Regional (In)Stability in Europe: a Quantitative Model of State Fragmentation

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REGIONAL (IN)STABILITY IN EUROPE
A QUANTITAVE MODEL OF STATE FRAGMENTATION

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Abstract

Despite a rich theoretical literature on regional (in)stability, little is known about its empirical validity. This paper presents simulated experimental findings on spatial heterogeneity in regional (in)stability accross 264 regions belonging to 26 European countries. To do so, it develops a broad model of state fragmentation that reconciles the views of the dominant strands in the literature. In order to apply the model, a novel indicator of regional political distinctiveness is proposed, rooted in the discrepancy between regional and national electoral behavior. Calibrating our model to the current European situation, we find that Cataluña, Flanders and the Basque country are the regions currently most likely to break away. In line with these results, governments in all three regions have consistently vocalized demands for increased autonomy - or even secession - in recent years. Denmark, Hungary and Slovenia show up as the most secession-robust European countries.

Keywords: Political heterogeneity, European Union, state fragmentation, secession and unification

JEL Classification: C63, C70, H77

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1 Introduction

With independence referendums in Scotland and Catalonia, increasing electoral support for regionalist parties in Belgium and Italy and surging separatist movements throughout Ukraine, the threat of regional instability seems well on its way to reclaim a prominent spot on the European political agenda. One novel feature is that regional independence movements increasingly utilize the electoral arena to posit their claims for more regional autonomy - or even secession - from the central government (Sorens, 2008).

In the slipstream of these events, economists have developed a small but growing theoretical literature aimed at isolating the political and economic forces that determine these processes of border formation. Agreeing on the fact that larger countries benefit from scale economies in the provision of public goods, one approach contends that larger political jurisdictions also suffer heterogeneity costs stemming from more diverse policy preferences (Alesina & Spolaore, 1997, 2003, AS hence on) whereas a quite different strand of the literature highlights differing fiscal preferences, originating from interregional income distribution differentials, in shaping incentives to secede (Bolton & Roland, 1997, BS hence on). As mentioned by Spolaore (2010), however, the theoretical study of the relationship between preference heterogeneity, income differences and the stability of countries is still in its infancy. Furthermore, quantitative applications of these frameworks remain scarce, such that their empirical validity and consequences remain unclear.

This paper aims to make progress on both fronts. First, it aims to reconcile the two dominant strands of the theoretical literature surrounding regional (in)stability by proposing a broad theoretical model of state fragmentation that combines key insights from both approaches. Secondly, as a way of validating the model, it is applied to a set of 264 regions in 26 European countries to identify both the most secession-prone European regions and the most secession-robust European countries. In doing so, it also diverges from the existing literature - which tends to approximate regional preference heterogeneity by the genetic, ethno-linguistic or cultural distances among populations - and proposes a novel and more direct indicator of regional political distinctiveness, rooted in the discrepancy between regional and national electoral behavior.

In our model, national governments provide a single public good representing a bundle of policy choices. Public policy is financed through a proportional income tax schedule, determined through majority voting. Agents, residing in a particular region of their country, vote on the optimal level of public spending taking into account increasing returns to scale in the provision of public goods, the intensity of their preference for the public good, the political distinctiveness of their policy preferences as well as their individual income level. Both richer agents and agents with more distinct policy preferences have a preference for lower tax rates, poorer agents and agents with preferences more closely aligned to those of the majority of the electorate prefer higher taxes; the equilibrium tax rate is the one most preferred by the median tax voter. These assumptions generate a

trade-off: separation would allow agents within a region to exercise greater influence on the content and the size of government whereas preserving the union would allow them to exploit economies of scale in the provision of government. Under the assumption that the decision to separate is taken by majority voting at the regional level, we explore the influence of various features of regions in shaping this trade-off.

First, we demonstrate that, except for the richest agents, *the net welfare gain of separation increases in the relative size of the future state*. The intuition behind this result is that smaller regions experience a more pronounced economy of scale disadvantage of secession, such that the economic costs of separation weigh more heavily on them. This finding resonates with the programmatic shift of the amalgam of North Italian regionalist movements to merge into a common *Lega Nord* party, which subsequently gathered significant electoral support based on a political program advocating the independence of Greater Padania from the rest of the country (Giordano, 2000, 2001).

Second, we show that *the incentive to secede is unambiguously increasing in the distinctiveness of own regional policy preferences*. In other words, the larger the distance between regionally preferred and actually provided public policy, the larger the political gain of separation. Consistent with this explanation, the Scottish independence referendum was defended by the Scottish Government (2013, p. xi) on the grounds that this would ensure that *"it will no longer be possible for governments to be elected and pursue policies against the wishes of the Scottish people"*.

