

Does the Winner Take It All?

Redistributive Policies and Political Extremism

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Abstract

The outcome of federal policies often depends on regional historical differences or other fixed factors. Certain regions are therefore always winners from a given policy whilst others are losers. This gives voters a strategic incentive to distort the policy *magnitude*, by electing representatives that are extremely protective of regional interests. Having a tough negotiator even outweighs being part of the ruling coalition. We test our predictions on national and European Parliamentary elections since 1990, and find that strategic voting is indeed U-shaped: winning and losing states distort more than those in the middle. Our online survey provides further evidence.

JEL Classification: D72, H6, H71, H77.

Keywords: Political Extremism, Interregional Redistribution, Federalism, Strategic Delegation, Bargaining, Coalitions, EU Elections, Euroscepticism, Populism.

Acknowledgements: We are grateful to our colleagues and friends for their helpful comments and suggestions. This work was presented at the ASSA (Chicago), APET (Strasbourg), ASSET (Florence), IIPF (Glasgow), LAGV (Marseille 2019), Urban Economic Society (Philadelphia) and SAEe (Madrid) meetings, at the BGSE Summer Forum 2019, Bruneck Workshop 2018, as well as seminars at UAB (Barcelona), Bocconi U. (Milan), CEU (Budapest), Collegio Carlo Alberto (Turin), CUNEF (Madrid), Freiburg U., Humboldt U. (Berlin), KU Leuven, LMU (Munich), Max Planck Institute (Munich), Tilburg U., TSE (Toulouse), UC-Irvine and UQAM (Montreal): we thank organisers and attendants.

Funding: A. Piolatto acknowledges the financial support from the Spanish Ministry of Economy and Competitiveness, through the Seed Grant SG2018-07 of the BGSE Severo Ochoa Programme for Centres of Excellence in R&D (SEV-2015-0563), through the Ramón y Cajal programme (RYC-2016-19371) and through grant PGC2018-094348, and the Catalan Generalitat through grant 2017SGR711. W. Sas is grateful for the financial support from the ESRC ('Between two Unions' project).

This draft: 6th July 2020.

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1 Introduction

A federal system of government can successfully manage complex and diverse societies: it optimises scale advantages, minimises coordination failures and often fosters innovative policies. It has not been immune, however, to the kind of political instability which is increasingly putting democratic institutions under pressure. Polarisation and extremism are on the rise in the EU, the US, but also Brazil or India. Explanations have so far focused on the economic and cultural insecurity of voters rather than institutional factors. When voters start feeling insecure – because of economic shocks, migration, austerity or automation – they demand more short-term protection.¹ While these are certainly important drivers, 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 regional heterogeneity in underlying fundamentals – e.g. economic history, natural resources or social capital – can be brought to the surface by a salient federal policy, such as a transfer scheme or (labour) market regulation. In other words, certain federal policies often imply a *persistent* ‘zero-sum’ redistribution across regions, if only in voters’ minds, which they may want to push in their favour.

Our theoretical model explains why voters indeed have the strategic incentive to elect what we will call ‘extremely protectionist’ politicians: to defend their regional interests in federal negotiations. They do so even when electing such a tough negotiator comes at an ideological cost, or increases the risk of not being included in the ruling coalition. Whether they believe their region is ‘winning’ or ‘losing’ from the federal policy turns out to be irrelevant too. Both elements set our model apart from previous work.

We validate our results comparing national to European Parliamentary elections, revealing a U-shaped relationship: ‘winning’ or ‘losing’ member states are indeed more likely to vote for extremely protective parties than the states in the ‘middle’. We also run a survey in Finland, France and Italy, further confirming our predictions. A policy recommendation to reduce the welfare losses from extreme voting could then be to cut the regional ties of the federal legislature, for example by introducing a union-wide electoral district.²

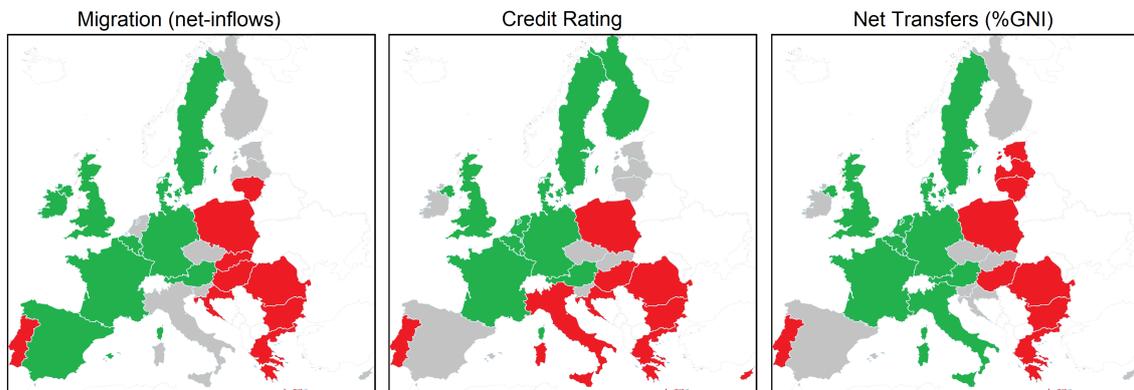
The fact that some regions will always gain from certain higher-level policies whilst others lose out, is true in many different contexts. This kind of ‘stickiness’ also depends on the

¹We discuss the relevant, and rapidly growing literature at length below.

²See e.g. Stojanović and Bonotti (2020). We discuss this and other reforms in more detail in our conclusion.

policy in question. For example, if migrant workers pay local taxes, attractive regions will be ‘winners’ of any federal policy supporting the free movement of workers. Less attractive regions facing labour outflows will be ‘losers’. Migration, illustrated in the left panel of Figure 1 for the EU, has indeed lead to regional disparities (Goldin et al., 2018). Countries such as Germany and the UK (in green) have seen relatively high net within-EU migration inflows, whilst Romania, Poland and Portugal (in red) are in the opposite camp.³ Or take the credit ratings of EU countries as a second example, shown in the central panel of Figure 1. Periphery countries (in red) would now clearly find themselves on the winning side of any debt mutualisation policy, such as Eurobonds, because of their lower rating. The opposite goes for the core countries (in green). A similar divide opens up in the right panel of Figure 1, thirdly, when considering EU cohesion and agricultural funding. Again the periphery countries stand to gain as net recipients (in red) from such a transfer scheme, whilst the core countries are contributors (in green). The same demarcations have emerged during the Eurocrisis in 2012-2015, and again in the handling of the COVID-19 crisis.⁴

Figure 1: Maps of the EU depending on Mobility (left), Credit Rating (middle), EU Net-Transfers (right)



The 28 countries are divided into 3 groups: 10 Green, 9 Gray, and 9 Red. Red and Green countries are at each extreme of the spectrum, while Grey refers to countries in the middle. Workers’ mobility (net inflow - Green highest) is computed from Fries-Tersch et al. (2018). S&P credit rating (Green highest) is taken from www.countryeconomy.com/ratings. EU net-transfers (Red - highest) are computed as a % of GNI in the period 2000-2015 (see section 3 for more details).

What is crucial in these and other examples, such as environmental and energy policies, is that certain regions are (perceived as) winners or losers because of *persistent* spatial heterogeneity, which at best only changes in the medium to long run. Such underlying fundamentals are usually economic and geographical – related to the divide between ‘rust belt’ or rural areas

³Computations of net flows are based on table 30 in (Fries-Tersch et al., 2018).

⁴The current situation in Europe may even be seen as a result of the voting behaviour we describe: representatives of southern member states are in favour of radical EU stimulus and mutualising incurred debts to cushion the COVID-19 shock, whilst delegates of northern ‘frugal’ countries are slow to accept these proposals.

on the one side, and successful urban agglomerations on the other. They could also be related to regionally concentrated natural resources or other endowments such as social and human capital, or follow from a complex set of national laws and regulations or institutional drift.⁵

One key innovation of our model is that this spatial heterogeneity of underlying fundamentals directly maps into the impact of a federal policy: a region *either* benefits or loses, possibly to different degrees. This drastically changes bargaining and coalition formation at the federal level, and in turn voting behaviour as well. Indeed, when the set of winners and losers from a given federal policy is exogenous (or, at least, perceived to be so), federal negotiations on the policy are entirely centred on its magnitude. Setting the size of the pie is what matters most, so to speak, instead of deciding how it is shared.

Both in ‘winning’ and ‘losing’ regions, the median voter then has similar incentives to elect extremely protective federal representatives: staking out a stronger bargaining position at the higher level to influence the size of the pie. For ‘winning’ regions this means more pronounced support of the federal policy in question, and vice-versa for the ‘losing’ regions. As a result, voters are willing to incur the ideological, reputational and efficiency costs of electing a tough negotiator with more extreme preferences than their own. In equilibrium, however, 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.

More specifically, citizens in each region cast their vote both in regional as well as federal elections, in a ‘citizen-candidate’ 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 agreement, 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 et al., 2003).⁶ 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.⁷ Our setting also allows regions to tax and provide

⁵These are all factors which are very hard to change even in the medium run. For example, federal regulation aimed at promoting pro-civic or social behaviour comes at the cost of restricting individual freedoms, and also has high enforcement costs. The level of social capital of a region then implies that the regulation may be beneficial or just costly and redundant.

⁶Carozzi 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.

⁷The 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

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) inefficient decisions such as over- or under-spending because it is in their strategic interest.

This outcome is entirely due to the strategic motive to improve welfare in one’s own region. Our argument is based on the belief that the sum-total of federal policy works in favour of a fixed set of regions, and against some others,⁸ unlike theories that rely on a shift in self-categorisation into an identity⁹ – which would then be centred on the regional identity dimension. Secondly, the strategic motive even persists when voters are not sure their representative will be part of the federal coalition. This for the simple reason that other regions will also be either winners or losers, so that a formateur likely has to pick coalition partners from both groups. Winners outside the coalition can then always rely on winners inside the coalition to defend their mutual interests, and the same goes for losers. The usual incentive to elect a centrist, more accommodating representative to improve chances of making it into the coalition, therefore disappears.

To test our theory we focus on the world’s largest ongoing experiment of multi-level government: the European Union (EU).¹⁰ In this context it is relatively easy to identify the extremely protective political parties as well as the ‘winners’ and ‘losers’. To proxy the latter we use the net contributions of each member state to the overall EU budget, and cluster EU member states in three intuitive groups (marked in the right panel of Figure 1): main contributors as ‘losers’ (green), main recipients as ‘winners’ (red), and those in between as neutral (grey). For instance, net transfers received from the EU represented 3,53% of GNI for Lithuania, 2,9% for Bulgaria and 2,11% for Poland (in 2000-2015). The Netherlands and Germany were the main net contributors.

Since the benefits from the EU Single Market are not necessarily well understood by the general public, we argue that our three clusters capture winning/losing perceptions of EU policies quite well. Indeed, the same demarcations have emerged during the Eurocrisis in 2012-2015, and again in the handling of the COVID-19 crisis. What is crucial here is the perception of voters about net-winning or losing positions, and that would still be true

automatically represented as well.

⁸Our model only considers one federal policy: its impact then immediately defines which region is a winner, a loser or in the neutral middle. The model easily extends to a vector of policies (transfers, migration, environmental policies...), so that voters build their perception on gains or losses for their district from *each* policy, and on the relative weight assigned to each of them.

⁹See Gennaioli and Tabellini (2019) and the references therein.

¹⁰The EU is the world biggest supranational political union, 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 – to the integration of bailout mechanisms such as the European Stability Mechanism (ESM) into Community law.

even if they were incongruent with reality.¹¹ For robustness, we replicate our results using Eurobarometer survey data, grouping countries according to average beliefs of benefiting from EU membership.

To identify political parties which are extremely protective of their own national interests, we use the categorisation of Eurosceptic parties from Algan et al. (2017). Such parties usually campaign on a platform of protecting the interests of the member state in question (Colantone et al. 2019).¹² We then analyse party performances from 1990 onwards and compare European Parliament (EP) elections to national elections. The EP then corresponds to the federal layer of our model, whilst member states correspond to regions in the model. Following our theoretical predictions, we expect strategic voting behaviour to mark EP elections but leave national elections unaffected.

First of all, the prediction that voters elect relatively more Eurosceptic delegates to the European parliament as compared to national elections, is confirmed. 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 losing and net winning member states, but *not* in countries where EU benefits and contributions are more or less balanced. We thus uncover a U-shaped relationship between the degree of (perceived) 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.

¹¹It is often argued that the benefits enjoyed by core countries of being part of the single market far outweigh the costs of contributing to the EU budget. Our main assumption is then that the former are far more salient than the latter. Second, and similar to external migration of which most citizens have rooted opinions (Alesina et al., 2018), EU within-migration still casts receiving countries as ‘losers’.

¹²Think for example of Syriza (Greece), Podemos (Spain), AfD (Germany), Front National (France), or Lega (Italy).

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” conjecture 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. Schulte-Cloos (2018) and the literature therein 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 them.

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,¹³ legislative bargaining and strategic delegation.¹⁴ Most of the earlier (relevant-to-us) literature belongs to either of two strands: the bargaining-oriented papers that followed the seminal paper of Schelling (1956)¹⁵ – with a focus on the bargaining process once a given coalition

¹³See Alonso et al. (2008); Kessler et al. (2011); Gancia et al. (2020) and the literature therein.

¹⁴Strategic 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.

