In the Appendix Table 6, we replicate our main findings considering a different 5-year window, centring each window on the year of EU elections (1992-1996; 1997-2001; 2002-2006; 2007-2011; 2012-2016).

Fig. 3 reports the distribution of our dependant variable (*DiffEU-Nat*). The figure highlights a different distribution for parties considered as Eurosceptic, which generally receive a higher vote share in European than in national elections. Fig. 11 highlights a very similar pattern when considering a 10-year time window. To validate this descriptive evidence, we estimate a simple OLS model, in which the dependent variable is the above-mentioned variable (*DiffEU-Nat*) and the main explanatory variable is a dummy set equal to 1 for Eurosceptic parties, based on Algan et al. (2017). To control for differences across countries and common time trends, we include (5-year) time-windows and country fixed effects. In a more demanding specification, we include time-country fixed effects.

[21] A clear limitation of this approach is that we cannot detect parties' performances when they enter a coalition, as we only observe the overall coalition votes share. This leads to an overall smaller sample size.

[22] https://www.chesdata.eu/

The "Second Order" theory might affect these estimates in several ways. First, Eurosceptic parties are often small ones, and if small parties are more likely to be voted for at the European level, we might just be capturing this effect. Therefore, we include a variable measuring the average vote share of a party in a specific time window. Note that this might be an endogenous control variable since, if our theory is correct, our model might explain why small parties – if they are also Eurosceptic – are rewarded in European elections in the first place.

Second, another bias could be introduced by the electoral system, as some countries, holding national elections under a majoritarian system and European ones under a proportional system, might differentially reward small parties across the two types of elections.[23] We tackle this issue in two alternative ways: i) we compute an index measuring the degree of proportionality of an electoral system, the so called "cube law" (Taagepera, 1973; Bol et al., 2019; Matakos et al., 2016; Piolatto, 2011) and use it as a control in our estimation;[24] ii) we report our findings dropping countries with a mixed or a majoritarian system at the national elections.

Third, Eurosceptic parties might be systematically rewarded or punished if they are part of the incumbent or the challenger coalition. To reduce this concern, we include a dummy set equal to 1 for the most voted for party in each country-time window period.

Fourth, lower turnout at the European elections might differently affect Eurosceptic parties. In turn, we control for turnout differences between national and European elections.[25]

Moreover, in some specifications, we include time-country fixed effects to control for all potential country level time-varying changes.

3.3 Results

3.3.1 Baseline Results

We report our findings in Table 1, in Columns 1 to 4, in which we gradually include our set of controls. Control variables do not play an important role, except for party size. This is in line with the Second Order Theory, which predicts smaller parties are indeed more likely to perform better at EU elections.[26] Across the board, however, our results strongly suggest that Eurosceptic parties are more likely to be elected to the European parliament than to

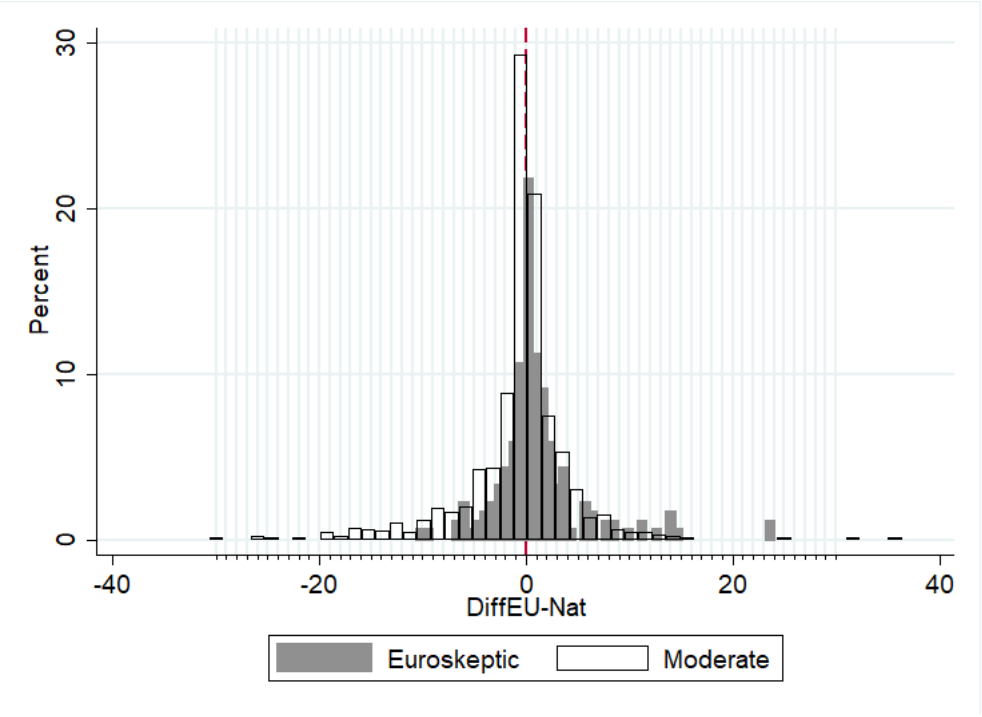
[23] Conversely, all EU countries, in the period of interest, held European elections under some form of proportional representation.

[24] This index takes value zero if an elector system assigns seats equally to all parties, regardless of the share of votes. It reaches value one for proportional systems. Values above one represent systems, such as First Past The Post, where larger parties obtain a share of seats that is larger than the proportion of collected votes. The larger the value of the parameter, the larger the premium for large parties.

[25] Those data are collected from the Chapel Hill Expert Survey.

[26] Note the *Cule Rule* coefficient is not estimated when introducing country fixed effects. Similarly, the *Diff Turnout* coefficient cannot be estimated when introducing Country-Time fixed effects.

Figure 3: Differences in Voting between EU and National Elections across Eurosceptic and not-Eurosceptic Parties



The figure shows the distributions of votes for parties participating in European and National elections in the period 1990-2013, differentiating between Eurosceptic and non-Eurosceptic Parties.

Table 1: Eurosceptic Voting at EU vs National Elections

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.869***	1.892***	2.017***	1.781***	2.242**	2.274**	2.644***	2.144**
	(0.562)	(0.557)	(0.617)	(0.610)	(0.861)	(0.854)	(0.908)	(0.810)
2^{nd}tertile					0.607	0.582		
					(0.465)	(0.476)		
3^{rd}tertile					-0.0920	-0.0533		
					(0.485)	(0.486)		
Eurosceptic*2^{nd}tertile					-2.466**	-2.478**	-2.887***	-2.450**
					(0.973)	(0.972)	(1.038)	(1.089)
Eurosceptic*3^{rd}tertile					1.096	1.070	0.653	1.285
					(1.159)	(1.157)	(1.340)	(1.420)
Diff Turnout	-0.0129	-0.0120	0.00846		-0.0136	-0.0121	0.00895	
	(0.00969)	(0.00980)	(0.0135)		(0.0101)	(0.0101)	(0.0136)	
Cube Law	0.441	0.494			0.409	0.478		
	(0.964)	(0.944)			(1.042)	(1.019)		
Party Size				-0.0911**				-0.0925**
				(0.0355)				(0.0350)
Incumbent				-0.635				-0.582
				(1.180)				(1.169)
Observations	1,128	1,128	1,128	1,140	1,128	1,128	1,128	1,140
R-squared	0.019	0.022	0.042	0.128	0.028	0.032	0.051	0.137
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is an index capturing the degree of proportionality of the electoral system; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* splits countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

its national counterparts. This effect is sizeable (almost 40% of the standard deviation) and statistically significant across all models. Table 5 in the Appendix considers a winsorised version at 99% of the dependent variable, while we test the same specification in Table 7 using a 10-year time window. In both cases our results are confirmed.

Our approach highlights that a Eurosceptic party profile is a salient dimension to determine differential strategic voting at the EU level. An alternative approach could be to consider the traditional ideological dimension, comparing moderate and extreme right/left parties, as a proxy for strategic voting. However, our intuition is that the extreme protection of national interests in the current European political scenario can be best captured by the fracture between Eurosceptic and Pro-European parties. To validate this reasoning, we replicate our findings (Columns 1 to 4) in Table 2, controlling for whether a party is classified as extreme on the ideological spectrum (note that only 50% of Eurosceptic parties are classified as extreme ones). While our findings are unaffected by this control, the extreme dummy is never statistically significant.

Table 2: Eurosceptic Voting at EU vs National Elections controlling for Extreme parties

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.757**	1.786**	2.130**	2.419**	2.134**	2.167**	2.710**	2.738**
	(0.787)	(0.776)	(0.905)	(1.133)	(0.917)	(0.898)	(0.982)	(1.110)
2^{nd}tertile					0.606	0.582		
					(0.464)	(0.475)		
3^{rd}tertile					-0.0908	-0.0519		
					(0.488)	(0.489)		
Eurosceptic*2^{nd}tertile					-2.489**	-2.502**	-2.876**	-2.341**
					(1.014)	(1.016)	(1.068)	(1.072)
Eurosceptic*3^{rd}tertile					1.065	1.039	0.671	1.454
					(1.246)	(1.248)	(1.444)	(1.492)
Extreme	0.152	0.144	-0.153	-0.855	0.167	0.165	-0.0982	-0.886
	(0.806)	(0.818)	(0.932)	(1.215)	(0.871)	(0.885)	(1.054)	(1.313)
Diff Turnout	-0.0127	-0.0119	0.00838		-0.0134	-0.0120	0.00888	
	(0.00967)	(0.00981)	(0.0136)		(0.0101)	(0.0102)	(0.0137)	
Cube Law	0.427	0.481			0.398	0.467		
	(0.945)	(0.922)			(1.014)	(0.989)		
Party Size				-0.0911**				-0.0926**
				(0.0353)				(0.0348)
Incumbent				-0.673				-0.625
				(1.177)				(1.165)
Observations	1,128	1,128	1,136	1,140	1,128	1,128	1,136	1,140
R-squared	0.019	0.022	0.042	0.129	0.029	0.032	0.051	0.138
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *Extreme* is a dummy set equal to 1 for extreme parties. *** p<0.01, ** p<0.05, * p<0.1.

In mixed or majoritarian systems, citizens might be more likely to strategically cast their vote at the national level, in turn, favouring moderate and pro-Europe parties. Conversely, they might be more likely to express their ideological preferences at the European elections, based on a proportional electoral system. While in Table 1 we include as a control the "cube rule" index (which is never statistically significant), in Table 3 we test the robustness of our findings dropping from our sample countries holding a mixed or a majoritarian electoral system at the national level. This classification is based on the International Institute for Democracy and Electoral Asstistance (International IDEA). At the European level, all countries use a proportional system with national specificities.[27] Our findings hold also in this case (Columns 1 to 4).

[27]Note that this specification is highly demanding as four out of six countries holding (at least for some years) a mixed or majoritarian system are in the first tertile, i.e. France, Germany, Italy and United Kingdom. The other two are Hungary and Lithuania.