Third, we illustrate that *whenever the income differential between the regional and the national median tax voter is positive, there is an additional tax base benefit of separation*. Indeed, a positive differential signifies that richer regions no longer need to provide tax transfers to poorer regions in case of separation. As noted by BR, social security transfers are an important reason why Flanders may want to secede from the Walloon region in Belgium. More recently, the anti-redistribution argument was raised by both Catalan and Scottish nationalists to justify their claim for the outright independence of their region.

Fourth, we find that *regional instability is increasing in the similarity between individual and regional fiscal preferences*. In the context of our model, this implies that the net welfare gain of separation increases whenever individual fiscal preferences correspond more strongly with those of the regional median tax voter. The portrayal of the Belgian experience as an example of tax-cutting separatism, where autonomy is *"no longer presented as a goal in itself, but instead as a means of implementing a right-wing economic policy that Flemish people actually voted for"* (The Economist, 2014, p. 64), is consistent with this implication. Moreover, the outcome of the recent devolution debate in Scotland illustrates that regions do care about autonomy over fiscal policy.

Finally, we highlight that *for richer agents, the incentives to secede are decreasing in the degree of preference heterogeneity in the rest of the country*. Note that the existing literature is silent on potential *stabilizing* effects of preference heterogeneity at the country level. The reason for this slightly counter-intuitive result is that, by reducing the utility

derived from public policy, preference heterogeneity in the rest of the country may serve as an instrument bringing tax rates closer in line with the fiscal preferences of the wealthy. This includes the possibility that the upper income class in the United Kingdom (UK) benefited from the notorious Scottish opposition to nuclear weapons, which stands in stark contrast to its UK-wide support, to the extent that this Scottish skepticism discouraged further tax-spending investments in the British nuclear weapons arsenal.[1]

The next step is to move beyond anecdotal empirical evidence and to assess the validity and the empirical implications of this theoretical model with respect to the current map of Europe. Applying the calibrated model to a set of over 260 regions in 26 European countries we find that, in a context of increasing nationalism, Catalonia, Flanders and the Basque country are the regions that are currently the most likely to break away. Consistent with these results, local governments in all three regions have systematically called for increased regional autonomy and two of them recently took steps to organize independence referendums. Further down the list, we quickly run into other 'usual suspects', such as Scotland (4^{th}), Italian South-Tyrol (7^{th}) and the French isle of Corsica (11^{th}), but we also encounter lesser-known separatist sensitivities, including Bulgaria's Turkish minorities in the provinces of Kardzhali (5^{th}) and Razgrad (10^{th}) and the Hungarian minority in Romania's Transylvanic region (12^{th}). Focusing on the most secession-robust countries, we find that Denmark, Hungary and Slovenia top the list, closely followed by Norway and the Czech Republic. Reassuringly, these countries effectively seem to lack the presence of credible autonomist movements. These results are taken as tentative proof of the model's capacity to partially explain present-day heterogeneity in regional instability in a European context, meriting further research on its general applicability.

The remainder of this paper is organized as follows. Section 2 provides a concise overview of the existing theoretical literature on regional instability. In section 3 we present the basic model while the proposed indicator of regional political distinctiveness is discussed in section 4. Section 5 explains the empirical strategy and contains the data description. Section 6 calibrates the model and identifies the most secession-prone regions as well as the most secession-robust countries in Europe. Section 7 concludes.

[1] In 2007, for instance, a majority of Scottish members of Parliament rebelled in a crucial vote to renew the nuclear weapons system, forcing prime minister Tony Blair to rely on the support of the Tories to secure Trident's replacement (BBC, 2007).

2 Theoretical literature[2]

Economic thinking on the determinants of state size can at least be traced back to the conference on the "Economic Consequences of the Size of Nations" held by the International Economic Association in 1957, the proceedings of which were published in a compendium in 1960 (Robinson, 1960). Interestingly, the contribution by Kuznets (1960, p. 28) already hints at the existence of a trade-off between the costs and the benefits of state size when he argues that *"in principle, small countries have a handicap for economic growth"*, due to a greater dependence on international trade and diseconomies of scale in national defense policy, but that the prospect of a smaller, more homogeneous population may enable them to more easily *"make the social adjustments needed to take advantage of the potentialities of modern technology and economic growth"*. Other early work includes Friedman (1977), where rulers shape countries to maximize net tax revenues, and Buchanan and Faith (1987), who demonstrate that the existence of a secession-option implicitly imposes an upper limit on the tax burden a ruling elite can impose on a minority.