¹⁵For example, see Bowen et al. (2014); Kessler (2014); Beath et al. (2016); Loeper (2017); Simon and Valasek (2017); Mattozzi and Snowberg (2018); Bouton et al. (in press) and the literature therein.

forms – and, second, the majoritarian-decision papers that followed Ferejohn et al. (1987) and Chari et al. (1997)¹⁶ – where the question is rather how a certain coalition is formed to begin with. In the first strand, a strong relative position is vital, so voters have an incentive to delegate an extreme negotiator that is more likely to obtain a good deal. In the second strand, voters tend to select milder negotiators which are more likely to be selected by the formateur to join the winning coalition. Harstad (2010) and Christiansen (2013) bridge the two groups. The tension between what one can obtain in the coalition and the likelihood of being part of it is the crucial trade-off there.¹⁷

While our results coincide with the bargaining-oriented group in that the selected delegate is a more extreme negotiator, our mechanism is different in one crucial way. Both previous strands of literature consider an environment where being part of the coalition is essential: all members in the coalition benefit from the policy that is put in place (possibly to a different extent), while regions that are not represented will not benefit from it (or only marginally). In our model we take a very different approach: the set of regions that benefits or loses from the policy is exogenous, so there will inevitably be cases where the coalition members have opposite objectives, and hence, potential allies outside of the coalition. The interests of a district are therefore equally protected if the district belongs to the coalition or if another district with aligned interests does. Choosing a milder negotiator will still increase the chances of being part of the coalition, but this is no longer essential. Indeed, when we consider the coalition formation process, the race to choose a mild negotiator is bounded. Consequently, in a setting that is close to the family of majoritarian-decision papers, we still find a tendency to select more extreme delegates. Further differences between our setting and the literature include that strategic incentives in Besley and Coate (2003) only materialise when the grand coalition is assumed to form. Buisseret and Bernhardt (2018) focuses on international agreements and assumes no commitment: agreements can be re-negotiated.¹⁸

Third, since our model rationalises why voters might elect politically extreme candidates – a result which is confirmed in our empirical analysis of voting across European countries and

¹⁶See, for example, Besley and Coate (2003); Knight (2008); Buisseret and Bernhardt (2018); Coate and Milton (2019) and the literature therein.

¹⁷In Harstad (2010), the strategic motive to vote progressively is to enhance a given delegate's chances to be included in the coalition, of which all members share the same goal: the expropriation of non-coalition members. Christiansen (2013), adding a delegation stage to the model of Volden and Wiseman (2007), studies strategic voting when legislators face a trade-off between public goods provision and targeted spending on pork projects. In our model there is no such trade-off, as redistributive shares are fixed whilst the budget is endogenous, so that side-payments in the form of particularistic spending are ruled out.

¹⁸Our result that voting also has a strategic element, to constrain the options of federal negotiators in the future, is similar to the findings of Hatfield and Padró i Miquel (2012). In their model, however, voters adjust the federal structure of the constitution to partially tie their own hands ex-ante, to rein in their ex-post desire for federal policies.

in our online survey – our paper links into the recent literature on populism,¹⁹ and provides an additional and complementary explanation for its rise. The current literature on populism includes, as a possible explanation, both economic and non-economic explanations. These include globalisation (Colantone and Stanig, 2018), austerity (Fetzer, 2019), public finance mismanagement (Daniele et al., 2018), recessions and financial crises (Algan et al., 2017), historical heritage and identity (Cantoni et al., 2019; Edo et al., 2019), immigration (Edo et al., 2019) or a combination of many of them (Guriev, 2018; Rodrik, 2018a). Additionally, all of these sources of economic insecurity can foment cultural insecurity as well (Margalit, 2019; Guiso et al., 2020). In any case, once populist demand is rising, parties on both sides of the political spectrum are formed or repositioned to jump into the niche (Rodrik, 2018b).²⁰ In our model, we provide a complementary explanation, where demand for extremely protectionist delegates directly affects political supply through via the voting mechanism.

Fourth, our paper also links into the literature on strategic voting (see Kawai and Watanabe, 2013, and the literature therein). We estimate the magnitude of the incentive to vote strategically in our empirical section which, according to the definition in Kawai and Watanabe (2013), is a measure of the degree of misaligned voting.²¹ Our estimates are consistent with those in the literature, which are in the order of magnitude of 1 to 3%.

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 .²² 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

$$U_r^j = c(C_r) + \beta_r X(G_r; X_r) + M_r; \quad (1)$$

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

¹⁹See Rovira Kaltwasser (2018) for a concise survey on populism.

²⁰If this is done successfully, and social stigma attached to radical ideologies is mitigated as a result, demand for such platforms can moreover be reinforced, as shown by Bursztyjn et al. (2017) and Cantoni et al. (2019).

²¹Misaligned voters are the subset of strategic voters that in equilibrium find it optimal to distort their vote. Hence, it excludes those strategic voters for whom the best strategic behaviour implies voting their preferred candidate.

²²Given the normalisation of regional population, public provision could entail a local public good, but also publicly provided private goods.

Both $c(\cdot)$ and $x(\cdot)$ 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

$$C_r = (1 - t_r) Y_r \quad (2)$$

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

$$G_r = t_r Y_r \quad (3)$$

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.²³ We only assume it has an intensive margin $P(\cdot)$ – capturing the magnitude, or the intensity of the policy – and an extensive margin $\Delta_r \geq 0$ – defining whether the region benefits ($\Delta_r > 0$) or loses ($\Delta_r < 0$) from the policy, so that

$$X_r = P(\cdot) \Delta_r \quad (4)$$

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

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{r} the ‘type’ of the representative at the federal government elected in region r , we assume

$$M_r = \alpha_r (\hat{r} - r)^2 \quad (5)$$

It follows that M_r measures the disutility of the “political match”: the distance between the voter’s type r and the type of their elected representative.²⁴ Parameter α_r can thus be thought of as a measure of political pragmatism: when α_r is small, voters are opportunistic, in the sense that they care mostly about policies, rather than who implements them. Conversely, when α_r is large, voters are ideological and dislike being represented by someone with whom they do not share the same political views. Lastly, since regional policies are decided via direct democracy, Eq. (5) only captures the potential mismatch occurring at the federal level.

²³Federal and local policies may complement or crowd out each other (Knight, 2002). Federal grants are a typical example of substitute policies. Instead, federal investment in infrastructure that increases the marginal value of local infrastructure would represent a complementary policy. Identically, environmental policies may be a complement to local policies to promote tourism.

²⁴See also Krasa and Polborn (2018) and Buisseret and Bernhardt (2018) for similar modeling assumptions.

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 β_r and, as previously remarked, the elected agent in region r is denoted \hat{a}_r . The federal government moves second and chooses X_r . A coalition of federal representatives bargains on the level of β , which defines the magnitude $P(\beta)$ of the federal policy X_r as expressed by Eq. (4).

We denote by $k \subseteq K \subseteq R$ 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, which can be thought the result of a specified institutional arrangement or the product of the political constellation at hand. In any case, 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 f and g , so that $K = \{f, g\}$.

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 ($\Delta_r < 0$).²⁵ For the sake of simplicity, we assume that this is a zero-sum game, that is,

$$\Delta_r = f - g \quad (6)$$

²⁵We 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.

and $\Delta = \Delta$.²⁶

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 magnitude of the federal intervention and, therefore, maximises:

$$\max_{k \in K} \prod_{k \in K} \lambda_k \hat{U}_k - F_k = \prod_{k \in K} \lambda_k [c(C_k) + \lambda_k X(G_k; X_k) - F_k]; \quad (7)$$

where \hat{U}_k is the utility of the representative elected in region k , that is obtained by rewriting Eq. (1) for $\lambda_k = \lambda_k$. The weight of region k in the bargaining process is λ_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 λ_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 is implicitly expressed by

$$\lambda_k \hat{\Delta} P^l(\cdot) X_2^l(G; X) + \lambda_k \hat{\Delta} P^l(\cdot) X_2^l(G; X) = 0; \quad (8)$$

Since $\Delta = \Delta$, Eq. (8) becomes $\Delta \lambda_k \hat{X}_2^l(G; X) - \lambda_k \hat{X}_2^l(G; X) = 0$, which leads to

$$\begin{aligned} f &= 0; \\ \text{with } f &= \lambda_k \hat{X}_2^l(G; X) - \lambda_k \hat{X}_2^l(G; X); \end{aligned} \quad (9)$$

Eq. (9) implicitly captures how the (federal) intensive margin $P(\cdot)$ responds to regional decisions. This is an important relation: indeed, how agents are tempted to distort their

²⁶This assumption can be easily relaxed, as long as it is ensured that some regions with positive and negative Δ are both represented within the federal government.

decisions depends on their expectations on the federal government's behaviour, which in turn depends on whether regional and federal policies are strategic complements ($x_{1,2}^{00}(\cdot) > 0$) or substitutes ($x_{1,2}^{00}(\cdot) < 0$). Lemma 1 precisely analyses how the federal choice reacts to changes in the local component G of the public policy.²⁷

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

$$\frac{\partial}{\partial t} = \frac{\hat{\gamma} x_{1,2}^{00}(G; X)}{\hat{\gamma} x_{2,2}^{00}(G; X) + \hat{\gamma} x_{1,2}^{00}(G; X) \Delta P'(\cdot)}; \quad (10)$$

It follows immediately that

$$\text{sgn} \frac{\partial}{\partial t} = \text{sgn} \frac{x_{1,2}^{00}(G; X)}{\Delta} \quad (11)$$

Whenever regional and federal policies are strategic complements ($x_{1,2}^{00}(\cdot) > 0$), an increase of regional public provision pushes the federal government to reinforce (/temper) its policy $P(\cdot)$ if the expansion occurred in the benefiting (/losing) region. All the opposite is true when regional and federal policies are strategic substitutes ($x_{1,2}^{00}(\cdot) < 0$).

Notice that $\frac{\partial}{\partial G} = \frac{1}{\gamma} \frac{\partial}{\partial t}$ and, hence, that $\text{sgn} \frac{\partial}{\partial G} = \text{sgn} \frac{\partial}{\partial t}$.

Proof. See Appendix D. □

Lemma 1 shows it is optimal for the federal government to boost its support for the winning region, whenever the latter spends additional funds to finance higher levels of the public good. Since regional spending erodes consumption and hence also utility, as shown by Eq. (2), the federal government compensates for this welfare loss by increasing the intensity of the federal policy if it works complementary to the public good G_r , and vice versa. The opposite is true for the losing region: lowering the magnitude 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 $\hat{\gamma}$ and $\hat{\gamma}$ of the federal legislators elected respectively in regions r and l . 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.

²⁷Without loss of generality, we consider the case of region r .

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

$$\frac{\partial \hat{p}}{\partial \Delta} = \frac{\text{sgn}(\Delta) x_2^0(G; X)}{\text{sgn}(\Delta) x_{2,2}^{00}(G; X) + \text{sgn}(\Delta) x_{2,2}^{00}(G; X) \Delta P'(\cdot)}; \quad (12)$$

with $\text{sgn} \frac{\partial \hat{p}}{\partial \Delta} = \text{sgn}(\Delta)$. 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 policy.

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 (/soften) the federal policy if they represent a winning (/losing) region. A similar dynamic can be found in the ongoing work by Kartik et al. (2020), although in the different context of veto bargaining: there too, extreme politicians tend to negotiate better deals. Of course, the question at this point becomes whether a more extreme preference type will emerge from the election process. Section 2.1.2 provides us with an answer.

2.1.2 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{k} who joins the federal government and negotiates in the name of region k , staying true to their preference type as is the common assumption in citizen-candidate settings.

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.²⁸

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

$$x_1^0(G; X) = \frac{\text{sgn}(\Delta) x_2^0(G; X) x_{1,2}^{00}(G; X)}{\text{sgn}(\Delta) x_{2,2}^{00}(G; X) + \text{sgn}(\Delta) x_{2,2}^{00}(G; X)} = \frac{c^0(C)}{m} \quad (13)$$

$$\frac{\text{sgn}(\Delta) (x_2^0(G; X))^2}{\text{sgn}(\Delta) x_{2,2}^{00}(G; X) + \text{sgn}(\Delta) x_{2,2}^{00}(G; X)} = \frac{2}{m} \left(\frac{\hat{m}}{m} \right). \quad (14)$$

²⁸Notice that in Eqs. (13) to (14) both \hat{m} and m appear. This is because the median voter is decisive in the election, hence the presence of m . Yet voters also anticipate the strategic role of politicians at the federal level, so that \hat{m} follows from the strategic and forward looking behaviour of the local median voter.

Proof. See Appendix D. □

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

Proposition 1 (Strategic Voting). *Suppose that a cooperative legislature of regionally elected representatives has to bargain over the intensity (Δ_k) of federal policies (X_k). Then, in all regions where the federal policy directly affects the utility of public provision ($\Delta_k \neq 0$), voters will strategically elect candidates with a preference for public provision strictly stronger than their own ($\hat{\kappa}_k > \frac{m}{k}$). If a region neither benefits nor loses from the federal policy ($\Delta_k = 0$) then local elections will not be distorted by strategic voting ($\hat{\kappa}_k = \frac{m}{k}$).*

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

$$\frac{(\Delta_k)}{(\Delta_k)} = \frac{! (X_2^{\Delta_k}(G; X_k))^2}{! (X_2^{\Delta_k}(G; X_k))^2} = \quad (15)$$

where $(\Delta_k) = (\hat{\kappa}_k - \frac{m}{k}) = \frac{m}{k}$ is the mark-up in terms of κ_k , that is, the percentage increase in κ_k from the median voter to the federal representative in region k .

Proof. See Appendix D. □

According to Proposition 1, elected federal representatives always have a strictly-stronger preference for public provision than the median voter, conditional on their region’s welfare being at stake. This may be surprising at first, since this implies 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.²⁹

Proposition 1 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 – and thus the federal contribution $X_k(\Delta_k)$ to public provision – is increasing in $\hat{\kappa}_k$ 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 $x(\cdot)$, resulting in higher utility. Higher $\hat{\kappa}_k$ types more gladly negotiate for

²⁹The empirical analyses in Kedar (2005) and Lachat (2018) support Proposition 1, albeit with generally descriptive evidence. Indeed, in both cases results suggest that voters support more extreme parties, with the hope to steer expected government policy closer to their bliss point.

higher, or lower federal intervention 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 Proposition 1. 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 κ from being ‘misrepresented’ as well as the relative marginal utility of federal intervention. Clearly, for the symmetric case in which $m = m$ and $! = !$, Eq. (15) simplifies to $\frac{(\cdot)}{(\cdot)} = (x_2^0(G; X))^2 = (x_2^0(G; X))^2$, which means that the distortion is relatively larger in the region in which the marginal impact of the 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. $x_{1,2}^{00}(G_k; X_k) > 0$) 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. $x_{1,2}^{00}(G_k; X_k) < 0$), the poorer region would distort more when it comes to selecting its federal representative.³⁰

Myopic, naive and sophisticated voters In our model agents are sophisticated, as 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 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 , yet they do not anticipate that the choice of the elected politician (\hat{r})

³⁰As 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.

is also affecting τ . This could happen if voters, for example, misunderstand the competence of different federal institutions.