Table 3: Eurosceptic Voting at EU vs National Elections - without Majoritarian/Mixed Systems

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.668***	1.685***	1.637***	1.441**	2.665***	2.676***	2.962***	2.535**
	(0.534)	(0.530)	(0.557)	(0.581)	(0.844)	(0.850)	(0.928)	(0.924)
2^{nd}tertile					0.884*	0.800*		
					(0.438)	(0.449)		
3^{rd}tertile					0.267	0.236		
					(0.476)	(0.485)		
Eurosceptic*2^{nd}tertile					-2.890***	-2.877***	-3.192***	-2.840**
					(0.964)	(0.975)	(1.050)	(1.172)
Eurosceptic*3^{rd}tertile					0.174	0.171	-0.562	-0.196
					(1.057)	(1.076)	(1.181)	(1.174)
Diff Turnout	-0.0132	-0.0154	0.000119		-0.0138	-0.0151	0.000526	
	(0.00925)	(0.00909)	(0.0227)		(0.00905)	(0.00929)	(0.0228)	
Cube Law	-0.135	-0.199			0.0866	0.0123		
	(0.978)	(0.945)			(0.902)	(0.881)		
Party Size				-0.0840***				-0.0860***
				(0.0295)				(0.0291)
Incumbent				-1.399				-1.270
				(1.331)				(1.329)
Observations	825	825	833	835	825	825	833	835
R-squared	0.016	0.021	0.043	0.149	0.029	0.033	0.054	0.158
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

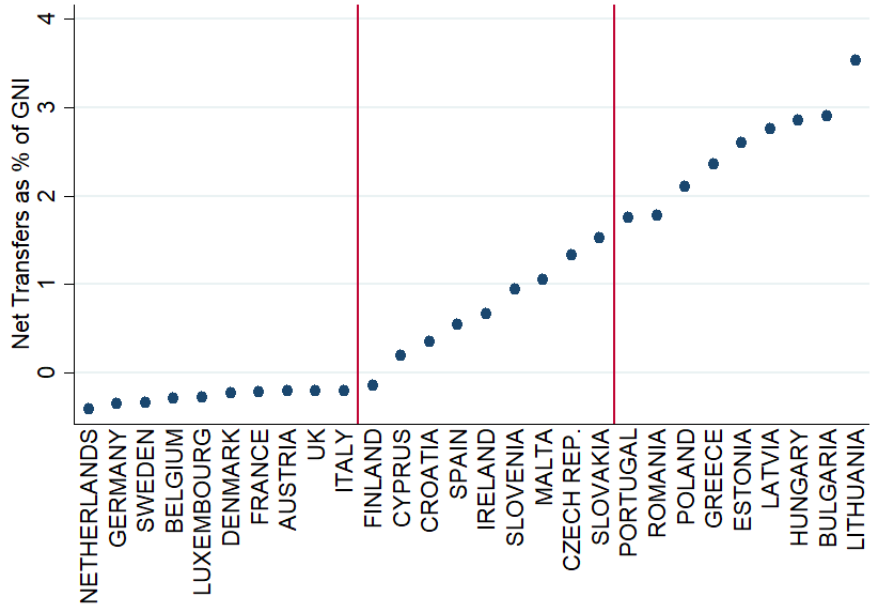
3.3.2 Heterogeneous Effects

The EU budget, which in 2015 was 145 billion Euros, represents a crucial source of financing for the poorest EU members, as well as for firms in several economic sectors (e.g. energy and agriculture) across all EU countries. Similar to our model specifications, some countries – such as Germany, the Netherlands and Sweden – are net contributors to the EU budget, others are net receiving members and others contribute as much as they receive. For instance, in the period 2000-2015, the net transfers received from the EU represented 3,53% of the GNI for Lithuania, 2,9% for Bulgaria and 2,11% for Poland.[28] Conversely, based on this measure, the Netherlands was the main EU net contributor (-0.41% of GNI). Following the model, we should expect a stronger bias toward Eurosceptic voting (at the European elections) in net receiving and net contributing member states, but less so in countries contributing about as much as they receive. To test this prediction, we consider the share of EU net contributions

[28]These data are available on the website of the European Commission: `http://ec.europa.eu/budget/financialreport/2015/revenue/index_en.html`

as a percentage of the gross national income (GNI) in the period 2000-2015, as depicted in Fig. 4. We then split countries in three groups, in which the top 33% includes the most generous net-contributors, as the Netherlands, Germany and Sweden and the bottom one the most net receiving countries. Interestingly, the split in tertiles allows for a U-shape test, as we expect a stronger effect in the top (net-contributors) and in the bottom tertile (net-receiving), while strategic Eurosceptic voting should matter less in countries in which contributions (to the EU) are, more or less, equal to the transfers (from the EU).

Figure 4: Net Transfers *from* the EU as % of GNI (2000-2015)

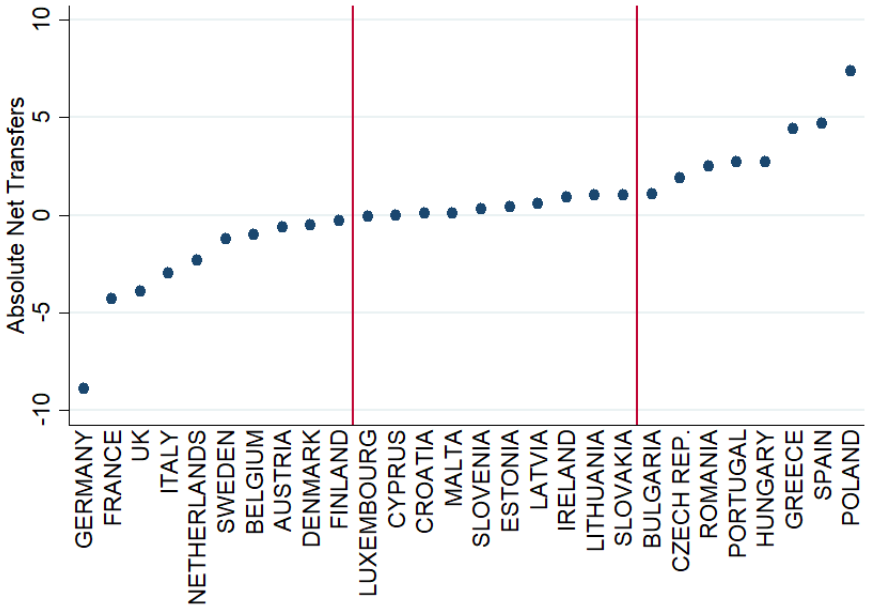


The figure shows the net transfers received from the EU budget as % of GNI in the period 2000-2015 for each EU country: the two red lines split countries in three tertiles.

In Columns 5 to 8 of Table 1, we interact the *Eurosceptic* dummy with this categorical variable. The coefficient *Eurosceptic* represents the effect of the omitted base category, i.e. the top 33% net contributors countries.

Columns 5 to 8 in Table 1 confirm our predictions. The effect materialises only in the top and the bottom tertile (lines 1 and 7), while there is not such effect for Eurosceptic parties in the intermediate tertile (line 6): these countries represent an ideal control group, as they receive more or less as much from the EU budget as they contribute to it. In line with our model, we find a higher, although not statistically significant, effect in the third tertile (top net receiving countries). A similar pattern emerges from Columns 5 to 8 of Table 2 and Table 3. As a complementary evidence, we plot our data differentiating between Eurosceptic

Figure 5: Net Transfers *from* the EU in billion euros (2000-2015)



The figure shows the net transfers received from the EU budget in billion euros in the period 2000-2015 for each EU country: the two red lines split countries in three tertiles.

and moderate parties. Specifically, in Figure Fig. 6, on the vertical axis, we plot the country level 5-year average of the dependent variable (*DiffEU-Nat*) for the two groups of parties: on the left(right) side Eurosceptic(moderate) parties. On the horizontal axis, we plot the net transfers as % of GNI similarly to Figure Fig. 4. The figure quite clearly shows the U-shaped pattern for the Eurosceptic plot, whereas no clear trend is visible on the right side for moderate parties.

In the Appendix, Table 8 highlights similar findings when grouping countries based on two alternative measures. First, in columns 1 to 4, we consider a survey question collected by the Eurobarometer[29] across EU countries (since 1983), i.e. the share of individuals agreeing with the statement "Taking everything in consideration, would you say your country has benefited from being a member of the European Union?". We calculate the average response for each country over time. This classification allows a split in tertiles based on citizens perception of their country as a "loser" or a "winner" of the EU project, instead of objective economic measures.

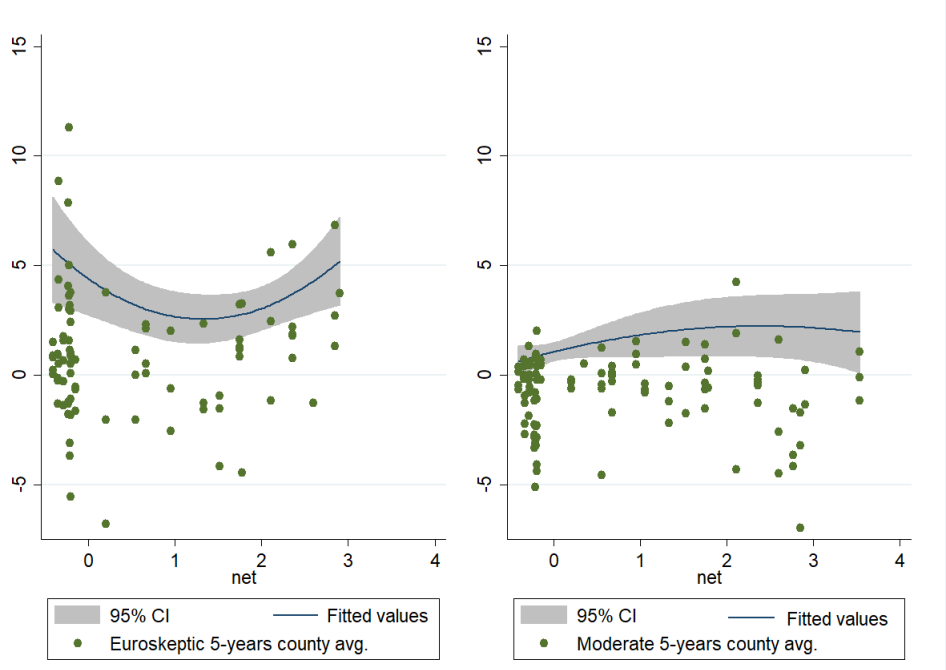
Second, in columns 5 to 8, we use an alternative measure of EU contribution: we consider countries' absolute average contribution in the period 2000-2015 (in this case, Germany is the

[29] `https://www.gesis.org/eurobarometer-data-service/search-data-access/eb-trends-trend-files/list-of-trends/membership-benefit`

top net-contributor with a yearly contribution of almost 9 billion Euros, as shown in Fig. 5). Finally, in Appendix Section F, we investigate whether these effects depend on the size of the federation, focusing on the EU enlargement in 2004.

Finally, in Table 10, we consider an alternative explanation for our findings. Eurosceptic parties might be more successful at the EU elections because their manifesto is built around EU topics, which are naturally more salient right before EU elections. This might provide them higher media exposure and in turn, more votes. However, this reasoning is true also for strongly pro-EU political parties. Therefore, to reduce concerns related to this reasoning, in Table 10, we restrict the sample to these two groups of parties (pro-EU and Eurosceptic ones). Similarly to our main definition of Eurosceptic parties, we classify pro-EU parties based on the Chapel Hill Expert Survey.[30] Our main findings are confirmed also in this case, although the estimated coefficients are considerably more noisy: this is not surprising considering that we are dropping the majority of the observations.

Figure 6: Scatter plot by type of party



On the vertical axis, we plot the country-level 5-year average of the dependent variable (*DiffEU-Nat*) for Eurosceptic(moderate) parties on left(right) side. On the horizontal axis, the figure shows the net transfers as % of GNI similarly to Figure Fig. 4.

[30]Specifically, to classify pro-EU parties, we consider the question: "Overall orientation of the party leadership towards European integration" (whose replies go from 1 – Strongly opposed – to 7 – strongly in favor –). We classify as pro-EU, parties scoring 6 or 7. The question is available in the period 1999–2014.

4 Survey Evidence: Strategic Eurosceptic Voting

In the previous section, we show that Europeans tend to vote more for Eurosceptic parties at the European than at the national elections, especially when they are in net receiving or contributing countries. Our key assumption is that this pattern is due to a strategic voting behaviour, whereby Eurosceptic parties are considered more fit to bargain at the EU level and protect national interests in the process.

To validate this assumption we run an online survey in cooperation with Qualtrics XM. Our aim is to better understand the behaviour of individuals who have voted for a Eurosceptic party at the last EU parliamentary elections (26th May 2019) and for a moderate party at the most recent national/subnational elections. This is an ideal group of voters to investigate why individuals might vote for different parties at different elections.

Our final sample includes 341 such respondents: 51 from Finland, 209 from France and 81 from the Italian region of Piedmont.[31] The choice of areas where to run the survey was made taking into account the time lag between European and national/subnational elections. While the election of the European Parliament took place on 26th May 2019 in all three areas, at the national/subnational level we registered voting behaviour for the Finnish Parliament (14th April 2019) and President (28th January 2018), the French Parliament (11th June 2017) and President (23rd April 2017) and, in the case of Italy, the Piedmontese Parliament, whose elections took place on the same day as the European Parliament elections (26th May 2019), hence, our Italian respondents voted simultaneously for both European and regional elections and, yet, they voted for different parties.

We first screened respondents by asking for which party they voted at the above mentioned elections. Individuals were selected only if they split their vote, by choosing a Eurosceptic party at the EU elections and a moderate party at least in one of the other elections. The survey continued with some additional questions, aimed at understanding why they cast their vote in favour of a Eurosceptic party only at the European elections.