In their seminal contribution, AS develop a Hotelling (1929)-type model where country size is determined by a trade-off between economies of scale in the provision of public goods, allowing larger states to offer more value for tax money, and heterogeneity costs, making it more difficult for a government to satisfy the policy preferences of its electorate. This trade-off is moderated by a number of channels, such that size benefits are greater the higher the impediments to trade and the larger the threat of international conflict. Political institutions matter as well, since autocratic regimes are less exposed to heterogeneity costs. In this setting, they emphasize that majority voting over national borders results in a tendency towards an equilibrium with too many small nations. However, they limit their analysis to a two-dimensional world where the population is continuously and uniformly distributed on a line and where geographical and preference dimensions coincide. Moreover, their model abstracts from income heterogeneity. Finally, public spending is considered as an exogenous and essentially fixed variable.[3]

Over the years, this model has been extended in several directions. Goyal and Staal (2004) analyze a similar model under the more realistic assumption that the decision to secede can only be taken at the regional, not the individual, level while also dealing with the implications of spatially clustered policy preferences. Staal (2004) confirms earlier results in a model where public spending and taxation exogenously depend on state size. Etro (2006) goes even further by endogenizing the provision of public goods, subjecting the level of public spending to majority voting at the country level. Furthermore, he parametrizes the elasticity of marginal utility from the public good and analyzes how the comparison of the optimal and the stable equilibrium behaves with respect to this parameter. Radax

[2]For an overview of the early literature, see Bolton, Roland, and Spolaore (1996); for an overview of the more recent literature, see Ruta (2005) and Spolaore (2010).
[3]For additional criticisms on the AS-framework, see Herrmann-Pillath (2008) and Radax (2009).

(2009) considers the case of non-uniform population distributions and concludes that AS's central results are highly sensitive to the choice of population distribution.

A different strand of the literature focuses on the potentially destabilizing effects of inter-regional income and wealth distribution differentials. An influential paper by BR analyzes the incentives to secede from the viewpoint of political conflict over redistribution policies. They demonstrate that, in a two region model, the richer region may have an incentive to secede to avoid paying tax transfers to the poorer region, but the poorer region might favor separation as well since this would remove the institutional constraints to implement a more generous redistribution policy. In addition to limiting their analysis to the two region case, preference heterogeneity is not explicitly included in their model while publicly provided and private goods are assumed to be perfect substitutes.

In a multi-country setting, Dagan and Volij (2000) similarly argue that richer individuals are more likely to favor separation in the presence of extensive redistribution policies induced by higher levels of welfare-state mindedness. Fidrmuc (1999) proposes a dynamic version of the model introduced by BR and demonstrates that asymmetric regional output shocks may drive regional fiscal preferences further apart, thereby increasing the likelihood of disintegration. Gregorini (2009) analyzes the robustness of the equilibrium results presented by AS when income inequality is introduced in their model.

Despite this rich theoretical literature on regional instability, empirical applications remain scarce. One notable exception is Lake and O'Mahony (2004), who relate the long-term trend in average state size to the general trends in a number of potential determinants but fail to find any clear relationship capable of explaining the incredible rise and subsequent fall in average state size witnessed in modern history. Desmet, Le Breton, Ortuño-Ortín, and Weber (2011) provide another interesting application, connecting genetic distances among populations to national stability of borders within a theoretical model of border formation. Calibrating this model enables them to successfully postdict the order of disintegration of former Yugoslavia into five separate states. Limited availability of inter-regional genetic distances, however, restricts their exploration of present-day regional instability to just three European regions. Additionally, their model abstracts from intra-regional income distributions and does not take heterogeneity in the intensity of preference for the public good into account.

Finally, this paper is also related to the political science literature surrounding nationalism and separatism, where various papers use multi-country panel data on the variation in the electoral results of separatist and autonomist political parties to tease out the determinants of secessionism in advanced democracies (Fearon & Van Houten, 2002; Sorens, 2005, 2008, 2009). This literature tends to confirm the importance of relative regional affluence, population size, language and ideological differences for the electoral success of regionalist parties. Similarly, Suesse (2014) exploits regional variation in pro-secessionist protests to test various economic theories of regional instability, finding strong evidence for the existence of a trade-off between regional size and two proxies for population het-

erogeneity, but remaining inconclusive with respect to the role of inter-regional income differences. One advantage of our proposed methodology, however, is that it also permits the analysis of regional (in)stability in democratic countries lacking politically significant autonomist movements - or where these movements are prohibited by law.[4]

3 A theoretical model of state fragmentation

Capitalizing on earlier work by Etro (2006) as well as Desmet et al. (2011), this section draws on the recent economic literature on regional instability to develop a broad model of state fragmentation. In this model, we consider a world of C countries, indexed by $c \in \{1, \ldots, C\}$, each consisting of two or more regions, indexed by $r \in \{1, \ldots, R\}$. Each region is inhabited by a population of geographically immobile agents, indexed by $i \in \{1, \ldots, I\}$, who derive utility from private consumption, c_i, and consumption of the public good, g_c. We follow BR and assume that the decision to separate is made at the regional, rather than the individual, level.

