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

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Abstract

Regional differences within a federation often imply that member states have opposing interests, with federal policies leading to competing camps (winners and losers) willing to act strategically. We show that median voters, therefore, have an incentive both to distort local policies and to elect federal representatives that are excessively protective of regional interests. This latter distortion is U-shaped in expected benefits. We do not observe the usual race to be included in the federal coalition, which would mitigate distortions. We confirm some of the model's predictions using European data. Hence, federalism may foment polarisation: we suggest ways to mitigate that.

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1 Introduction

Federal systems of government can successfully manage complex and diverse societies. They are not immune, however, to the political instability that is increasingly putting democratic institutions under pressure. Polarisation and extremism are on the rise all over the globe. While economic and cultural insecurity of voters are certainly driving this process,[1] we will argue that a federal structure of governance produces an additional (strategic) motive for voters to elect extreme candidates.

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 separately cast their vote for different levels of government, which allows them to act differently (i.e. use different strategies) in each political arena. Second, nationwide (federal) policies inevitably affect lower-level voting districts (henceforth, regions), which can lead to competing interests between regions.

Federations are better equipped, among other things, to absorb externalities or to exploit economies of scale and of scope. Potential members agree to form and remain in a federation as long as the benefits are larger than the costs. Oates (1972) seminal contribution and the literature that followed has shown that decentralisation, within a federation, introduces flexibility and allows to better deal with local needs (including political accountability). However, the rationale for a federation is to coordinate and rule over the whole set of regions, inevitably restricting their discretion. Alesina et al. (2005) discusses the optimal balance between centralisation and decentralisation.

In some cases, all regions benefit from a federal policy, however, in many other cases the 'greater good' requires that some regions benefit while some are hurt. This becomes evident in the many contexts in which the heterogeneity across regions leads to opposing local goals.[2] Typically, the balance of environmental policies is likely to be negative in regions that rely heavily on emission-intense industries, while positive for regions relying on nature-tourism. Similarly, regions with young and not yet competitive firms may benefit from some level of protectionism, while internationally-competitive firms would benefit from free trade. Other compelling examples would include labour-market and financial-market regulations, migration policies, as well as debt and fiscal policies or tax harmonisation.

All of these dividing policies push regions' interests in opposite directions, so that two opposing camps form: 'winning' regions and 'losing' regions. This gives voters good reason to act strategically. In our model, we focus exclusively on these kind of policies and assume

[1] Voters demand more short-term protection, the argument goes, when they start feeling insecure because of economic shocks, migration, austerity or automation. We cite the main studies in our literature review below.

[2] Such heterogeneity may be eradicated in underlying fundamentals. Economic background, natural resources or social capital inevitably translate into different impacts of federal policies depending on the region.

that all regions benefit enough from the federation not to question their own participation.[3]

Our theoretical model explains why voters have the strategic incentive to elect what we will call 'extremely protectionist' politicians: to defend their interests in federal negotiations, when regional goals are diverging. Interestingly, whether they believe their region is benefitting or losing from a federal policy turns out to be irrelevant. Even though voters from 'winning' regions want to scale up the policy and voters from 'losing' regions want to scale it back, both types elect similarly extreme politicians to bring this about. 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. Moreover, voters have another card up their sleeve: in all regions they vote for sub-optimal local policies, to make their bargaining position even stronger. All of these elements set our model apart from previous work.

We validate our predictions by comparing national and European Parliamentary elections. Our empirical analysis confirms that voters select more extreme representatives when it comes to supranational elections. Furthermore, data reproduce the U-shaped relationship predicted by the model: strategic voting is stronger in regions that are expected to 'benefit' or 'lose' more. We complement our analysis with a small-size survey run in Finland, France and Italy, which confirms the presence of strategic voting attempts to steer federal negotiations.

We conclude that it's possible to reduce the incentive to vote for extreme representatives. One option is to cut the ties between federal MPs and regions, for example by introducing a union-wide electoral district.[4] Another is to decrease the ex-ante pivotal character of elected representatives, by reducing the required qualification for a majority to act.

For the sake of exposition, we propose a simplified version of the model in Section 2.1, assuming that the ruling coalition includes all the regions. It is important to stress, first of all, that results are robust to the several extensions presented in Section 2.2 and Appendices A and B, but the simplified framework allows to disentangle and track the different driving forces of the model. Furthermore, while unanimity is quite infrequent as a decision rule, one could also argue that having all regions represented in the ruling coalition could be achieved by a coalition of representatives of similar political colour elected in different regions. Appendices A and B are important complements to the model in Section 2, for they show that the mechanism survives when the coalition formation is endogenous and, therefore, regions may compete with each-other to be part of it.

The empirical analysis is performed using European data for several reasons. To begin with, the EU is the largest supranational federation and, more importantly, it is extremely diverse both in terms of the countries that belong to it (hence, their interests are often

[3]In other words, policies that benefit all regions (together with possible side-transfers) are substantial enough to justify some losses when it comes to divisive policies.

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

diverging) and in terms of the set of political parties that run for election.[5] The European Parliament, directly elected by all citizens of the union, equally share legislative and budgetary powers with the Council.[6] By being the only elected European institution, the Parliament is the only instrument that citizens may use to directly influence European politics.

The fact that certain federal policies have opposite impacts on members applies in many different contexts for the EU too. For example, if migrant workers pay local taxes, attractive regions will benefit from any federal policy supporting the free movement of workers. Less attractive regions facing labour outflows will be harmed. Migration, illustrated in the left panel of Fig. 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.[7] An analogous picture appears in the central panel of Fig. 1, looking at the credit ratings of EU countries. Periphery countries (in red) 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 Fig. 1, when considering EU cohesion and agricultural funding. Again the periphery countries stand to gain as net recipients (in red) from such a funding scheme, whilst the core countries are contributors (in green). Similar demarcations have emerged during the Eurocrisis in 2012-2015 and in the handling of the COVID-19 crisis.[8]

In these and many other examples, including environmental and energy policies, certain regions are (perceived as) benefitting or losing 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 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.[9]

One key innovation of our model is that we account for the fact that such spatial heterogeneity directly maps into the impact of federal policies: a region either benefits or is harmed, possibly to different degrees. This drastically changes bargaining at the federal level and, in

[5]For instance, in 2019 a total of about 180 different political parties were represented in the parliament!

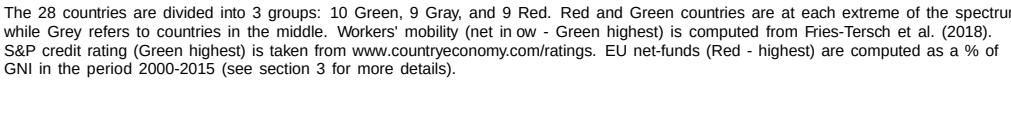
[6]MPs continuously bargain over common policies, ranging from regulation of labour migration to a common budget – which in 2018 amounted to 160 billion Euros – to the integration of bailout mechanisms such as the European Stability Mechanism (ESM) into Community law.

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

[8]The 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.

[9]These factors are very hard to change even in the medium run. E.g. federal regulation aimed at promoting pro-civic behaviour comes at the cost of restricting individual freedoms and 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.

Figure 1: Maps of the EU depending on Mobility (left), Credit Rating (middle), EU Net-Funds (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 in ow - 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-funds (Red - highest) are computed as a % of GNI in the period 2000-2015 (see section 3 for more details).

turn, voting behaviour as well. Indeed, when regions have opposite goals the set of districts on each side is xed and federal negotiations on the policy centres 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 bene tting and harmed 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 in uence the size of the pie. For bene tting regions this means more pronounced support of the federal policy in question, and vice-versa for the losing regions. As a result, median voters are willing to incur the ideological, reputational and e ciency costs of electing a tough negotiator with more extreme preferences than their own. In equilibrium, all regions 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.

In our model, citizens in each region cast their vote both in regional and federal elections, in a `citizen-candidate' setting. The federal government is a coalition of regionally elected politicians. Policy decisions are made in a cooperative way: coalition members reach a mutually advantageous agreement, defending the interests of their respective regions. Bargaining in the federal legislation thus re ects regional considerations, which is often observed in real-world federations (Rodden et al., 2003). Indeed, we can expect region-oriented bargaining to direct most of federal policy-making whenever federal decisions follow more from consensus than a simple majority voting rule, if (locally elected) federal politicians behave as regional representatives.[10] Regional and federal policies may be complementary or substitutive of each

[10] The direct representation of regions in any central government can also be seen as a by-product of the electoral process. Federal MPs are elected in each region of the federation: if a coalition forms around a given

other. Median voters anticipate how the federal policy is negotiated and, through regional politicians, takes advantage of it when setting local policies. Indeed, they make (socially) ine cient decisions 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 idea that the federal policy works in favour of a xed set of regions and against some others,[11] unlike theories that rely on a shift in self-categorisation into an identity [12] { which would then be centred on the regional identity dimension. We demonstrate (Appendices A and B) that the strategic motive persists when voters are not sure their representative will belong to the federal coalition. In particular, voters do not engage in a race to enter the coalition, which could reduce or eliminate the distortion. It is never pro table to elect a more moderate representative with the sole objective of entering the coalition, as long as the coalition includes representatives from both sides. The usual incentive, commonly observed in the pork-barrel literature, to elect a more accommodating representative to improve chances of making it into the coalition, therefore, disappears.

Our model suggests that federal MPs are more protective of national interest when it comes to the implementation of federal policies, which may equally translate into left- or right-wing extreme platforms. For our main empirical analysis, we use the categorisation of Eurosceptic parties from Algan et al. (2017) to identify political parties which are extremely protective of their own national interests. Such parties usually campaign on a platform of protecting the interests of the member state in question (Colantone et al. 2019).[13] We then analyse party performances from 1990 onward 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. Following our theoretical predictions, we expect strategic voting behaviour to mark EP elections but leave national elections una ected.

The model predicts a similar behaviour in both bene tting and harmed regions, non-linearly increasing in the region's stakes. To proxy for that, we cluster EU member states in three groups: `harmed', `bene tting' and neutral. In our main speci cation we use members' EU net-funds, as depicted in the right panel of Fig. 1 (top contributors in green, top recipients in red). We believe that funds, being easier to observe than other policies, are a proper proxy for voters' winning/losing perceptions of EU policies. Our theoretical model, however,

political platform, most likely it would include all MPs of a given colour elected in di erent regions. As such, most or all regions will be represented.

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

[12] See Gennaioli and Tabellini (2019) and the references therein.

[13] E.g. think of Syriza (Greece), Podemos (Spain), AfD (Germany), Front National (France), or Lega (Italy).

refers more generally to any divisive policy, beyond the redistribution of EU funds: what matters there is voters' perceptions about winning or losing, regardless of how congruent with reality those are.[14] For robustness, we replicate our results using Eurobarometer survey data, grouping countries according to average beliefs of bene tting from EU membership.

The model's prediction is con rmed that voters elect relatively more Eurosceptic delegates to the European parliament as compared to national elections.[15] Our results apply to both sides of the political spectrum and are robust to di erent speci cations, de nitions of the key variables and a broad set of controls. Crucially, and fully in line with our predictions, we only nd this Eurosceptic support di erential in net losing and net winning member states, but not in countries where EU bene ts 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.

We also investigate whether people splitting their ticket (i.e. voting for di erent parties) are doing so because of the strategic reasons we propose: our small online survey, rolled out in Italy, France and Finland, suggests that this explanation is at play.

In what follows, Section 2 presents the theoretical model, whilst the empirical analysis is reported in Section 3. Section 4 concludes. Appendices A and B extend the theoretical model, proofs are all in Appendix C. Finally, Appendix E complements and extends the empirical analysis while the online survey results are set out in Appendix D. Before moving to the presentation of the model, we review the related literature and underline what di erentiates our work from it.

Related literature

Our model rationalises why we observe more strategically-protective voting behaviour in elections for higher layers of government as compared to lower levels. The existing literature on this issue is quite thin. In the EU context, there is some evidence suggesting that voters vote for di erent parties at the national and European level. Studying regularities rst observed by Reif and Schmitt (1980), the `Second-Order' conjecture suggests that voters send signals to their representatives using elections that they consider to be of second-order relevance. This could rationalise most odd voting behaviours at any election. Schulte-Cloos (2018) and the literature therein support the second-order conjecture in an empirically non-causal manner. We propose a solid theoretical framework that provides a complementary explanation for why

[14] It is often argued that the bene ts 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 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'.

[15]

voters should act differently depending on the type of election. Our empirical test suggests that data are compatible with our predictions, including the U-shaped distortion that the second-order theory is not able to explain. 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 documents that elected members of Congress are more extreme than their constituency. The authors mainly focus on the lack of convergence towards the median voter, showing that extremists are over-represented on both sides of the spectrum. The authors neither relate their results to the second-order conjecture nor to any specific attitude or characteristic of voters. The theoretical analysis in Krasa and Polborn (2018) explains the difference in extremism between local and national policy positions when the end-goal of voters is securing a national majority. Inversely, in our model the strategic reflex of voters is to mitigate the objectives of federal coalition partners that are in an opposite camp. The two driving forces nicely complement each other. Our predictions coincide with those of Enikolopov and Zhuravskaya (2007) to the extent that stronger national parties undercut the regional ties of federal representatives. 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 relates closely to the rich theoretical literature on federalism, legislative bargaining and strategic delegation.[16] Most of the relevant-to-us literature belongs to either of two strands: the first includes the bargaining-oriented papers that, following the seminal paper of Schelling (1956),[17] focus on the bargaining process once a given coalition forms. The second includes the majoritarian-decision work where, following Ferejohn et al. (1987) and Chari et al. (1997),[18] the question is rather how a certain coalition is formed to begin with. In the first strand, a strong relative position is vital: voters have an incentive to delegate to an extreme negotiator that is more likely to obtain a good deal. Such incentive may further increase when side transfers are allowed (Harstad, 2008). 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 strands. The

[16] Within the literature on federalism, interested readers may look at Alonso et al. (2008); Kessler et al. (2011); Gancia et al. (2020) and the literature therein. Strategic delegation has been studied in many different contexts. A parallel 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.

[17] For 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. (2020) and the literature therein.