Specifically, we asked them how much they agreed with the following statements on a scale from 1 (fully disagree) to 7 (fully agree):

1. whether the Eurosceptic party they voted will be able to better:

   a) protect the interests of their country at the European Level

   b) attract more European funds to their country

   c) lead their country out of the European Union

[31] The relatively small sample size is due to the effort in selecting individuals with such specific voting requirements.

2. whether they voted the Eurosceptic party to express their discontent with the current national government and/or president.

Questions 1a) and 1b) are aimed at capturing our mechanism, i.e. the idea that voters might strategically vote for Eurosceptic parties only at the EU level, since they expect a better deal for their member state in all kinds of EU level negotiations by electing them. Questions 1c) and 2) are intended to capture alternative reasons for voting for such parties only at the EU level. Furthermore, for each of the voted parties, we asked which party represents them better, as compared to other parties. The order of questions was randomised.

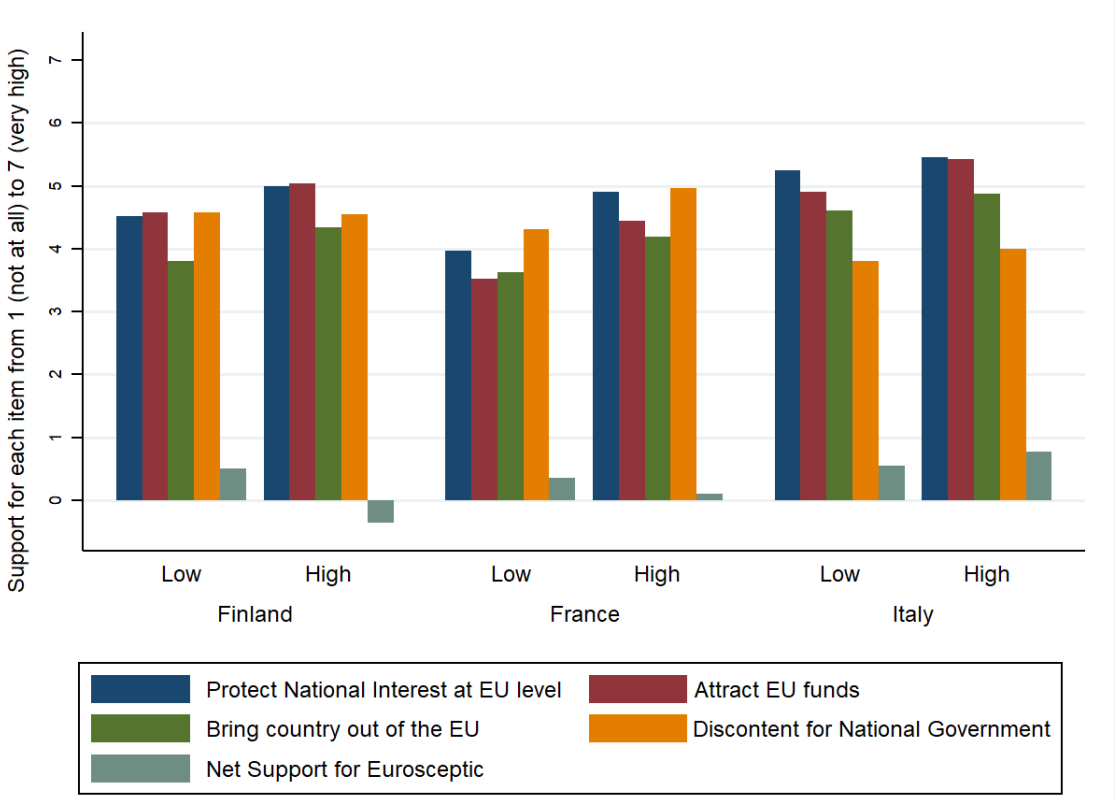
Finally, we collected the answers to a set of standard demographic questions and a few questions on media use and interest in politics. The survey, whose duration was approximately 10 minutes, was translated in the national language. We coded Eurosceptic and moderate parties based on the same methodology of the previous section.

We report the results in Fig. 7. The figure shows the average support for each statement across countries and levels of political interest (low and high). We highlight this cleavage, as it appears the only one along which preferences seem to consistently change across individuals.[32] The first four bars of each graph represent the above four options. The fifth grey bar in each graph represents the difference in support between the voted Eurosceptic and the voted moderate party(ies). Positive (negative) values imply higher support for the Eurosceptic (moderate) party(ies).

Overall, we find that strategic reasons seem to matter to explain such voting behaviours. This is true both if we conceptualise it in abstract terms (protecting the national interest) or in more concrete terms (attracting EU funds). This is specifically true for Finland and Italy and for voters highly interested in politics in France. Unsurprisingly, also the other two options seem to matter, i.e. wanting to leave the EU and expressing discontent with the national government. This is not undermining our reasoning, as we are not arguing that strategic reasons are the only ones leading voters to vote for different parties depending on the level of government. Instead, our results highlight that strategic voting plays an important and complementary role in this decision-making process. The fifth bar in each graph shows no big differences in support across the voted Eurosceptic/moderate parties. This validates the idea that, on average, voters do not systematically feel closer to a specific party. Finally, across all countries, individuals more interested in politics show higher preferences for the motivations linked to strategic voting (p-value$<$0.001): such sophisticated voting behaviour is indeed typical of voters more involved in the political arena and its discourse.

[32]Specifically, we consider as having a high political interest, those individuals replying 4 or above on a scale from 0 to 7. Conversely, we do not find any heterogeneity across other dimensions, as gender, age, education, job status and media consumption.

Figure 7: Online Survey results



The figure shows the distributions of replies across countries and levels of political interest.

5 Conclusion

Incentives play a major role when it comes to economic decision-making, as a badly designed incentive scheme may lead to undesired outcomes. This paper shows that in a multi-tiered country – as well as in a union of countries such as the EU – the presence of interregional redistribution can bring about political extremism at higher levels of government, for strategic reasons.

When voters are sophisticated, they anticipate the bargaining process that leads to the concession of federal support. Proposition 1 shows that they manipulate their choice in order to move the bargaining point in a more favourable direction. To do that, they vote for federal candidates that have more extremely protective preferences than their own. In other words, median voters in each region willingly elect delegates with preferences that are more extreme than their own. This is a strategic choice, reflected by the preference type of the elected federal representatives. Net receiving regions will elect delegates which are more likely to support lower-level governments with their policies, whilst net contributors are more likely to

elect representatives in favour of less federal intervention.

Such behaviour has direct and testable consequences on the level of polarisation and extremism. Our empirical analysis (Section 3) – consistent with the model's predictions – shows that citizens in the European Union have voted for more nationalist/protectionist parties in EU elections than they did for their own national elections. This strategic effect arises only for net receiving and net contributing member states, but not in countries where EU contributions and expenditures are more or less balanced.

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Appendix A Three-region setting

We extend here the analysis by adding one region to the federal constellation studied above: $|R| = 3$. We focus on the case when a coalition of two forms: $|K| = 2$.[33] We abstract from the discussion or formal analysis of why a given coalition forms between two of the three regions.[34] Following the previous notation and without loss of generality $K = \{\alpha, \beta\} \subset R$. Furthermore, we denote by $z \in R \backslash K$ the region that is not represented in the coalition.

We focus on the case in which the coalition is formed by a contributor and a recipient,[35] and neglect the trivial case of a coalition of regions of the same kind, which inevitably leads to a corner equilibrium.[36] By construction, if the two regions in the coalition are of opposite type, one of them must be of the same type as region z.

The maximisation problem of the federal government is the same as with two regions (Eq. 7):

$$\max_{\gamma} \sum_{k \in K} \omega_k \left(\hat{U}_k - F_k \right) = \sum_{k \in K} \omega_k \left(c\left(C_k\right) + \hat{\theta}_k x\left(G_k, X_k\right) - F_k \right), \tag{19}$$

and the first order condition is:

$$\begin{aligned} \phi_f^3 &= 0, \\ \text{with } \phi_f^3 &\equiv \omega_\alpha \hat{\theta}_\alpha \Delta_\alpha x_2'\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta x_2'\left(G_\beta, X_\beta\right). \end{aligned} \tag{20}$$

Eq. (20) is the counterpart of Eq. (9). The main difference between them is that with two regions $\Delta_\alpha = -\Delta_\beta$ while in the 3-region case $\Delta_\alpha = -\Delta_\beta - \Delta_z$.

Proposition 3 compares the choice γ of the federal government in the case of two and three regions (respectively $|R| = 2$ and $|R| = 3$). For that, denote by γ^R the equilibrium magnitude of the federal policy with R regions.

Proposition 3. *When the region excluded from the coalition (z) benefits from the federal policy ($\Delta_z > 0$), the implemented policy is more generous with two regions ($\gamma^2 > \gamma^3$). The opposite ($\gamma^2 < \gamma^3$) is true when the region excluded looses from the federal policy ($\Delta_z < 0$).*

The federal decision is taken by representatives with opposing interests, yet decisions are taken in a cooperative way. With three regions, the interest of only two regions is defended

[33] The analysis of the equilibrium when the grand coalition forms is isomorphic to what we observe with $|R| = 2$ and its study does not bring new insights.

[34] We briefly come back to this point in appendices B and C, where we test the robustness of our model against that.

[35] Region z, despite being left outside the coalition, is part of the federal state and as such they participate in the process of collection and redistribution of federal taxes even if they are not participating to the federal decision process.

[36] When both regions in the coalition are recipients, they set the largest possible federal policy and extract all surplus from the excluded region. When both regions are contributors, they repeal the policy and set it to the lowest possible level.

within the federal government. This leads to the result behind Proposition 3. When the benefits of the policy are shared with the excluded region, the federal government only internalises part of them, which leads to a relatively smaller policy $\gamma^2 > \gamma^3$. Similarly, if the cost of the policy is shared with excluded region (($\Delta_z < 0$), but not internalised, then the size of the federal policy is relatively larger $\gamma^3 > \gamma^2$.

Despite not being part of the federal coalition, region z has an (indirect) effect on the equilibrium policy γ. Lemma 4 shows how and when it happens.[37]

Lemma 4. *When region z (the one out of the coalition) looses from the policy ($\Delta_z < 0$), the marginal impact of t_k and $\hat{\theta}_k$ on the federal policy γ (respectively $\frac{\partial \gamma}{\partial t_k}$ and $\frac{\partial \gamma}{\partial \hat{\theta}_k}$) is larger in the 3-region setting than in the 2-region one. Conversely, when z benefits from the policy the marginal effect is smaller.*

Proof. See appendix D. □

When moving to local elections, it is immediate to notice that voting in the region that is excluded from the coalition (z) acts as if there were no federal government (which, as previously discussed, corresponds to the myopic case). Hence $c'(C_z) - \theta_z^m x_1'(G_z, X_z) = 0$. Eqs. (21) to (22) implicitly define the preferences of the median voter in region α, in terms of the local tax t_α^1 (Eq. 21) and of the representative selected to join the federal legislature $\hat{\theta}_\alpha$ (Eq. 22).

$$x_1'(G_\alpha, X_\alpha) - \frac{\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x_2'(G_\alpha, X_\alpha)\, x_{1,2}''(G_\alpha, X_\alpha)}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x_{2,2}''(G_\alpha, X_\alpha) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x_{2,2}''(G_\beta, X_\beta)\right)} = \frac{c'(C_\alpha)}{\theta_\alpha^m} \tag{21}$$

$$-\frac{\omega_\alpha \left(\Delta_\alpha x_2'(G_\alpha, X_\alpha)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x_{2,2}''(G_\alpha, X_\alpha) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x_{2,2}''(G_\beta, X_\beta)\right)} = \frac{2\eta_\alpha(\hat{\theta}_\alpha - \theta_\alpha^m)}{\theta_\alpha^m}. \tag{22}$$

Proposition 4. *When region k's interest is aligned with the one of the excluded region (that is, when $\text{sgn}(\Delta_k) = \text{sgn}(\Delta_z)$), their mark-up ($\mu(\theta_k)$) is smaller in the 3-region case than with 2 regions. Conversely, if region k's interest is opposite to the one of the excluded region (that is, when $\text{sgn}(\Delta_k) \neq \text{sgn}(\Delta_z)$), their mark-up ($\mu(\theta_k)$) is larger in the 3-region case than with 2 regions.*

Proof. See appendix D. □

Proposition 4 describes the level of distortion (mark-up) in region k by comparing the type of the region (Δ_k) with the type of the region excluded from the coalition (Δ_z).

[37] For a graphical representation, see Fig. 1 at Page 14.