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

The “sophisticated” tax rate t^s is set implicitly at:

$$c^d(C) \quad m_{X_1^d}(G; X) = \frac{! \hat{x}_2^d(G; X) x_{1,2}^{00}(G; X)}{! \hat{x}_{2,2}^{00}(G; X) + ! \hat{x}_{2,2}^{00}(G; X)} \quad m \quad (16)$$

Similarly, the “naive” tax rate t^n is set implicitly at:

$$c^d(C) \quad m_{X_1^d}(G; X) = \frac{! \hat{x}_2^d(G; X) x_{1,2}^{00}(G; X)}{! \hat{x}_{2,2}^{00}(G; X) + ! \hat{x}_{2,2}^{00}(G; X)} \quad m \quad (17)$$

Finally, the “myopic” tax rate t^m is set implicitly at:

$$c^d(C) \quad m_{X_1^d}(G; X) = 0 \quad (18)$$

Proposition 2. *Taking the myopic agent as a benchmark – as an 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 2. *When local and federal policy are strategic complements ($x_{1,2}^{00}(G_r; X_r) > 0$), sophisticated voters expand local taxes more than the naive ones: $t^s > t^n > t^m$. Conversely, when local and federal policy are strategic substitutes ($x_{1,2}^{00}(G_r; X_r) < 0$), sophisticated voters choose to under-tax locally, again to a larger extent than naive voters: $t^m > t^n > t^s$.*

Proof. See Appendix D. □

The intuition behind Proposition 2 is straightforward: while the cost of distorting the vote is the same for everyone, sophisticated voters fully anticipate its marginal benefit and, hence, optimally calibrate the distortion. Naive voters underestimate the benefit. Myopic voters do not anticipate any benefit at all, hence they do not distort their vote.³¹

While Proposition 2 stresses the magnitude of the distortion, maximal for strategic voters and minimal for the myopic ones, Corollary 2 focuses on the direction of the distortion. When federal and local policy are complements, the benefit comes from inflating the local tax, hence if voters in a region are strategic they will vote for a larger local tax. Conversely, when policies are substitutes, the benefit is obtained by reducing the local tax. Then naive voters will reduce it compared to myopic voters, but strategic voters will reduce it even more.

³¹Taking 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.

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 (β) 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 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.³² 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.

2.2 Extensions

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 ($K = f ; g \in R$), with one winner and one loser. We denote z the region that is left out of the coalition.³³

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 loser while the opposite is true

³²The 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.

³³When 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.

when Z is a winner. 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 $\hat{\cdot}$ is more pronounced with three regions if the excluded region is a loser ($\Delta_Z < 0$), while the opposite is true when Z is a winner ($\Delta_Z > 0$). Fig. 2 illustrates Proposition 3 and Lemma 4.

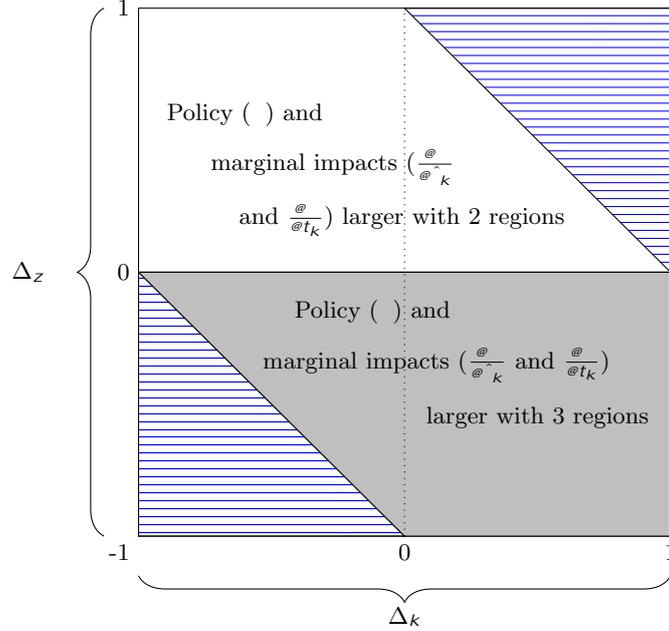


Figure 2: Size of the policy () and marginal impacts ($\frac{\partial}{\partial k}$ and $\frac{\partial}{\partial t_k}$) in the (k - z) space

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 ($\hat{\cdot}(k)$) 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. 3.

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 ρ_k to the fact that their elected politician will be able to impact federal policy-making, and thus the federal policy intensity as previously described. With probability $1 - \rho_k$, instead, they will not influence the federal government's decisions at all and the federal policy will be exogenously set at $\hat{\cdot}$.

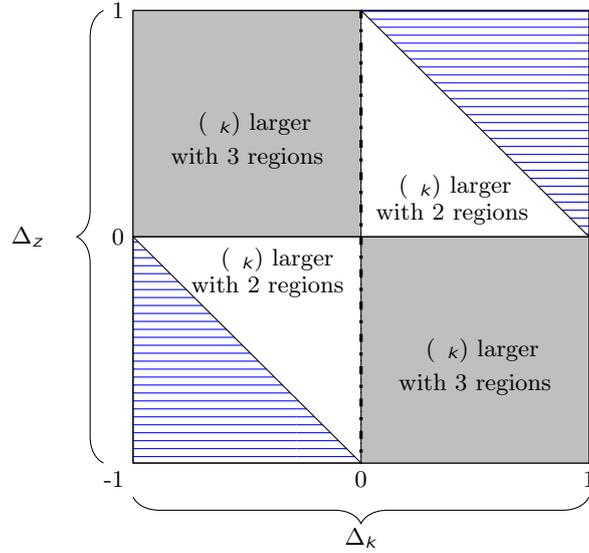


Figure 3: Mark-up (κ) in the (k, z) space

There can be several ways to rationalise such beliefs. Amongst others, voters may believe that $1 - \rho_k$ is the probability that a coalition forms, but with their own representative kept out of the formation process.³⁴

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 does not always have an impact, their expected benefit from manipulating their behaviour is reduced and, following Lemma 5, they distort t_k and $\hat{\kappa}$ 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 ρ_k relates to endogenous federal decision-making and $1 - \rho_k$ to a setting where $\hat{\kappa}$ is exogenously set ($\hat{\kappa}$), 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 $\hat{\kappa}$. Indeed, when we consider the coalition formation process, the race

³⁴We work out this micro-foundation of beliefs in Appendix C.

to choose a mild negotiator to be included in the coalition is bounded by the lowest type \hat{k} , if higher than all median voter types. This is because the set of regions that benefits or loses from the policy is exogenous, so there will inevitably be cases where the coalition members have opposite objectives, and hence, potential allies outside of the coalition. The interests of a district are therefore equally protected if the district belongs to the coalition or if another district with aligned interests does. Choosing a milder negotiator will still increase the chances of being part of the coalition, but this is no longer essential.

3 Empirical Analysis: European vs National Elections

In this section, we provide evidence on some of our key predictions. When elections are organised at multiple levels, the model shows that citizens select candidates for the upper level with more extremely protective preferences than their own. Conversely, we do not expect such distortion to characterise elections at lower levels of jurisdiction, in which case citizens will vote more sincerely. Importantly, the strategic effect occurs both in benefiting and losing districts, but not in those where benefits and costs of the upper-jurisdiction policies 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 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.

Our use of the Eurosceptic classification as a measure of extremely protective political parties is rooted in the notion of ‘economic nationalism’, described by Colantone and Stanig (2019) as on the rise in Europe. As a policy platform, economic nationalism bundles isolationist and nationalist narratives, where the former consists of mainly protectionist positions and the latter is centred on the goal of ‘taking back control’ of the country in question. This platform then aligns perfectly with the extremely protective type described in our model,

and matches it to the Eurosceptic proxy we use. Indeed, our Eurosceptic classification stems from an appeal to national sovereignty and critique of EU institutions, and can be linked to nationalism and protectionism.³⁵

The European setting thus forms a welcome 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 are of ‘second-order’ importance, hence 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 which are part of their respective national government. This leads to a general punishment of the governing 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 undermine the European integration project as a whole, rather than bringing about more favourable conditions for their constituencies – which is our interpretation here. However, both sides can be seen as opposite ends of the same coin, if we consider that the most extreme parties are pursuing a hard (and potentially fatal for the union) bargaining strategy precisely to obtain more favorable conditions for their countries. Indeed, many analysts argue that most Eurosceptics are not out to destroy EU institutions and funding mechanisms, but rather want to turn these to their advantage (Vasilopoulou, 2013).³⁶

3.2 Data

First, we create a data set including the vote share of all parties at national and European elections, for parties running at least at one national and one European election.³⁷ 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 (CHES), an established source, which estimates party positioning on European

³⁵Differently from Colantone and Stanig (2019), our definition does not include economic conservative parties, as this dimension is not part of the model.

³⁶The 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.

³⁷A 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.

integration and ideology.³⁸ Algan et al. (2017) extends it including some brand-new and small parties. In our dataset, parties classified as Eurosceptic following Algan et al. (2017) show a 60% correlation with parties marked as ‘populist’, further validating our choice of proxy as the populist classification is based on the protectionist and nationalist categories in the CHES.

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 1994, the first European election in our dataset. Therefore, the periods are 1990-94; 1995-99; 2000-04; 2005-09; 2010-14. 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 window as this maximises the number of observations in our sample. In Table 7 of the Appendix, we replicate our main findings considering a different 5-year window, centring each window on the year of EU elections (1992-96; 1997-01; 2002-06; 2007-11; 2012-16).

Fig. 4 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 the following OLS model:

$$DiffEU=Nat_{jit} = \alpha_i + \beta_t + \gamma_1 Euroceptic_{ji} + \mathbf{X}_{jit} + \epsilon_{jit} \quad (19)$$

in which the dependent variable is the above-mentioned variable $DiffEU = Nat_{jit}$, i.e. the difference between a party vote share at the European and at the national elections within a 5-year period. j refers to a party, i refers to a country and t refers to a 5-year period. The main explanatory variable is $Euroceptic_{ji}$, 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 (β_t) and country fixed effects (α_i). In a more demanding specification, we include time-country fixed effects. \mathbf{X}_{jit} includes a set of control variables,

³⁸www.chesdata.eu/

which we explain in the next paragraph.

The ‘second-order’ theory might affect these estimates in several ways, as explained above. 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 both national and EU elections during the previous 5-year 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, 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. Third, lower turnout at the European elections might differently affect Eurosceptic parties. In turn, we control for turnout differences between national and European elections.³⁹

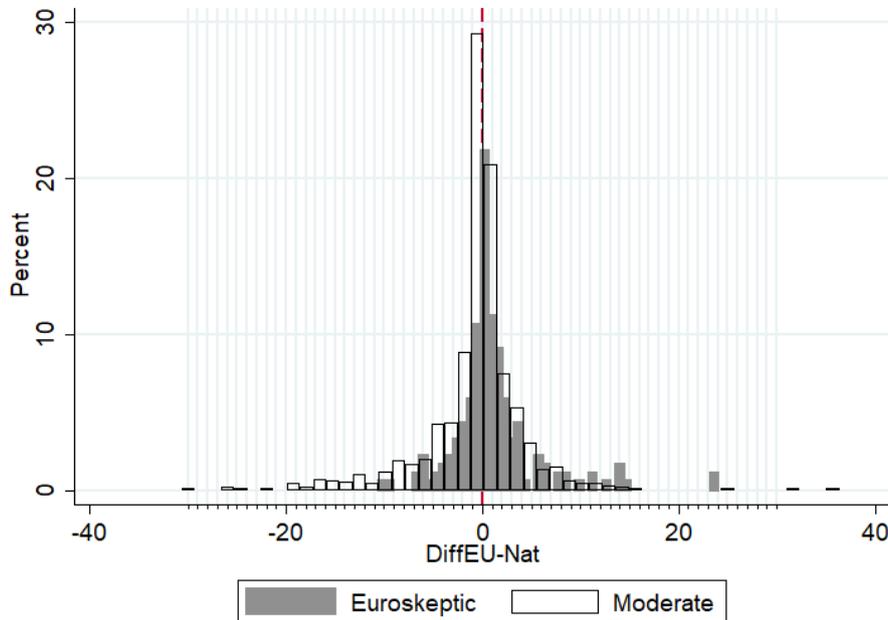
Another potential source of bias is related, and inherent to differences in electoral systems across levels of government. Some countries, holding national elections under a majoritarian system and European elections under a proportional system, might differentially reward small and/or Eurosceptic parties across the two types of elections.⁴⁰ We tackle this issue in two alternative ways: i) we compute an index of disproportionality of the electoral system and use it as a control in our estimation;⁴¹ ii) we report our findings dropping countries with a mixed or a majoritarian system at the national elections.

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

3.3 Results

We report our main findings in Table 1 and Table 2, in Columns 1 to 4, in which we gradually include our set of controls. In Columns 5 to 8 we report a heterogeneity analysis, which we discuss in the next section.

Figure 4: 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.

3.3.1 Baseline Results

Across the board, our results in Table 1 strongly suggest that Eurosceptic parties are more likely to be elected to the European parliament than to its national counterpart. This effect is sizeable (almost 40% of the standard deviation) and statistically significant across all models. Table 6 in the Appendix considers a winsorised version at 99% of the dependent variable, while we test the same specification in Table 8 using a 10-year time window. In both cases our results are confirmed.

Party Size appears to be statistically significant: smaller parties are more likely to perform better at EU elections. Although this is in line with the ‘second-order’ theory, our results are not driven by it. Indeed, the other control variables do not play an important role:

³⁹Those data are collected from the Chapel Hill Expert Survey.

⁴⁰Conversely, all EU countries, in the period of interest, held European elections under some form of proportional representation.

⁴¹The index is a “contest success function”, already defined by Theil (1969), and used in (Taagepera, 1973; Piolatto, 2011; Morelli et al., 2016; Matakos et al., 2016; Bol et al., 2019), it is also known as “cube rule” for the main parameter should take value 3 in two-party First Past The Post systems. It would take value 0 if an electoral system assigned 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.