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

tension between what one can obtain in the coalition and the likelihood of being part of it is the crucial trade-o there.[19]

While our results coincide with the rst, bargaining-oriented strand in that the selected delegate is a more extreme negotiator, our mechanism is di erent in one crucial way. Both previous strands of literature consider an environment where being part of the coalition is essential: policies are tailored to ensure that all members in the coalition bene t from them (possibly to di erent extents), while excluded regions do not bene t from them (or only marginally). In our model we take a very di erent approach: the set of regions that bene ts or loses is orthogonal to the coalition composition, but is instead an attribute of the policy. As a result, coalition members may have opposite objectives, yet share similar objectives with some regions that are excluded from the coalition. For instance, countries will either bene t or lose from an open migration policy, regardless of their inclusion in the ruling coalition.

In that case, some districts in the coalition would accidentally protect the interest of those that do not belong to it. Districts are, therefore, equally protected if they belong to the coalition or if another district with aligned interests does instead. Crucially, choosing a milder negotiator would still increase the chances of belonging to the coalition, but it is no longer essential to be part of it. Indeed, when we consider the coalition formation process, the race to choose a mild negotiator is bounded. In sum, in a setting that is close to the family of majoritarian-decision papers, we still nd a tendency to select more extreme delegates. Further di erences 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, while in our model the size of the coalition doesn't matter. Buisseret and Bernhardt (2018) focus on international agreements and assume no commitment: agreements can be re-negotiated.[20]

Our paper also links into the recent literature on populism,[21] by providing an additional and complementary rationale for why voters might elect politically extreme candidates and, hence, why populism is on the rise. The current literature on populism includes, as a possible explanation, both economic and non-economic explanations. The former include globalisation (Colantone and Stanig, 2018), austerity (Fetzer, 2019), public nance mismanagement (Daniele et al., 2018), recessions and nancial crises (Algan et al., 2017), historical heritage

[19] In 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-o between public goods provision and targeted spending on pork projects. In our model there is no such trade-o , as redistributive shares are xed whilst the budget is endogenous, so that side-payments in the form of particularistic spending are ruled out.

[20] Our result that voting also has a strategic element, to constrain the options of federal negotiators in the future, is similar to the ndings of Hat eld and Padro 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.

[21] See Rovira Kaltwasser (2018) for a concise survey on populism.

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). The latter include the informativeness of the electoral campaign (Boleslavsky and Cotton, 2015) and cultural insecurity (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 re-positioned to jump into the niche (Rodrik, 2018b).[22] In our model, we provide a complementary explanation, where demand for extremely protectionist delegates is a direct consequence of the multi-level governance that provides incentives to voters to reward more extreme politicians.

Finally, 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 de nition in Kawai and Watanabe (2013), is a measure of the degree of misaligned voting[23]. 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. Citizens of r care about consumption of a private good C_r and a publicly provided one, which has both a local (monetary) component, G_r^{ℓ}, and a federal (possibly not monetary) one, G_r^{f}.

Each agent j in region r has a type $\theta_r^j > 0$ de ning the relative primacy of public provision in their utility. Agents' type can be heterogeneous within and across regions and can follow any distribution with positive support. Agents' utility also depends on the distance D_r between their type and the one of the politician that represents them.

The utility of voter j living in region r is then:

$$U_r^j = c(C_r) + \theta_r^j g\left(G_r^{\ell}; G_r^{f}\right) + D_r; \tag{1}$$

where the utility from consumption and public provision, respectively $c(:)$ and $g(:)$, are increasing and strictly concave functions.

Regions levy a proportional income-tax t_r that nances the local component of the publicly provided good G_r^{ℓ}. Private consumption C_r is equal to the after-tax disposable income.

$$G_r^{\ell} = t_r Y_r: \tag{2}$$

$$C_r = (1 - t_r) Y_r; \tag{3}$$

[22] If 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 Bursztyn et al. (2020) and Cantoni et al. (2019).

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

The federal component G_r^f has a much wider interpretation: we remain agnostic as to its concrete nature, which could be either material or immaterial (any federal law, regulation, policy or intervention affecting the value of the local component). G_r^f affects the value of public provision either positively or negatively.[24] We use $\in \{b; h\}$ to refer to regions that benefit from ($= b$) or are harmed by ($= h$) the federal component. Then, $R = \{R^b; R^h\}$ represents the (nonempty) subset of regions that either benefits or is harmed by the federal policy, with $R^b \cup R^h = R$. With a slight abuse of notation, subset R has cardinality $|R| = $. The federal component, as defined by Eq. (4), includes an intensive margin and an extensive margin $_r$:

$$G_r^f = \quad _r: \tag{4}$$

The intensive margin captures the magnitude of the federal policy and it is endogenously selected by the federal government. The extensive margin is positive ($_r = \ ^b > 0$) for $r \in R^b$ and negative ($_r = \ ^h < 0$) for $r \in R^h$.

Voters' dislike for being represented by politicians with type different from their own enters the utility function - Eq. (1) - as the distance D_r between the type of the agent ($_r^j$) and the one of their federal representative ($\hat{}_r$):

$$D_r = \quad _r \quad \hat{}_r \quad _r^j \quad ^2: \tag{5}$$

Hence, D_r describes the disutility of the political match as the distance between an agent's type and the type of their elected representative.[25] Parameter $_r$ measures political pragmatism: when small, voters are opportunistic (they care mostly about policies, not who implements them). Conversely, when large, voters are ideological and dislike very much being represented by someone with whom they do not share the same political views.[26]

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 $G_r^{\backprime}$. 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: the elected candidate in region has type $\hat{}_r$.

[24] Federal 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.

[25] See also Krasa and Polborn (2018) for similar modelling assumptions.

[26] Since regional policies are decided via direct democracy, Eq. (5) only captures the potential mismatch occurring at the federal level.

The federal government moves second: a coalition of federal representatives bargains on the level of parameter , which de nes the federal policy G_r^f according to Eq. (4). We allow for a randomly selected formateur to steer the formation process. Once the federal coalition is formed, decisions are taken cooperatively so that the federal policy maximises the joint utility of the coalition members. We denote by K R the set of regions that belong to the federal coalition.

Section 2.1 solves the grand coalition case (K = R), where all regions are included. This occurs when the institutional setting requires decision to be taken by unanimity, but it could also be interpreted as a coalition among all the elected representatives of a similar political colour from each of the regions (e.g. a selection, for each region, of the MPs located at the left of the political spectrum). We focus on the grand coalition case, despite being relatively uncommon as a decision method, for expositional convenience. Indeed, through subsequent extensions of the model, we will show that our results from the grand coalition setting are robust. Focusing on such a simpli ed framework makes it possible to disentangle the di erent driving forces of the model. Section 2.2 considers the case when one region is excluded from the coalition. Again, at this stage we keep the coalition formation exogenous, which allows us to appreciate the mechanical e ect of a decrease in the size of the coalition. Appendix A studies how voters react if they are unsure about their representative being part of the coalition. Finally, Appendix B studies the coalition formation case. The main results from the two appendices are summarised in Section 2.2.

Should MPs not be able to reach an agreement, they face 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 bene ts, wages, or more generally, all possible kinds of (ego)rents enjoyed simply by staying in o ce.

2.1 The Grand-Coalition Setting

Section 2.1.1 solves the model backward, starting with the choice of the federal coalition, after which we analyse the equilibrium in each region . Section 2.1.2 discusses the ndings.

2.1.1 Voting process

Federal politics We assume the federal government will seek the weighted utilitarian bargaining solution to decide on the magnitude of the federal intervention and, therefore, maximises:

$$\max \sum_{k2K} !_k \hat{U}_k \quad _k = \sum_{k2K} !_k \quad c(C_k) + \hat{}_k g \quad G_k^{\grave{}}; G_k^f \quad _k \; ; \tag{6}$$

where $\hat{U}_k$ is the utility of the representative elected in region k, that is obtained by rewriting Eq. (1) for $_k = \hat{}_k$. The weight of region k in the bargaining process is $_k$, while $_k$ 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 bene ts, with $_k = \begin{cases} 0; & \text{if a coalition is formed} \\ _k; & \text{otherwise} \end{cases}$. We assume $_k$ to be su ciently 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 this section.

How a speci c candidate rose to power in region k in period 1, in other words why they were elected, will be dealt with when we discuss the local voting mechanism. For now, it su ces to see that the utility of an elected legislator $\hat{U}_k$ is de ned by their appreciation of public and private consumption in their constituency, where $\hat{}_k$ in Eq. (6) de nes the relative weight assigned to the public good.

Deriving and rewriting the rst order conditions of the optimisation problem de ned by Eq. (6) and subject to Eqs. (3) to (4), the optimal intensive margin parameter is implicitly expressed by

$$\sum_{k2K} ! _k \quad _k \hat{}_k g_f^0 = 0 : \tag{7}$$

which leads to

$$^b \sum_{k2R^b} ! _k \hat{}_k g_f^0 = \quad ^h \sum_{k2R^h} ! _k \hat{}_k g_f^0 : \tag{8}$$

Eq. (8) implicitly captures how the federal intensive margin responds to regional decisions.[27] This will prove to be an important relation: indeed, based on it, Lemmas 1 and 2 show how the choice of responds to a change in local taxes $_k$ and on the type of the regional representatives $\hat{}_k$. The nature of such links depends on whether regional and federal policies are strategic complements ($g_f^{00} > 0$) or substitutes ($g_f^{00} < 0$).

Lemma 1. Given the optimal intensity of the federal policy , de ned by Eq. (8), for any region $k \in K$ we nd that

$$\frac{@}{@_k} = \frac{! _k \hat{}_k Y_k}{^{00}} \quad _k g_f^{00}; \tag{9}$$

where ^{00} is de ned as the second derivative with respect to of the federal maximisation problem in Eq. (6), taken in absolute value.[28] It follows immediately that

$$\text{sgn} \quad \frac{@}{@_k} = \text{sgn} \quad _k g_f^{00} \tag{10}$$

[27] Throughout the paper, subscripts $_`$ and $_f$ will refer to the partial derivative with respect to $G^`$ and G^f.

[28] Its value, obtained in the proof, is $^{00} = @ \sum_{s=\{b;h\}} (\ ^s)^2 \sum_{k2R^s} ! _k \hat{}_k g_{ff}^{00} A$.

Whenever regional and federal policies are strategic complements ($g_f^{00} > 0$), an increase of local public provision (G_k^L) in the benefitting (/harmed) region pushes the federal government to reinforce (/temper) its policy . All the opposite is true when regional and federal policies are strategic substitutes ($g_f^{00} < 0$).

Proof. See Appendix C. □

Lemma 1 shows when it is optimal for the federal government to boost the intensity of its policy ( ) following an increase in regional spending to finance the publicly provided good. Since regional spending erodes consumption (Eq. 3), the federal government compensates for the welfare loss when a region increases its local spending. This results in an increase of the federal policy when either i) the region benefits from it (= b) and the policies are strategic complements ($g_f^{00} > 0$) or ii) the region is harmed from it (= h) and the policies are strategic substitutes ($g_f^{00} < 0$). The federal policy decreases otherwise.

Lemma 2. Given the equilibrium intensity of federal public policy defined by Eq.(8), for any region $k \in K$ we find that

$$\frac{\partial}{\partial \hat{}_k} = \frac{!_k}{00 \ k} g_f^0; \tag{11}$$

with $\operatorname{sgn}\frac{\partial}{\partial \hat{}} = \operatorname{sgn}(\ _k)$. Hence, any increase in the taste for public provision of the representatives elected in a benefitting (/harmed) region, leads to an increase (/reduction) in the intensity of the equilibrium federal policy.

Proof. See Appendix C. □

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 benefitting (/harmed) region.[29] 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.

Local Elections 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.

[29] 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.

The voters' objective function, de ned by Eq. (1), is optimised under constraints imposed by Eqs. (3) to (5). Clearly, Eq. (1) meets all the requirements in Gans and Smart (1996) and therefore the median voter theorem applies. Lemma 3 presents the results of the maximisation.[30]

Lemma 3. Eqs. (12) and (13) implicitly de ne the preferences of the median voter in region k, in terms of the local tax t_k (Eq. 12) and of the representative $\hat{}_k$ selected to join the federal legislature (Eq. 13).

$$\frac{c^0(C_k)}{\substack{m\\k}} = g^0 + \frac{(\quad_k)^2 ! \ _k \hat{}_k g_f^0 g_f^{00}}{00} \tag{12}$$

$$\frac{(\hat{}_k \quad \substack{m\\k})}{\substack{m\\k}} = \frac{! \ _k}{2 \ _k \ 00} \quad _k g_f^{0\ 2}: \tag{13}$$

Proof. See Appendix C. □

2.1.2 Analysis and discussion

Here we analyse the previous results and discuss their policy implications, starting with the choice of local taxes. We then look at the distortion in the choice of federal representatives and nally move to the analysis of the possible consequences of entry, exit and gerrymandering.

Local tax distortion Eq. (12) implicitly de nes the preferred tax to nance local provision of the good. 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.

The rst benchmark corresponds to the case of myopic voters. Here, voters completely ignore all mechanisms at work at the federal level and act as if were xed. 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 $t_r()$ a ects the choice of , yet they do not anticipate that the choice of the elected politician ($\hat{}_r$) is also a ecting . The consequence of that is that naive voters elect the median voter to be their federal representative, hence $\hat{}_k = \substack{m\\k}$. This could happen if voters, for example, misunderstand the workings or e ectiveness of di erent federal institutions.

[30] Notice that in Eqs. (12) to (13) both $\hat{}$ 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 $\hat{}$ follows from the strategic and forward looking behaviour of the local median voter.

From Eq. (12), the `sophisticated' ($t_k^s$), `naive' (t_k^n) and `myopic' (t_k^m) tax rate are set implicitly by:

$$c'(C_k) \quad {}^{m}_{k}g' = \begin{cases} \frac{{}^{m}_{k} - {}^{\wedge}_{k}}{\theta''({}^{\wedge}_{k})} \, !_k \, (\quad_k)^2 \, g_f' g_f'' & \text{if sophisticated} \\ \frac{({}^{m}_{k})^2}{\theta''({}^{m}_{k})} \, !_k \, (\quad_k)^2 \, g_f' g_f'' & \text{if naive} \\ 0 & \text{if myopic} \end{cases} \tag{14}$$

Proposition 1 (Distortion in local taxes). Both in bene tting and harmed regions, the distortion of local taxes is always more pronounced with sophisticated voters than with naive ones, when taking the case of an exogenous federal policy (myopic equilibrium) as a benchmark.