Notice that when region α is aligned with z, then $\frac{(\Delta_\alpha)^2}{(\Delta_\beta)^2} < 1$, while $\frac{(\Delta_\alpha)^2}{(\Delta_\beta)^2} > 1$ when α is not aligned with z. Then, Proposition 4 can be restated in the following way: whenever $\frac{(\Delta_\alpha)^2}{(\Delta_\beta)^2} > 1$, mark-up $\mu(\theta_\alpha)$ is larger in the 3-region case and $\mu(\theta_\beta)$ is smaller, hence the ratio $\mu(\theta_\alpha)/\mu(\theta_\beta)$ increases. Whenever $\frac{(\Delta_\alpha)^2}{(\Delta_\beta)^2} < 1$, mark-up $\mu(\theta_\alpha)$ is smaller in the 3-region case and $\mu(\theta_\beta)$ is larger, hence the ratio $\mu(\theta_\alpha)/\mu(\theta_\beta)$ decreases.

The mechanism behind this result is that the region outside the coalition is either sharing the cost or the benefit with one of the regions in the coalition. This changes the marginal incentive to negotiate within the coalition, as pointed out by Lemma 4.

Figs. 8 to 10 represent the content of Proposition 4 by showing when $\frac{(\Delta_\alpha)^2}{(\Delta_\beta)^2} > 1$ from different space perspectives.

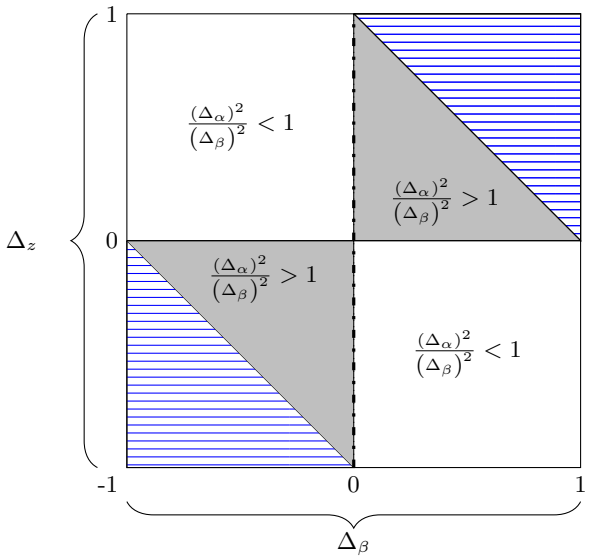


Figure 8: Distortion of $\hat{\theta}_\alpha$ in the $(\beta - z)$ space

White areas represent combinations of Δ_r such that regions α and z are both of the same type (recipient or contributor) and therefore the distortion of $\hat{\theta}_\alpha$ is smaller in the 3-region setting. Conversely grey areas represent combinations of Δ_r such that regions α and z are of opposite type and therefore the distortion of $\hat{\theta}_\alpha$ is larger in the 3-region setting. Striped areas indicate combinations of Δ_r that are incompatible with the assumption $\sum_r \Delta_r = 0$.

Figs. 8 and 9 mirror each other. This is because by construction $\text{sgn}(\Delta_\alpha) = -\text{sgn}(\Delta_\beta)$. Fig. 10 allows to identify in the $\Delta_\alpha, \Delta_\beta$ space which are the areas (white) in which α and z are of the same type and those (grey) in which β and z are of the same type.

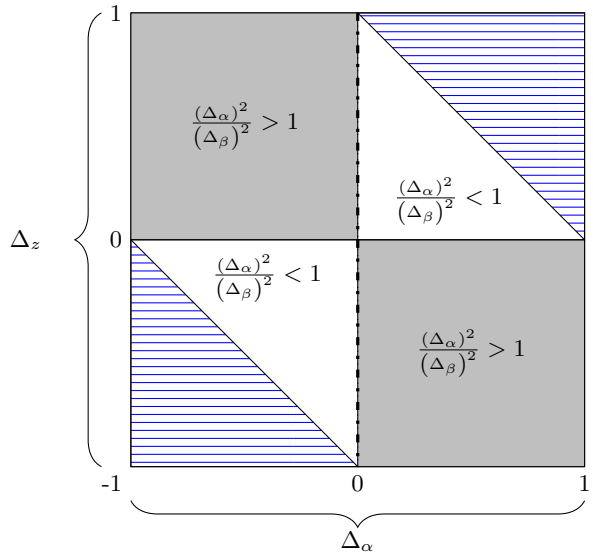


Figure 9: Distortion of $\hat{\theta}_\alpha$ in the $(\alpha - z)$ space

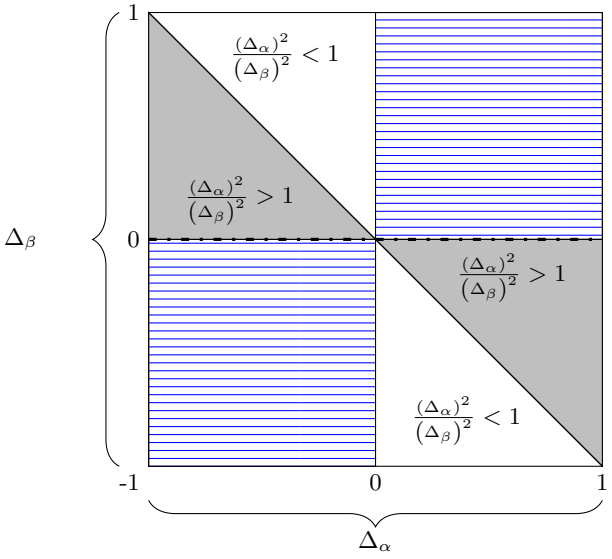


Figure 10: Distortion of $\hat{\theta}_\alpha$ in the $(\alpha - \beta)$ space

Appendix B Strategic Behaviour and Beliefs

Until now we assumed that elected delegates have a certain say in federal negotiations, and that agents are fully rational, in the sense that they perfectly understand the institutional setting and act strategically, thus taking advantage of the system as much as possible. We could relax both assumptions by assuming that agents assign a region-specific probability p_k to the fact that their elected politician will be able to impact federal policy-making, and thus the federal policy intensity γ as previously described, whereas with probability $1 - p_k$ they will not influence the federal government's decisions at all. In this latter case the federal policy will consequently be exogenously set at $\hat{\gamma}$.[38]

There can be several ways to rationalise such beliefs. Voters may think – or correctly anticipate – that $1-p_k$ is the probability that a coalition forms, but with their own representative kept out of the formation process.[39] Another possibility could be that voters believe the federal government has not full discretion over γ and with some probability another (possibly not directly elected) institution controls it. One more option could be that voters believe the political weight of their region within the coalition is such that their politician is not able to influence γ, or at least to a lesser degree. In this sense, voters are incorrectly anticipating ω, so that probabilities p_k express the perceived political weight of a representative, rather than the actual weight. This could be the case when their own politicians are less ideally positioned to pull the levers of policy-making because they have less insight in the various practices and rules involved. It could also be that the latter are perceived as potentially stacked in favour of other representatives enjoying more leverage when the rules are set. Lastly, the general opinion could be that once regional representatives are part of the national, higher-level establishment, they will lose interest in their own region, or will be pushed to do so.[40] Clearly, one may think that p_k – as interpreted above – could also vary through time in a more general dynamic setting. In order to keep our robustness check in this section distinct and clear, however, we keep the model static and study how results change when p_k varies.

Conditional on the politician being able to influence γ, and still solving backwards, results from period 2 in Section 2.1.1 go through in our extended setting here, as voter beliefs do not directly affect actual federal decision-making. However, and moving to period 1 when the federal representatives are elected, the maximisation problem of the median voter in region

[38] Notice that at this point it does not matter whether these beliefs originate from voters not fully understanding the game at play, or whether they correctly anticipate that the local politician will not always have a say on the decision of γ.

[39] We work out this micro-foundation of beliefs in appendix C, where voters have to make conjectures for the likelihood of their representative being the formateur, who shapes the federal minimum winning coalition. We show that all possible combinations collapse into a formulation where p_k relates to endogenous federal decision-making and $1 - p_k$ to a setting where γ is exogenously set ($\hat{\gamma}$).

[40] See e.g. Thorlakson (2009) and the references therein.

$k \in K$ now includes the additional constraint that γ is defined by Eq. (9) with probability p_k, and $\gamma = \hat{\gamma}$ with probability $1 - p_k$. Here then, Lemma 3 translates into the following lemma.

Lemma 5. *Eqs.* (23) *to* (24) *implicitly define the preferences of the median voter in region* α*, in terms of the local tax* t_α *(Eq.* (23)*) and of the representative selected to join the federal legislature* $\hat{\theta}_\alpha$ *(Eq.* (24)*).*

$$p_k \left(x_1' \left(G_\alpha, X_\alpha(\gamma) \right) - \frac{\omega_\alpha \hat{\theta}_\alpha x_2' \left(G_\alpha, X_\alpha(\gamma) \right) x_{1,2}'' \left(G_\alpha, X_\alpha(\gamma) \right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}'' \left(G_\alpha, X_\alpha(\gamma) \right) + \omega_\beta \hat{\theta}_\beta x_{2,2}'' \left(G_\beta, X_\beta(\gamma) \right) \right)} \right) + \tag{23}$$

$$+ (1 - p_k) x_1' \left(G_\alpha, X_\alpha(\hat{\gamma}) \right) = \frac{c'(C_\alpha)}{\theta_\alpha^m}$$

$$\frac{-p_k \omega_\alpha \left(x_2' \left(G_\alpha, X_\alpha(\gamma) \right) \right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}'' \left(G_\alpha, X_\alpha(\gamma) \right) + \omega_\beta \hat{\theta}_\beta x_{2,2}'' \left(G_\beta, X_\beta(\gamma) \right) \right)} = \frac{2\eta_\alpha (\hat{\theta}_\alpha - \theta_\alpha^m)}{\theta_\alpha^m}. \tag{24}$$

From Lemma 5, we immediately obtain that Proposition 1 still holds. Eq. (24) is identical to Eq. (14), with the exception that the left hand side of Eq. (24) is multiplied by $p_k \in [0, 1]$, from which we immediately conclude that the equilibrium distortion of θ_k is lower in this case. This result is quite intuitive, since now agents expect the strategic mechanism to be at work only with probability p_k, so that they have less reason to manipulate the federal vote, and reduce distortion as a result. Comparing these distortion across regions subsequently, we obtain Corollary 4. This is the equivalent of Corollary 1, but then in the more general setting allowing for varying voter beliefs.

Corollary 4. *The strategic voting of the median voter – assigning beliefs to the effectiveness of federal representation – is characterised by*

$$\frac{\mu(\theta_\alpha)}{\mu(\theta_\beta)} = \frac{p_\alpha \omega_\alpha}{p_\beta \omega_\beta} \frac{\left(x_2' \left(G_\alpha, X_\alpha \right) \right)^2 / \eta_\alpha}{\left(x_2' \left(G_\beta, X_\beta \right) \right)^2 / \eta_\beta}, \tag{25}$$

Corollary 4 sheds more light on how beliefs captured by p_k affect our previous results. The more representatives of a certain region are seen as being influential as compared to another, the more voters will distort federal elections in that region. In other words, the more pronounced the beliefs captured by p_α as compared to p_β, the higher the relative mark-up of distortion $\frac{\mu(\theta_\alpha)}{\mu(\theta_\beta)}$ in Corollary 4.

Appendix C Coalition formation

In this section, we add some structure to the 3-region setting of appendix A, by looking deeper into how a coalition forms. The aim of this extension is twofold. First, we provide a plausible foundation for the 3-region setting in Section A, where coalition formation was taken for granted and treated as a black box. Second, we link this section to Section B, where voters anticipate that with some probability the their representative has no direct impact on federal decision making. Indeed, in what follows voters are put in a similar position of uncertainty, as they cannot be sure their own representative will be part of the coalition.

We keep restricting our focus to the minimum-winning coalition, so that $|R| = 3$ and $|K| = 2$. This to demonstrate that equilibria where a coalition of two forms, are indeed admissible in our setting. Also, whenever a grand-coalition were to form results would be isomorphic to the 2-region setting studied in Section 2.1, hence we would gain little insight by studying such an event. The only difference with respect to Section A, therefore, is that we introduce one additional step between federal elections and the decision over γ: a "formateur" is randomly selected amongst representatives, and is asked to choose a partner to form the federal government. Once this coalition is formed, the representatives of the two regions act cooperatively, as before, and select the federal tax that maximises their joint utility.[41] This sequential structure, with a formateur choosing first who to form a coalition with and then the terms of the bargaining, is quite common. One notable exception would be Talamàs (2020), where agents simultaneously bargain on who will be part of the coalitions and on its terms.