Each country, with total national income Y_c, has a single government providing public policy. To keep the model tractable, we only consider a single, non-rival public good, g_c, representing a bundle of policy choices. Public policy is financed through a country-wide proportional income tax schedule, decided by majority voting. Note that this implies redistribution, although not in the conventional income sense. Rather, poorer agents may benefit from increased taxation through an increase in the portfolio of state-provided services in areas such as health, education or public safety.[5] Regions have distinct policy preferences, d_r, such that any deviation from their most preferred policy bundle reduces the utility their inhabitants derive from the (nationally determined) public good. Therefore, the utility of agent i residing in region r of country c has the following general functional form:

$$U_{i,r,c} = f(c_i, g_c, d_r) \tag{1}$$

To obtain closed form results, more specific assumptions are needed. First of all, we will focus on linear utility from private consumption and isoelastic utility from public spending. Second, we assume that taxation is non-distortionary, implying that if country c adopts tax rate t_c, the corresponding level of the public good will be $t_c Y_c$. This simplifying assumption seems reasonable to the extent that the electorate does not take into account tax distortions when voting on tax rates. Finally, we assume that the welfare cost associated with the mismatch between regionally preferred and actually provided public policy is a convexly decreasing function of d_r. This implies that the welfare cost of a further increase in the distance between regionally preferred and actually provided public policy is itself increasing

[4] Eg. Bulgaria or Turkey.
[5] For a similar treatment, see Besley and Coate (1991).

in the initial regional preference distance to public policy. Following these assumptions, an agent with gross income y_i has the following utility under the unified country:

$$U_{i,r,c} = (1 - t_c)\, y_i + \frac{(1 - d_r)^{\delta}\, (t_c Y_c)^{\theta}}{\theta} \tag{2}$$

where $\theta \in [0, 1]$ parametrizes the intensity of preference for the public good[6], with larger values representing a more intense preference for a larger public sector. $\delta \geq 0$ captures the intensity of regionalist feelings, where it is clear that rising regionalist sentiments increase the welfare costs associated with deviations from regionally preferred public good bundles.

This allows us to explicitly derive the preferred tax rate of any agent i, $t^*_{i,r,c}$, as

$$t^*_{i,r,c} = \left[\frac{(1 - d_r)^{\delta}}{y_i}\right]^{\frac{1}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} \tag{3}$$

Individual preferences over tax rates are clearly single peaked, such that the equilibrium tax rate under majority voting equals the tax rate most preferred by the median tax voter, m, at the country level.[7] Denoting the income level of the national median tax voter by y^* and the political distinctiveness of his policy preferences by d^*, we can write the prevailing tax rate in the unified country, t^*_c, as

$$t^*_c = t^*_{m,r,c} = \left[\frac{(1 - d^*)^{\delta}}{y^*}\right]^{\frac{1}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} \tag{4}$$

implying that tax rates are increasing in country size but decreasing in median income and the distinctiveness of regional policy preferences, broadly consistent with the empirical findings of Alesina, Baqir, and Easterly (1999), Luttmer (2001) and Amin (2011).

Therefore, the utility of any agent i under the unified country can be rewritten as

$$U_{i,r,c} = (1 - t^*_c)\, y_i + \frac{(1 - d_r)^{\delta}\, (t^*_c Y_c)^{\theta}}{\theta} \tag{5}$$

Under separation, this agent ends up in region $r \in R$, where the equilibrium tax rate t^*_r is determined by the regional median tax voter. By a similar chain of reasoning, we can express this tax rate as a function of the income level, y^{**}, of the regional median tax voter:

$$t^*_r = \left(\frac{1}{y^{**}}\right)^{\frac{1}{1-\theta}} Y_r^{\frac{\theta}{1-\theta}} \tag{6}$$

implying that individual utility of any agent i under separation is given by

$$U_{i,r} = (1 - t^*_r)\, y_i + \frac{(t^*_r Y_r)^{\theta}}{\theta} \tag{7}$$

[6]Technically, θ captures the elasticity of marginal utility from public good consumption, as in Etro (2006).
[7]This is a direct implication of the median voter theorem.

This means that any agent i contemplating a move towards the independence of his region r will prefer separation over preserving the union with country c whenever $\Delta_{i,r,c} = U_{i,r} - U_{i,r,c} > 0$. More specifically, this implies that separation is preferred whenever

$$\Delta_{i,r,c} = (t_c^* - t_r^*)\, y_i + \frac{(t_r^* Y_r)^\theta - (1-d_r)^\delta \,(t_c^* Y_c)^\theta}{\theta} > 0 \tag{8}$$