Corollary 1. Both in bene tting and harmed regions, and when local and federal policies are strategic complements ($g_f'' > 0$), sophisticated voters over-tax locally, i.e. they set local taxes at higher levels than naive voters: $t^s > t^n > t^m$. Conversely, when local and federal policy are strategic substitutes ($g_f'' < 0$), sophisticated voters choose to under-tax locally, again to a larger extent than naive voters: $t^m > t^n > t^s$.

Proof. See Appendix C. □

Eq. (14) and Proposition 1 show that while the cost of distorting the vote is the same for everyone, sophisticated voters fully anticipate its marginal bene t and optimally calibrate the distortion. Sophisticated voters choose a sub-optimal combination of private consumption and local investment. As a result, their federal representative can claim that a further change (expansion or decrease) in the intensive margin would have a large impact on their region, as the marginal bene t from a change in the federal policy is arti cially heightened. This strengthens their bargaining position at the federal negotiating table. Naive voters under-exploit this bene t: by electing a moderate federal representative, any distortion in local taxes becomes less powerful in the hands of a representative with, as a result, reduced bargaining power. Myopic voters do not anticipate any bene t at all, hence they do not distort their vote.[31]

When the federal policy is exogenous, the bene t from distorting local taxes disappears. As a consequence, the myopic benchmark corresponds to the case of having an exogenous federal policy.

While Proposition 1 stresses the magnitude of the distortion, maximal for strategic voters and minimal for the myopic ones, Corollary 1 focuses on the direction of the distortion.

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

When federal and local policy are complements, the bene t comes from in ating 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 bene t 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.

It is important to notice that all regions behave (qualitatively) in the same way. That is, the sign of the distortion (too much or too little local provision) is independent of the type of region (i.e. of the sign of $_k$). Similarly, strategic voters distort more than naive voters in all types of region. The rationale is always the same: since the federation maximises the sum of the utilities of each representative, strategic voters will want to force the hand of the federation by moving the marginal utility of their representative in the `right' direction, hence increasing their incentive to obtain a better deal. This also shows directly in the choice of the federal representative, as we explain in what follows.

Selection of federal representatives Eq. (13) implicitly measures the distortion that materialises in terms of the type of the elected regional representative at the federal government. Suppose that a cooperative legislature of regionally elected representatives has to bargain over the intensity ( ) of federal policies (G_k^f): Proposition 2 and its corollary reveal the incentive to strategically delegate to more extreme federal representatives.

Proposition 2 (Strategic delegation). Median voters strategically elect candidates that are more protective of regional interest than them ($\hat{}_k > {}^m_k$) in all regions where federal political decisions (G_k^f) matters ($_k \neq 0$). If a region neither bene ts nor loses from the federal policy ($_k = 0$) then local elections are not distorted by strategic voting ($\hat{}_k = {}^m_k$).

Corollary 2. Consider regions and and denote by ($_k$) = ($\hat{}_k$ ${}^m_k$)$=$ ${}^m_k$ the mark-up in terms of $_k$, that is, the percentage increase in $_k$ from the median voter to the federal representative in region k. The strategic voting of the two median voters is characterised by

$$\frac{(\quad)}{(\quad)} = \frac{! \ (\quad g_f^0)^2 =}{! \ (\quad g_f^0)^2 =}; \tag{15}$$

Proof. See Appendix C. □

Proposition 2 shows that elected federal representatives always have a strictly-stronger preference for public provision than the median voter.[32] The median voter in each region is bound to select a representative with preferences di erent from theirs, despite the fact

[32] Conditional on their region's welfare being at stake.

that their utility depends negatively on the distance between their type and the elected representative type.

Indeed, the median voter anticipates the federal bargaining process. Lemma 2 states that the federal policy intensity is increasing in the type ($\hat{}_k$) of the representatives from bene tting regions and decreasing in the type of the representatives from harmed regions. From the median voter's perspective therefore, the cost of being represented by an extreme politician is o set by the increase in utility from public provision g(:). Higher $\hat{}_k$ types more gladly negotiate for higher, or lower federal intervention to bring the utility from public good consumption up. Knowing this in advance, voters turn this behaviour to their advantage by voting in precisely such types. Hence, median voters pre-commit to a more extreme stand to manoeuvre their representative in a { at least for them { more favourable bargaining position at the outset of negotiations.[33]

Importantly, the strategic voting predicted by Proposition 2 occurs both in winning and losing districts, but for di erent 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. Proposition 2 further shows that when federal policy has no consequence on the value of locally provided goods ($_k$ = 0), the level of federal intervention loses its strategic appeal to voters who will then vote sincerely. In the presence of some externalities of the federal policy, however, the question becomes which region will distort the elections the most, and why.

Corollary 2 further studies the political distortion, computed as the mark-up on $_k$. In particular, Eq. (15) compares the mark-ups between two regions. This allows us to understand the determinants of the distortion. A rst element to discuss is the ratio $!_k = _k$. Remember that $!_k$ re ects the bargaining power of a region within the federal coalition, while $_k$ represents the political opportunism of a region, that is, how much a region is willing to sacri ce their political preferences in exchange for a better deal. Clearly, a higher bargaining power (larger !) implies higher returns when distorting the type of federal representatives and, hence, larger incentives to do so. Similarly, higher political opportunism (smaller $_k$) implies lower costs of distorting the type of representatives and, hence, again larger incentives to distort.

Eq. (15) also leads to another interesting conclusion: suppose that regions and are of the same type (hence, =) and exhibit the same ratio $!_k = _k$. Eq. (15) simpli es to $\frac{(\ )}{(\ )} = g_f^0(\ ) = g_f^0(\ )^2$. It is immediate to conclude that, when goods are strategic complements ($g_f^{00} > 0$) the political distortion is increasing in local public provision G_k while the opposite

[33] The empirical analyses in Kedar (2005) and Lachat (2018) support Proposition 2, 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.

is true for strategic substitute goods ($g_f^{00} < 0$). The intuition for that goes along the same line as before: if G_k^{ℓ} and G_k^f are complements, an increase in local provision is increasing the benefits of influencing the federal policy, hence there is a stronger incentive to distort the type of the representative.[34]

Proposition 2 already showed that the distortions disappear when $\alpha_k = 0$, that is, when a region is neither benefitting nor harmed by the federal policy. However, it is not explicit about how the distortion varies, depending on the magnitude of benefits/costs. Proposition 3 sheds some light on that.

Definition. Let's measure the concavity of $g(G_k^{\ell}; G_k^f)$ with respect to the federal policy as

$$R(G_k^f) = \frac{\alpha_k g_{ff}^{00}}{g_f^0} \tag{16}$$

where Eq. (16) corresponds to the Arrow-Pratt measure of relative risk-aversion. $R(G_k^f)$ will prove particularly useful in Eq. (15) and Lemma 4.

Clearly, higher levels of concavity of $g(:)$ imply that the marginal benefit of influencing the federal policy has decreasing returns.

Proposition 3 (Non-linearity). Relative distortion across jurisdictions is U-shaped in α_k as long as $g(:)$ is not too concave ($R(G_k^f) < 1$). Instead, should g be highly concave, the relative distortion is decreasing in α_k.

Proof. See Appendix C. □

Proposition 3 indicates the conditions, in terms of convexity of function $g(:)$, that determine whether strategic delegation is U-shaped (increasing more than proportionally in benefits/costs). In particular, when $g(:)$ is not `too concave', the distortion is U-shaped, hence, both for benefitting and for losing regions the distortion increases disproportionally with their stakes. When $g(:)$ is instead highly concave, only harmed regions distort disproportionally more when they lose more, while benefitting regions distort marginally less when their benefit increases.

The empirical analysis (Fig. 5 and columns 5-8 in Table 1) will show that, at least in our sample, the distortion is clearly U-shaped, in line with the model predictions under the assumption of moderate concavity. When the distortion is U-shaped in benefits/costs, the federation faces a direct threat: the larger its `power' (expressed by α in the model, power could refer to the reach, depth, broadness or effectiveness of its activity) and the stronger the

[34] A typical example of strategic substitutability is when the federal policy is a transfer of money across regions. Then, Eq. (15) suggests that the poorest region will be more aggressive in the choice of the federal representative.

incentives to elect more extreme, populist, candidates that may undermine the survival of the federation. As a consequence, any increase in competence, reach or budget of the federation should be accompanied by a change in decision mechanisms to balance the potential raise in extremism. Our final remarks (Section 4) include some policy recommendations.

Entry, exit and gerrymandering within the federation 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 ($!$) is a primitive of the model that can hardly be modified by the legislator; 2) the level of interregional redistribution ($_k$) and the concavity of the federal objective function (^{00}) depend on the institutional setting and can be modified by the legislator but often it is a politically very costly task, however they may change (in quite unpredictable ways) when a jurisdiction changes in size or composition, or when new jurisdictions enter or exit the federation; 3) several attributes of the median voter in each jurisdiction (their preferences , the slope and concavity of their preferences over the publicly provided good, their income and their disutility from political diversity).

Changes in the boundaries of electoral constituencies (including practices such as mal-apportionment or gerrymandering) is a common practice in several countries, including the UK and the US. In the case of unions, such as the EU, it is less likely to expect a change in boundaries, however entry and exit of members is possible. Our model is not equipped to directly deal with such events. Nonetheless, it provides us with some partial insights that we discuss here.

Any change in the shape, size or number of electoral constituencies is likely to affect in unpredictable ways 3 elements of our model: $!_k$; $_k$ and ^{00}. The weight of each constituency within the federal government ($!_k$) is bound to change for each member of the government, every time that a change of districts occurs: we cannot say if it diminishes or increases for a given district, nor do we have reason to think that the change will be similar across districts in sign or magnitude. The extensive margin of the federal policy ($_k$) may also move in any possible direction: in the presence of spillovers across jurisdictions, the entry of a new player or the change in the internal boundaries may increase or decrease those spillovers. Finally, the curvature (^{00}) of the federal problem (Eq. 6) is the weighted average of the curvature of g(:) for each jurisdiction, hence any new region or a change in the existing ones would change ^{00}.

Summing up, any change in jurisdictions has unpredictable consequences on the value of $!_k$; $_k$ and ^{00}. Yet, we can learn something by looking at the consequences of a change in

those parameters, even if we cannot specify how events trigger the change.

Suppose that ω_k increases for one region. From Eqs. (12), (13) and (15) we immediately conclude that the direct effect of it is an increase in the mark-up (distortion of the type of the representative). Furthermore, local provision of goods (G_k) increases if and only if local and federal provision are complements ($g''_f > 0$).[35] To understand the effect on G_k, notice that an increase in ω_k reinforces the channels of the model, increasing the incentive to distort local provision (upward when goods are complement and downward when they are substitute).[36]

Suppose, instead, that a change in jurisdictions affects α_k. Lemma 4 reveals how the equilibrium intensity of the federal policy τ changes with α_k.

Lemma 4. The intensive margin τ is increasing in α_k if and only if $g(\cdot)$ is moderately concave ($R(G_k^f) < 1$).

Proof. See Appendix C. □

Hence, as long as $g(\cdot)$ is moderately concave, if an institutional change leads to an increase in α_k, then the intensity of the federal policy increases in equilibrium.

As for political distortion, Proposition 3 already unveiled the U-shaped relationship between α_k and the mark-up. One alternative way to understand its meaning is that, as long as $g(\cdot)$ is not too concave, any exogenous event will increase the political distortion in all regions if it makes $|\alpha_k|$ increase, that is, if it increases both the marginal damage (α^h) for harmed regions and the marginal benefit (α^b) for benefiting regions. An example would be the entry of a new poor member that produces positive externalities to already benefiting regions (e.g. market expansion or cheap labour force) while it negatively affects already harmed regions (e.g. fiercer competition).[37]

Notice also that a change in the number of jurisdictions (R) is inevitably affecting the degree of concavity of the federal objective function (g''). From Eq. (13), the distortion of representatives increases when the curvature of the function decreases, and vice-versa when the curvature increases.

[35] For the effect on G_k, notice that an increase in the right hand side of Eq. (12) implies a decrease in consumption of the private good, which is achieved by increasing the income tax that finances the local good.

[36] Mathematically, an increase in the right side of Eq. (12) calls for an increase in the left side, which is obtained by a decrease in consumption C_k and, hence, by an increase in the tax rate that finances the local public good.

[37] We focus, in our main discussion, on the case of $g(\cdot)$ being moderately concave, which is in line with our empirical results. Should $g(\cdot)$ be extremely concave, any exogenous event (say entry or exit of a region) increases the political distortion in all regions if it makes the extensive margin α_k decrease both for benefiting and harmed regions, i.e. we observe a decrease in both α^b and α^h. As an example, think of a policy consisting in some financial redistribution. The entry of a new poor region may imply simultaneously an increase in the contribution of rich regions (decrease in α^h) and a decrease in the benefit of the other poor regions (decrease in α^b).

Consequently, we can conclude that a change in the federal composition increases the degree of political distortion in all regions if and only if either a) it increases $|\ _k|$, with $g(:)$ moderately concave ($R(G_k^f) < 1$),[38] or b) it decreases ^{00}. The theoretical model remains agnostic on the sign of the change in $_k$, $!_k$ or ^{00} that a change in jurisdictions may trigger. As such, whether entry of new members increases or decreases polarisation remains a purely empirical question that future research may shed light on. For instance, eventually it may be possible to quantify the impact of Brexit on that regard.

Lastly, 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 a ect the identity of the median voter who, in turn, is the ultimate cause of the undesired distortions.[39] 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 e ects highlighted in our model may be ampli ed. 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 bene ts of gerrymandering, we claim that our channel, that operates through strategic delegation, should not be ignored.

2.2 Extensions

We extend the main model in three ways. We rst consider the case in which a coalition of $R \quad 1$ regions forms. Here, the set of regions that belongs to the coalition is still exogenous. This extension allows to appreciate the impact of a change that only depends on the coalition size. At the end of this section, we summarise the results from two additional extensions, available in Appendices A and B. In particular, in Appendix A we discuss the case of voters holding beliefs about the likelihood that their representatives will be able to in uence the federal policy. Finally, we introduce the endogenous coalition formation process in Appendix B and show that previous results hold.

The R-1 coalition We extend here the analysis by considering the case in which region q is excluded from the coalition: $K = R \setminus \{q\}$. We abstract here from the discussion or

[38] The corresponding condition, under $R(G_k^f) > 1$ would be that it decreases $_k$.