Table 1: Eurosceptic Voting at EU vs National Elections

	Baseline				Heterogeneity			
Eurosceptic	1.869*** (0.562)	1.892*** (0.557)	2.017*** (0.617)	1.781*** (0.610)	2.242** (0.861)	2.274** (0.854)	2.644*** (0.908)	2.144** (0.810)
2 nd tertile					0.607 (0.465)	0.582 (0.476)		
3 rd tertile					-0.0920 (0.485)	-0.0533 (0.486)		
Eurosceptic*2 nd tertile					-2.466** (0.973)	-2.478** (0.972)	-2.887*** (1.038)	-2.450** (1.089)
Eurosceptic*3 rd tertile					1.096 (1.159)	1.070 (1.157)	0.653 (1.340)	1.285 (1.420)
Diff Turnout	-0.0129 (0.00969)	-0.0120 (0.00980)	0.00846 (0.0135)		-0.0136 (0.0101)	-0.0121 (0.0101)	0.00895 (0.0136)	
Proportional Voting	0.441 (0.964)	0.494 (0.944)			0.409 (1.042)	0.478 (1.019)		
Party Size				-0.0911** (0.0355)				-0.0925** (0.0350)
Incumbent				-0.635 (1.180)				-0.582 (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 *Di EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *Di 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.

the *Incumbent* coefficient is never significant, which suggests that protest voting against the incumbent is not an alternative channel for our findings. Differences in turnout (*Diff Turnout*) also do not seem to matter much.⁴² Of course, this does not mean our mechanism cannot co-exist with other explanations. Rather, and given our controls, we can conclude that our mechanism persists even after filtering out potential ‘second order’ channels.

Next, different electoral systems do not seem to affect our proposed mechanism either. This downplays the importance of yet another source of bias: the fact that citizens may be more likely to vote strategically at the national level in majoritarian voting system, hence favouring moderate and/or pro-Europe parties, whilst expressing their ideological preferences at the European elections which are proportional. While in Table 1 we include as a control the ‘proportional voting’ index (described in Footnote 41) which is never statistically significant. In Table 2, instead, we test the robustness of our findings dropping from our sample countries

⁴²Note the *Proportional Voting* coefficient is not estimated when introducing country fixed effects. Similarly, the *Di Turnout* coefficient cannot be estimated when introducing Country-Time fixed effects.

Table 2: Eurosceptic Voting at EU vs National Elections - without Majoritarian/Mixed Systems

	Baseline				Heterogeneity			
Eurosceptic	1.668*** (0.534)	1.685*** (0.530)	1.637*** (0.557)	1.441** (0.581)	2.665*** (0.844)	2.676*** (0.850)	2.962*** (0.928)	2.535** (0.924)
2 nd tertile					0.884* (0.438)	0.800* (0.449)		
3 rd tertile					0.267 (0.476)	0.236 (0.485)		
Eurosceptic*2 nd tertile					-2.890*** (0.964)	-2.877*** (0.975)	-3.192*** (1.050)	-2.840** (1.172)
Eurosceptic*3 rd tertile					0.174 (1.057)	0.171 (1.076)	-0.562 (1.181)	-0.196 (1.174)
Diff Turnout	-0.0132 (0.00925)	-0.0154 (0.00909)	0.000119 (0.0227)		-0.0138 (0.00905)	-0.0151 (0.00929)	0.000526 (0.0228)	
Proportional Voting	-0.135 (0.978)	-0.199 (0.945)			0.0866 (0.902)	0.0123 (0.881)		
Party Size				-0.0840*** (0.0295)				-0.0860*** (0.0291)
Incumbent				-1.399 (1.331)				-1.270 (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 *DI EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *DI 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.

holding a mixed or a majoritarian electoral system at the national level. This classification is based on the International Institute for Democracy and Electoral Assistance (International IDEA). At the European level, all countries use a proportional system with national specificities.

Lastly, 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 Appendix Table 9, 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.

3.3.2 Heterogeneous Effects

Similarly to our model in which there are winning and losing jurisdictions, EU countries can be classified into winners, losers and neutral in terms of EU status. An objective way to approximate this is to use the net-contributions of each member state to the overall EU budget.

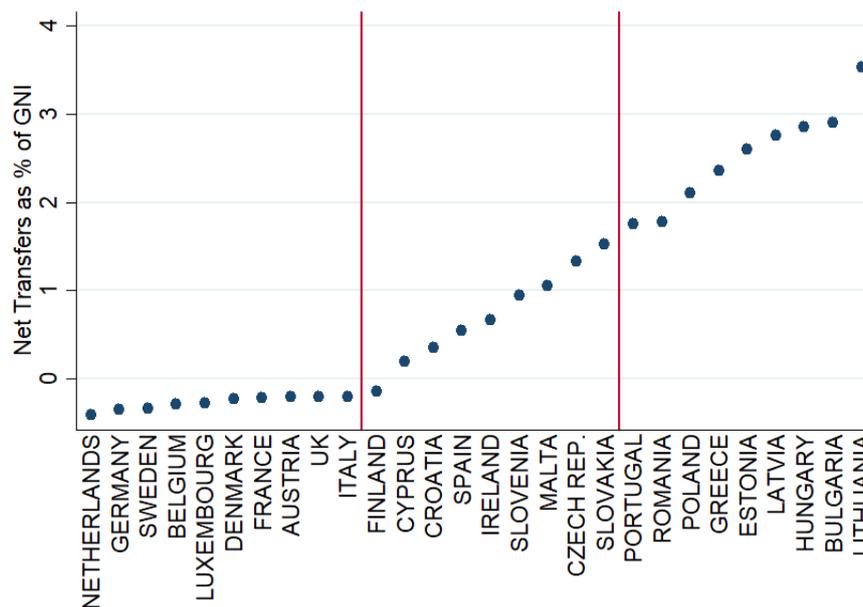
The EU budget, which in 2015 was 145 billion Euros, represents a crucial source of financing for the poorest EU members, as well as for firms in several economic sectors (e.g. energy and agriculture) across all EU countries. Similar to our model specifications, some countries – such as Germany, the Netherlands 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.⁴³ Conversely, based on this measure, the Netherlands was the main EU net contributor (-0.41% of GNI).

Following the model, we expect support for Eurosceptic parties to be differentially stronger at the European elections (compared to national elections) both in net contributing member states and also in net receiving ones. Such effect should vanish, according to our model, in countries contributing about as much as they receive. To test this prediction, we consider the share of EU net contributions as a percentage of the gross national income (GNI) in the period 2000-2015. We then split countries in three groups, as depicted in Fig. 5, in which the top 33% includes the most generous net-contributors, such as the Netherlands, Germany and Sweden, and the bottom 33% the largest net receivers. Interestingly, the split in tertiles allows for a U-shape test: indeed, from Proposition 1 we expect a stronger effect both in the 1st tertile (net-contributors) and in the 3rd tertile (net-receivers), while strategic Eurosceptic voting should matter less in the 2nd tertile, which includes countries for which contributions-to and transfers-from the EU are quite balanced.

In Columns 5 to 8 of Table 1, we interact the *Eurosceptic* dummy with the categorical variable *tertile*. The coefficient *Eurosceptic* represents the effect of the omitted base category, i.e. the 1st tertile (top 33% net contributor countries). Results confirm our predictions. The effect materialises both in the 1st and 3rd tertile (lines 1 and 7), while there is no such effect for Eurosceptic parties in the 2nd 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. Specifically, our baseline variable *Eurosceptic* suggests that belonging to the 1st tertile explains a better

⁴³These data are available on the website of the European Commission: http://ec.europa.eu/budget/financialreport/2015/revenue/index_en.html

Figure 5: 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.

performance of Eurosceptic parties at European elections (as opposed to national ones) by more than 2ppt, and such increase is significant. The 3rd tertile is not statistically different from the 1st one, hence, also for net-receiving countries the performance of Eurosceptic parties is statistically superior at the EU level than at the national one. Conversely, this effect disappears when focusing on the 2nd tertile. A similar pattern emerges in our robustness Tables 2 and 9 (again Columns 5 to 8).⁴⁴

As complementary evidence, we plot our data differentiating between Eurosceptic and moderate parties. Specifically, in Fig. 7, 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 Fig. 5. As in Table 6, we use a winsorised version of the dependent variable to exclude outliers. The figure quite clearly shows the U-shaped pattern for the Eurosceptic plot (the quadratic term is statistically significant, p-value=0.002), whereas no clear trend is visible on the right side for moderate parties.

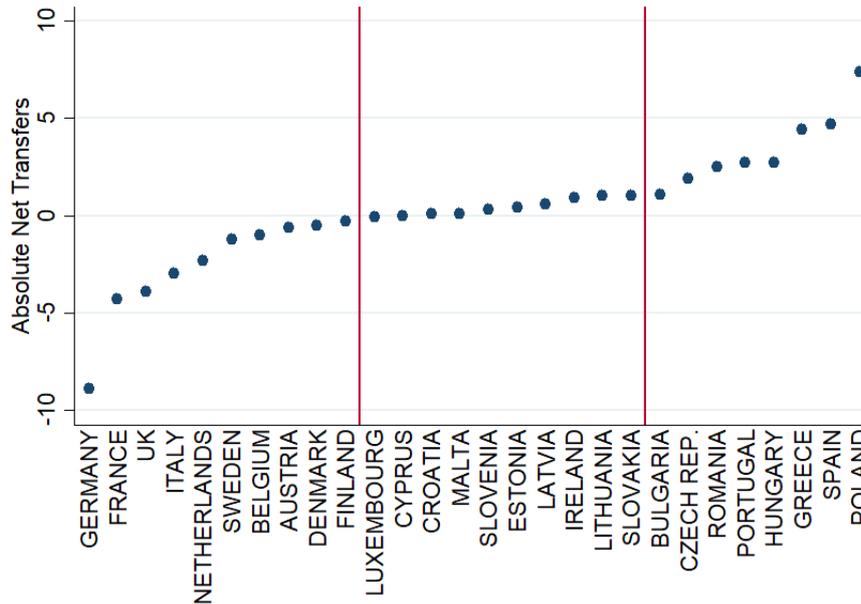
⁴⁴Note that in Table 2 this test is highly demanding as four out of six countries holding (at least for some years) a mixed or majoritarian system are in the first tertile, i.e. France, Germany, Italy and United Kingdom. The other two are Hungary and Lithuania.

3.3.3 Robustness tests

In this section, we briefly outline some robustness tests which validate our main findings.

First, in our main specification we group countries based on an objective measure: net transfers from the EU as a share of GNI. Table 3 proposes two alternatives to that: the first one relies on people’s perceptions, the other one is a different objective measure. In particular, in columns 1 to 4 we use 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?”. The question was collected across EU countries (since 1983) by the Eurobarometer survey.⁴⁵ 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. In columns 5 to 8, we rely on a different, second, objective economic measure: countries’ absolute average contribution in the period 2000-2015 (in this case, Germany is the top net-contributor with a yearly contribution of almost 9 billion Euros, as shown in Fig. 6).

Figure 6: 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.

In Appendix Section F, we investigate whether both our baseline and heterogeneity results

⁴⁵www.gesis.org/eurobarometer-data-service/search-data-access/eb-trends-trend-files/list-of-trends/membership-benefit.

depend on the size of the federation, focusing on the EU enlargement in 2004. Our results hold, and are even stronger in the period post-enlargement. Linking these results back to our model, we offer some explanations for this trend in the same Appendix section.

Appendix Table 10 deals with a possible alternative explanation for our findings. Euro-sceptic parties might be more successful at the EU elections simply because their manifesto is built around EU topics, which are naturally more salient right before EU elections. This might provide them with higher media exposure and in turn, more votes. However, this would also have to be true 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 using the Chapel Hill Expert Survey.⁴⁶ 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.

Finally, in Figs. 12 and 13, we validate an important assumption of our analysis, i.e. that a country position in a certain tertile is rather stable and does not change much over time, as it reflects underlying spatial heterogeneity. First, for each 5-year period, we split countries into tertiles depending on their net-transfers to the EU (in the period 2000-2015) or the perceived benefits from being into the EU (in the period 1983-2011). Then, we calculate each country's average position across tertiles in the entire period (blue dots) and the standard deviation (red dots). Both figures report very low values of the standard deviations, in absolute as well as relative terms compared to the mean, which highlights countries' stickiness to a specific tertile across time. Specifically, in the case of Fig. 12, several countries are placed in all 5-year periods within the same tertile, while some others change tertile at most once. In the case of Fig. 13, most countries are always placed in the same tertile or they switch tertile at most once. Only three countries change tertile twice (i.e. Denmark, Greece and Spain).⁴⁷

4 Survey Evidence: Strategic Eurosceptic Voting

In the previous section, we show that Europeans tend to vote more for Eurosceptic parties at the European level than at the national level, especially when they live in net receiving or contributing countries. Our key prediction is that this pattern is due to strategic considerations, with rational voters trying to steer federal/EU negotiations in their national favour. Testing this prediction, we used Eurosceptic parties as a proxy for parties that are extremely

⁴⁶Specifically, 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.

⁴⁷Greece and Spain tertile change takes place during the 2008 economic crisis, due to a decline in the perceived benefit of being in the EU.