It is easy to see that the net welfare gain of separation is a strictly increasing function of δ. Substituting for t_c^* and t_r^* and rearranging terms, we can rewrite the expression for the net welfare gain of separation experienced by any agent i residing in region r of country c as a function of its underlying components

$$\begin{aligned}\Delta_{i,r,c} = \varphi_1 \Bigg(& \left[\theta \frac{y_i}{y^{**}} - 1\right] \left\{1 - \left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}}\right\} + \varphi_2 \left\{1 - \frac{(1-d_r)^\delta}{(1-d^*)^\delta}\right\} + \left\{1 - \frac{y^*}{y^{**}}\right\} \\ & + \varphi_3 \left[1 - \theta \frac{y_i}{y^*}\right] \left\{1 - (1-d^*)^{\frac{\delta}{1-\theta}} \left(\frac{y^{**}}{y^*}\right)^{\frac{1}{1-\theta}}\right\} \Bigg)\end{aligned} \tag{9}$$

where

$$\varphi_1 = \frac{Y_c^{\frac{\theta}{1-\theta}}}{\theta y^{**\frac{\theta}{1-\theta}}} > 0, \varphi_2 = (1-d^*)^{\frac{\delta}{1-\theta}} \left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}} \geq 0 \quad \text{and} \quad \varphi_3 = \frac{y^*}{y^{**}} > 0$$

A closer inspection of equation (9) reveals that there are four important channels determining a region's choice of separation.[8]

First, the *economic cost of separation*, reflected in the first term in curly brackets, corresponds to the economy of scale loss in the provision of public goods. This term indicates that, except for the richest agents, the incentive to secede is increasing in the relative size of the region since larger regions are able to retain more economies of scale under separation. However, a more subtle result lies in the fact that richer agents may even experience an economic benefit of separation. The intuition behind this result is that a larger efficiency loss of separation induces a more pronounced post-secession reallocation towards private spending, such that separation may act an instrument to bring (post-separation) tax rates more in line with the fiscal preferences of the richest agents.

Proposition 1

If $y_i < \frac{y^{**}}{\theta}$, $\Delta_{i,r,c}$ *is increasing in* $\frac{Y_r}{Y_c}$.

If $y_i > \frac{y^{**}}{\theta}$, $\Delta_{i,r,c}$ *is decreasing in* $\frac{Y_r}{Y_c}$.

Second, the *political gain of separation*, reflected in the second term in curly brackets, captures the welfare gain of a public policy better suited to regional policy preferences.

[8] For more details on the derivations and interpretation of the general model, see appendix A.

It is easy to see that an increase in the distinctiveness of own regional policy preferences unambiguously increases the incentives to secede. Thus, proposition 2 can be seen as the translation of the welfare benefits of a government closer to the people.

Proposition 2

$\Delta_{i,r,c}$ is unambiguously increasing in d_r.

Note, however, that the political gain of separation also depends on the degree of preference heterogeneity in the rest of the country. Since a large degree of preference heterogeneity decreases utility from public policy, an increase in regional political distinctiveness in the rest of the country serves as a mechanism that reduces tax rates. To the extent that reduced public spending limits the relative importance of carefully tailored government policies, a general increase in preference heterogeneity decreases the political gain of separation. Whether the existence of preference heterogeneity in the rest of the country effectively plays a stabilizing role, however, critically depends on fiscal preferences.[9]

Third, the *tax base effect of separation*, reflected in the third term in curly brackets, captures the income differential between the median tax voters at the regional and the national level. If this differential is positive, there is an additional benefit of separation since richer regions would no longer need to provide tax transfers to poorer regions in case of separation. Conversely, if this differential is negative, there is an additional cost of secession due to the decrease in the tax base.

Proposition 3

If $y^{**} > y^*$, there is an additional tax base benefit of separation.

If $y^{**} < y^*$, there is an additional tax base cost of separation.

Fourth, the *redistributive effect of separation*, reflected in the last term in curly brackets, depends on the similarity of fiscal preferences. More specifically, whenever individual fiscal preferences resonate more with those of the median tax voter at the regional level, the net welfare gain of separation increases.

Proposition 4

If $y^{**} > \frac{y^*}{(1-d^*)^\delta}$, $\Delta_{i,r,c}$ is increasing in y_i.

If $y^{**} < \frac{y^*}{(1-d^*)^\delta}$, $\Delta_{i,r,c}$ decreasing in y_i.

Finally, note that the distinctiveness of the policy preferences of the rest of the country influences both political and redistributive gains of separation. Indeed, the tax-reducing effect of increased preference heterogeneity in the rest of the country serves as a mechanism

[9] More specifically, see proposition 5.

that brings (national) tax rates more in line with the fiscal preferences of the richest strata, thereby decreasing political as well as redistributive gains of secession for this particular group. For poorer agents, the stabilizing effect of reducing incongruent government policies is traded off against their preference for a larger government.

Proposition 5

If $y_i > \left(\frac{(1-d_r)^\delta}{(1-d^*)^\delta}\right) y^*$, $\Delta_{i,r,c}$ *is decreasing in* d^*.

If $y_i < \left(\frac{(1-d_r)^\delta}{(1-d^*)^\delta}\right) y^*$, $\Delta_{i,r,c}$ *is increasing in* d^*.