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

formal analysis of why a given coalition forms: we come back to this point in Appendices A and B, where we test the robustness of our model against that. We assume that $jR^b j > 1$ and $jR^h j > 1$, which guarantees that the coalition is never formed by only regions of one type.

The maximisation problem of the federal government looks the same as with the grand coalition (Eq. 6), the only difference being that set K doesn't include $f qg$ any longer. Hence, denoting the first derivative by $\_^0$, we can immediately compare the first order condition and, hence, the equilibrium value for under the two scenarios.

Proposition 4 (Impact of the coalition size). At the equilibrium, the federal policy's magnitude ( ) is larger under the grand-coalition setting than when the R-1 coalition forms ( ), if and only if the excluded region benefits from the federal policy ($_q > 0$).

Corollary 3. Whenever a region is excluded from the coalition, the marginal impact of a change in t_k and $\hat{}_k$ increases for regions in the coalition. Indeed, taking the absolute values $\frac{@}{@t_k}$ and $\frac{@}{@\hat{}_k}$, their magnitude increases when a region leaves the coalition.

Proof. See Appendix C. □

Figure 2: Intensive margin with grand coalition and with R-1 coalition

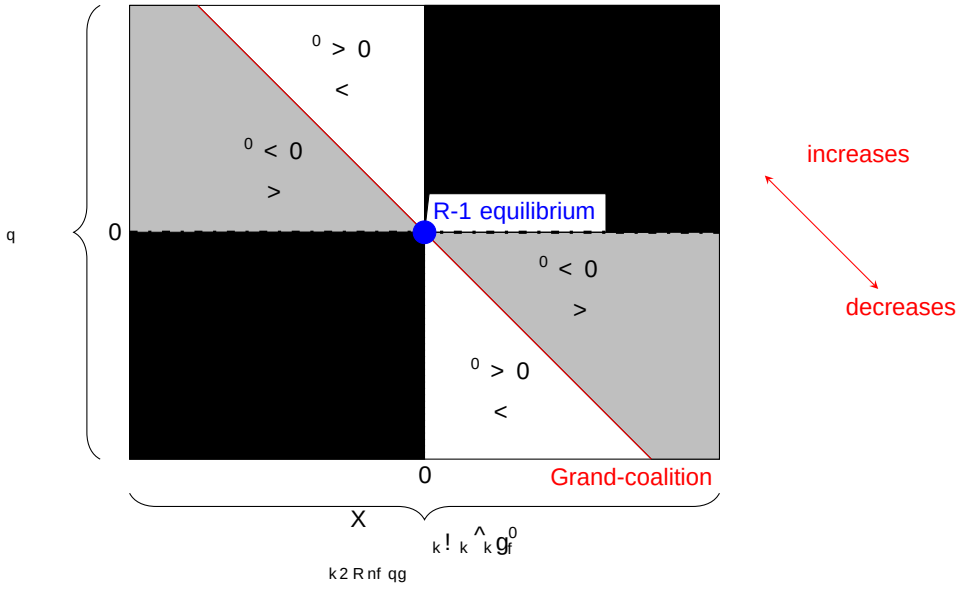


Fig. 2 depicts the result of Proposition 4. On the horizontal axis we have the sum of the marginal benefits from of all the regions other than q. On the vertical axis we find the extensive margin of regionq. The red line that cuts quadrants 2 and 4 corresponds to the equilibrium policy under the Grand-Coalition. Along this red line, moving top-left

corresponds to larger values of . From Appendix C moreover, we know that the point at the crossing of both axes with coordinates (0,0) corresponds to the equilibrium level of in the R 1 setting, with region q being excluded from the coalition. It follows immediately that is larger when q belongs to the coalition if and only if $_q > 0$. The white and grey areas coincide with o -equilibrium values of . Proposition 4 focuses on the choice of the federal government when region q is excluded from the coalition. The federal decision is taken by representatives with opposing interests, yet decisions are taken in a cooperative way. Not surprisingly, when one region is excluded from the negotiation process, the bargaining position of one side is weakened. In particular, when the excluded region bene ts from the federal policy, its exclusion leads to a decrease in federal intervention. On the opposite, when the excluded region is harmed by the policy, not sitting at the negotiation table implies that the implemented policy will expand.

With R 1 regions in the coalition, the interest of region q is represented within the federal government by other regions that share the same view, but their weight in the nal decision is diminished: the externality that the policy produces on region q is no longer internalised in the federal choice. This leads to the result behind Proposition 4.

Corollary 3 shows that once a region leaves the coalition, the marginal impact of distortion is larger for the remaining regions. However, this change in incentives a ects all regions equally, which is why the relative mark-up when comparing two regions in Eq. (15) is not changing as a consequence of being left out of the coalition. Second, and importantly, although political distortion is more e ective for regions that remain in the coalition after one region is left out, this does not imply that these regions will necessarily distort more. Indeed, two countervailing e ects are at play here. On the one hand, the same level of distortion now has a larger e ect, hence a given region can distort less and get the same result. On the other hand, precisely because the marginal e ect of distorting is larger this same region may want to distort more. We will see in what follows that the former e ect tends to dominate, since regions inside the coalition can now achieve their goal with less distortion, and distortion is costly.

When looking at local elections, it is immediate to notice that, as long as region q anticipates that they will be excluded from the coalition, their voting behaviour corresponds to the case of no federal government (which, as previously discussed, corresponds to the myopic case). Hence $c^0(C_q)$ $^m_q g^0 = 0$ and $\hat{}_q = {}^m_q$.

Strategic Behaviour and Beliefs Our main framework assumes that elected delegates have a certain say in federal negotiations. 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 A we relax both assumptions and assume that agents assign a region-speci c probability p_k to the fact that their representative will impact federal policy-making, namely the policy intensity . With probability 1 p_k, instead, they will not in uence the federal government's decisions at all and the federal policy will be exogenously set at ^.

There can be several ways to rationalise such beliefs. Amongst others, voters may believe that 1 p_k is the probability that a coalition forms, but with their own representative kept out of the formation process.[40]

In Appendix A we show that this has no qualitative impact on results. However, if agents believe that their choice does not always have an impact, their expected bene t from strategic voting is reduced and, following Lemma 5, they distort t_k and $\hat{}_k$ less.

Coalition formation Up to here, we disregarded the coalition formation process. However, we know from the literature (e.g. Harstad, 2005) that the formateur will try to form a coalition with the regions that are relatively inexpensive to persuade and this may lead to a race to the bottom, where regions soften their requests to increase the chances of being included in the coalition. Should this happen, our previous results about strategic distortion may disappear.

In Appendix B we add more structure and study the coalition-formation process. This makes the model more realistic and smoothly links our grand-coalition and R-1 coalition setting with the extension on beliefs (Appendix A). The endogenous coalition formation setup boils down to a set of probabilities of being part of the coalition, which only partially reduces the incentive to distort.

From this extension, we better understand three aspects of the model:

1. the formateur will indeed select the regions that are less demanding (cheaper to persuade), however, regions here have no incentive to undercut each other. The cheapest set of regions will keep distorting according to the previous patterns, while the others will distort just enough not to engage in a race with the regions included in the coalition.

2. the marginal bene t of distorting is increasing in the number of members in the coalition. Hence, the larger the coalition, the more pronounced the distortion in equilibrium;

3. mixed strategy cannot be optimal.

The rst outcome depends on the fact that regions are only interested in having someone that safeguards their interest, hence they care about the value of , but they do not care about being part of the coalition per se. Therefore, there is no race to the bottom in this context.

[40] We work out this micro-foundation of beliefs in Appendix B.

The second outcome clearly shows that regions inside the coalition will opt for lower levels of distortion as their numbers decrease, since the same nal policy can in that case be achieved at a lower cost. From a pragmatic point of view, and inversely, it also suggests that quali ed majorities or an increase of the number of jurisdictions may lead to an increase in the level of distortion.

The third outcome is a consequence of the fact that the level of distortion is inversely related to the probability of belonging to the coalition. Consequently, playing mixed-strategies a region would always end up distorting sub-optimally: too much when they are excluded from the coalition (and the distortion is useless) and too little when they belong to the coalition.

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 e ect occurs both in winning and losing districts, but not in those where bene ts and costs of the upper-jurisdiction policies are of similar magnitude. Finally, the model predicts such distortion to be non-linear (U-shaped).

3.1 Hypothesis

We assess these predictions focusing on elections for the European Union (EU) parliament. This is an ideal setting for our model as: i) the EU is the world's largest supranational federation, enveloping the policies of 27 di erent countries with respect to justice, home a airs, 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 in our model while the latter match federal politicians. As a proxy for the extremely protective political type, we consider the performances of Eurosceptic as compared to non-Eurosceptic parties. Speci cally, following Proposition 2, our main hypothesis is that voters anticipate the MPs' bargaining over EU policy-making and, consequently, favour Eurosceptic parties relatively more at the European (federal) than they do at the national (regional) level.

Our use of the Eurosceptic classi cation as a measure of extremely protective political parties is rooted in the notion of `economic nationalism', described by Colantone and Stanig (2019) as being 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 own country. This

de nition aligns perfectly with the extremely protective type in our model and matches it to the Eurosceptic proxy we use. Indeed, our Eurosceptic classi cation stems from an appeal to national sovereignty and critique of EU institutions and can be linked to nationalism and protectionism.[41]

The European setting thus forms a welcome testing ground for our predictions. Previous studies have looked at di erences in party performances between national and supranational elections. The most established conjecture, as discussed in the introduction, suggests 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 ndings might be driven by this `second-order' conjecture.

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, those are opposite sides 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 favourable 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).[42]

3.2 Data

We built a data set including parties vote share at national and EU elections, including all parties that run at least at one national and one European election.[43] Data are based on the `Election and Referendum Database', which provides election results for European countries, starting from 1990. Parties were classi ed as either Eurosceptic or not-Eurosceptic following Algan et al. (2017) that, in turn, is based on the Chapel Hill Expert Survey (CHES),

[41] Di erently from Colantone and Stanig (2019), our de nition does not include economic conservative parties, as this dimension is not part of the model.

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

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

an established source estimating party positioning on European integration and ideology.[44] Algan et al. (2017) extends CHES including some brand-new and small parties. In our dataset, parties classi ed 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 classi cation is based on CHES' protectionist and nationalist categories.

The EU parliament is elected every 5 years, while national elections follow heterogeneous schedules across countries. For this reason, EU and national elections often take place in di erent years. Therefore, we consider 5-year time windows, each of them ending the same year as an EU election: 1990-94, 1995-99, 2000-04, 2005-09, 2010-14 and 2015-19. Within each window, we then compute the di erence between a party's vote share for the EU and national elections (Di EU-Nat): positive (/negative) values imply that a party performed better for the European (/national) elections. Whenever, in a given country, several national elections took place within the same window, we average the national vote share per party. Should a party run only for one type of election (national or European) within a window, we would have a missing observation. For robustness, Table 7 (Appendix E) successfully replicates our main ndings using a 10-year time window, yet, we prefer the 5-year window that maximises the number of observations in our sample.

Fig. 3 reports the distribution of our dependent variable (Di EU-Nat). The gure highlights a di erent distribution for parties considered as Eurosceptic, which generally obtain a higher vote share in European than in national elections.[45] To validate this descriptive evidence, we estimate the following OLS model:

$$DiffEU\_Nat_{jit} = {}_i + {}_t + {}_1 Eurosceptic_j + X_{jit} + {}_{jit} \quad (17)$$

in which the dependent variable ($DiffEU\_Nat_{jit}$) is the di erence 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 the 5-year window. The main explanatory variable is $Eurosceptic_j$, a dummy set equal to 1 for Eurosceptic parties, based on Algan et al. (2017). To control for di erences across countries and common time trends, we include (5-year) time-windows ($_t$) and country xed e ects ($_i$). In some speci cations, we include time-country xed e ects to control for all potential country level time-varying changes. X_{jit} includes a set of control variables, which we explain in the next paragraph.

The `second-order' conjecture might a ect these estimates in several ways, as explained above. First, Eurosceptic parties are often small ones: if small parties are more likely to be voted for at the European level, we might just be capturing this e ect. Therefore, we include a

[44] www.chesdata.eu/

[45] Fig. 7 in the appendix highlights a very similar pattern when considering a 10-year time window.

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

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

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, according to our model, small Eurosceptic parties are rewarded in European elections in the rst place. Second, Eurosceptic parties might be systematically punished (/rewarded) if they are part of the incumbent (/opposition) 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 di erently a ect Eurosceptic parties. In turn, we control for turnout di erences between national and European elections.[46]

Another potential source of bias is related and inherent to di erences in electoral systems across levels of government. Some countries, holding national elections under a majoritarian system and European elections under a proportional system, might di erentially reward small and/or Eurosceptic parties across the two types of elections.[47] We tackle this issue in two alternative ways: i) we compute an index of disproportionality of the electoral system and use

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

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

it as a control in our estimation;[48] ii) Table 2 reports our findings dropping countries with a mixed or a majoritarian system at the national elections.

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 Section 3.3.2.

3.3.1 Baseline Results

Table 1: Eurosceptic Voting at EU vs National Elections

	Baseline				Heterogeneity			
Eurosceptic	1.644***	1.670***	1.765***	1.344**	1.991**	2.030**	2.331**	1.735**
	(0.552)	(0.550)	(0.622)	(0.564)	(0.882)	(0.883)	(0.967)	(0.790)
2nd tertile					0.540	0.530		
					(0.441)	(0.459)		
3rd tertile					-0.0834	-0.0530		
					(0.475)	(0.480)		
Eurosceptic*2nd tertile					-2.156**	-2.176**	-2.500**	-2.094*
					(0.994)	(1.001)	(1.092)	(1.055)
Eurosceptic*3rd tertile					0.945	0.912	0.481	0.829
					(1.122)	(1.123)	(1.272)	(1.354)
Di Turnout	-0.00803	-0.00740	0.0112		-0.00882	-0.00785	0.0110	
	(0.00880)	(0.00887)	(0.0125)		(0.00896)	(0.00901)	(0.0126)	
Proportional Voting	0.555	0.616			0.553	0.625		
	(0.916)	(0.885)			(0.999)	(0.972)		
Party Size				0.00602				0.00445
				(0.0323)				(0.0308)
Incumbent				-7.855***				-7.800***
				(1.132)				(1.143)
Observations	1,250	1,250	1,259	1,269	1,250	1,250	1,259	1,269
R-squared	0.014	0.017	0.033	0.245	0.021	0.024	0.040	0.251
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 clustered at the country level 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.