We show that, with some probability, the federal decision responds directly to the preferences $\hat{\theta}_k$ of strategically elected representatives, which is the channel upon which the main model is built. With the complementary probability, federal decisions do not lend themselves to strategic motives. Hence, results are in line with our previous claim that voters act strategically when it comes to the choice of who is going to represent them at the federal level, as long as they believe the latter will – to a certain extent – be influential in setting γ. Indeed, the more structured model developed here micro-founds one of the interpretations considered in appendix B, where beliefs were precisely shaped by the probability assigned to the event of being included in the federal coalition.

The timing of the game, hence, becomes the following. In period 1, citizens vote over the local tax t_r and elect the delegate $\hat{\theta}_r$ to potentially join the federal government. Then, a formateur is randomly selected: each delegate $\hat{\theta}_r$ has the same probability $\frac{1}{3}$ to be selected. To ensure a majority, it suffices for the formateur to choose just one coalition partner. Once this partner is selected, the bargaining process is the same as in Sections A and 2.1, with coalition

[41] The bargaining power of the formateur within the coalition may vary substantially depending on the bargaining system (Ali et al., 2018). Weight (ω_k) in our model could account for that.

members cooperatively seeking to maximise joint surplus against the threat of negotiations breaking down.

The type of a region depends on whether it is a contributor or a recipient. Hence, with three regions, it must be that two of them are always of the same type, while the third one is of the opposite one. Regions' type is common knowledge. Hence, at the moment of the vote, citizens know if they are voting in the region of "unique type" or "non-unique type", i.e. whether there is another region of the same type in the federation. We solve those two cases separately, respectively in Sections C.1 and C.2. In both cases, we show that median voters will be driven to choose the federal representative $\hat{\theta}$ strategically, leading to federal representatives with stronger preferences for consumption in period 2. However, this driving force is mitigated by another one which goes in the opposite direction, and leads to select the median voter as the representative at the federal level. Voters' behaviour will ultimately be the result of a weighted average of the two forces, as depicted (in reduced form) in appendix B.

We already argued in Section A that a coalition of two regions of a kind allows members to expropriate the left-out region. When both regions in the coalition are net recipients, they set the largest possible federal policy ($\gamma = \overline{\gamma}$) and extract all surplus from the excluded region. If both regions are net contributors, they repeal the policy and set it at the lowest possible level ($\gamma = \underline{\gamma}$).[42] In both cases we arrive at a corner solution, over which voters in the excluded region will have no control. Therefore, when the formateur is of the "non-unique type", their optimal strategy is always to form a coalition with the other region of identical type.

However, a formateur of the "unique type" will have no alternative but to form a coalition with a representative of a region of the opposite type. In this case, the best strategy is to form a coalition with the representative with the smallest $\hat{\theta}$. The formateur's preference to form a coalition with the smallest $\hat{\theta}$ is anticipated by voters and will be reflected in their choice of the representative they elect. The details about this follow below.

C.1 Unique type

In this section, we consider the case in which the region's type is opposite to the type of the two other regions. Consider first the possibility that voters' representative is not the formateur, with probability $\frac{2}{3}$. Here then, following the previous argument, the two other regions form a coalition together and expropriate the region of interest, by choosing federal tax $\gamma^{\not F}$. Utility of the median voter in region r then becomes

$$U_r^m(\gamma^{\not F}) = c\left(C_r\right) + \theta_r^m x\left(G_r, X_r(\gamma^{\not F})\right) - \eta_r\left(\hat{\theta}_r - \theta_r^m\right)^2. \tag{26}$$

[42] Clearly, if there are constitutional bounds to the acceptable tax rates, the coalition would opt for these, instead of 0 and 1.

Notice that delegates will have no say over federal spending and, therefore, utility is maximised when $\hat{\theta}_r = \theta_r^m$. That is, when the median voter elects a representative with their own same preferences.

With the complementary probability $\frac{1}{3}$, the representative is the formateur. Hence, by construction, they are part of the coalition and select, as a partner, the representative with the lowest $\hat{\theta}$. In such case, the two members of the coalition have opposite goals. Expropriating the region outside of the coalition is no longer an option, so they maximise joint surplus as in Section A.[43] In a sense coalition partners try to mitigate each other's objectives. The federal tax rate is the result of the weighted utilitarian bargaining solution and we denote it by $\gamma^3(\hat{\theta}_k)$, with

$$\gamma^3(\hat{\theta}_k) = \arg\max_{\gamma} \sum_{k \in K} \omega_k \left(c\left(C_k\right) + \hat{\theta}_k x\left(G_k, X_k(\gamma)\right) - F_k \right). \tag{27}$$

The median voter's utility in this case is:

$$U_r^m(\gamma^3(\hat{\theta}_r)) = c\left(C_r\right) + \theta_r^m x\left(G_r, X_r(\gamma^3(\hat{\theta}_r))\right) - \eta_r \left(\hat{\theta}_r - \theta_r^m\right)^2. \tag{28}$$

Hence, when electing the federal representative by maximising Eq. (28), the motive to vote strategically for voters in region r reappears, and is the same as in Section A. Indeed, their delegate will now have a clear say over federal spending.

Combining Eq. (26) and Eq. (28) subsequently, and given the probability of becoming the formateur, first period optimisation in region r boils down to

$$\max_{t_r, \hat{\theta}_r} \; U_r^m(\gamma^3(\hat{\theta}_r), \gamma^{\not E}) = \frac{1}{3} U_r^m(\gamma^3(\hat{\theta}_r)) + \frac{2}{3} U_r^m(\gamma^{\not E}), \tag{29}$$

subject to

$$C_r = (1 - t_r)\, Y_r, \tag{30}$$

$$G_r = t_r Y_r. \tag{31}$$

Eq. (29) simplifies to

$$\max_{t_r, \hat{\theta}_r} \; U_r^m = c\left(C_r\right) + \frac{1}{3}\theta_r^m x\left(G_r, X_r(\gamma^3(\hat{\theta}_r))\right) + \frac{2}{3}\theta_r^m x\left(G_r, X_r(\gamma^{\not E})\right) - \eta_r \left(\hat{\theta}_r - \theta_r^m\right)^2, \tag{32}$$

which is the isomorphic equivalent of Eq. (63), and consequently also serves as a first example of a possible micro-foundation for the more general case developed in appendix B.

[43] More specifically, the setting for the formateur region is isomorphic to the case when α and z are of the opposite type, while for the region that is not the formateur, the setting corresponds to the one in which α and z are of the same type.

C.2 Not-unique type

Consider now the case in which region r is of a given type and there exists another region of the same type. This brings about three, equally likely, possibilities:

1. The representative of region r becomes the formateur. In this case, the formateur forms a coalition with the representative from the region of identical type. Together they "expropriate" the region that is left out of the coalition. This leads to a corner solution, similarly to the previous case of expropriation: the only difference is that now our region of interest is the one expropriating. Yet, by choosing a corner solution to expropriate, the choice of γ does not depend on the type $\hat{\theta}_r$ that the region selects to operate within the federal government. Hence, in this setting, there is no need for strategic manipulation by voters, as their delegate will always get to fully expropriate the region outside of the coalition. We denote the resulting federal tax by γ^E, where the expropriating policy corresponds to the constitutional boundary for federal policy. In such case, the utility of the median voter in region r is:

$$U_r^m(\gamma^E) = c\left(C_r\right) + \theta_r^m x\left(G_r, X_r(\gamma^E)\right) - \eta_r\left(\hat{\theta}_r - \theta_r^m\right)^2. \tag{33}$$

2. The formateur is the representative of the region of the same type as our region of interest. Such situation mirrors the previous one. The one region of the same type as our region of interest will invite the region of interest to form a coalition, and together they again expropriate the region left out of the coalition. Once again, voters in region r have no reason to vote strategically, since their delegate always gets to fully expropriate the region outside of the coalition. Eq. (33) is again the utility of the median voter in our region of interest.

3. The formateur is the representative of the unique-type region, hence of the type opposite to our region of interest. Inevitably, the coalition members must have opposing goals. A priori, both regions could be selected by the formateur, yet the formateur has a clear incentive to face the weakest possible opponent, who is represented by the lowest $\hat{\theta}$. The two regions may compete to be part of the coalition, however, competition is limited by the fact that both regions pursue a common goal: to preserve the interests of their (common) type. The benefit of sitting at the table with the formateur is intrinsically determined by the fact of preserving their utility. There is no ulterior motive to be part of the coalition. As such, compared to a standard competition "à la Bertrand", behaviour is more strategic, which we analyse in the remainder of this section. For now, assume that a representative of type $\overline{\theta}$ is selected to form a coalition. Negotiations will

proceed as before, by maximising joint utility, so that the resulting federal tax $\overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta})$ is defined as

$$\overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}) = \arg\max_{\gamma} \omega_\phi \left(c\left(C_\phi\right) + \hat{\theta}_\phi x\left(G_\phi, X_\phi(\gamma)\right) - F_\phi \right) + \overline{\omega}_k \left(c\left(C_k\right) + \overline{\theta}_k x\left(G_r, X_r(\gamma)\right) - F_k \right) \quad (34)$$

where subscript ϕ denotes the formateur.

Denote by $i = \{1, 2\}$ the two regions that are of the same kind. Then their maximisation problem boils down to

$$\max_{t_i, \hat{\theta}_i} U_i^m \left(\gamma^E, \overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i) \right) = \frac{2}{3} U_i^m(\gamma^E) + \frac{1}{3} U_i^m \left(\overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i) \right), \quad (35)$$

subject to

$$C_i = (1 - t_i) Y_i, \quad (36)$$

$$G_i = t_i Y_i, \quad (37)$$

where Eq. (35) simplifies to

$$\max_{t_i, \hat{\theta}_i} c\left(C_i\right) + \frac{2}{3} \theta_i^m x\left(G_i, X_i(\gamma^E)\right) + \frac{1}{3} \theta_i^m x\left(G_i, X_i(\overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i))\right) - \eta_i \left(\hat{\theta}_i - \theta_i^m \right)^2. \quad (38)$$

The FOC with respect to $\hat{\theta}_i$ is then $\frac{1}{3} \theta_i^m \frac{\partial x\left(G_i, X_i(\overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i))\right)}{\partial \overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i)} \frac{\partial \overline{\gamma}^3(\hat{\theta}_\phi, \hat{\theta}_i))}{\partial \hat{\theta}_i} = 2\eta_i \left(\hat{\theta}_i - \theta_i^m \right)$. Define $\overline{\theta}_i$ as the implicit solution to

$$\frac{\partial x\left(G_i, X_i(\overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}_i))\right)}{\partial \overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}_i)} \frac{\partial \overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}_i))}{\partial \overline{\theta}_i} = 6\eta_i \frac{\left(\overline{\theta}_i - \theta_i^m\right)}{\theta_i^m} \quad (39)$$

when $\frac{\partial \overline{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}_i))}{\partial \overline{\theta}_i} \neq 0$.

Proposition 5. *When regions 1 and 2 are of the same type, the unique equilibrium for the median voters in both regions is to act strategically and elect* $\hat{\theta}_i = \max\{\theta_i^m; \min\{\overline{\theta}_1; \overline{\theta}_2\}\}$, *where* $i = \{1, 2\}$ *and* $\overline{\theta}_1$ *and* $\overline{\theta}_2$ *are defined by Eq.* (39).

Proof. See Section D □

When a region is of a not-unique type – that is, the region is a net contributor and there exists another contributing region, or the region is a net recipient and there exists another receiving region – two alternatives may materialise, depending on whether or not $\max\{\theta_1^m; \theta_2^m\} < \min\{\overline{\theta}_1; \overline{\theta}_2\}$.

Proposition 5 shows that, if $\theta_i^m \geq \min\{\overline{\theta}_1; \overline{\theta}_2\}$, the elected candidate in region $i = \{1, 2\}$ is $\hat{\theta}_i = \theta_i^m$, hence median voters are acting in a non-strategic way, by selecting a representative of their own type. However, this can only occur in one region at the time, because the condition $\theta_i^m \geq \min\{\overline{\theta}_1; \overline{\theta}_2\}$ cannot be verified simultaneously for both regions. Furthermore, it can only materialise for the region that is left out of the coalition whenever the formateur is of the unique, opposite type.