To gain a fuller understanding of the pure political effect, assume that income is uniformly distributed across the population and public spending is fixed, in which case the model reverts to the original AS-model:[10]

$$\Delta^{AS}_{i,r,c} = \frac{(tY_r)^\theta}{\theta} - \{1-d_r\}^\delta \left\{\frac{Y_c}{Y_r}\right\}^\theta \tag{10}$$

In this special case the incentive to secede solely depends on the magnitude of the tax disadvantage as against the welfare gains of a government closer to the people. It can be shown that the incentive to secede is unambiguously increasing in the relative size of the region and the political distinctiveness of own region's policy preferences, while it is independent of preference heterogeneity in the rest of the country:

Proposition 6

If $y_i = y^* = y^{**} = y \ \forall i \in \{1,\ldots,n\}$ *and* $t^*_c = t^*_r = t$*:*

$\Delta_{i,r,c}$ *is unambiguously increasing in* $\frac{Y_r}{Y_c}$.

$\Delta_{i,r,c}$ *is unambiguously increasing in* d_r.

$\Delta_{i,r,c}$ *is independent of* d^*.

Finally, to see the redistributive effect at play, consider the case where there is no preference heterogeneity such that equation (9) now reduces to the original BR-model:

$$\Delta^{BR}_{i,r,c} = \varphi_1 \left(\left[1 - \theta\frac{y_i}{y^*}\right] \left\{\frac{y^*}{y^{**}} - \left(\frac{y^*}{y^{**}}\right)^{\frac{\theta}{1-\theta}}\right\} + \left[\theta\frac{y_i}{y^{**}} - 1\right] \left\{1 - \left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}}\right\} + \left\{1 - \frac{y^*}{y^{**}}\right\} \right) \tag{11}$$

Thus, in this special case, the incentive to secede solely depends on - borrowing their terminology - the political (cf. redistributive) effect, the efficiency (cf. economic) effect and the tax base effect. These can be summarized as follows:

[10] For more details on the derivations and interpretation of these special cases, see appendix A.3.

Proposition 7

If $d_R = d^* = 0 \ \forall R \in \{1, \ldots, r\}$*:*

If $y^{**} > y^*$, $\Delta_{i,r,c}$ *is increasing in* y_i.

If $y_i < \frac{y^{**}}{\theta}$, $\Delta_{i,r,c}$ *is increasing in* $\frac{Y_r}{Y_c}$.

If $y^{**} > y^*$, $\Delta_{i,r,c}$ *is subject to an additional tax base benefit.*

4 A novel index of regional political distinctiveness

The idea of a government policy insufficiently tailored to regional needs as a primary threat to state stability has a long pedigree in economic thinking on the determinants of state size and also plays an important role in our model of state fragmentation. Empirical research on its significance, however, has been complicated by the necessity to quantify the degree of preference heterogeneity. Traditionally, the literature proxies preference heterogeneity by the genetic (Desmet et al., 2011), ethno-linguistic (Alesina & Wacziarg, 1998; Lake & O'Mahony, 2004) or cultural (Kaasa, Vadi, & Varblane, 2013) distances among populations. One drawback is that the supposed link with actual preference heterogeneity remains far from clear. In this light, Spolaore (2010, p. 334) contends that the degree of ethno-linguistic fractionalization proxies *"only imperfectly for the extent and intensity of preference heterogeneity that affect the determination of national borders"*. Similarly, Giuliano, Spilimbergo, and Tonon (2013, p. 17) conclude that *"genetic distance could therefore be largely a proxy for* [...] *geographical impediments, and economists should be careful when using it as a proxy for vertically transmitted characteristics."*. Another criticism concerns the limited temporal availability of data and the often-made assumption that diversity is time-constant. Thus, Stichnoth and Straeten (2009, p. 4-5) argue that *"most studies* [...] *assume, sometimes implicitly, that ethnic diversity does not change or changes slowly. This assumption is questionable."* while Campos, Saleh, and Kuzeyev (2009, p. 11) add that this literature *"has not yet explored that diversity changes over time and may also be endogenous"*.[11]

Therefore, this section proposes a novel and more direct indicator of regional preference heterogeneity. Departing from the premise that, in a democratic setting, regional policy preferences translate primarily into regional electoral behavior, we construct an indicator of regional political distinctiveness based on the discrepancy between regional and national party preferences. We proceed in two steps. First, we define the political distance between any two regions as the sum of the absolute differences between the vote

[11] With respect to ethno-linguistic fractionalization, for instance, Stichnoth and Straeten (2009, p. 5) note that *"most studies use data on ethno-linguistic groups from the early 1960s to test hypotheses about the consequences of ethnic diversity in much later periods."*.

percentages received by each political party contesting elections inside these regions, divided by 2 to eliminate double counting.[12] More specifically, when a total of P parties, indexed by $p \in \{1, \ldots, P\}$, compete in the national election that takes place at time t, the corresponding political distance between two regions r and s, $PD_{r,s,t}$, is given by

$$PD_{r,s,t} = \sum_{p=1}^{P} \frac{|v_{p,r,t} - v_{p,s,t}|}{2} \tag{12}$$

where $v_{p,r,t}$ denotes the vote percentage for party p in region r at time t.