[48] The 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 2: Eurosceptic Voting at EU vs National Elections - without Majoritarian/Mixed Systems

	Baseline				Heterogeneity			
Eurosceptic	1.257**	1.270**	1.198**	0.870*	1.815**	1.817**	1.935**	1.528*
	(0.457)	(0.455)	(0.475)	(0.474)	(0.799)	(0.799)	(0.861)	(0.822)
2nd tertile					0.586	0.519		
					(0.422)	(0.426)		
3rd tertile					0.0557	0.0440		
					(0.459)	(0.470)		
Eurosceptic*2nd tertile					-1.986**	-1.969**	-2.093**	-1.867*
					(0.927)	(0.935)	(0.997)	(1.051)
Eurosceptic*3rd tertile					0.581	0.591	0.0262	0.0405
					(0.885)	(0.891)	(0.936)	(0.967)
Di Turnout	-0.00574	-0.00688	0.00709		-0.00603	-0.00655	0.00663	
	(0.00946)	(0.00972)	(0.0200)		(0.00913)	(0.00937)	(0.0200)	
Proportional Voting	0.162	0.128			0.333	0.293		
	(0.865)	(0.843)			(0.889)	(0.878)		
Party Size				-0.00594				-0.00737
				(0.0224)				(0.0223)
Incumbent				-6.614***				-6.564***
				(1.047)				(1.057)
Observations	936	936	945	953	936	936	945	953
R-squared	0.009	0.013	0.032	0.234	0.016	0.020	0.038	0.238
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 clustered at the country level 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.

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, as predicted by Proposition 2. This effect is sizeable (up to 1.7 ppt., i.e. 33% of the standard deviation) and statistically significant across all models. In the Appendix, Table 6 considers a winsorised version at 99% of the dependent variable, while we test the same specification using alternative time windows in Table 7. In all cases our results are confirmed.

Incumbent appears to be statistically significant with a very large magnitude: protest voting against the incumbent seems to systematically take place at the European 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: the Party Size coefficient is never significant, which suggests that smaller parties are not more likely to perform better at EU elections. Differences in turnout (Di Turnout) also do not seem to matter much.[49] Of

[49] Note the Proportional Voting coefficient is not estimated when introducing country fixed effects. Similarly,

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 ltering out potential `second order' channels.

Next, di erent electoral systems do not seem to a ect 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. In Table 1 we control for the `proportional voting' index (described in Footnote 48) which is never statistically signi cant. In Table 2 we test the robustness of our ndings dropping from our sample countries holding a mixed or a majoritarian electoral system at the national level. This classi cation 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 speci cities.

Lastly, our approach highlights that a Eurosceptic party pro le is a salient dimension to determine di erential 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 ndings (Columns 1 to 4) in Table 8 (Appendix E), controlling for whether a party is classi ed as extreme on the ideological spectrum (note that only 50% of Eurosceptic parties are classi ed as extreme ones). While our ndings are una ected by this control, the extreme dummy is statistically signi cant only in one of our four speci cations.

3.3.2 Heterogeneous E ects

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

The EU budget, which in 2015 was 145 billion Euros, represents a crucial source of nancing for the poorest EU members, as well as for rms in several economic sectors (e.g. energy and agriculture) across all EU countries. 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 funds received from the EU represented 3,53% of the GNI for Lithuania, 2,9% for Bulgaria

the Di Turnout coe cient cannot be estimated when introducing Country-Time xed e ects. The slightly di erent number of observations across columns is due to a few missing observations in Di Turnout and Proportional Voting .

and 2,11% for Poland.[50] Conversely, based on this measure, the Netherlands was the main EU net contributor (-0.41% of GNI). Fig. 4 shows net-funds from the EU as a share of GNI for each EU member.

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

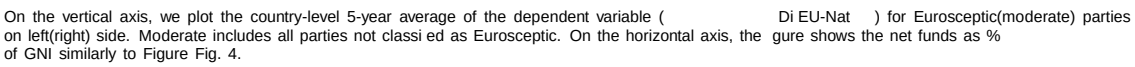
The gure shows the net funds received from the EU budget as % of GNI in the period 2000-2015 for each EU country: the two red lines split countries in three tertiles.

Following the model, we expect support for Eurosceptic parties to be di erentially stronger at the European elections (compared to national elections) both in net contributing member states and also in net receiving ones. Such e ect should vanish, according to Proposition 2, in countries contributing about as much as they receive. Proposition 3 predicts that the distortion should be U-shaped in the bene t.

As a rst graphical evidence, we plot our data di erentiating between Eurosceptic and moderate parties. Speci cally, in Fig. 5, on the vertical axis, we plot the country level 5-year average of the dependent variable (Ω_i EU-Nat) for the two groups of parties with Eurosceptic (Moderate) parties on the left (right) side. On the horizontal axis, we plot the net funds as % of GNI, similarly to Fig. 4. As in Table 6, we use a winsorised version of the dependent variable to exclude outliers. The gure quite clearly shows the U-shaped pattern for the Eurosceptic plot (the quadratic term is statistically signi cant, p-value=0.01), whereas no clear trend is visible for moderate parties (on the right side). The results of this analysis, in which the unit of observation is a country 5-year average and we include a quadratic term, are reported in Appendix Table 10.

[50] These data are available on the website of the European Commission: http://ec.europa.eu/budget/ nancialreport/2015/revenue/index _en.html

Figure 5: 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 Eurosceptic(moderate) parties on left(right) side. Moderate includes all parties not classi ed as Eurosceptic. On the horizontal axis, the gure shows the net funds as % of GNI similarly to Figure Fig. 4.

To formally test the predictions of Propositions 2 and 3 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. 4, 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. We expect a stronger e ect 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 coe cient Eurosceptic represents the e ect of the omitted base category, i.e. the 1st tertile (top 33% net contributor countries). Results con rm our predictions. The e ect materialises both in the 1st and 3rd tertile (lines 1 and 7), while there is no such e ect 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. Speci cally, our baseline variable Eurosceptic suggests that belonging to the 1st tertile explains a better

performance of Eurosceptic parties at European elections (as opposed to national ones) by more than 2ppt, and such increase is signi cant. The 3rd tertile is not statistically di erent 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 e ect disappears when focusing on the 2nd tertile. A similar pattern emerges in our robustness Tables 2 and 8 (again Columns 5 to 8).[51]

3.3.3 Robustness tests

In this section, we brie y outline some robustness tests which validate our main ndings.

First, in our main speci cation we group countries based on an objective measure: EU net-funds as a share of GNI. Table 3 proposes two alternatives to that: the rst one relies on people's perceptions, the other one is a di erent 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 bene ted from being a member of the European Union?". The question was collected across EU countries (since 1983) by the Eurobarometer survey.[52] We calculate the average response for each country over time. This classi cation allows a split in tertiles based on citizens' perception of their country as bene tting from or being harmed by the EU project. In columns 5 to 8, we rely on an alternative 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) depicted in Fig. 6.

Table 9 (Appendix E) deals with a possible alternative explanation for our ndings. Eurosceptic 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 9 we restrict the sample to these two groups of parties (pro-EU and Eurosceptic ones). Similarly to our main de nition of Eurosceptic parties, we classify pro-EU parties using the Chapel Hill Expert Survey.[53] Our main ndings are con rmed also in this case, although the estimated coe cients are considerably more noisy: this is not surprising

[51] Note 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 rst tertile, i.e. France, Germany, Italy and United Kingdom. The other two are Hungary and Lithuania. Finally, our ndings are una ected by removing from the sample each country one by one.

[52] www.gesis.org/eurobarometer-data-service/search-data-access/eb-trends-trend- les/list-of-trends/membership-bene t.

[53] Speci cally, 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 favour {). We classify as pro-EU, parties scoring 6 or 7. The question is available in the period 1999{2014.

Figure 6: Net Funds from the EU in billion euros (2000-2015)

The gure shows the net funds 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.

considering that we are dropping the majority of the observations.

Finally, in Figs. 8 and 9 (Appendix E) we validate an important assumption of our analysis, i.e. that a country position in a certain tertile is rather stable over time, as it re ects underlying spatial heterogeneity. First, for each 5-year period, we split countries into tertiles depending on their net-funds to the EU (in the period 2000-2015) or the perceived bene ts 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 gures 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 speci c tertile across time. Speci cally, in the case of Fig. 8, 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. 9, 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).[54]

[54] Greece and Spain tertile change takes placed during the 2008 economic crisis, due to a decline in the perceived bene t of being in the EU.

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

	Bene t EU				Abs. Contributions			
Eurosceptic	2.720**	2.736**	2.930**	2.512**	1.675*	1.708*	1.942**	1.391*
	(1.077)	(1.073)	(1.226)	(1.176)	(0.843)	(0.847)	(0.932)	(0.759)
2nd tertile	0.735	0.694			0.248	0.237		
	(0.552)	(0.546)			(0.517)	(0.530)		
3rd tertile	0.642	0.625			-0.0930	-0.108		
	(0.517)	(0.519)			(0.400)	(0.397)		
Eurosceptic*2nd tertile	-2.497**	-2.483**	-2.676**	-2.401*	-2.003*	-2.010*	-2.670**	-2.090
	(1.128)	(1.121)	(1.269)	(1.262)	(1.122)	(1.137)	(1.214)	(1.380)
Eurosceptic*3rd tertile	-1.288	-1.282	-1.374	-1.664	0.736	0.707	0.457	0.716
	(1.240)	(1.238)	(1.400)	(1.439)	(1.037)	(1.037)	(1.153)	(1.165)
Di Turnout	-0.00999	-0.00936	0.0145		-0.0114	-0.0105	0.0139	
	(0.0110)	(0.0114)	(0.0109)		(0.0102)	(0.0106)	(0.0111)	
Proportional Voting	0.391	0.481			0.408	0.465		
	(1.085)	(1.090)			(0.991)	(0.994)		
Party Size				0.00521				0.00378
				(0.0316)				(0.0316)
Incumbent				-7.795***				-7.808***
				(1.153)				(1.141)
Observations	1,250	1,250	1,250	1,260	1,250	1,250	1,259	1,269
R-squared	0.021	0.023	0.039	0.250	0.018	0.020	0.037	0.248
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 coe cients and Robust Standard errors clustered at the country level in brackets. The dependent variable is Di EU-Nat (i.e. the di erence 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 di erences in turnout between national and European elections. Tertiles split countries in three groups based on share of people agreeing their country has bene ted of being a EU member (columns 1 to 4); their level of net EU funds in absolute values (columns 5 to 8). The omitted category is the rst tertile (largest net contributors). *** p < 0.01, ** p < 0.05, * p < 0.1.

4 Final remarks

In multi-tiered countries and political unions, central policies often have heterogeneous e ects across its constituent units. For instance, the cost-bene t balance of environmental policies may have opposite signs depending on the regional economic structure. We show how this can bring about political extremism precisely at the highest level of government.

Sophisticated voters anticipate the bargaining process that leads to the design of federal policies. Proposition 2 shows that they cast their ballot strategically, to move the bargaining point in a more favourable direction. In particular, elected delegates in each region have more extreme preferences than the corresponding median voters, which leads to an increase in political extremism. This is a strategic choice aimed at in uencing the magnitude of federal intervention. Simultaneously, voters also manipulate local taxes (Proposition 1) with the same

purpose of improving the outcome of federal negotiations. Section 2.2 and Appendices A and B show that any reduction in the probability of being included in the coalition (for example, when a smaller coalition has to form) mitigates voting distortions. However, this does not entail full- edged race to the bottom in which regions compete to enter the coalition, hence undoing any extreme voting. Therefore, the distortions predicted by our model are highly persistent.

Proposition 3 suggests that the incentives to strategically delegate are U-shaped in potential bene ts or losses. This implies that the growth of a federation (in terms of competence, power or budget) induces a rise in extremism. Changes in the number or size of districts (e.g. because of gerrymandering) impact the level of distortion in many possible ways, instead a decrease in the quali cation of the required majority clearly induces a reduction in distortions (Propositions 4 and 5).

Some of the model's predictions have direct and testable consequences on the level of polarisation and extremism. Our empirical analysis { 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 (Section 3.3.1). This strategic e ect, as expected, is heterogeneous across countries. We show that the distortion is U-shaped in the distribution of EU funds (Section 3.3.2), and the same occurs when we instead look at citizens' perceived bene ts from belonging to the union (Section 3.3.3) as reported by the Eurobarometer.

Distortions come at a cost, which can range from the economic cost of over- or under provision of locally nanced goods (Proposition 1) to the the psychological cost of voters electing politicians they (ideologically) disagree with (Proposition 2). Yet, also the broader societal cost of political instability is relevant here, as populist polarisation can lead to intensi cation of con ict 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 bene tting the entire federation and not just their own constituency. In the EU context, this might imply the creation of a pan-European voting district 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 di erent countries and di erent 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.

An additional way to reduce the distortions is to reduce the support required to take federal decisions. In particular, simple majority decisions should be preferred to quali ed majority ones. However, this may entail other risks that should also be accounted for.

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Appendix A 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-speci c probability p_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 $1 - p_k$ they will not in uence the federal government's decisions at all. In this latter case the federal policy will consequently be exogenously set at $\hat{}$. Notice that at this point it does not matter whether these beliefs originate from voters not fully understanding the game at play, or whether they correctly anticipate that the local politician will not always have a say on the decision of .

There can be several ways to rationalise such beliefs. Voters may think { or correctly anticipate { that $1 - p_k$ is the probability that a coalition forms, but with their own representative kept out of the formation process.[55] Another possibility could be that voters believe the federal government has not full discretion over 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 in uence , or at least to a lesser degree. In this sense, voters are incorrectly anticipating, so that probabilities p_k express the perceived political weight of a representative, rather than the actual weight. This could be the case when their own politicians are less ideally positioned to pull the levers of policy-making because they have less insight in the various practices and rules involved. It could also be that the latter are perceived as potentially stacked in favour of other representatives enjoying more leverage when the rules are set. Lastly, the general opinion could be that once regional representatives are part of the national, higher-level establishment, they will lose interest in their own region, or will be pushed to do so.[56] Clearly, one may think that p_k { as interpreted above { could also vary through time in a more general dynamic setting. In order to keep our robustness check in this section distinct and clear, however, we keep the model static and study how results change when p_k varies.