Table 3: Eurosceptic Voting at EU vs National Elections: Benefit of EU membership (1-4) and Absolute Contributions (5-8)

	Benefit EU				Abs. Contributions			
Eurosceptic	2.726*** (0.593)	2.745*** (0.598)	2.891*** (0.657)	2.620*** (0.667)	1.920*** (0.491)	1.950*** (0.491)	2.211*** (0.528)	1.740*** (0.520)
2 nd tertile	0.726* (0.400)	0.678* (0.399)			0.240 (0.545)	0.230 (0.554)		
3 rd tertile	0.471 (0.491)	0.449 (0.490)			-0.0226 (0.345)	-0.0359 (0.348)		
Eurosceptic*2 nd tertile	-2.219*** (0.795)	-2.225*** (0.798)	-2.299*** (0.841)	-2.128** (0.862)	-2.193** (0.893)	-2.199** (0.901)	-2.936*** (0.934)	-2.504** (1.004)
Eurosceptic*3 rd tertile	-0.664 (0.973)	-0.648 (0.976)	-0.653 (1.043)	-0.667 (1.035)	0.708 (0.846)	0.683 (0.850)	0.475 (0.895)	1.122 (0.907)
Diff Turnout	-0.00999 (0.0110)	-0.00936 (0.0114)	0.0145 (0.0109)		-0.0114 (0.0102)	-0.0105 (0.0106)	0.0139 (0.0111)	
Proportional Voting	0.391 (1.085)	0.481 (1.090)			0.408 (0.991)	0.465 (0.994)		
Party Size				-0.0889*** (0.0282)				-0.0940*** (0.0284)
Incumbent				-0.678 (1.025)				-0.600 (1.031)
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 DI_{EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *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). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

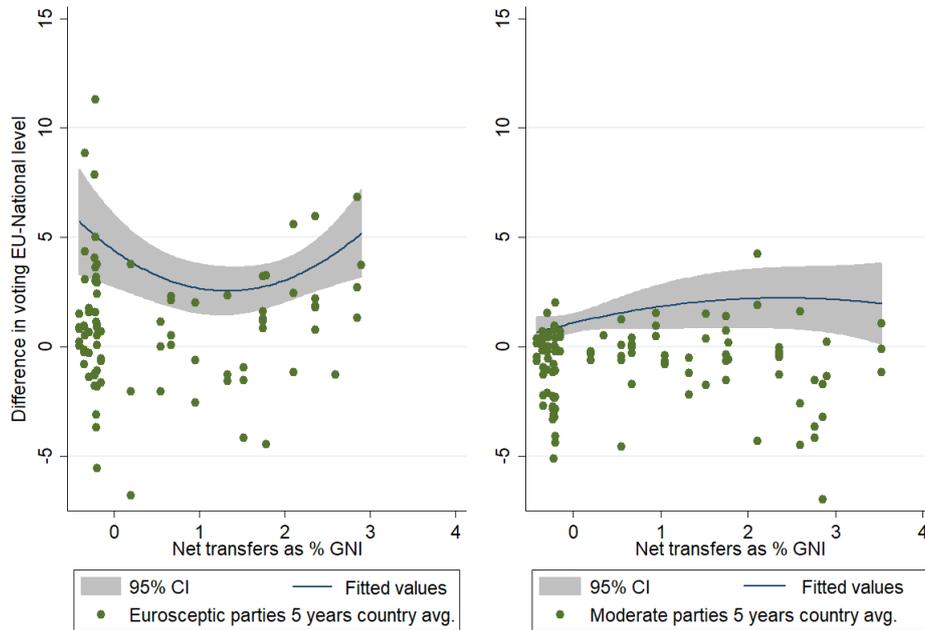
protective of national interests in federal negotiations.

To further validate this prediction we ran an online survey in cooperation with Qualtrics XM. Our aim was to fully understand the reasons why individuals would vote differently depending on the level of government, and whether these reasons were strategic in nature. More precisely, we queried why they voted for a Eurosceptic party during the last EU parliamentary elections (26th May 2019), and for a moderate party in the most recent national/subnational elections. We could not rely on existing surveys for this since, to the best of our knowledge, there is no survey including both: i) respondents' voting behaviour in national and European elections; ii) and data on voter intentions or motives when voting for specific parties.

Our final sample includes 341 such respondents: 51 from Finland, 209 from France and 81 from the Italian region of Piedmont.⁴⁸ The choice of areas where to run the survey was

⁴⁸The relatively small sample size is due to the effort in selecting individuals with such specific voting

Figure 7: Scatter plot by type of party



On the vertical axis, we plot the country-level 5-year average of the dependent variable (DI_{EU-Nat}) for Euroseptic(moderate) parties on left(right) side. Moderate includes all parties not classified as Euroseptic. On the horizontal axis, the figure shows the net transfers as % of GNI similarly to Figure Fig. 5.

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 Euroseptic 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 Euroseptic 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 Euroseptic party they voted will be able to better:

 requirements.

- 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
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 their views 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, with a duration of approximately 10 minutes, was translated in each of the respective national languages. We coded Eurosceptic and moderate parties based on the same methodology outlined in the previous section.

We report our results in Table 4. The first four lines represent the above four options. The fifth line 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). The table reports the total number of observations for each question (columns 1 and 3) and the average support for each statement (columns 2 and 4), distinguishing by the level of political interest (low interest in columns 1 and 2, high interest in 3 and 4). We highlight this differential, as it appears to be the only dimension along which preferences seem to consistently change across individuals. Column 5 shows the difference (4-2), that is, by how much preferences are more intense for agents with a high interest in politics. The last columns reports a t-test comparing the two groups.⁴⁹

We find that respondents with high levels of political interest tend to agree more with all four statements, while they are not different in terms of their support for Eurosceptic parties.⁵⁰ However, such differences are higher and statistically more significant for the two strategic statements, both if we conceptualise it in abstract terms (protecting the national interest) or in more concrete terms (attracting EU funds). Fig. 14 graphically reports the average support for each statement differentiating by country and levels of political interest.

⁴⁹Specifically, we consider as having 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, such as gender, age, education, job status and media consumption.

⁵⁰This validates the idea that, on average, voters do not systematically feel closer to the Eurosceptic parties the more they are politically informed. Hence, it provides additional validation of the informed voter being even more strategic.

Overall, these results highlight that strategic voting plays an important and complementary role in this decision-making process and that such sophisticated voting behaviour is indeed typical of voters more involved in the political arena and its discourse.

Table 4: Online survey: descriptive statistics and t-test by political interest

	N Low-Int	Mean Low-Int	N High-Int	Mean High-Int	Diff.	p-value
National Interest	136	4.24	170	5.01	0.775	0.000
Attract EU Funds	136	3.88	170	4.71	0.827	0.000
Out of EU	136	3.79	170	4.34	0.547	0.014
National Discontent	136	4.27	170	4.71	0.438	0.060
Support Eurosceptic	122	.413	147	0.17	-.243	0.323

Note: This table reports descriptive statistics on the online survey. We report the number of observations and the mean for the entire sample and differentiate between respondents with high and low political interest. The last two columns report a t-test comparing the average support for each statement between low and high respondents in terms of political interest.

5 Final remarks

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.

Distortions come at a cost, which can range from the economic cost of over- or under provision to the the psychological cost of voters electing politicians they (ideologically) disagree

with. Yet also the broader societal cost of political instability is relevant here, as populist polarisation can lead to intensification of conflict and even the potential break-up of the federation. A relevant question then becomes how a federation could prevent this outcome, and mitigate the costs.

One obvious solution would be to weaken the regional ties of federal politicians, who would then have the incentive to design policies benefiting the entire federation, and not just their own countries or regions. In the EU context, this might imply the creation of a pan-European constituency to elect some EU deputies and/or the requirement of a minimum number of countries where a party should be forced to run. This would turn the EU into a mixed electoral system, similarly to other federal entities as Mexico, Germany, Italy or South Africa, in which both proportional and majoritarian electoral systems coexist.

Implementing this solution in the EU would certainly not be easy. Among other things, it would require politicians campaigning in different countries and different languages. The voters may lose interest if they cannot clearly identify with certain parties. However, on the plus side, it would put debates on the opportunities and challenges of the union squarely in the spotlight, which can only contribute to the creation of a shared political sphere any democracy relies on.

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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: $|K| = 2$.⁵¹ We abstract from the discussion or formal analysis of why a given coalition forms between two of the three regions.⁵² Following the previous notation and without loss of generality $K = \{f, g\} \subset R$. Furthermore, we denote by $z \in R \setminus K$ 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,⁵³ and neglect the trivial case of a coalition of regions of the same kind, which inevitably leads to a corner equilibrium.⁵⁴ 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):

$$\max_{\{c_k, x_k\}_{k \in K}} \sum_{k \in K} \beta_k \hat{U}_k - F_k = \sum_{k \in K} \beta_k [c(C_k) + \hat{x}_k X(G_k; X_k)] - F_k; \quad (20)$$

and the first order condition is:

$$\frac{\partial}{\partial c} = 0; \quad (21)$$

with $\frac{\partial}{\partial x} = \beta_f \hat{\Delta} x_2^f(G; X) + \beta_g \hat{\Delta} x_2^g(G; X)$:

Eq. (21) is the counterpart of Eq. (9). The main difference between them is that with two regions $\Delta = \Delta$ while in the 3-region case $\Delta = \Delta \cup \Delta_z$.

Proposition 3 compares the choice of the federal government in the case of two and three regions (respectively $|R| = 2$ and $|R| = 3$). For that, denote by 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 ($R^2 > R^3$). The opposite ($R^2 < R^3$) is true when the region excluded loses 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

⁵¹The 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.

⁵²We briefly come back to this point in appendices B and C, where we test the robustness of our model against that.

⁵³Region 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.

⁵⁴When 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 $\tau^2 > \tau^3$. 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 $\tau^3 > \tau^2$.

Despite not being part of the federal coalition, region Z has an (indirect) effect on the equilibrium policy τ . Lemma 4 shows how and when it happens.⁵⁵

Lemma 4. *When region Z (the one out of the coalition) loses from the policy ($\Delta_Z < 0$), the marginal impact of τ_k and $\hat{\tau}_k$ on the federal policy τ (respectively $\frac{\partial \tau}{\partial \tau_k}$ and $\frac{\partial \tau}{\partial \hat{\tau}_k}$) 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 $\mathcal{C}^l(C_Z) = \frac{m}{Z} x_1^l(G_Z; X_Z) = 0$. Eqs. (22) to (23) implicitly define the preferences of the median voter in region k , in terms of the local tax τ^k (Eq. 22) and of the representative selected to join the federal legislature $\hat{\tau}^k$ (Eq. 23).

$$x_1^l(G; X) = \frac{\tau^k \hat{\tau}^k \Delta^2 x_2^l(G; X) x_{1,2}^{ll}(G; X)}{\tau^k \hat{\tau}^k \Delta^2 x_{2,2}^{ll}(G; X) + \tau^k \hat{\tau}^k \Delta^2 x_{2,2}^{ll}(G; X)} = \frac{\mathcal{C}^l(C)}{m} \quad (22)$$

$$\frac{\tau^k (\Delta x_2^l(G; X))^2}{\tau^k \hat{\tau}^k \Delta^2 x_{2,2}^{ll}(G; X) + \tau^k \hat{\tau}^k \Delta^2 x_{2,2}^{ll}(G; X)} = \frac{2}{m} (\hat{\tau}^k)^m. \quad (23)$$

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 (τ^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 (τ^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).

⁵⁵For a graphical representation, see Fig. 2 at Page 18.

Notice that when region r is aligned with z , then $\frac{(\Delta_r)^2}{(\Delta)^2} < 1$, while $\frac{(\Delta_r)^2}{(\Delta)^2} > 1$ when r is not aligned with z . Then, Proposition 4 can be restated in the following way: whenever $\frac{(\Delta_r)^2}{(\Delta)^2} > 1$, mark-up μ_r is larger in the 3-region case and μ_z is smaller, hence the ratio $\mu_r = \mu_z$ increases. Whenever $\frac{(\Delta_r)^2}{(\Delta)^2} < 1$, mark-up μ_r is smaller in the 3-region case and μ_z is larger, hence the ratio $\mu_r = \mu_z$ 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 $\frac{(\Delta_r)^2}{(\Delta)^2} > 1$ from different space perspectives.

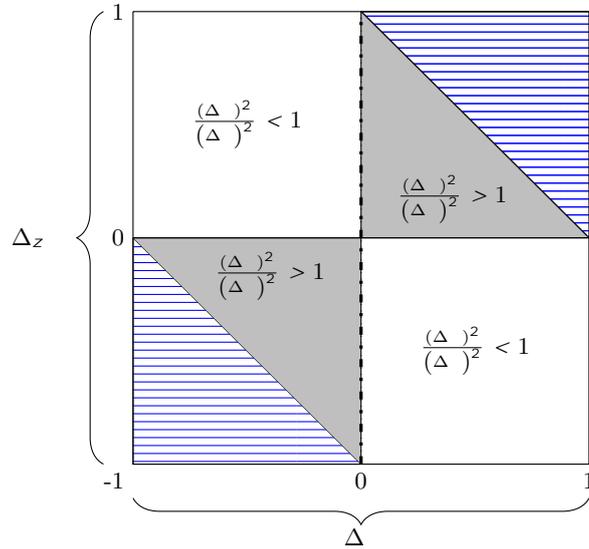


Figure 8: Distortion of $\hat{\mu}$ in the (Δ, z) space

White areas represent combinations of Δ_r such that regions r and z are both of the same type (recipient or contributor) and therefore the distortion of $\hat{\mu}$ is smaller in the 3-region setting. Conversely grey areas represent combinations of Δ_r such that regions r and z are of opposite type and therefore the distortion of $\hat{\mu}$ 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 $\text{sgn}(\Delta_r) = -\text{sgn}(\Delta_{-r})$. Fig. 10 allows to identify in the $\Delta_r; \Delta$ space which are the areas (white) in which r and z are of the same type and those (grey) in which r and z are of opposite type.