If $\theta_i^m < \min\{\overline{\theta}_1; \overline{\theta}_2\}$, instead, the elected candidate in region i is $\hat{\theta}_i = \min\{\overline{\theta}_1; \overline{\theta}_2\}$. The existence condition can hold for both regions simultaneously, and it always holds for the region that belongs to the coalition when the formateur is of the unique, opposite type. In such a region, the median voter chooses to distort the type of the elected candidate, by selecting a type $\hat{\theta}_i > \theta_i^m$.

As in Section C.1, this equilibrium setting belongs to the family of equilibria described in appendix B, where the median voter maximises a weighted sum of one element for which the federal tax is orthogonal to the identity of the regional representative and another element for which, instead, the federal tax depends on the identity of the regional representative.

Appendix D Proofs

Proof of Lemma 1 and Lemma 2. The federal optimisation problem set out in Section 2.1.1 can be summed up as

$$\max_{\gamma} \sum_{k \in K} \omega_k \left(\hat{U}_k - F_k \right) = \sum_{k \in K} \omega_k \left(c\left(C_k\right) + \hat{\theta}_k x\left(G_k, X_k\right) - F_k \right), \tag{40}$$

subject to

$$C_k = \left(1 - t_k\right) Y_k, \tag{41}$$

$$G_k = t_k Y_k, \tag{42}$$

$$X_k = P(\gamma)\Delta_k. \tag{43}$$

so that we get the following first order condition

$$\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha P'(\gamma) x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta P'(\gamma) x_2'\left(G_\beta, P(\gamma)\Delta_\beta\right) = 0. \tag{44}$$

Since $\Delta_\beta = -\Delta_\alpha$, it follows that

$$\phi_f \equiv \omega_\alpha \hat{\theta}_\alpha x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) - \omega_\beta \hat{\theta}_\beta x_2'\left(G_\beta, P(\gamma)\Delta_\beta\right) = 0. \tag{45}$$

Eq. (45) implicitly defines the equilibrium value for γ. Applying the implicit function theorem, we obtain:

$$\frac{\partial \gamma}{\partial \hat{\theta}_\alpha} = -\frac{\frac{\partial \phi_f}{\partial \hat{\theta}_\alpha}}{\frac{\partial \phi_f}{\partial \gamma}} = -\frac{\omega_\alpha x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right) \Delta_\alpha P'(\gamma)}. \tag{46}$$

Taking into account that $x_{2,2}''(\cdot) < 0$, while $\omega_k, \hat{\theta}_k, Y_k$, $x_2'(\cdot)$ and $P'(\gamma)$ are all positive, the sign of Eq. (46) only depends on Δ_α. More generally: $\operatorname{sgn}\left(\frac{\partial \gamma}{\partial \hat{\theta}_k}\right) = \operatorname{sgn}\left(\Delta_k\right)$.

Similarly, we obtain

$$\frac{\partial \gamma}{\partial G_\alpha} = -\frac{\frac{\partial \phi_f}{\partial G_\alpha}}{\frac{\partial \phi_f}{\partial \gamma}} = -\frac{\omega_\alpha \hat{\theta}_\alpha x_{1,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right) \Delta_\alpha P'(\gamma)} \tag{47}$$

and

$$\frac{\partial \gamma}{\partial t_\alpha} = -\frac{\frac{\partial \phi_f}{\partial t_\alpha}}{\frac{\partial \phi_f}{\partial \gamma}} = -\frac{\omega_\alpha \hat{\theta}_\alpha Y_\alpha x_{1,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right) \Delta_\alpha P'(\gamma)}. \tag{48}$$

The sign of Eqs. (47) and (48) is: $\operatorname{sgn}\left(\frac{\partial \gamma}{\partial G_\alpha}\right) = \operatorname{sgn}\left(\frac{\partial \gamma}{\partial t_\alpha}\right) = \operatorname{sgn}\left(\frac{x_{1,2}''(G_\alpha, P(\gamma)\Delta_\alpha)}{\Delta_\alpha}\right)$.

□

Proof of Lemma 3. The optimisation problem of the median voter in region $k \in K$ set out in Section 2.1.2 can be summed up as

$$\max_{t_k, \hat{\theta}_k} U_k = c\left(C_k\right) + \theta_k^m x\left(G_k, P(\gamma)\Delta_k\right) - \eta_k \left(\hat{\theta}_k - \theta_k^m\right)^2, \tag{49}$$

subject to Eq. (45) and

$$C_k = \left(1 - t_k\right) Y_k \tag{50}$$

$$G_k = t_k Y_k \tag{51}$$

so that we get the following first order condition for t_k

$$- c'(C_k) Y_k + \theta_k^m x_1'\left(G_k, P(\gamma)\Delta_k\right) Y_k + \theta_k^m x_2'\left(G_k, P(\gamma)\Delta_k\right) \left(\Delta_k P'(\gamma) \frac{\partial \gamma}{\partial t_k}\right) = 0, \tag{52}$$

which, using Eq. (48) for $k = \alpha$ yields

$$- c'(C_\alpha) Y_\alpha + \theta_\alpha^m x_1'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) Y_\alpha + \theta_\alpha^m x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) \left(\Delta_\alpha P'(\gamma) \frac{\partial \gamma}{\partial t_\alpha}\right) = 0, \tag{53}$$

$$\theta_\alpha^m x_1'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) - \theta_\alpha^m \frac{\omega_\alpha \hat{\theta}_\alpha x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right) x_{1,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right)} = c'(C_\alpha). \tag{54}$$

For $\hat{\theta}_k$, we obtain the following first order condition

$$\theta_k^m x_2'\left(G_k, P(\gamma)\Delta_k\right) \left(\Delta_k P'(\gamma) \frac{\partial \gamma}{\partial \hat{\theta}_k}\right) - 2\eta_k(\hat{\theta}_k - \theta_k^m) = 0, \tag{55}$$

which, using Eq. (46) for $k = \alpha$ yields

$$- \theta_\alpha^m \frac{\omega_\alpha \left(x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right)} = 2\eta_\alpha(\hat{\theta}_\alpha - \theta_\alpha^m). \tag{56}$$

□

Proof of Proposition 1. Rewriting Eq. (56), we know that

$$\frac{-\omega_\alpha \left(x_2'\left(G_\alpha, P(\gamma)\Delta_\alpha\right)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}''\left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}''\left(G_\beta, P(\gamma)\Delta_\beta\right)\right)} = \frac{2\eta_\alpha(\hat{\theta}_\alpha - \theta_\alpha^m)}{\theta_\alpha^m}, \tag{57}$$

Since $x_{2,2}''\left(G_k, P(\gamma)\Delta_k\right) < 0$, the left-hand side is always positive and hence a solution can only exist if $\hat{\theta}_k \geq \theta_k^m$. Hence, in equilibrium, the elected federal representative will always have a weakly stronger taste for the public policy that the median voter.

Combining Eqs. (54) and (56), we have that

$$\theta_\alpha^m x_1' \left(G_\alpha, P(\gamma)\Delta_\alpha\right) + \hat{\theta}_\alpha x_{1,2}'' \left(G_\alpha, P(\gamma)\Delta_\alpha\right) \frac{2\eta_\alpha(\hat{\theta}_\alpha - \theta_\alpha^m)}{x_2' \left(G_\alpha, P(\gamma)\Delta_\alpha\right)} = c'(C_\alpha). \tag{58}$$

From that, we can check if there is any combination of exogenous parameters that implies that in equilibrium we will have that the preferred choice of $\hat{\theta}$ is exactly the median voter type: $\hat{\theta}_\alpha = \theta_\alpha^m$. For that to be the case, we need

$$\theta_\alpha^m = \frac{c'(C_\alpha)}{x_1' \left(G_\alpha, P(\gamma)\Delta_\alpha\right)}. \tag{59}$$

□

Proof of Corollary 1 and Corollary 2. Eq. (15) is simply obtained by combining Eq. (57) computed respectively for region α and β.

$$\frac{\omega_\alpha \left(x_2' \left(G_\alpha, P(\gamma)\Delta_\alpha\right)\right)^2 / \eta_\alpha}{\omega_\beta \left(x_2' \left(G_\beta, P(\gamma)\Delta_\beta\right)\right)^2 / \eta_\beta} = \frac{\mu(\theta_\alpha)}{\mu(\theta_\beta)}, \tag{60}$$

The first order condition with respect to $\hat{\theta}_k$, as shown in Eq. (55), is $\theta_k^m c'(C_k^2)\Delta_k \frac{\partial t_f}{\hat{\theta}_k} - 2\eta_k(\hat{\theta}_k - \theta_k^m) = 0$.

When a region is neither a beneficiary nor a bearer of the federal policy ($\Delta_k = 0$), Eq. (55) reduces to

$$2\eta_k^m \left(\hat{\theta}_k - \theta_k^m\right) = 0. \tag{61}$$

Hence, for an equilibrium to exist, we must have that $\hat{\theta}_k = \theta_k^m$, so that the elected federal representative and the median voter will have identical preferences for the public policy. As a result, there will be no strategic voting. □

Proof of Proposition 2 and its corollary. We look at different behaviours (or levels of sophistication) of the median voter in one region, keeping everything else equal. This means that, focusing on the median voter in region α, we assume that choices in region β are given, with local representative being $\hat{\theta}_\beta$.

The left hand side is the same in the three equations and is increasing in t_α. The right hand side can be ranked as follow:

- $R^s > R^n > R^m = 0$ when $x_{1,2}'' > 0$,
- $0 = R^m > R^n > R^s$ when $x_{1,2}'' < 0$,

where R^s, R^n, R^m are the right hand side respectively for sophisticated, naive and myopic voters.

Since the left hand side is increasing in t_α, it immediately follows that $t_\alpha^s > t_\alpha^n > t_\alpha^m$ if and only if $x_{1,2}'' > 0$, while $t_\alpha^m > t_\alpha^n > t_\alpha^s$ if and only if $x_{1,2}'' < 0$.

□

Proof of Proposition 3. Using $\Delta_\beta = -\Delta_\alpha - \Delta_z$ in Eq. (20), we obtain

$$\Delta_\alpha \left(\omega_\alpha \hat{\theta}_\alpha x_2' \left(G_\alpha, X_\alpha\right) - \omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right)\right) = \omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right) \Delta_z \tag{62}$$

The proof is organised as follows:

1. We first study the sign of the right hand side of the equation.
2. Then we show that the left hand side is zero when γ is set at the two-region equilibrium level.
3. Finally, we show that the left hand side is decreasing in γ.

With these information at our disposal, we will be able to conclude the proof.

1. Since $\omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right)$ is always positive, the sign of the right hand side coincides with the sign of Δ_z.

2. The parenthesis on the left hand side $\left(\omega_\alpha \hat{\theta}_\alpha x_2' \left(G_\alpha, X_\alpha\right) - \omega_\beta \hat{\theta}_\beta x_2' \left(G_\beta, X_\beta\right)\right)$ corresponds to ϕ_f in Eq. (9) and, hence, it's by construction equal to 0 for $\gamma = \gamma^2$, that is, when the federal policy is the one chosen when $|R| = 3$.

3. $\frac{\partial \Delta_\alpha \phi_f}{\partial \gamma} = \omega_\alpha \hat{\theta}_\alpha x_{2,2}'' \left(G_\alpha, X_\alpha\right) P'(\gamma) \Delta_\alpha^2 - \omega_\beta \hat{\theta}_\beta x_{2,2}'' \left(G_\beta, X_\beta\right) P'(\gamma) \Delta_\alpha \Delta_\beta$. Notice that the first term is always negative, because by assumption $x_{2,2}'' \left(G_\alpha, X_\alpha\right)$. The second term has three negative components: the initial $-$ sign, $x_{2,2}'' \left(G_\beta, X_\beta\right)$ and $\Delta_\alpha \Delta_\beta$, where the latter is negative because the two terms have always opposite sign. Hence, $\frac{\partial \Delta_\alpha \phi_f}{\partial \gamma} < 0$.

If we evaluate Eq. (62) at $\gamma = \gamma^2$, the left hand side would be 0. The right hand side has the same sign as Δ_z. Because the left hand side is decreasing in γ, if $\Delta_z > 0$, for the left hand side to be positive we need $\gamma^3 < \gamma^2$. If, instead, $\Delta_z < 0$, for the left hand side to be negative we need $\gamma^3 > \gamma^2$.