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

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

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

voter in region $k \in K$ now includes the additional constraint that θ is defined by Eq. (8) with probability p_k, and $\theta = \hat{\theta}$ with probability $1 - p_k$. Here then, Lemma 3 translates into the following lemma.

Lemma 5. Eqs. (18) to (19) implicitly define the preferences of the median voter in region k, in terms of the local tax t_k (Eq. (18)) and of the representative selected to join the federal legislature $\hat{\theta}_k$ (Eq. (19)).

$$\frac{c'(C_k)}{m_k} = p_k \left[g'(\theta) + \frac{(\theta - \theta_k)^2}{2} \lambda_k \hat{\theta}_k g_f'(\theta) g_f''(\theta) \right] + (1 - p_k) g'(\hat{\theta}) \tag{18}$$

$$\frac{(\hat{\theta}_k - m_k)}{m_k} = p_k \frac{\lambda_k}{2 - \lambda_k} \left[-\lambda_k g_f'(\theta) \right]^2. \tag{19}$$

Proof. See Appendix C. □

From Lemma 5, we immediately obtain that Proposition 2 still holds. Eq. (19) is identical to Eq. (13), with the exception that the right hand side of Eq. (19) is multiplied by $p_k \in [0, 1]$, from which we immediately conclude that the equilibrium distortion of θ_k is lower in this case. Indeed, agents expect the strategic mechanism to be at work only with probability p_k, so the incentive to manipulate the federal vote decreases and so does the distortion as a result.

Comparing these distortion across regions subsequently, in the more general setting allowing for varying voter beliefs previous Eq. (15) translates into

$$\frac{(\theta - \theta)}{(\theta - \theta)} = \frac{p - (1 - p)(g_f')^2}{p - (1 - p)(g_f')^2}. \tag{20}$$

Eq. (20) sheds more light on how beliefs captured by p_k affect our previous results. The more voters expect their representatives to be influential (relative to others), the more they will distort their vote. In other words, the more pronounced the beliefs captured by p as compared to p, the higher the relative mark-up of distortion $\frac{(\theta - \theta)}{(\theta - \theta)}$.

Appendix B Coalition formation

In this section, we add some structure to the 3-region setting of Section 2.2, by looking into how a coalition may form. The aim of this extension is twofold. First, we provide a plausible foundation for the 'R-1 coalition' setting of Section 2.2, where coalition formation was taken for granted and treated as a black box. Second, we link this section to Appendix A, 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 introduce two simplifying assumptions:

A) the minimum size of a coalition requires $|K| > \max\{|R^b|; |R^h|\}$.

B) all regions of a same type are identical

Assumption A) guarantees that any coalition always includes at least some representatives from regions of both types. Assumption B) allows us to focus on symmetric equilibria. Relaxing assumption B) would lead to an asymmetric equilibrium that shares all the relevant features with the symmetric one. At the end of this section, without formally solving the asymmetric equilibrium, we provide a description of it.

Compared to the model in Section 2.1, we introduce a coalition formation stage. Once representatives have been elected, a randomly selected formateur of type forms a coalition. Since b- and h-regions have diverging interests in terms of , hence -formateurs always prefer regions of their own type and only include regions of opposite type, ensuring that $|R| + n$ is the minimum size necessary for a coalition to form. The -formateur cherry-picks the regions with the smallest value $|\omega_k - \hat{\alpha}_k g_f'|$, for those are the weakest regions in terms of negotiation. Under assumption B) all regions display the same equilibrium value $|\omega_k - \hat{\alpha}_k g_f'|$, hence they are all equally likely to be (randomly) picked.

The last stage of the game (conditional on $\hat{\alpha}_k$ and the -formateur being selected) is isomorphic to the one in Section 2.1: $\max \sum_{k \in K} |\omega_k - \hat{\alpha}_k| U_k$, where K is the coalition that a -formateur would form, and the first order condition implicitly defines the optimal policy $: \sum_{k \in K} |\omega_k - \hat{\alpha}_k g_f'| = 0 :$

The choice of $\hat{\alpha}_k$ influences the probability of being part of the coalition and, therefore, the optimal delegation strategy in each region, instead, may be affected. At the time of local elections, agents don't know the type of the federal formateur and expect = to occur with probability $\frac{|R|}{|R|}$. Consequently, the median voter of each region maximises their

expected utility, which boils down to

$$E(U_r^m) = c(C_r) + \ ^{j}_{r}g \ \ G_r^{`}; \ \ _rE(\ ) \ + D_r: \tag{21}$$

From the perspective of each region, three scenarios are possible: 1) with probability $p_1 = \frac{jR\ j}{jRj}$ the formateur is of the same type and the representative belongs to the coalition with certainty; 2) With probability p_2 the formateur is of opposite side and the representative belongs to the coalition; 3) With probability p_3 the formateur is of opposite side and the representative doesn't belong to the coalition.

We should notice that $\frac{@}{@t_k} = 0$ and $\frac{@}{@\hat{}_k} = 0$ whenever region k doesn't belong to the coalition. This means that under scenario 3) a region has no incentive to distort t_k or $\hat{}_k$ because this won't a ect . The rst order condition for a region of type b is[57]

$$\frac{c^0(C_k)}{^m_k} = \ p_1g^0(\ ^b) + p_2g^0(\ ^h) + p_3g^0(\ ^h) \ + \ p_1\frac{@^b}{@t_k}g_f^0(\ ^b) + p_2\frac{@^h}{@t_k}g_f^0(\ ^h) \tag{22}$$

$$\frac{(\hat{}_k \ \ ^m_k)}{^m_k} = \frac{^k_{2\ k}}{} \ \ p_1\frac{@^b}{@\hat{}_k}g_f^0(\ ^b) + p_2\frac{@^h}{@\hat{}_k}g_f^0(\ ^h) \ : \tag{23}$$

The last term in both Eqs. (22) and (23) account for the distortion that takes place in a region with the objective of in uencing the equilibrium , as such, they only appear when the representative belongs to the coalition.

It is very important to notice some important features of this game.

1. the mark-up is strictly increasing in p_2, that is, the electoral distortion increases with the probability of being included in the federal coalition.

2. the probability p_2 is weakly decreasing in the distortion

From those features, it immediately follows that mixed-strategy equilibria are not admissible. Suppose that regions play a mixed strategy, they would select a low and a high value of distortion. However, the probability of belonging to the coalition endogenously decreases with the level of distortion. Hence, playing a mixed strategy a region would inevitably distort more when chances of being in the coalition are relatively small (hence, when it is optimal distort less) and would distort less when they have a relatively large chance of belonging to the coalition (hence, when it is optimal distort more).

Proposition 5. When all regions of a same type are identical, there cannot be mixed-strategy equilibria.

The distortion of local taxes and the strategic delegation mechanism remain, but their magnitude is reduced. Eqs.(22) and (23) de ne the choice of each b-region, with the equilibrium probabilities being $p_1 = \frac{jR^bj}{jRj}$, $p_2 = \frac{jR^hjn^h}{jRjjR^bj}$ and $p_3 = \frac{jR^hj(jR^bj \ n^h)}{jRjjR^bj}$.

[57] Inverting superscripts b and h would provide the rst order condition for a region of type h.

The equilibrium for h-regions is obtained by simply invertingb and h superscripts in the equations.

Proof. See Appendix C. □

Proposition 5 solves the equilibrium for the symmetric case. We obtain four interesting results from the study of the symmetric case:

1. regions have no incentive to undercut each other, hence there is no race to the bottom in this context,

2. the marginal bene t of distorting is increasing in the size of the coalition, hence the distortion in equilibrium is less pronounced when the coalition is smaller,

3. it is never optimal to play a mixed strategy, because of the endogenous probability of being part of the coalition would imply that selection would play against the interest of the region,

4. in equilibrium, all regions of a same type have the same probability of belonging to the coalition.

Although we don't formally solve the asymmetric case, we provide the intuition for it. The asymmetric case is very similar in most respects to the symmetric case: results 1 to 3 hold, while result 4 is slightly di erent in a very intuitive way.

Let's consider again the perspective of b-regions. If the formateur is of type b, regions belong to the coalition for sure. Instead, anh-formateur includes n^h regions of typeb, choosing those with the lowest $|\lambda_k \hat{} g_f^0|$.

When the formateur is of type h, depending on the parameter values, three scenarios are possible, that we name `natural separation', `arti cial separation' and `partial pooling'.

`Natural separation' refers to the case in which n^h regions always belong to the coalition while the remaining regions are never included in the coalition. All regions optimally distort according to Eqs. (22) and (23): regions that are always included anticipate that $p_3 = 0$ for them, regions that are never included anticipate that $p_2 = 0$ for them.

`Arti cial separation' di ers from `natural separation' in that regions that are always included are distorting less than what Eqs. (22) and (23) would suggest when $p_3 = 0$. Regions slightly decrease their level of distortion and this ensures that they are always selected into the coalition.

Finally, `partial pooling' refers to the equilibrium in which two or more regions share the same value $|\lambda_k \hat{} g_f^0|$ and the formateur randomly includes a subset of those regions in the coalition. Those regions have the same probability of being selected (strictly positive and

strictly less than 1). The symmetric equilibrium previously described is a special case of this one, in which all regions have the same value $|\omega_k \wedge_k g_f^0|$. However, this scenario is compatible with some regions being always included or excluded from the coalition.

A `natural separation' equilibrium can only occur when regions are sufficiently different from each other that the regions with the lowest value of $|\omega_k \wedge_k g_f^0|$ can optimally distort and they are still more attractive, in the eyes of the formateur, than any other region, even if the excluded regions anticipate that $p_2 = 0$ for them. The presence of the formateur guarantees that the less extreme regions are selected into the coalition, but this is not providing incentives to regions that belong to the coalition to distort less. Hence, regions do not undercut each other.

`Artificial separation' occurs when the marginal region (the one with the largest value $|\omega_k \wedge_k g_f^0|$ among those belonging to the coalition) is not too different from the first excluded.[58] The marginal region faces the following situation: distorting as if they belonged to the coalition with certainty would create a loop,[59] but distorting as if they were selected with 50% chance (sharing it with the region ranked next), would imply that the region is selected with certainty. Since mixed strategies cannot be optimal, the only equilibrium in this case implies that the marginal region distorts the maximum feasible amount that still guarantees them to be included in the coalition with certainty.

`Partial pooling' occurs when the marginal region is even closer to the next one than under `artificial separation'.[60] In this case, the two (or possibly even more) regions will distort in a way that they will share the same value $|\omega_k \wedge_k g_f^0|$. In this case, there will be a multiplicity of equilibria.[61]

[58] Technically speaking, this occurs if the marginal-region's optimal distortion with $p_2(n^h) = p_3(n^h)$ is less than the first-excluded-region optimal distortion with $p_2(n^h + 1) = 0$.

[59] If they distort that much they are not selected, but if they are not selected they don't want to distort that much.

[60] Technically speaking, this occurs if the marginal-region's optimal distortion with $p_2(n^h) = p_3(n^h)$ is larger than the first-excluded-region optimal distortion with $p_2(n^h + 1) = 0$.

[61] The minimum level of distortion would correspond to when the first-excluded-region selects the optimal distortion for $p_2(n^h + 1) = 0$, while the maximum level of distortion would corresponds to when the marginal-region selects the optimal distortion for $p_2(n^h) = p_3(n^h)$.

Appendix C Proofs

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

$$\max \sum_{k2K} !_k \hat{U}_k \quad _k = \sum_{k2K} !_k \; c(C_k) + \hat{}_k g \; G_k^{`}; G_k^f \quad _k \; ; \tag{24}$$

subject to

$$C_k = (1 \quad t_k) Y_k; \tag{25}$$

$$G_k^L = t_k Y_k; \tag{26}$$

$$G_k^F = \quad _k: \tag{27}$$

so that we get the rst order condition

$$\text{with} \quad {}^0 = 0; \quad {}_0 \quad {}^b \sum_{k2R^b} !_k \hat{}_k g_f^0 \quad {}^h \sum_{k2R^h} !_k \hat{}_k g_f^0: \tag{28}$$

Further deriving and taking the absolute value, we obtain

$${}^{00} \quad \frac{@ {}^0}{@} = \quad @ \sum_{s= f b;hg} (\quad {}^s)^2 \sum_{k2R^s} !_k \hat{}_k g_{ff}^{00} A \; ; \tag{29}$$

where the sign, guaranteed by the concavity of $g(:)$, ensures that the problem is well behaved.

Eq. (28) implicitly de nes the equilibrium value for . Applying the implicit function theorem, we obtain for $k \; 2 \; K$:

$$\frac{@}{@ t_k} = \frac{\frac{@ {}^0}{@ t_k}}{\frac{@ {}^0}{@}} = \frac{\sum_{s= f b;hg} \quad _k !_k \hat{}_k Y_k g_f^{00}}{(\quad {}^s)^2 \sum_{k2R^s} !_k \hat{}_k g_{ff}^{00}} \tag{30}$$

and

$$\frac{@}{@ \hat{}_k} = \frac{\frac{@ {}^0}{@ \hat{}_k}}{\frac{@ {}^0}{@}} = \frac{\sum_{s= f b;hg} \quad _k !_k g_f^0}{(\quad {}^s)^2 \sum_{k2R^s} !_k \hat{}_k g_{ff}^{00}} \tag{31}$$

The signs of Eqs. (30) and (31) are respectively $\operatorname{sgn} \frac{@}{@ t_k} = \operatorname{sgn} \quad _k g_f^{00}$ and $\operatorname{sgn} \frac{@}{@ \hat{}_k} = \operatorname{sgn} (\quad _k)$, because $g_{ff}^{00} < 0$, while $!_k; \hat{}_k$ and g_f^0 are all positive. □

Proof of Lemma 3 . The optimisation problem of the median voter in region $k \in K$ set out in Section 2.1.1 can be summed up as

$$\max_{t_k, \hat{}_k} U_k = c(C_k) + {}^{m}_{k} g\left(\grave{G}_k; G^{f}_{k}\right) \quad {}_{k}\left(\hat{}_k - {}^{m}_{k}\right)^2; \tag{32}$$

subject to Eq. (28) and

$$C_k = (1 - t_k) Y_k \tag{33}$$

$$\grave{G}_k = t_k Y_k \tag{34}$$

The first order condition for t_k is

$$c'(C_k) Y_k + {}^{m}_{k} Y_k g' + {}^{m}_{k} \; {}_{k} \frac{@}{@t_k} g^{0}_{f} = 0; \tag{35}$$

which, using Eq. (30), yields

$$c'(C_k) Y_k + {}^{m}_{k} Y_k g' + {}^{m}_{k} \; {}_{k} \frac{{}_{k} ! {}_{k} \hat{} {}_{k} Y_k g''_{f}}{00} g^{0}_{f} = 0; \tag{36}$$

and, therefore,

$$g' + \frac{! {}_{k} \hat{} {}_{k}}{00} (\quad {}_{k})^2 g^{0}_{f} g''_{f} = \frac{c'(C_k)}{{}^{m}_{k}}. \tag{37}$$

The first order condition for $\hat{}_k$ is

$${}^{m}_{k} g^{0}_{f} \quad {}_{k} \frac{@}{@\hat{}_k} \quad 2 \; {}_{k}(\hat{}_k \quad {}^{m}_{k}) = 0; \tag{38}$$

which, using Eq. (31), yields

$${}^{m}_{k} g^{0}_{f} \quad {}_{k} \frac{{}_{k} ! {}_{k} g^{0}_{f}}{00} = 2 \; {}_{k}(\hat{}_k \quad {}^{m}_{k}); \tag{39}$$

and

$${}^{m}_{k} \frac{! {}_{k}}{00} (\quad {}_{k} g^{0}_{f})^2 = 2 \; {}_{k}(\hat{}_k \quad {}^{m}_{k}). \tag{40}$$

□

Proof of Proposition 1 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 k, we assume that choices in all other regions are fixed.