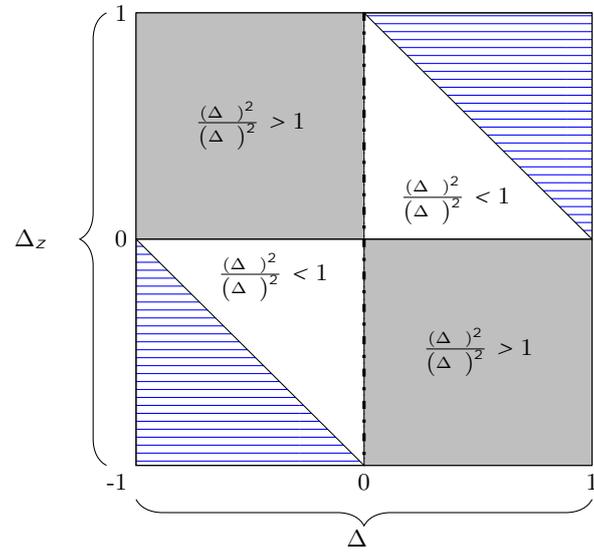


Figure 9: Distortion of $\hat{\Delta}$ in the (Δ, z) space

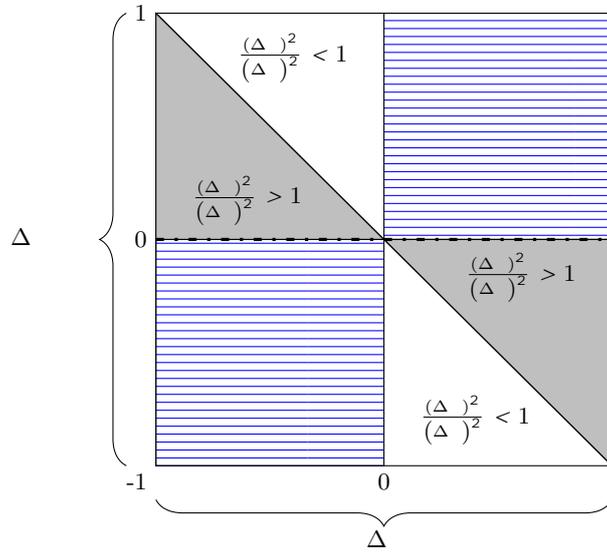


Figure 10: Distortion of $\hat{\Delta}$ in the (Δ, Δ) space

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 ρ_k to the fact that their elected politician will be able to impact federal policy-making, and thus the federal policy intensity – as previously described, whereas with probability $1 - \rho_k$ they will not influence the federal government’s decisions at all. In this latter case the federal policy will consequently be exogenously set at $\hat{\tau}$.⁵⁶

There can be several ways to rationalise such beliefs. Voters may think – or correctly anticipate – that $1 - \rho_k$ is the probability that a coalition forms, but with their own representative kept out of the formation process.⁵⁷ Another possibility could be that voters believe the federal government has not full discretion over τ 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 τ , or at least to a lesser degree. In this sense, voters are incorrectly anticipating τ , so that probabilities ρ_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.⁵⁸ Clearly, one may think that ρ_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 ρ_k varies.

Conditional on the politician being able to influence τ , 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

⁵⁶Notice 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 τ .

⁵⁷We 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 ρ_k relates to endogenous federal decision-making and $1 - \rho_k$ to a setting where τ is exogenously set ($\hat{\tau}$).

⁵⁸See e.g. Thorlakson (2009) and the references therein.

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

Lemma 5. *Eqs. (24) to (25) implicitly define the preferences of the median voter in region k , in terms of the local tax t_k (Eq. (24)) and of the representative selected to join the federal legislature \hat{x}_k (Eq. (25)).*

$$\rho_k \hat{x}_k^l(G; X(\cdot)) = \frac{\rho_k \hat{x}_2^l(G; X(\cdot)) \hat{x}_{1,2}^{ll}(G; X(\cdot))}{\rho_k \hat{x}_{2,2}^{ll}(G; X(\cdot)) + \rho_k \hat{x}_{2,2}^{ll}(G; X(\cdot))} \frac{1}{A} + (1 - \rho_k) \hat{x}_1^l(G; X(\hat{x})) = \frac{c^l(C)}{m} + \frac{\rho_k \hat{x}_2^l(G; X(\cdot))^2}{\rho_k \hat{x}_{2,2}^{ll}(G; X(\cdot)) + \rho_k \hat{x}_{2,2}^{ll}(G; X(\cdot))} = \frac{2}{m} \hat{x}_k^m. \quad (24)$$

$$(25)$$

From Lemma 5, we immediately obtain that Proposition 1 still holds. Eq. (25) is identical to Eq. (14), with the exception that the left hand side of Eq. (25) is multiplied by $\rho_k \in [0; 1]$, from which we immediately conclude that the equilibrium distortion of \hat{x}_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 ρ_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 3. This is the equivalent of Corollary 1, but then in the more general setting allowing for varying voter beliefs.

Corollary 3. *The strategic voting of the median voter – assigning beliefs to the effectiveness of federal representation – is characterised by*

$$\frac{\hat{x}_k^l(G; X(\cdot))}{\hat{x}_k^m} = \frac{\rho_k \hat{x}_2^l(G; X(\cdot))^2}{\rho_k \hat{x}_{2,2}^{ll}(G; X(\cdot))} = \dots \quad (26)$$

Corollary 3 sheds more light on how beliefs captured by ρ_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 ρ as compared to ρ , the higher the relative mark-up of distortion $\frac{\hat{x}_k^l(G; X(\cdot))}{\hat{x}_k^m}$ in Corollary 3.

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 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 τ : 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.⁵⁹ 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 (2019), 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 $\hat{\tau}_k$ 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 τ . 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 $\hat{\tau}_r$ to potentially join the federal government. Then, a formateur is randomly selected: each delegate $\hat{\tau}_r$ 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

⁵⁹The bargaining power of the formateur within the coalition may vary substantially depending on the bargaining system (Ali et al., 2018). Weight (λ_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 $\hat{\tau}$ 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 ($\tau = \bar{\tau}$) 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 ($\tau = \underline{\tau}$).⁶⁰ 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 $\hat{\tau}$. The formateur's preference to form a coalition with the smallest $\hat{\tau}$ 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 $\bar{\tau}$. Utility of the median voter in region r then becomes

$$U_r^m(\bar{\tau}) = c(C_r) + \frac{m}{r} X_r(\bar{\tau}) \quad r \neq \hat{r} \quad \frac{m}{r} > 2 \quad (27)$$

⁶⁰Clearly, 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 $\hat{r} = \frac{m}{r}$. 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{r} . In such a 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.⁶¹ 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 $\tau^3(\hat{r}_k)$, with

$$\tau^3(\hat{r}_k) = \arg \max_{k \in K} \frac{1}{3} c(C_k) + \frac{2}{3} \tau^2(\hat{r}_k) \quad F_k : \quad (28)$$

The median voter's utility in this case is:

$$U_r^m(\tau^3(\hat{r}_r)) = c(C_r) + \frac{m}{r} \tau^2(\hat{r}_r) \quad r = \hat{r} = \frac{m}{r} : \quad (29)$$

Hence, when electing the federal representative by maximising Eq. (29), 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. (27) and Eq. (29) subsequently, and given the probability of becoming the formateur, first period optimisation in region r boils down to

$$\max_{\tau_r, \hat{r}_r} U_r^m(\tau^3(\hat{r}_r); E) = \frac{1}{3} U_r^m(\tau^3(\hat{r}_r)) + \frac{2}{3} U_r^m(E); \quad (30)$$

subject to

$$C_r = (1 - \tau_r) Y_r; \quad (31)$$

$$G_r = \tau_r Y_r; \quad (32)$$

Eq. (30) simplifies to

$$\max_{\tau_r, \hat{r}_r} U_r^m = c(C_r) + \frac{1}{3} \frac{m}{r} \tau^2(\hat{r}_r) + \frac{2}{3} \frac{m}{r} \tau^2(E) \quad r = \hat{r} = \frac{m}{r}; \quad (33)$$

which is the isomorphic equivalent of Eq. (62), and consequently also serves as a first example of a possible micro-foundation for the more general case developed in Appendix B.

⁶¹More specifically, the setting for the formateur region is isomorphic to the case when β and Z are of the opposite type, while for the region that is not the formateur, the setting corresponds to the one in which β 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 τ does not depend on the type $\hat{\tau}_r$ 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 τ^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:

$$U_r^m(\tau^E) = c(C_r) + \frac{m}{r} \times G_r; X_r(\tau^E) \quad \tau^E = \hat{\tau}_r \quad \frac{m}{r}^2 : \quad (34)$$

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. (34) 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 $\hat{\tau}$. 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 $\bar{\tau}$ is selected to form a coalition. Negotiations will

proceed as before, by maximising joint utility, so that the resulting federal tax $\tau^{-3}(\hat{\tau}; \bar{\tau})$ is defined as

$$\tau^{-3}(\hat{\tau}; \bar{\tau}) = \arg \max_{\tau} [c(C_k) + \tau X(G; X(\tau))] - F_k + \tau_k [c(C_k) + \bar{\tau} X(G; X(\bar{\tau})) - F_k] \quad (35)$$

where subscript k denotes the formateur.

Denote by $i = f1; 2g$ the two regions that are of the same kind. Then their maximisation problem boils down to

$$\max_{t_i; \hat{\tau}_i} U_i^m(E; \tau^{-3}(\hat{\tau}; \hat{\tau}_i)) = \frac{2}{3} U_i^m(E) + \frac{1}{3} U_i^m(\tau^{-3}(\hat{\tau}; \hat{\tau}_i)) \quad (36)$$

subject to

$$C_i = (1 - t_i) Y_i \quad (37)$$

$$G_i = t_i Y_i \quad (38)$$

where Eq. (36) simplifies to

$$\max_{t_i; \hat{\tau}_i} c(C_i) + \frac{2}{3} \tau X(G_i; X_i(E)) + \frac{1}{3} \tau X(G_i; X_i(\tau^{-3}(\hat{\tau}; \hat{\tau}_i))) - \hat{\tau}_i - \frac{m}{i} \tau^2 \quad (39)$$

The FOC with respect to $\hat{\tau}_i$ is then $\frac{1}{3} \frac{m \tau X(G_i; X_i(\tau^{-3}(\hat{\tau}; \hat{\tau}_i)))}{\tau^{-3}(\hat{\tau}; \hat{\tau}_i)} \frac{\tau^{-3}(\hat{\tau}; \hat{\tau}_i)}{\tau} = 2 \hat{\tau}_i - \frac{m}{i}$. Define $\bar{\tau}_i$ as the implicit solution to

$$\frac{\tau X(G_i; X_i(\tau^{-3}(\hat{\tau}; \bar{\tau}_i)))}{\tau^{-3}(\hat{\tau}; \bar{\tau}_i)} \frac{\tau^{-3}(\hat{\tau}; \bar{\tau}_i)}{\tau} = 6 \bar{\tau}_i - \frac{m}{i} \quad (40)$$

when $\frac{\tau^{-3}(\hat{\tau}; \bar{\tau}_i)}{\tau} \neq 0$.

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 $\hat{\tau}_i = \max\{f_i^m; \min\{\bar{f}_1; \bar{2}g\}$, where $i = f1; 2g$ and \bar{f}_1 and $\bar{2}g$ are defined by Eq. (40).*

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 $\max\{f_1^m; \frac{m}{2}g\} < \min\{\bar{f}_1; \bar{2}g\}$.

Proposition 5 shows that, if $\hat{m}_i < \min\{\bar{f}_1; \bar{2}g\}$, the elected candidate in region $i = 1, 2$ is $\hat{m}_i = \hat{m}_i$, 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 $\hat{m}_i < \min\{\bar{f}_1; \bar{2}g\}$ 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 $\hat{m}_i > \min\{\bar{f}_1; \bar{2}g\}$, instead, the elected candidate in region i is $\hat{m}_i = \min\{\bar{f}_1; \bar{2}g\}$. 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 $\hat{m}_i > \hat{m}_i$.

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

$$\max_{k \in K} \prod_k \hat{U}_k F_k = \prod_{k \in K} \left[c(C_k) + \hat{X}(G_k; X_k) F_k \right]; \quad (41)$$

subject to

$$C_k = (1 - t_k) Y_k; \quad (42)$$

$$G_k = t_k Y_k; \quad (43)$$

$$X_k = P(\Delta) \Delta_k; \quad (44)$$

so that we get the following first order condition

$$\hat{\Delta} P'(\Delta) X_2^0(G; P(\Delta) \Delta) + \hat{\Delta} P'(\Delta) X_2^0(G; P(\Delta) \Delta) = 0; \quad (45)$$

Since $\Delta = \Delta$, it follows that

$$f \hat{X}_2^0(G; P(\Delta) \Delta) - \hat{X}_2^0(G; P(\Delta) \Delta) = 0; \quad (46)$$

Eq. (46) implicitly defines the equilibrium value for Δ . Applying the implicit function theorem, we obtain:

$$\frac{\partial \Delta}{\partial f} = \frac{\frac{\partial f}{\partial \Delta}}{\frac{\partial f}{\partial \Delta}} = \frac{\hat{X}_2^0(G; P(\Delta) \Delta)}{\hat{X}_2^{00}(G; P(\Delta) \Delta) + \hat{X}_2^{00}(G; P(\Delta) \Delta) \Delta P'(\Delta)}; \quad (47)$$

Taking into account that $X_{2,2}^{00}(\Delta) < 0$, while $\hat{X}_k; \hat{Y}_k; X_2^0(\Delta)$ and $P'(\Delta)$ are all positive, the sign of Eq. (47) only depends on Δ . More generally: $\text{sgn} \frac{\partial \Delta}{\partial f} = \text{sgn}(\Delta_k)$.

Similarly, we obtain

$$\frac{\partial \Delta}{\partial G} = \frac{\frac{\partial f}{\partial G}}{\frac{\partial f}{\partial \Delta}} = \frac{\hat{X}_{1,2}^{00}(G; P(\Delta) \Delta)}{\hat{X}_2^{00}(G; P(\Delta) \Delta) + \hat{X}_2^{00}(G; P(\Delta) \Delta) \Delta P'(\Delta)}; \quad (48)$$

and

$$\frac{\partial \Delta}{\partial t} = \frac{\frac{\partial f}{\partial t}}{\frac{\partial f}{\partial \Delta}} = \frac{\hat{Y} X_{1,2}^{00}(G; P(\Delta) \Delta)}{\hat{X}_2^{00}(G; P(\Delta) \Delta) + \hat{X}_2^{00}(G; P(\Delta) \Delta) \Delta P'(\Delta)}; \quad (49)$$

The sign of Eqs. (48) and (49) is: $\text{sgn} \frac{\partial \Delta}{\partial G} = \text{sgn} \frac{\partial \Delta}{\partial t} = \text{sgn} \frac{X_{1,2}^{00}(G; P(\Delta) \Delta)}{\Delta}$.