□

Proof of Lemma 4. We use here, again, the notation γ^2 and γ^3 to refer to the equilibrium value with 2 and 3 regions respectively. By the implicit function theorem, we have that

$$\frac{\partial \gamma^3}{\partial \hat{\theta}_k} = -\frac{\omega_k \Delta_k x_2' \left(G_k, X_k\right)}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x_{2,2}'' \left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x_{2,2}'' \left(G_\beta, X_\beta\right)\right) P'(\gamma)}$$

We now compare $\frac{\partial \gamma^3}{\partial \hat{\theta}_k}$ with $\frac{\partial \gamma^2}{\partial \hat{\theta}_k}$, where the latter is defined in Eq. (12) as

$$\frac{\partial \gamma^2}{\partial \hat{\theta}_k} = -\frac{\omega_k x_2' \left(G_k, X_k\right)}{\left(\omega_\alpha \hat{\theta}_\alpha x_{2,2}'' \left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x_{2,2}'' \left(G_\beta, X_\beta\right)\right) \Delta_k P'(\gamma)}.$$

$\frac{\partial \gamma^3}{\partial \hat{\theta}_k} > \frac{\partial \gamma^2}{\partial \hat{\theta}_k}$ if

$$\frac{-\Delta_k}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x''_{2,2}\left(G_\beta, X_\beta\right)\right)} > \frac{-1}{\left(\omega_\alpha \hat{\theta}_\alpha x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x''_{2,2}\left(G_\beta, X_\beta\right)\right)\Delta_k}$$

Without loss of generality, we assume that $k = \alpha$ and solve separately for $\Delta_\alpha > 0$ and $\Delta_\alpha < 0$.

When $\Delta_\alpha > 0$ and $\Delta_\beta < 0$, we obtain $\Delta_\alpha^2 > \Delta_\beta^2$. Since $\sum_k \Delta_k = 0$, the condition is satisfied if and only if $\Delta_z < 0$.

When $\Delta_\alpha < 0$ and $\Delta_\beta > 0$, we obtain $\Delta_\alpha^2 < \Delta_\beta^2$. Since $\sum_k \Delta_k = 0$, the condition is satisfied if and only if $\Delta_z < 0$.

The same can be done with

$$\frac{\partial \gamma^3}{\partial t_k} = -\frac{\omega_k \hat{\theta}_k \Delta_k Y_k x''_{1,2}\left(G_k, X_k\right)}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x''_{2,2}\left(G_\beta, X_\beta\right)\right) P'(\gamma)}$$

□

Proof of Proposition 4. For region α, markup in the 3-region case is larger if and only if

$$-\frac{\omega_\alpha \left(\Delta_\alpha x'_2\left(G_\alpha, X_\alpha\right)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha \Delta_\alpha^2 x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta \Delta_\beta^2 x''_{2,2}\left(G_\beta, X_\beta\right)\right)} > -\frac{\omega_\alpha \left(x'_2\left(G_\alpha, X_\alpha\right)\right)^2}{\left(\omega_\alpha \hat{\theta}_\alpha x''_{2,2}\left(G_\alpha, X_\alpha\right) + \omega_\beta \hat{\theta}_\beta x''_{2,2}\left(G_\beta, X_\beta\right)\right)}$$

which immediately simplifies to

$$\Delta_\alpha^2 > \Delta_\beta^2.$$

We already know that the condition is satisfied if and only if $\text{sgn}(\Delta_\alpha) \neq \text{sgn}(\Delta_z)$. □

Proof of Lemma 5. The maximisation problem of the median voter in region $k \in K$ set out in appendix B can be summed up as

$$\max_{t_k, \hat{\theta}_k} U_k = c\left(C_k\right) + p_k \theta_k^m x\left(G_k, X_k(\gamma^*)\right) + (1 - p_k)\theta_k^m x\left(G_k, X_k(\hat{\gamma})\right) - \eta_k \left(\hat{\theta}_k - \theta_k^m\right)^2, \quad (63)$$

subject to

$$C_k = \left(1 - t_k^1\right) Y_k \quad (64)$$

$$C_k = t_k Y_k \quad (65)$$

where we use γ^* to denote the federal tax implicitly defined by Eq. (9), in order to distinguish it from $\hat{\gamma}$, which represents the federal tax when exogenously set.

The first order condition for t_k is

$$p_k \left(x'_1(G_k, X_k(\gamma^*)) + \frac{\Delta_k P'(\gamma^*) x'_2(G_k, X_k(\gamma^*))}{Y_k} \frac{\partial \gamma^*}{\partial t_k}\right) + (1 - p_k) x'_1(G_k, X_k(\hat{\gamma})) = \frac{c'(C_k)}{\theta_k^m}, \quad (66)$$

which, using Eq. (11) for $k = \alpha$ yields Eq. (23).

For $\hat{\theta}_k$, we obtain the following first order condition

$$p_k \theta_k^m x_2'(G_k, X_k(\gamma^*)) \left(\Delta_k P'(\gamma^*) \frac{\partial \gamma^*}{\partial \hat{\theta}_k} \right) - 2\eta_k(\hat{\theta}_k - \theta_k^m) = 0, \tag{67}$$

which, using Eq. (12) for $k = \alpha$ yields Eq. (24). □

Proof of Proposition 5. From the first order condition, it immediately follows that the solution is $\hat{\theta}_i = \theta_i^m$, whenever $\frac{\partial \bar{\gamma}^3(\hat{\theta}_\phi, \overline{\theta}_i))}{\partial \overline{\theta}_i} = 0$, and this is true if and only if region i is not part of the coalition.

Note that (median) voters are aware of the importance of their choice of $\hat{\theta}_i$, in that it will determine whether their region is part of the coalition when the formateur represents a region of the unique type (i.e. the opposite type compared to both their types).

Suppose, without loss of generality, that $\overline{\theta}_1 < \overline{\theta}_2$. Then, by Proposition 1, either we have $\max\{\theta_1^m; \theta_2^m\} < \overline{\theta}_1 < \overline{\theta}_2$, or $\theta_1^m < \overline{\theta}_1 < \theta_2^m < \overline{\theta}_2$. Finally, notice that, for each region i, preferences are single-peaked around:

- $\overline{\theta}_i$, conditional on being part of the coalition,
- θ_i^m, conditional on being left out of the coalition.

Start from a candidate equilibrium in which region 1 chooses $\hat{\theta}_1 = \overline{\theta}_1$. Then region 2 will be left out of the coalition for any $\hat{\theta}_2 > \overline{\theta}_1$, in which case, conditional on remaining out of the coalition, the best response will always be to select $\hat{\theta}_2$ to be as close as possible to θ_2^m. This implies choosing $\hat{\theta}_2 = \theta_2^m$ if $\theta_2^m > \overline{\theta}_1$. However, if $\theta_2^m \leq \overline{\theta}_1$, the median voter in region 2 may choose $\hat{\theta}_2 = \overline{\theta}_1$ and remain out of the coalition, or may decide to undercut and choose $\hat{\theta}_2 < \overline{\theta}_1$, in order to get closer to θ_2^m. However, by doing so, region 2 would become part of the coalition, in which case they would want to move as close as possible to $\overline{\theta}_2$, which implies to increase $\hat{\theta}_2$, and they can do so up to $\hat{\theta}_2 = \overline{\theta}_1$. Consequently, any deviation above or below $\overline{\theta}_1$ is not profitable.

Suppose, instead, that we start from a candidate equilibrium in which region 2 chooses $\hat{\theta}_2 = \overline{\theta}_2$. Then region 1 will be left out of the coalition for any $\hat{\theta}_1 > \overline{\theta}_2$. In such cases, conditional on remaining out of the coalition, the best response will always be to select $\hat{\theta}_1$ to be as close as possible to θ_1^m. This implies choosing $\hat{\theta}_1 = \overline{\theta}_2$ (remember that $\theta_1^m < \overline{\theta}_1 < \overline{\theta}_2$). Suppose that region 1 decides to move further close to θ_1^m, the moment they move below $\overline{\theta}_2$, region 1 is selected to form the coalition and will as a result want to move as close as possible to $\overline{\theta}_1$. Because $\hat{\theta}_2 = \overline{\theta}_2$, then region 1 can choose $\hat{\theta}_1 = \overline{\theta}_1$ and be part of the coalition, which is what is optimal for them. Then region 1 will choose $\hat{\theta}_1 = \overline{\theta}_1$ and we are back to the situation

previously analysed, where we showed that region 2 will choose $\hat{\theta}_2 = \begin{cases} \theta_2^m, & \text{if } \theta_2^m > \overline{\theta}_1 \\ \overline{\theta}_1, & \text{if } \theta_2^m \leq \overline{\theta}_1. \end{cases}$ and this concludes the proof.

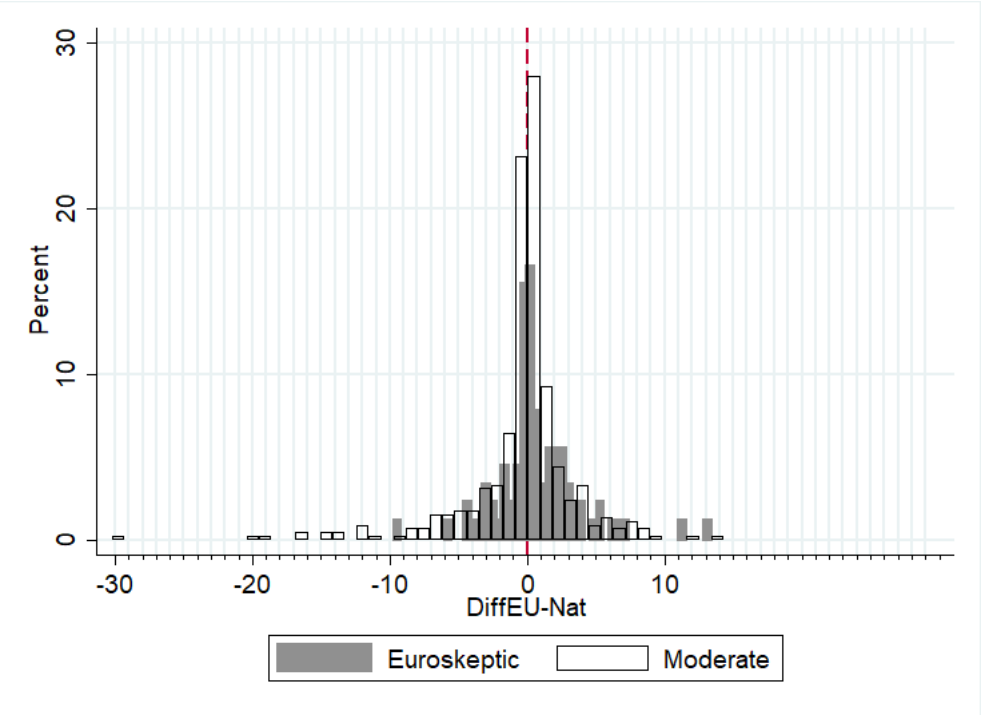
□

Appendix E Additional Empirical Results

Table 4: Summary Statistics

Variable	**Mean**	**Std. Dev.**	**N**
DiffEU-Nat	-0.307	5.117	1138
DiffEU-Nat (Winsorized .01)	-0.324	4.618	1138
Eurosceptic	0.166	0.372	1138
Extreme	0.129	0.336	1138
Diff Turnout	21.253	13.952	1135
Party Size	9.096	10.942	1138
Incumbent	0.095	0.293	1138
% Net Contribution/GNI (2000-2015)	0.668	1.188	1138
Net Contribution Absolute Values (2000-2015) (Billion Euros)	-0.62	3.756	1138
Cube Rule	1.104	0.157	1130
Variable 10-year window	**Mean**	**Std. Dev.**	**N**
DiffEU-Nat	-0.111	3.888	542
Eurosceptic	0.166	0.372	542
Party Size	7.746	10.508	542
Incumbent	0.142	0.349	542

Figure 11: Differences in Voting between EU and National Elections across Pro-Europe and Eurosceptic Parties: 10-year window



The figure shows the distributions of votes for parties at European and at National elections in the period 1990-2013, differentiating between Eurosceptic and not-Eurosceptic parties. The analysis is based on a 10-year window.