The left hand side is the same in the three equations and is increasing in . We show below that the right hand side (RHS) can be ranked as follow:

$\hat{}$ $RHS^{s} > RHS^{n} > RHS^{m} = 0$ when $g''_{f} > 0$,

$\hat{} \; 0 = RHS^m > RHS^n > RHS^s$ when $g_f^{00} < 0$,

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

Since the left hand side is increasing in t_k, it immediately follows that $t_k^s > t_k^n > t_k^m$ if and only if $g_f^{00} > 0$, while $t_k^m > t_k^n > t_k^s$ if and only if $g_f^{00} < 0$.

To prove the ranking of the right hand side, rst we isolate region k from the others in the equation of ^{00}and obtain

$$^{00} = \left({}^2_k !_k \hat{}_k g_f^{00} + \sum_{i \in k 2 K} {}^2_i !_i \hat{}_i g_f^{00} \right) :$$

Then, $RHS^s > RHS^n$ if $\frac{{}^m_k \hat{}_k}{{}^{00}(\hat{}_k)} !_k (\quad_k)^2 g_f' g_f^{00} > \frac{({}^m_k)^2}{{}^{00}({}^m_k)} !_k (\quad_k)^2 g_f' g_f^{00}$. We solve here for the case $g_f^{00} > 0$, while the opposite case is omitted, being the same but with the inverted inequality. Then we can simplify to $\frac{\hat{}_k}{{}^{00}(\hat{}_k)} > \frac{{}^m_k}{{}^{00}({}^m_k)}$. Using the expression for ^{00}, we obtain

$$\frac{\hat{}_k}{{}^2_k !_k \hat{}_k g_f^{00} + \sum_{i \in k 2 K} {}^2_i !_i \hat{}_i g_f^{00}} > \frac{{}^m_k}{{}^2_k !_k \hat{}_k g_f^{00} + \sum_{i \in k 2 K} {}^2_i !_i \hat{}_i g_f^{00}}; \qquad (41)$$

which simpli es to

$$\hat{}_k \sum_{i \in k 2 K} {}^2_i !_i \hat{}_i g_f^{00} > {}^m_k \left(\sum_{i \in k 2 K} {}^2_i !_i \hat{}_i g_f^{00} \right); \qquad (42)$$

which is clearly always veri ed.

□

Proof of Proposition 2 and its corollary . The rst order condition with respect to $\hat{}_k$, as shown in Eq. (40), is ${}^m_k !_k (\quad_k g_f')^2 = 2 \quad_k (\hat{}_k \quad {}^m_k)$.

If a region neither bene ts nor is harmed by the federal policy ($_k = 0$), then the previous condition reduces to $2 \quad_k \hat{}_k \quad {}^m_k = 0$. For an equilibrium to exist, the elected federal representative and the median voter must have identical preferences for the public policy: $\hat{}_k = {}^m_k$. As a result, there will be no strategic voting.

As long as $_k \neq 0$, Eq. (40) can be written as

$$\frac{!_k}{{}^{00}} (\quad_k g_f')^2 = \frac{2 \quad_k (\hat{}_k \quad {}^m_k)}{{}^m_k}; \qquad (43)$$

Because the left-hand side is always positive, a solution can only exist if $\hat{}_k > {}^m_k$. Hence, in equilibrium, the elected federal representative will always have a weakly stronger taste for the public policy that the median voter.

Defining $(\ _k) = \frac{(\hat{}_k \quad {}^m_k)}{{}^m_k}$, Eq. (15) is simply obtained by combining Eq. (43) computed for any two region $\quad$ and $\ :$

$$\frac{(\quad)}{(\quad)} = \frac{!\ (\Delta\ g^0_f)^2=}{!\ (\Delta\ g^0_f)^2=}; \tag{44}$$

Within the setting of the grand coalition, suppose that there's a change in the number of regions and study how the mark-up changes.

□

Proof of Proposition 3. From Eq. (15), we can write $\frac{(\quad)}{(\quad)} = a\ \Delta\ g^0_f(\ \Delta\ )\ ^{\left[\right]_2}$, where $a = \frac{!}{!\quad[\Delta\ g^0_f(\ \Delta\ )]^2} > 0$ does not depend on $\Delta\ .$

Notice that $\frac{@[\Delta\ g^0_f(\ \Delta\ )]^2}{@\Delta} = 2\Delta\ g^0_f[g^0_f + \ \Delta\ g^{00}_{ff}]$.

Suppose that $\Delta\ < 0$, then $2\Delta\ g^0_f[g^0_f + \ \Delta\ g^{00}_{ff}] < 0$ follows immediately.

Suppose that $\Delta\ > 0$, then $2\Delta\ g^0_f[g^0_f + \ \Delta\ g^{00}_{ff}] > 0$ if and only if $g^0_f + \ \Delta\ g^{00}_{ff} > 0$, hence if $\frac{\Delta\ g^{00}_{ff}}{g^0_f} < 1$. □

Proof of Lemma 4. Deriving Eq. (8), it follows that $\frac{@}{@\Delta_k} = \frac{!_k\hat{}_k g^0_f + !_k\hat{}_k\ \Delta_k g^{00}_{ff}}{00}$.

Therefore, $\frac{@}{@\Delta_k} > 0$ if and only if $!_k\hat{}_k g^0_f + !_k\hat{}_k\ \Delta_k g^{00}_{ff} > 0$. This is true whenever either $\Delta_k < 0$ or $\Delta_k > 0$ and $\frac{\Delta_k g^{00}_{ff}}{g^0_f} < 1$.

Notice that $\frac{\Delta_k g^{00}_{ff}}{g^0_f} > 1$ requires $\Delta_k > 0$, therefore, condition $\frac{\Delta_k g^{00}_{ff}}{g^0_f} < 1$ embeds the case of $\Delta_k < 0$ too. □

Proof of Proposition 4 and its corollary. When the grand coalition forms, we can write the first derivative (leading to the FOC) as $^0 = \sum_{k2Rnfqg} \Delta_k !_k\hat{}_k g^0_f + \Delta_q !_q\hat{}_q g^0_f$. Instead, when q is excluded from the coalition, we have $\_^0 = \sum_{k2Rnfqg} \Delta_k !_k\hat{}_k g^0_f$. Since $!_q\hat{}_q g^0_f > 0$, it follows that $^0 > \_^0$ if and only if $\Delta_q > 0$.

Knowing that $^{00} < 0$, it follows that ^{0} is decreasing in $\ $, hence, the equilibrium value for $\ $ is larger with the grand coalition if $\Delta_q > 0$ and, vice versa, it is smaller with the grand coalition if $\Delta_q < 0$.

When looking at $\frac{@}{@t_k}$ and $\frac{@}{@\hat{}_k}$, it is immediate to notice that in both cases the denominator depends on a sum of positive terms including $\Delta^2_q !_q\hat{}_q g^{00}_{ff}$. This term disappears when q is excluded from the coalition. Hence, the absolute value of the ratio decreases. □

Proof of Lemma 5. The maximisation problem of the median voter in region $k\ 2\ K$ set out in appendix A can be summed up as

$$\max_{t_k;\hat{}_k}\ U_k = c\,(C_k) + p_k\ {}^m_k x\,(G_k; X_k(\quad)) + (1 \quad p_k)\ {}^m_k x\,(G_k; X_k(\hat{}\,)) \qquad {}_k \quad \hat{}_k \qquad {}^m_k \quad {}^2; \tag{45}$$

subject to

$$C_k = \quad 1 \quad t_k^1 \quad Y_k \tag{46}$$

$$C_k = t_k Y_k \tag{47}$$

where we use to denote the federal tax implicitly defined by Eq. (8), in order to distinguish it from $\hat{}$, which represents the federal tax when exogenously set.

The first order condition for t_k is

$$p_k \quad x_1^{\prime}(G_k; X_k(\quad)) + \frac{\Delta_k P^{\prime}(\quad) x_2^{\prime}(G_k; X_k(\quad))}{Y_k} \frac{@}{@t_k} \quad +(1 \quad p_k) x_1^{\prime}(G_k; X_k(\hat{})) = \frac{c^{\prime}(C_k)}{\frac{m}{k}}; \tag{48}$$

which, using Eq. (9) for $k =$ yields Eq. (18).

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

$$p_k \ \frac{m}{k} x_2^{\prime}(G_k; X_k(\quad)) \quad \Delta_k P^{\prime}(\quad) \frac{@}{@ \hat{}_k} \qquad 2 \ _k(\hat{}_k \qquad \frac{m}{k}) = 0; \tag{49}$$

which, using Eq. (11) for $k =$ yields Eq. (19). □

Proof of Proposition 5. The proof is by contradiction. As long as the minimal size of the coalition is common knowledge, regions can anticipate what the equilibrium will be and, hence, they already know their probability of being part of the coalition. Conditional on knowing the probability, preferences are single-peaked in $\hat{}_k$. All regions being identical, they share the same bliss point (for a same given probability of belonging to the coalition).

Distorting is costly, the optimal distortion is strictly increasing in p_2 and the probability p_2 is weakly decreasing in the distortion. Suppose that there exist an equilibrium in which two regions opt for different values of $\hat{}_k$. Inevitably, the one choosing the lowest value for $\hat{}_k$ will have a weakly larger chance of belonging to the coalition.

If they both have the same probability of belonging to the coalition (this may happen if they are both always selected or always excluded), then both regions share the same optimal distortion and choosing two different levels of distortion cannot be optimal.

Suppose that regions A and B have different probabilities of being included in the coalition. Suppose, WLOG, that $p_2(A) > p_2(B)$, then the optimal distortion implies that $\hat{}_A > \hat{}_B$ (the optimal distortion is strictly increasing in p_2). But $\hat{}_A > \hat{}_B$ implies that $p_2(A) \quad p_2(B)$, which contradicts the initial statement.

Hence, if an equilibrium exists, all (identical) regions of a same type must choose the same level of distortion. If so, the formateur is indifferent and will randomly select them. This leads to the same probability of being part of the coalition: for any region of type b, $p_1 = \frac{jR^b j}{jRj}$, $p_2 = \frac{jR^h jn^h}{jRjjR^b j}$ and $p_3 = \frac{jR^h j(jR^b j \quad n^h)}{jRjjR^b j}$ and, similarly, for regions of type h, $p_1 = \frac{jR^h j}{jRj}$, $p_2 = \frac{jR^b jn^b}{jRjjR^h j}$ and $p_3 = \frac{jR^b j(jR^h j \quad n^b)}{jRjjR^h j}$.

To guarantee that this is an equilibrium, we should check that regions have no incentive to deviate. Consider a candidate equilibrium with all -regions aligned on a same level of distortion. If a region deviates by increasing the distortion, their probability of being selected into the coalition would plump, reducing the incentive to distort, while the cost of distorting would increase. Hence, the region would necessarily be worse-off. If a region deviates by decreasing the distortion, their chance of being selected would increase, but this has no per-se benefit attached. However, the elected candidate would obtain a worse deal (a less favourable) than before. Hence, the region would be more likely to belong to the coalition but would negotiate a worse deal.

It is important to notice that regions obtain no direct benefit from being part of the coalition, other than the opportunity to steer the equilibrium federal policy. Hence, regions have no incentive to undercut each-other in order to enter the coalition. A race to the bottom doesn't materialise because regions' benefit is attached to only. Undercutting a region that is pursuing the same objective would only decrease the benefit of all regions of that type. □

Appendix D Survey Evidence: Strategic Eurosceptic Voting

In Section 3, 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 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 some individuals would vote differently depending on the level of government, and whether these reasons were strategic in nature. More precisely, we queried why respondents 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 and ii) 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.[62] The choice of areas where to run the survey was made taking into account the time lag between European and national/subnational elections. While the election of the European Parliament took place on 26th May 2019 in all three areas, at the national/subnational level we registered voting behaviour for the Finnish Parliament (14th April 2019) and President (28th January 2018), the French Parliament (11th June 2017) and President (23rd April 2017) and, in the case of Italy, the Piedmontese Parliament, whose elections took place on the same day as the European Parliament elections (26th May 2019), hence, our Italian respondents voted simultaneously for both European and regional elections and, yet, they voted for different parties.

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

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

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

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

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

   b) attract more European funds to their country

   c) lead their country out of the European Union

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.[63]

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.[64] 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

[63]Specifically, 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.

[64]This 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.

interest) or in more concrete terms (attracting EU funds). Fig. 10 (Appendix E) shows the average support for each statement differentiating by country and levels of political interest.