This index thus summarizes the extent to which party preferences deviate between regions. It is easy to see that larger weight is given to votes for regionally concentrated parties, which mechanically increase the value of the index for the corresponding region. This accords with the conventional wisdom in the political science literature, that regionally concentrated parties represent region-specific interests (Rokkan & Urwin, 1982; De Winter, Gomez-Reion, & Lynch, 2006; Brancati, 2007), implying that the regional variation in their electoral strength acts like a canary in the coal mine of the existence and intensity of regionally distinct policy preferences. Note, however, that this indicator does presuppose a minimal degree of overlap in the political party landscape in each particular region and the rest of the country in order to be able to estimate meaningful inter-regional political distances. The absence of this overlap will necessitate the removal of a small number of interesting regions from the empirical application.[13,14]

In a second step, we approximate the discrepancy between regionally preferred and actually provided public policy that arises due to the existence of these inter-regional political distances by also taking into account the political influence each region has on the policy-making process. As this influence is primarily related to regional population size in a democratic context, we define the political distinctiveness experienced by region r at time t, which we denote by $d_{r,t}$, as the population-weighted political distance of this particular region to all other regions in the country

$$d_{r,t} = \sum_{s \in c} q_{s,t} PD_{r,s,t} \tag{13}$$

where $q_{s,t}$ captures the population share of region s in country c at time t.

As can be seen from this expression, the indicator takes values between 0 and 1 where higher values indicate a larger gap between regional and national policy preferences. Intuitively, this implies that the more a region's party preferences diverge from those of the majority in the rest of the country, the larger will be the estimated political distinctiveness of that region's policy preferences.

[12] A similar index is used by Lee (1988) and Hearl, Budge, and Pearson (1996).
[13] Including Northern Ireland in the UK, Valle d'Aosta in Italy and Åland in Finland, see appendix B.1.
[14] These regions could still be included when computing political distances based on the vote shares accrued by political party families, as identified by Caramani (2004), or European Parliament groups.

Before employing this index to characterize present-day regional political distinctiveness in Europe, as well as its historical evolution, several notes are in order. First, to calculate these indexes, we only use regional electoral results related to state-wide legislative elections as these are most closely related to the public policy formulation process. Second, as a basic rule, regional indexes are calculated at the NUTS 2 level. However, when the relevant autonomist movements are organized at the more aggregate NUTS 1 level - as is the case in Belgium and the UK - or the more disaggregated NUTS 3 level - as in Bulgaria - these are taken as the spatial units of interest. Also, in those cases where the NUTS 2 level corresponds to the entire country itself, the NUTS 3 level is considered instead. Finally, in our effort to place European regional voting distinctiveness in a broader historic perspective, we also report pre-universal suffrage estimates of the indicator. Although these estimates may not accurately reflect the degree of preference heterogeneity in the entire population, they do reflect the degree of preference heterogeneity of that part of the population that is politically salient. We include them to provide a historic perspective that is as complete as possible. Taken together, this leaves us with information on a total of 623 elections in 264 regions of 26 European countries. Appendix B.1 details the country-specific data construction methods utilized and provides an overview of the regions and election years included as well as the data sources.

Table 1 summarizes the present-day voting distinctiveness of both the 15 most and least distinctive European regions in our sample by relying on the most recent regional electoral results available for each separate country.[15] Unsurprisingly, regions with notoriously persistent separatist currents - such as the Basque country, neighboring Navarra and Catalonia in Spain, the isle of Corsica in France, Scotland in the UK and the predominantly German-speaking South Tyrol region in Italy - also turn out to be the most distinctive European regions in political terms. Also featured prominently on this list are those regions harboring large (ethno-) linguistic minorities, including Bulgaria's Turkish minorities in the provinces of Kardzhali, Razgrad and Targovishte, Switzerland's Italian speaking minority in Ticino and Estonia's Russian minority of Kirde-Eesti. Interestingly, some regions lacking strong regionalist movements nonetheless have voting patterns that diverge considerably from the rest of the country. For example, the above-average electoral support for the political left in the Walloon region in Belgium almost puts her on a par with Spanish Navarra. Hungary, Slovenia and Denmark, on the other hand, show up as being among the most homogeneous countries in terms of party preferences.

[15] The full results are reported in table A5.