Table 5: Eurosceptic Voting at EU vs National Elections: Winsorized Dependent Variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.751***	1.774***	1.840***	1.604***	2.098**	2.129***	2.459***	1.981**
	(0.511)	(0.507)	(0.554)	(0.549)	(0.772)	(0.764)	(0.814)	(0.731)
2^{nd}tertile					0.592	0.581		
					(0.425)	(0.431)		
3^{rd}tertile					-0.187	-0.147		
					(0.465)	(0.453)		
Eurosceptic*2^{nd}tertile					-2.340**	-2.349**	-2.715***	-2.309**
					(0.889)	(0.884)	(0.946)	(1.004)
Eurosceptic*3^{rd}tertile					1.069	1.043	0.489	1.054
					(1.054)	(1.043)	(1.175)	(1.232)
Diff Turnout	-0.0120	-0.0105	0.00539		-0.0133	-0.0114	0.00586	
	(0.00864)	(0.00883)	(0.0125)		(0.00910)	(0.00916)	(0.0126)	
Cube Law	0.573	0.624			0.515	0.579		
	(0.896)	(0.871)			(0.953)	(0.923)		
Party Size				-0.0882***				-0.0894***
				(0.0295)				(0.0289)
Incumbent				-0.622				-0.571
				(1.122)				(1.110)
Observations	1,128	1,128	1,136	1,140	1,128	1,128	1,136	1,140
R-squared	0.021	0.023	0.046	0.134	0.031	0.034	0.056	0.143
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections winsorized at 1% level); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Eurosceptic Voting at EU vs National Elections: alternative 5-year period definition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.241**	1.255**	1.424**	1.223**	1.755*	1.780*	2.042**	1.693**
	(0.560)	(0.561)	(0.611)	(0.581)	(0.876)	(0.884)	(0.939)	(0.812)
2^{nd}tertile					0.939**	0.927**		
					(0.411)	(0.423)		
3^{rd}tertile					0.185	0.218		
					(0.351)	(0.369)		
Eurosceptic*2^{nd}tertile					-2.058*	-2.058*	-2.252*	-2.069*
					(1.080)	(1.093)	(1.140)	(1.193)
Eurosceptic*3^{rd}tertile					0.118	0.0839	0.00755	0.478
					(1.178)	(1.185)	(1.291)	(1.259)
Diff Turnout	-0.00376	-0.00393	0.00919		-0.00518	-0.00455	0.00960	
	(0.00745)	(0.00767)	(0.0101)		(0.00727)	(0.00756)	(0.0101)	
Cube Law	0.345	0.391			0.338	0.411		
	(0.726)	(0.734)			(0.752)	(0.768)		
Party Size				-0.0965**				-0.0965**
				(0.0364)				(0.0360)
Incumbent				-0.0608				-0.0538
				(0.925)				(0.929)
Observations	1,148	1,148	1,148	1,148	1,148	1,148	1,148	1,148
R-squared	0.010	0.012	0.031	0.114	0.018	0.020	0.037	0.120
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is an index capturing the degree of proportionality of the electoral system; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* splits countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Eurosceptic Voting at EU vs National Elections: 10-year time window

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.322**	1.314**	1.368**	1.398**	1.669**	1.621**	1.878**	1.891**
	(0.488)	(0.496)	(0.561)	(0.588)	(0.746)	(0.757)	(0.850)	(0.804)
2^{nd}tertile					0.737*	0.697*		
					(0.372)	(0.371)		
3^{rd}tertile					-0.224	-0.317		
					(0.399)	(0.404)		
Eurosceptic*2^{nd}tertile					-2.143**	-2.094**	-2.271**	-2.366*
					(0.982)	(1.000)	(1.082)	(1.169)
Eurosceptic*3^{rd}tertile					0.838	0.917	0.381	0.639
					(0.921)	(0.927)	(1.143)	(1.206)
Diff Turnout	-0.00567	-0.00658	0.0143		-0.00825	-0.00910	0.0140	
	(0.00693)	(0.00746)	(0.0111)		(0.00781)	(0.00854)	(0.0110)	
Cube Law	-0.593	-0.592			-0.683	-0.712		
	(0.669)	(0.681)			(0.714)	(0.745)		
Party Size				-0.0748**				-0.0743**
				(0.0303)				(0.0295)
Incumbent				-0.0284				-0.0791
				(0.734)				(0.708)
Observations	826	826	837	840	826	826	837	840
R-squared	0.015	0.017	0.045	0.111	0.028	0.029	0.054	0.121
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: *The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is DiffEU-Nat (i.e. the difference in party vote shares between European and National elections); Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Eurosceptic Voting at EU vs National Elections: Benefit of EU membership (1-4) and Absolute Contributions (5-8)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	2.726***	2.745***	2.891***	2.620***	1.920***	1.950***	2.211***	1.740***
	(0.593)	(0.598)	(0.657)	(0.667)	(0.491)	(0.491)	(0.528)	(0.520)
2^{nd}tertile	0.726*	0.678*			0.240	0.230		
	(0.400)	(0.399)			(0.545)	(0.554)		
3^{rd}tertile	0.471	0.449			-0.0226	-0.0359		
	(0.491)	(0.490)			(0.345)	(0.348)		
Eurosceptic*2^{nd}tertile	-2.219***	-2.225***	-2.299***	-2.128**	-2.193**	-2.199**	-2.936***	-2.504**
	(0.795)	(0.798)	(0.841)	(0.862)	(0.893)	(0.901)	(0.934)	(1.004)
Eurosceptic*3^{rd}tertile	-0.664	-0.648	-0.653	-0.667	0.708	0.683	0.475	1.122
	(0.973)	(0.976)	(1.043)	(1.035)	(0.846)	(0.850)	(0.895)	(0.907)
Diff Turnout	-0.00999	-0.00936	0.0145		-0.0114	-0.0105	0.0139	
	(0.0110)	(0.0114)	(0.0109)		(0.0102)	(0.0106)	(0.0111)	
Cube Law	0.391	0.481			0.408	0.465		
	(1.085)	(1.090)			(0.991)	(0.994)		
Party Size				-0.0889***				-0.0940***
				(0.0282)				(0.0284)
Incumbent				-0.678				-0.600
				(1.025)				(1.031)
Interactions:	Benefit EU	Benefit EU	Benefit EU	Benefit EU	Abs Contr	Abs Contr	Abs Contr	Abs Contr
Observations	1,128	1,128	1,140	1,140	1,128	1,128	1,140	1,140
R-squared	0.025	0.028	0.046	0.132	0.023	0.026	0.047	0.134
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: *The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is DiffEU-Nat (i.e. the difference in party vote shares between European and National elections); Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on share of people agreeing their country has benefited of being a EU member (columns 1 to 4); their level of net EU transfers in absolute values (columns 5 to 8). The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

Appendix F Additional Empirical Results II: A Bigger Federation

EU integration was a staggered process which started out from a small set of just six countries, to end up 60 years later as a union of 28 member states. This evolution can be interpreted in the light of Section B, where we investigate the potential role of beliefs over political effectiveness. More specifically, we allowed agents to assign region-specific probabilities to the fact that their elected politician will be able to impact federal policy-making in a certain period, which in turn affects the intensity of their strategic behaviour. This could occur when voters believe the political weight of their region – within the federal coalition – is such that their politician is more, or less, able to influence federal redistribution. Another possibility would be when voters perceive the chances to be included in the ruling coalition as becoming slimmer, the more the set of member states expands. Applied to our setting of EU enlargement, both interpretations imply that voters will behave less strategically since they expect the influence of their representatives to decline. However, it could also be that EU political processes are perceived as potentially stacked in favour of the initial member states, as they enjoyed quite some leverage when the initial rules were set. Knowing the ins and outs of EU policy making therefore, the perceived probability for these representatives to steer EU budget decisions could come out reinforced post-expansion. Moreover, if expansion towards the east implies larger contributions from net-contributors, even our baseline model would predict more strategic voting in these countries.

To bring these predictions to the data, we consider the 2004 discontinuity when the EU moved from 15 to 25 (and then 27 in 2007) countries: the biggest expansion in European history, which, indeed, took place in the middle of our sample period. Then, we look at whether our main results change before/after 2004. We report this test in Table 9. We code a dummy equals 1 after 2004 (*Post 2004*). To facilitate the visualisation of the table, in this case, we focus on a dummy representing countries in the second tertile (2^{nd}*tertile*), instead of two dummies for the first and third tertile. Therefore the base category is represented by both the first and third tertile. We then create the triple interaction *Eurosceptic*2*nd*tertile*Post 2004*, to look at whether our effects change before/after 2004. Indeed, the negative sign of *Eurosceptic*2*nd*tertile*Post 2004* suggests that our effects are mostly driven by the period following the EU enlargement.[44] Nevertheless, we find a negative effect also in the period before the enlargement, as shown by *Eurosceptic*2*nd*tertile*. Those results provide support for the idea that voters support even more Eurosceptic representatives after a federal expansion,

[44] This negative effect is driven by both control groups, i.e. countries in the first and the third tertile (results available upon request.

reacting to an increased distance between local and federal preferences.[45]

Table 9: Eurosceptic Voting at EU vs National Elections: Effects Over Time

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	1.203***	1.228***	1.426***	0.904**	1.466***	1.489***	1.755***	1.231**
	(0.401)	(0.399)	(0.435)	(0.442)	(0.463)	(0.464)	(0.514)	(0.523)
Post 2004	-0.147				-0.264			
	(0.331)				(0.389)			
Eurosceptic*Post 2004	0.917	0.914	0.794	1.222*	1.609**	1.606**	1.520*	1.893**
	(0.623)	(0.620)	(0.653)	(0.697)	(0.761)	(0.760)	(0.804)	(0.864)
2^{nd}tertile					0.556	0.533		
					(0.472)	(0.474)		
2^{nd}tertile*Post 2004					0.206	0.182	-0.0997	
					(0.655)	(0.659)	(0.813)	
2^{nd}tertile*Eurosceptic					-1.325	-1.317	-1.516*	-1.544*
					(0.871)	(0.848)	(0.875)	(0.925)
Eurosceptic*2^{nd}tertile*Post 2004					-2.079*	-2.088*	-2.151*	-1.886
					(1.220)	(1.209)	(1.253)	(1.341)
Diff Turnout	-0.0139	-0.0131	0.0144		-0.0142	-0.0132	0.0147	
	(0.0105)	(0.0106)	(0.0112)		(0.0111)	(0.0112)	(0.0113)	
Cube Law	0.604	0.648			0.671	0.725		
	(0.958)	(0.961)			(0.955)	(0.957)		
Party Size				-0.0935***				-0.0939***
				(0.0282)				(0.0280)
Incumbent				-0.611				-0.537
				(1.027)				(1.027)
Observations	1,128	1,128	1,140	1,140	1,128	1,128	1,140	1,140
R-squared	0.020	0.023	0.041	0.129	0.030	0.033	0.052	0.138
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is index of whether the electoral system is proportional/majoritarian; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* split countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

[45]This finding holds also when considering tertiles based on absolute contributions to the EU (results available upon request).

Table 10: Eurosceptic Voting at EU vs National Elections – Restricted Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurosceptic	2.281**	2.263**	2.155**	2.781*	1.603*	1.568*	1.187	1.657
	(0.897)	(0.894)	(1.038)	(1.458)	(0.799)	(0.799)	(0.786)	(0.978)
2^{nd}tertile					-0.682	-0.827		
					(1.363)	(1.412)		
3^{rd}tertile					-1.931	-2.018		
					(1.586)	(1.671)		
Eurosceptic*2^{nd}tertile					-1.213	-1.170	-1.576	-1.483
					(1.425)	(1.440)	(1.377)	(1.779)
Eurosceptic*3^{rd}tertile					3.385	3.406	4.362*	5.704**
					(2.081)	(2.132)	(2.378)	(2.595)
Diff Turnout	0.0204	0.0170	0.0597		0.0320	0.0278	0.0559	
	(0.0225)	(0.0229)	(0.0461)		(0.0217)	(0.0218)	(0.0456)	
Cube Law	-0.795	-0.872			-1.129	-1.194		
	(1.264)	(1.253)			(1.549)	(1.547)		
Party Size				0.0197				0.0444
				(0.0555)				(0.0601)
Incumbent				0.692				0.869
				(2.260)				(2.154)
Observations	314	314	314	315	314	314	314	315
R-squared	0.046	0.051	0.124	0.435	0.081	0.086	0.156	0.479
Country FE	NO	NO	YES	YES	NO	NO	YES	YES
Time Fe	NO	YES	YES	YES	NO	YES	YES	YES
Country-Time FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *DiffEU-Nat* (i.e. the difference in party vote shares between European and National elections); tha sample is restricted only to strongly pro/anti EU parties. *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Cube Rule* is an index capturing the degree of proportionality of the electoral system; *Diff Turnout* measures the differences in turnout between national and European elections. *Tertiles* splits countries in three groups based on their level of net contributions to the EU budget. The omitted category is the first tertile (largest net contributors). *** p<0.01, ** p<0.05, * p<0.1.

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