Overall, these results suggest that strategic voting plays a 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

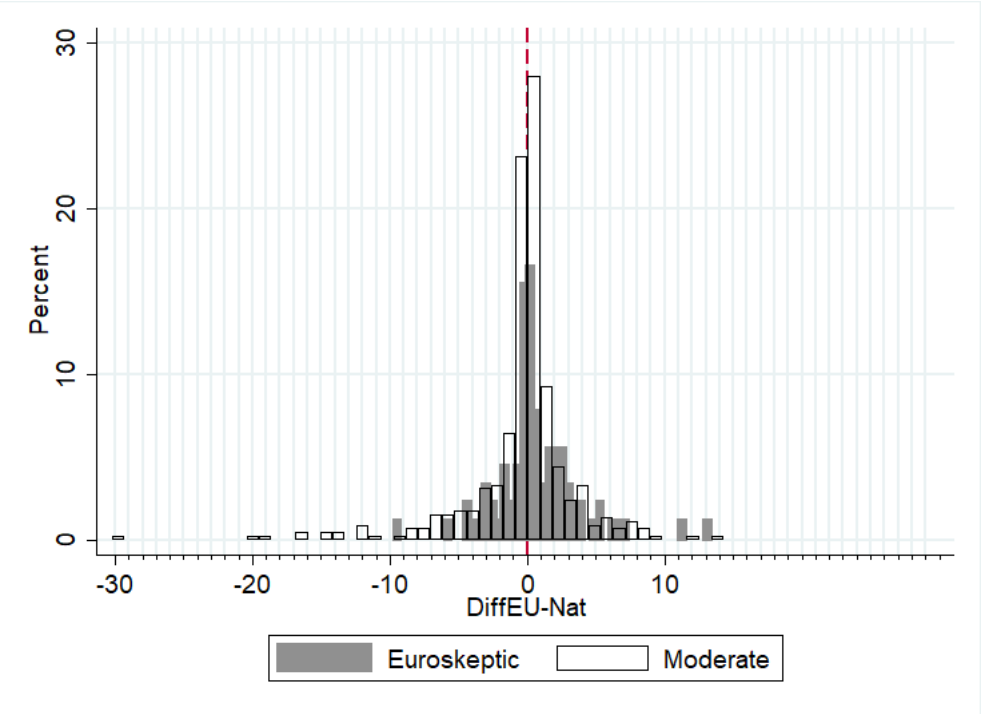
Note: *This table reports descriptive statistics on the online survey. We report the number of observations and the mean for the entire sample and di erentiating between respondents with high and low political interest. The last two columns report a t-test comparing the average support for each statement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

Appendix E Additional Empirical Results

Table 5: Summary Statistics

Variable	**Mean**	**Std. Dev.**	**N**
DiffEU-Nat	-0.286	5.248	1269
DiffEU-Nat (Winsorized .01) .01	-0.3	4.779	1269
Eurosceptic	0.175	0.38	1269
Extreme	0.153	0.36	1269
Diff Turnout	20.71	13.986	1259
Party Size	8.983	11.208	1269
Incumbent	0.091	0.287	1269
% Net Contribution/GNI (2000-2015)	0.638	1.173	1269
Net Contribution Absolute Values (2000-2015) (Billion Euros)	-0.582	3.611	1269
Cube Rule	1.108	0.158	1260
Variable 10-year window	**Mean**	**Std. Dev.**	**N**
DiffEU-Nat	-0.147	4.351	952
Eurosceptic	0.159	0.366	952
Party Size	7.487	9.891	952
Incumbent	0.098	0.297	952

Figure 7: Differences in Voting between EU and National Elections across Pro-Europe and Eurosceptic Parties: 10-year window



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

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

	Baseline				Heterogeneity			
Eurosceptic	1.524***	1.543***	1.586***	1.182**	1.830**	1.857**	2.114**	1.548**
	(0.505)	(0.502)	(0.560)	(0.506)	(0.791)	(0.787)	(0.858)	(0.696)
2^{nd}tertile					0.510	0.507		
					(0.396)	(0.405)		
3^{rd}tertile					-0.179	-0.139		
					(0.444)	(0.439)		
Eurosceptic*2^{nd}tertile					-2.003**	-2.012**	-2.287**	-1.906*
					(0.912)	(0.913)	(0.989)	(0.963)
Eurosceptic*3^{rd}tertile					0.943	0.920	0.389	0.703
					(1.066)	(1.058)	(1.160)	(1.201)
Diff Turnout	-0.00750	-0.00594	0.00836		-0.00883	-0.00701	0.00818	
	(0.00739)	(0.00746)	(0.0110)		(0.00753)	(0.00740)	(0.0111)	
Proportional Voting	0.595	0.667			0.558	0.642		
	(0.790)	(0.769)			(0.845)	(0.821)		
Party Size				0.00515				0.00379
				(0.0280)				(0.0265)
Incumbent				-7.349***				-7.300***
				(1.017)				(1.027)
Observations	1,250	1,250	1,259	1,269	1,250	1,250	1,259	1,269
R-squared	0.015	0.017	0.035	0.253	0.022	0.024	0.042	0.259
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 clustered at the country level 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: 10-year time window

	Baseline				Heterogeneity			
Eurosceptic	1.689***	1.709***	1.735***	1.654***	1.834**	1.848**	2.045**	2.054***
	(0.483)	(0.480)	(0.524)	(0.522)	(0.791)	(0.795)	(0.854)	(0.669)
2^{nd}tertile					0.207	0.241		
					(0.315)	(0.323)		
3^{rd}tertile					-0.0517	-0.0651		
					(0.355)	(0.345)		
Eurosceptic*2^{nd}tertile					-1.773**	-1.762**	-1.992**	-2.294**
					(0.844)	(0.851)	(0.913)	(0.873)
Eurosceptic*3^{rd}tertile					1.353	1.356	0.995	1.001
					(1.006)	(0.998)	(1.084)	(1.134)
Diff Turnout	-0.00694	-0.00699	0.0155		-0.00545	-0.00569	0.0153	
	(0.0104)	(0.0101)	(0.0112)		(0.00958)	(0.00923)	(0.0111)	
Proportional Voting	0.460	0.477			0.518	0.515		
	(0.848)	(0.842)			(0.829)	(0.811)		
Party Size				-0.0191				-0.0208
				(0.0313)				(0.0295)
Incumbent				-5.331***				-5.346***
				(1.114)				(1.111)
Observations	937	937	947	952	937	937	947	952
R-squared	0.021	0.023	0.043	0.218	0.030	0.032	0.051	0.227
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 coe cients and Robust Standard errors clustered at the country level in brackets. The dependent variable is Di EU-Nat (i.e. the di erence 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 8: Eurosceptic Voting at EU vs National Elections controlling for Radical parties

	Baseline				Heterogeneity			
Eurosceptic	1.775**	1.801***	2.161**	2.169***	2.101**	2.137**	2.678**	2.496***
	(0.642)	(0.631)	(0.789)	(0.731)	(0.878)	(0.865)	(0.993)	(0.706)
2^{nd}tertile					0.541	0.531		
					(0.443)	(0.460)		
3^{rd}tertile					-0.0852	-0.0551		
					(0.477)	(0.482)		
Eurosceptic*2^{nd}tertile					-2.133**	-2.153**	-2.449**	-1.981*
					(0.985)	(0.995)	(1.052)	(0.996)
Eurosceptic*3^{rd}tertile					0.975	0.941	0.574	1.029
					(1.147)	(1.152)	(1.270)	(1.316)
Radical	-0.183	-0.184	-0.543	-1.129*	-0.172	-0.168	-0.523	-1.140*
	(0.567)	(0.570)	(0.656)	(0.583)	(0.579)	(0.585)	(0.655)	(0.627)
Diff Turnout	-0.00812	-0.00751	0.0114		-0.00890	-0.00794	0.0112	
	(0.00885)	(0.00892)	(0.0125)		(0.00901)	(0.00906)	(0.0126)	
Proportional Voting	0.565	0.626			0.560	0.632		
	(0.924)	(0.893)			(1.002)	(0.975)		
Party Size				0.00704				0.00520
				(0.0318)				(0.0304)
Incumbent				-7.907***				-7.850***
				(1.136)				(1.146)
Observations	1,250	1,250	1,259	1,269	1,250	1,250	1,259	1,269
R-squared	0.014	0.017	0.033	0.247	0.021	0.024	0.040	0.253
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 clustered at the country level 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 9: Eurosceptic Voting at EU vs National Elections – Restricted Sample

	Baseline				Heterogeneity			
Eurosceptic	1.739**	1.726**	1.456*	1.363	1.353**	1.309**	0.675	0.639
	(0.736)	(0.736)	(0.816)	(1.177)	(0.510)	(0.493)	(0.491)	(0.607)
2^{nd}tertile					-0.468	-0.587		
					(1.341)	(1.369)		
3^{rd}tertile					-1.128	-1.204		
					(1.262)	(1.330)		
Eurosceptic*2^{nd}tertile					-1.102	-1.060	-1.167	-1.486
					(1.346)	(1.349)	(0.984)	(1.416)
Eurosceptic*3^{rd}tertile					2.341	2.398	3.432*	3.838*
					(1.620)	(1.654)	(1.824)	(2.167)
Diff Turnout	0.0182	0.0147	0.0456		0.0258	0.0228	0.0417	
	(0.0187)	(0.0198)	(0.0461)		(0.0197)	(0.0205)	(0.0472)	
Proportional Voting	-0.552	-0.672			-0.758	-0.872		
	(1.103)	(1.088)			(1.243)	(1.228)		
Party Size				0.0888				0.0930
				(0.0753)				(0.0666)
Incumbent				-6.900***				-6.581***
				(2.374)				(2.339)
Observations	362	362	362	365	362	362	362	365
R-squared	0.028	0.032	0.100	0.476	0.047	0.053	0.118	0.497
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

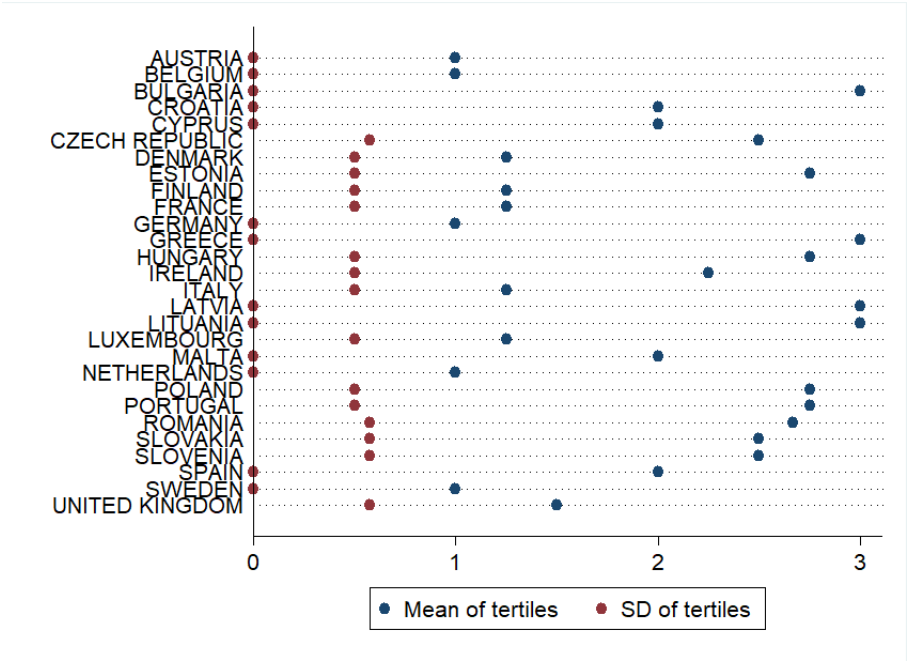
Note: The Table reports OLS coefficients and Robust Standard errors clustered at the country level in brackets. The dependent variable is *Di EU-Nat* (i.e. the difference in party vote shares between European and National elections); tha sample is restricted only to strongly pro/anti EU parties. *Eurosceptic* is a dummy set equal to 1 for Eurosceptic parties; *Party Size* is a continuous variable measuring party vote share; *Incumbent* is a dummy set equal to one for the main incumbent party; *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.

Table 10: Country level analysis - Similar to Figure 5

	DiffEU-Nat Eurosceptic	DiffEU-Nat Moderate
Net Funds	-1.521*	0.497
	(0.841)	(0.427)
Net Funds^2	0.840**	-0.218
	(0.312)	(0.178)
Observations	102	128
R-squared	0.051	0.017

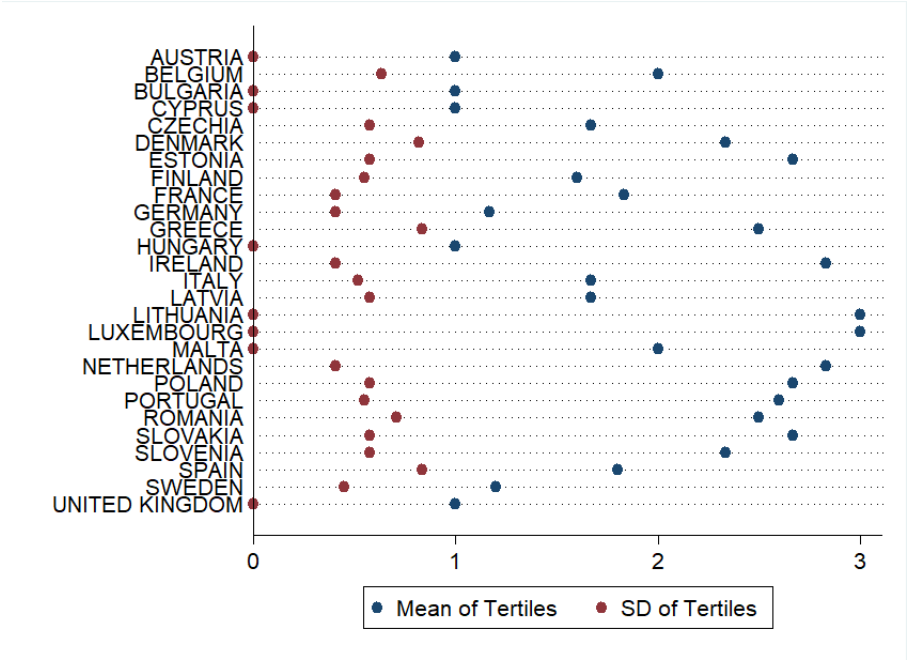
Note: The Table reports OLS coefficients and Robust Standard errors clustered at the country level in brackets. The dependent variable is *Di EU-Nat* (i.e. the difference in party vote shares between European and National elections) for Euroscpetic parties (column 1) and moderate parties (column 2); the observation units are country 5-year average. The indipendent variable *NetFunds* measures the net funds as % of GNI. *** p<0.01, ** p<0.05, * p<0.1.

Figure 8: Net Funds *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 EU net-funds. 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 9: 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.