□

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

$$\max_{t_k, \hat{k}} U_k = c(C_k) + \frac{m}{k} X(G_k; P(\Delta_k)) \quad k \in \hat{k} \quad \frac{m}{k} > 0; \quad (50)$$

subject to Eq. (46) and

$$C_k = (1 - t_k) Y_k \quad (51)$$

$$G_k = t_k Y_k \quad (52)$$

so that we get the following first order condition for t_k

$$c'(C_k) Y_k + \frac{m}{k} X_1^l(G_k; P(\Delta_k)) Y_k + \frac{m}{k} X_2^l(G_k; P(\Delta_k)) \Delta_k P^l(\Delta_k) \frac{\partial}{\partial t_k} = 0; \quad (53)$$

which, using Eq. (49) for $k = \hat{k}$ yields

$$c'(C_{\hat{k}}) Y_{\hat{k}} + \frac{m}{\hat{k}} X_1^l(G_{\hat{k}}; P(\Delta_{\hat{k}})) Y_{\hat{k}} + \frac{m}{\hat{k}} X_2^l(G_{\hat{k}}; P(\Delta_{\hat{k}})) \Delta_{\hat{k}} P^l(\Delta_{\hat{k}}) \frac{\partial}{\partial t_{\hat{k}}} = 0; \quad (54)$$

$$\frac{m}{\hat{k}} X_1^l(G_{\hat{k}}; P(\Delta_{\hat{k}})) = \frac{m \frac{\partial}{\partial t_{\hat{k}}} X_2^l(G_{\hat{k}}; P(\Delta_{\hat{k}})) X_{1,2}^{00}(G_{\hat{k}}; P(\Delta_{\hat{k}}))}{\frac{\partial}{\partial t_{\hat{k}}} X_{2,2}^{00}(G_{\hat{k}}; P(\Delta_{\hat{k}})) + \frac{\partial}{\partial t_{\hat{k}}} X_{2,2}^{00}(G_{\hat{k}}; P(\Delta_{\hat{k}}))} = c'(C_{\hat{k}}); \quad (55)$$

For \hat{k} , we obtain the following first order condition

$$\frac{m}{\hat{k}} X_2^l(G_{\hat{k}}; P(\Delta_{\hat{k}})) \Delta_{\hat{k}} P^l(\Delta_{\hat{k}}) \frac{\partial}{\partial \hat{k}} - 2 \hat{k} (\hat{k} - \frac{m}{\hat{k}}) = 0; \quad (56)$$

which, using Eq. (47) for $k = \hat{k}$ yields

$$\frac{m \frac{\partial}{\partial \hat{k}} (X_2^l(G_{\hat{k}}; P(\Delta_{\hat{k}})))^2}{\frac{\partial}{\partial \hat{k}} X_{2,2}^{00}(G_{\hat{k}}; P(\Delta_{\hat{k}})) + \frac{\partial}{\partial \hat{k}} X_{2,2}^{00}(G_{\hat{k}}; P(\Delta_{\hat{k}}))} = 2 (\hat{k} - \frac{m}{\hat{k}}); \quad (57)$$

□

Proof of Proposition 1 and its corollary. The first order condition with respect to \hat{k} , as shown in Eq. (56), is $\frac{m}{\hat{k}} c'(C_{\hat{k}}) \Delta_{\hat{k}} \frac{\partial t_{\hat{k}}}{\partial \hat{k}} - 2 \hat{k} (\hat{k} - \frac{m}{\hat{k}}) = 0$.

When a region is neither a beneficiary nor a bearer of the federal policy ($\Delta_k = 0$), Eq. (56) reduces to

$$2 \frac{m}{\hat{k}} (\hat{k} - \frac{m}{\hat{k}}) = 0; \quad (58)$$

Hence, for an equilibrium to exist, we must have that $\hat{k} = \frac{m}{\hat{k}}$, 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.

As long as $\Delta_k \neq 0$, rewriting Eq. (57), we obtain

$$\frac{! (x_2^0(G; P(\cdot)\Delta)) ^2}{! \hat{x}_{2,2}^0(G; P(\cdot)\Delta) + ! \hat{x}_{2,2}^0(G; P(\cdot)\Delta)} = \frac{2 (\hat{\cdot}^m)}{m}; \quad (59)$$

Since $x_{2,2}^0(G; P(\cdot)\Delta_k) < 0$, the left-hand side is always positive and hence a solution can only exist if $\hat{k} > \frac{m}{k}$. Hence, in equilibrium, the elected federal representative will always have a weakly stronger taste for the public policy than the median voter.

Finally, Eq. (15) is simply obtained by combining Eq. (59) computed respectively for region and .

$$\frac{! (x_2^0(G; P(\cdot)\Delta))^2 =}{! (x_2^0(G; P(\cdot)\Delta))^2 =} = \frac{(\cdot)}{(\cdot)}. \quad (60)$$

□

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 , we assume that choices in region are given, with local representative being $\hat{\cdot}$.

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

$$R^s > R^n > R^m = 0 \text{ when } x_{1,2}^0 > 0,$$

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

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 , it immediately follows that $t^s > t^n > t^m$ if and only if $x_{1,2}^0 > 0$, while $t^m > t^n > t^s$ if and only if $x_{1,2}^0 < 0$.

□

Proof of Proposition 3. Using $\Delta = \Delta \Delta_z$ in Eq. (21), we obtain

$$\Delta ! \hat{x}_2^0(G; X) ! \hat{x}_2^0(G; X) = ! \hat{x}_2^0(G; X) \Delta_z \quad (61)$$

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 is set at the two-region equilibrium level.

3. Finally, we show that the left hand side is decreasing in Δ_z .

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

1. Since $! \hat{x}_2^l(G; X)$ 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 $! \hat{x}_2^l(G; X) - ! \hat{x}_2^l(G; X)$ corresponds to f in Eq. (9) and, hence, it's by construction equal to 0 for $\Delta = \Delta^2$, that is, when the federal policy is the one chosen when $|R^j| = 3$.

3. $\frac{\partial \Delta}{\partial k} f = ! \hat{x}_{2,2}^{ll}(G; X) P^l(\Delta^2) - ! \hat{x}_{2,2}^{ll}(G; X) P^l(\Delta) \Delta$. Notice that the first term is always negative, because by assumption $x_{2,2}^{ll}(G; X)$. The second term has three negative components: the initial sign, $x_{2,2}^{ll}(G; X)$ and $\Delta \Delta$, where the latter is negative because the two terms have always opposite sign. Hence, $\frac{\partial \Delta}{\partial k} f < 0$.

If we evaluate Eq. (61) at $\Delta = \Delta^2$, 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 Δ_z , if $\Delta_z > 0$, for the left hand side to be positive we need $\Delta^3 < \Delta^2$. If, instead, $\Delta_z < 0$, for the left hand side to be negative we need $\Delta^3 > \Delta^2$.

□

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

$$\frac{\partial \Delta^3}{\partial k} = \frac{!_k \Delta_k x_2^l(G_k; X_k)}{! \hat{\Delta}^2 x_{2,2}^{ll}(G; X) + ! \hat{\Delta}^2 x_{2,2}^{ll}(G; X) - P^l(\Delta)}$$

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

$$\frac{\partial \Delta^2}{\partial k} = \frac{!_k x_2^l(G_k; X_k)}{! \hat{x}_{2,2}^{ll}(G; X) + ! \hat{x}_{2,2}^{ll}(G; X) - \Delta_k P^l(\Delta)}$$

$\frac{\partial \Delta^3}{\partial k} > \frac{\partial \Delta^2}{\partial k}$ if

$$\frac{\Delta_k}{! \hat{\Delta}^2 x_{2,2}^{ll}(G; X) + ! \hat{\Delta}^2 x_{2,2}^{ll}(G; X)} > \frac{1}{! \hat{x}_{2,2}^{ll}(G; X) + ! \hat{x}_{2,2}^{ll}(G; X) - \Delta_k}$$

Without loss of generality, we assume that $k = 1$ and solve separately for $\Delta > 0$ and $\Delta < 0$.

When $\Delta > 0$ and $\Delta < 0$, we obtain $\Delta^2 > \Delta^2$. Since $!_k \Delta_k = 0$, the condition is satisfied if and only if $\Delta_z < 0$.

When $\Delta < 0$ and $\Delta > 0$, we obtain $\Delta^2 < \Delta^2$. Since $!_k \Delta_k = 0$, the condition is satisfied if and only if $\Delta_z < 0$.

The same can be done with

$$\frac{\partial^3}{\partial t_k^3} = \frac{!_k \hat{\Delta}_k Y_k X_{1,2}^{\theta\theta}(G_k; X_k)}{! \hat{\Delta}^2 X_{2,2}^{\theta\theta}(G; X) + ! \hat{\Delta}^2 X_{2,2}^{\theta\theta}(G; X) P^\theta(\cdot)}$$

□

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

$$\frac{!(\Delta X_2^\theta(G; X))^2}{! \hat{\Delta}^2 X_{2,2}^{\theta\theta}(G; X) + ! \hat{\Delta}^2 X_{2,2}^{\theta\theta}(G; X)} > \frac{!(X_2^\theta(G; X))^2}{! \hat{X}_{2,2}^{\theta\theta}(G; X) + ! \hat{X}_{2,2}^{\theta\theta}(G; X)}$$

which immediately simplifies to

$$\Delta^2 > \hat{\Delta}^2:$$

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

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

$$\max_{t_k, \hat{X}_k} U_k = c(C_k) + \rho_k X_k^m(G_k; X_k(\cdot)) + (1 - \rho_k) X_k^m(G_k; X_k(\hat{\cdot})) \quad k \in K \quad m > 2; \quad (62)$$

subject to

$$C_k = 1 - t_k Y_k \quad (63)$$

$$C_k = t_k Y_k \quad (64)$$

where we use t_k to denote the federal tax implicitly defined by Eq. (9), in order to distinguish it from \hat{t}_k , which represents the federal tax when exogenously set.

The first order condition for t_k is

$$\rho_k X_1^\theta(G_k; X_k(\cdot)) + \frac{\Delta_k P^\theta(\cdot) X_2^\theta(G_k; X_k(\cdot))}{Y_k} \frac{\partial}{\partial t_k} + (1 - \rho_k) X_1^\theta(G_k; X_k(\hat{\cdot})) = \frac{c'(C_k)}{m}; \quad (65)$$

which, using Eq. (10) for $k = i$ yields Eq. (24).

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

$$\rho_k X_2^m(G_k; X_k(\cdot)) - \Delta_k P^\theta(\cdot) \frac{\partial}{\partial \hat{t}_k} - 2 X_k^m(\hat{X}_k) = 0; \quad (66)$$

which, using Eq. (12) for $k = i$ yields Eq. (25). □

Proof of Proposition 5. From the first order condition, it immediately follows that the solution is $\hat{X}_i = X_i^m$, whenever $\frac{\partial^{-3}(\hat{X}_i)}{\partial \hat{t}_i} = 0$, 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{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 $\bar{1} < \bar{2}$. Then, by Proposition 1, either we have $\max\{f_1^m; g_2^m\} < \bar{1} < \bar{2}$, or $f_1^m < \bar{1} < g_2^m < \bar{2}$. Finally, notice that, for each region i , preferences are single-peaked around:

\bar{i} , conditional on being part of the coalition,

f_i^m , conditional on being left out of the coalition.

Start from a candidate equilibrium in which region 1 chooses $\hat{1} = \bar{1}$. Then region 2 will be left out of the coalition for any $\hat{2} > \bar{1}$, in which case, conditional on remaining out of the coalition, the best response will always be to select $\hat{2}$ to be as close as possible to f_2^m . This implies choosing $\hat{2} = f_2^m$ if $f_2^m > \bar{1}$. However, if $f_2^m < \bar{1}$, the median voter in region 2 may choose $\hat{2} = \bar{1}$ and remain out of the coalition, or may decide to undercut and choose $\hat{2} < \bar{1}$, in order to get closer to f_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 $\bar{2}$, which implies to increase $\hat{2}$, and they can do so up to $\hat{2} = \bar{1}$. Consequently, any deviation above or below $\bar{1}$ is not profitable.

Suppose, instead, that we start from a candidate equilibrium in which region 2 chooses $\hat{2} = \bar{2}$. Then region 1 will be left out of the coalition for any $\hat{1} > \bar{2}$. In such cases, conditional on remaining out of the coalition, the best response will always be to select $\hat{1}$ to be as close as possible to f_1^m . This implies choosing $\hat{1} = \bar{2}$ (remember that $f_1^m < \bar{1} < \bar{2}$). Suppose that region 1 decides to move further close to f_1^m , the moment they move below $\bar{2}$, region 1 is selected to form the coalition and will as a result want to move as close as possible to $\bar{1}$. Because $\hat{2} = \bar{2}$, then region 1 can choose $\hat{1} = \bar{1}$ and be part of the coalition, which is what is optimal for them. Then region 1 will choose $\hat{1} = \bar{1}$ and we are back to the situation previously analysed, where we showed that region 2 will choose $\hat{2} = \begin{cases} f_2^m; & \text{if } f_2^m > \bar{1} \\ \bar{1}; & \text{if } f_2^m < \bar{1} \end{cases}$ and this concludes the proof.

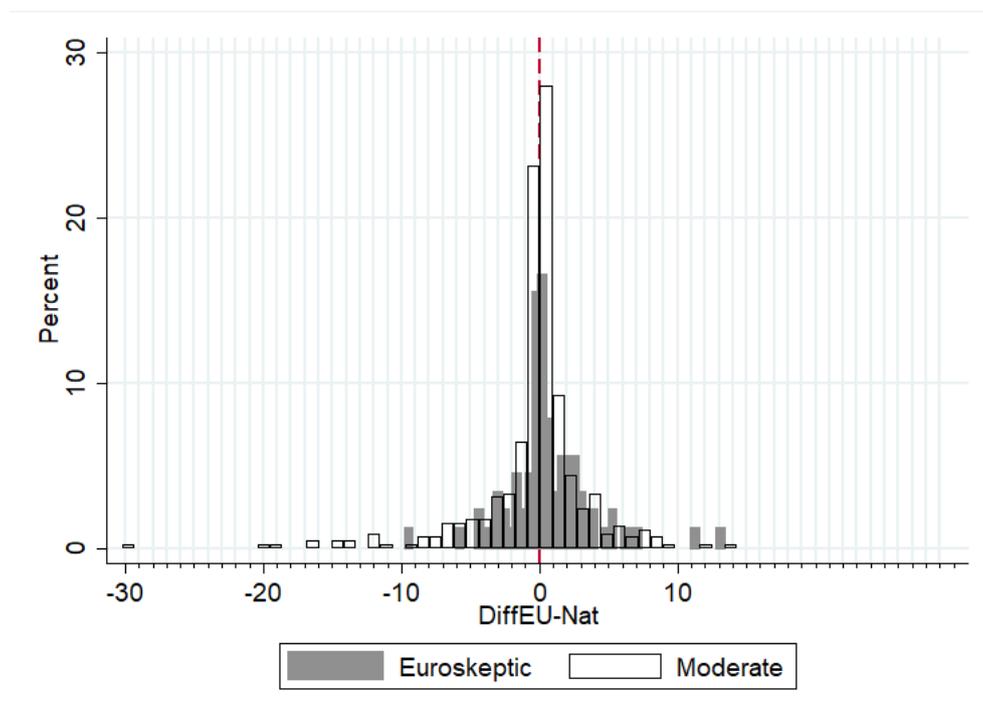
□

Appendix E Additional Empirical Results

Table 5: Summary Statistics

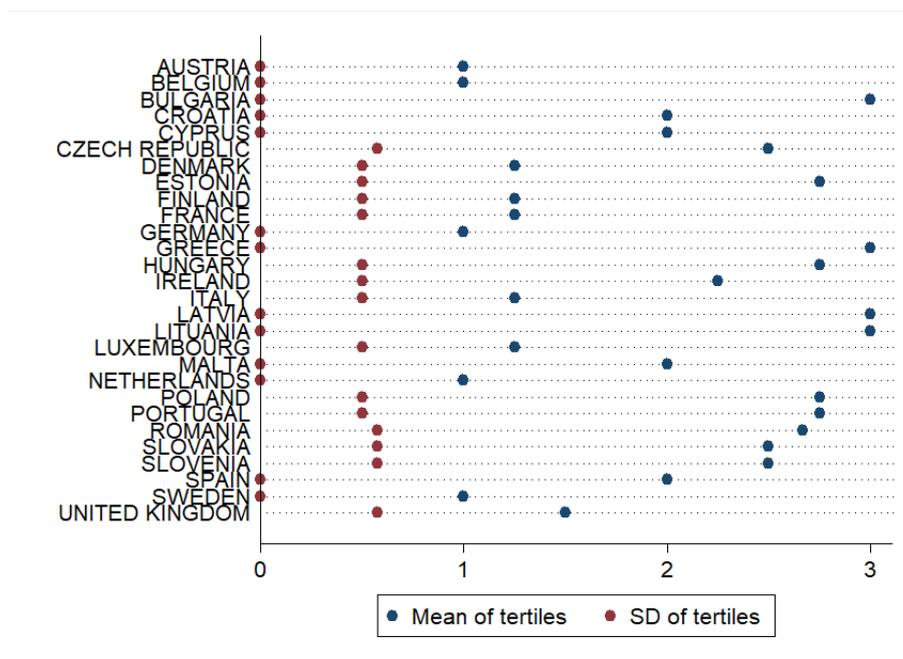
Variable	Mean	Std. Dev.	N
DiffEU-Nat	-0.307	5.117	1138
DiffEU-Nat (Winsorized .01)	-0.324	4.618	1138
Eurosceptic	0.166	0.372	1138
Extreme	0.129	0.336	1138
Diff Turnout	21.253	13.952	1135
Party Size	9.096	10.942	1138
Incumbent	0.095	0.293	1138
% Net Contribution/GNI (2000-2015)	0.668	1.188	1138
Net Contribution 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



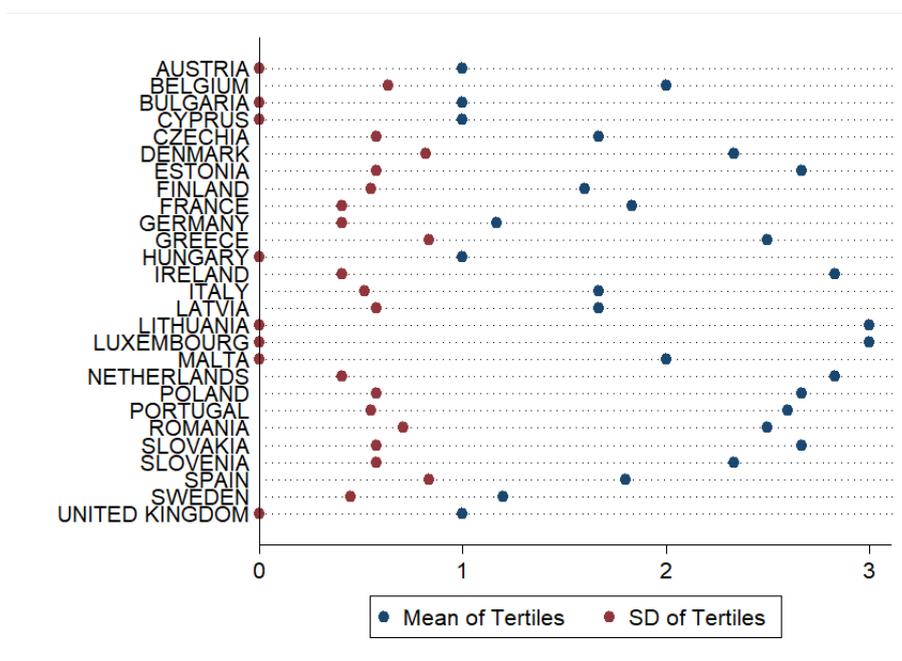
The figure shows the distributions of votes for parties at European and at National elections in the period 1990-2013, differentiating between Eurosceptic and not-Eurosceptic parties. The analysis is based on a 10-year window.

Figure 12: Net Transfers *from* the EU as % of GNI (2000-2015): mean and standard deviation across tertiles



For each 5-year period, we place a country in a tertile depending on the net-transfers to the EU. We then calculate the average position across tertiles in the entire period (blue dots) and the standard deviation (red dots). The very low values of the standard deviations highlight countries' stickiness to a specific tertile across time.

Figure 13: Perceived Benefit from EU membership: mean and standard deviation across tertiles



For each 5-year period, we place a country in a tertile depending on the perceived benefits from being into the EU (i.e. similarly to Table 3). We then calculate the average position across tertiles in the entire period (blue dots) and the standard deviation (red dots). The very low values of the standard deviations highlight countries' stickiness to a specific tertile across time.

Table 6: Eurosceptic Voting at EU vs National Elections: Winsorized Dependent Variable

	Baseline				Heterogeneity			
Eurosceptic	1.751*** (0.511)	1.774*** (0.507)	1.840*** (0.554)	1.604*** (0.549)	2.098** (0.772)	2.129*** (0.764)	2.459*** (0.814)	1.981** (0.731)
2 nd tertile					0.592 (0.425)	0.581 (0.431)		
3 rd tertile					-0.187 (0.465)	-0.147 (0.453)		
Eurosceptic*2 nd tertile					-2.340** (0.889)	-2.349** (0.884)	-2.715*** (0.946)	-2.309** (1.004)
Eurosceptic*3 rd tertile					1.069 (1.054)	1.043 (1.043)	0.489 (1.175)	1.054 (1.232)
Diff Turnout	-0.0120 (0.00864)	-0.0105 (0.00883)	0.00539 (0.0125)		-0.0133 (0.00910)	-0.0114 (0.00916)	0.00586 (0.0126)	
Proportional Voting	0.573 (0.896)	0.624 (0.871)			0.515 (0.953)	0.579 (0.923)		
Party Size				-0.0882*** (0.0295)				-0.0894*** (0.0289)
Incumbent				-0.622 (1.122)				-0.571 (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

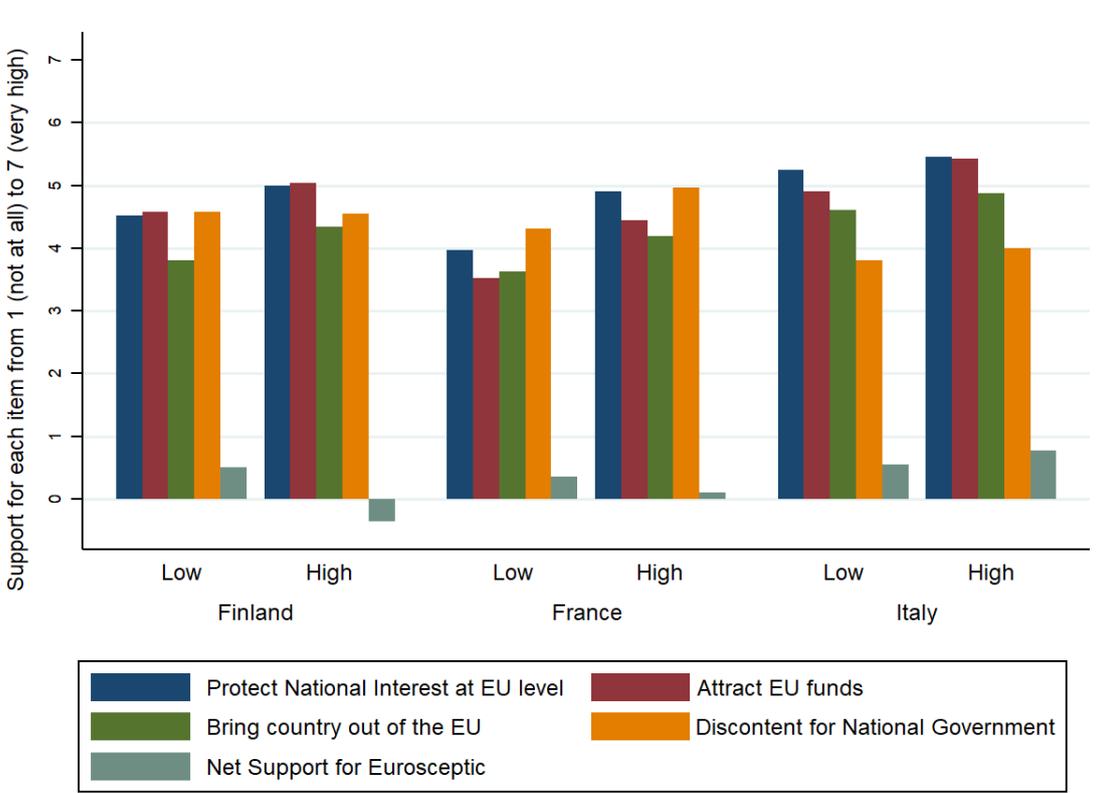
Note: The Table reports OLS coefficients and Robust Standard errors in brackets. The dependent variable is *Di EU-Nat* (i.e. the difference in party vote shares between European and National elections winsorized at 1% level); *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *Di 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 7: Eurosceptic Voting at EU vs National Elections: alternative 5-year period definition

	Baseline				Heterogeneity			
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)	
Proportional Voting	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 DI_{EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *DI 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.

Figure 14: Online Survey results



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

Table 8: Eurosceptic Voting at EU vs National Elections: 10-year time window

	Baseline				Heterogeneity			
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)	
Proportional Voting	-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 Di_{EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *Di 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 9: Eurosceptic Voting at EU vs National Elections controlling for Radical parties

	Baseline				Heterogeneity			
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)
Radical	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)	
Proportional Voting	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 Di_{EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *Di 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). *Radical* is a dummy set equal to 1 for radical left/right parties. *** p<0.01, ** p<0.05, * p<0.1.

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

	Baseline				Heterogeneity			
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)	
Proportional Voting	-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 DI_{EU-Nat} (i.e. the difference in party vote shares between European and National elections); the 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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *DI 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.

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 as well as the new member states, being on the opposite side of the same coin.⁶²

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 11. 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 (*2nd 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 *Euro sceptic*2nd tertile*Post 2004*, to look at whether our effects change before/after 2004. Indeed, the negative sign of *Euro sceptic*2nd tertile*Post 2004* suggests that our effects are mostly driven by the period following the EU enlargement.⁶³ Nevertheless, we find a negative effect also in the period

⁶²As a consequence of this, individuals in net-contributors might lose trust towards EU institutions, and in turn, vote more for Euro sceptic parties.

⁶³This negative effect is driven by both control groups, i.e. countries in the first and the third tertile (results available upon request).

before the enlargement, as shown by *Eurosceptic*2ndtertile*. Those results provide support for the idea that voters support even more Eurosceptic representatives after a federal expansion, reacting to an increased distance between (perceived) winning and losing positions.⁶⁴

Table 11: Eurosceptic Voting at EU vs National Elections: Effects Over Time

	Baseline Post-2004				Heterogeneity Post-2004			
Eurosceptic	1.203*** (0.401)	1.228*** (0.399)	1.426*** (0.435)	0.904** (0.442)	1.466*** (0.463)	1.489*** (0.464)	1.755*** (0.514)	1.231** (0.523)
Post 2004	-0.147 (0.331)				-0.264 (0.389)			
Eurosceptic*Post 2004	0.917 (0.623)	0.914 (0.620)	0.794 (0.653)	1.222* (0.697)	1.609** (0.761)	1.606** (0.760)	1.520* (0.804)	1.893** (0.864)
2 nd tertile					0.556 (0.472)	0.533 (0.474)		
2 nd tertile*Post 2004					0.206 (0.655)	0.182 (0.659)	-0.0997 (0.813)	
2 nd tertile*Eurosceptic					-1.325 (0.871)	-1.317 (0.848)	-1.516* (0.875)	-1.544* (0.925)
Eurosceptic*2 nd tertile*Post 2004					-2.079* (1.220)	-2.088* (1.209)	-2.151* (1.253)	-1.886 (1.341)
Diff Turnout	-0.0139 (0.0105)	-0.0131 (0.0106)	0.0144 (0.0112)		-0.0142 (0.0111)	-0.0132 (0.0112)	0.0147 (0.0113)	
Proportional Voting	0.604 (0.958)	0.648 (0.961)			0.671 (0.955)	0.725 (0.957)		
Party Size				-0.0935*** (0.0282)				-0.0939*** (0.0280)
Incumbent				-0.611 (1.027)				-0.537 (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 *Di EU-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; *Proportional Voting* is a continuous index of the degree of dis-proportionality of the electoral system; *Di 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.

⁶⁴This finding holds also when considering tertiles based on absolute contributions to the EU (results available upon request).