Table 1: **Most/least distinct European regions**

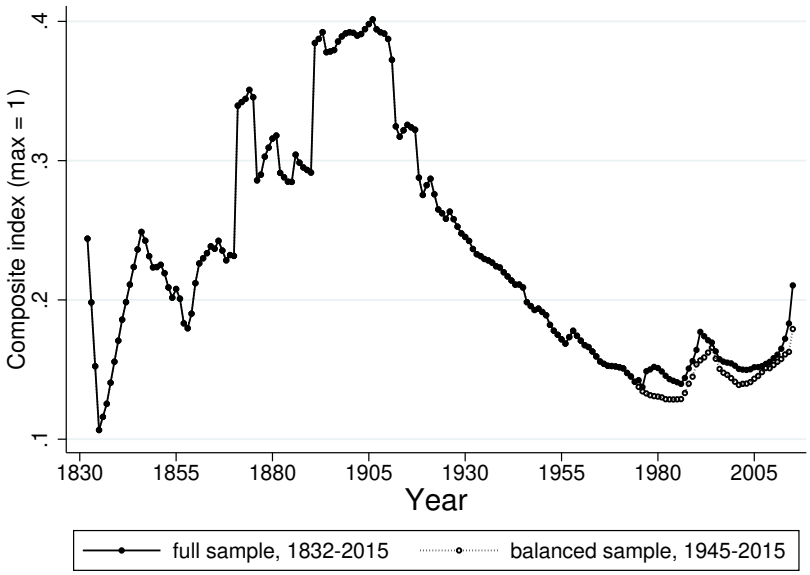
Most distinct				*Least distinct*			
#	*NUTS*	*Region*	$\widehat{d_r}$	#	*NUTS*	*Region*	$\widehat{d_r}$
1	BG425	Kardzhali	0.573	250	SK04	Gelderland	0.089
2	PT30	Região Autónoma da Madeira	0.561	251	NL22	Eastern Slovakia	0.089
3	ES51	Cataluña	0.502	252	SE12	East Middle Sweden	0.086
4	PT20	Região Autónoma dos Açores	0.496	253	HU32	Northern Great Plain	0.085
5	ES21	País Vasco	0.483	254	NL33	Zuid-Holland	0.084
6	UKM	Scotland	0.481	255	PT11	Norte	0.083
7	FR83	Corse	0.479	256	SI02	West Sweden	0.082
8	BG324	Razgrad	0.432	257	SE23	Zahodna Slovenija	0.082
9	ITH9	Trentino-Alto Adige/Südtirol	0.403	258	HU22	Western Transdanubia	0.078
10	CH07	Ticino	0.399	259	DK03	Syddanmark	0.077
11	BG334	Targovishte	0.318	260	DK04	Midjylland	0.073
12	EE007	Kirde-Eesti	0.314	261	SI01	Vzhodna Slovenija	0.072
13	ES22	Comunidad Foral de Navarra	0.302	262	HU33	Southern Great Plain	0.062
14	BE1	Brussels-Capital Region	0.294	263	HU23	Southern Transdanubia	0.06
15	BE3	Walloon region	0.263	264	HU21	Central Transdanubia	0.059

Note: This table summarizes the estimates of contemporary regional political distinctiveness, as defined in equation 13, of the 15 most and least distinctive regions in our sample relying on the most recent electoral data. Information on the most recent available election years, data construction and sources is provided in section 2 and appendix B.1.

Utilizing historical data on regional electoral results, this methodology moreover allows us to put European regional preference heterogeneity in a historical perspective. To do so, we compile an index of regional distinctiveness in Europe which captures the expected regional distinctiveness experienced by its inhabitants at any given point in time. More specifically, this corresponds to the population-weighted degree of preference heterogeneity present in our sample.[16] Calculating this composite index based on the full dataset reveals that regional preference heterogeneity rose considerably during the 19^{th} century, indicating an increasing vulnerability of European states to the destabilizing effects of regionalism throughout this period, but that regional policy preferences converged drastically in the aftermath of World War 2, reaching a low point in the early 70's. After this period of convergence, however, the most recent period is characterized by a persistent increase in regional preference heterogeneity, which resonates with the increasing regional instability witnessed during the same period. Recomputing this index for a balanced panel of 14 countries, for which data is consistently available for the postwar period, does not significantly alter the results.

[16] Data on national population size comes from Madison (2010). Assuming that regional political distinctiveness evolves gradually over time, non-election years are linearly interpolated at the regional level.

Figure 1: **Regional political distinctiveness in Europe (1832-2015)**



Note: This figure plots the evolution of the expected degree of regional political distinctiveness between 1832 and 2015. Political distinctiveness in non-election years is approximated by linear interpolation at the regional level.

These results are striking because they differ markedly from earlier results reported by Lake and O'Mahony (2004), who fail to find empirical evidence for increasing preference heterogeneity throughout the second half of the 20^{th} century, leading them to exclude this channel as a potential culprit for the dramatic contemporary decline in average state size.[17] Our indicator, in contrast, tends to confirm the existence of an upward trend in regional preference heterogeneity in the European context and thus seems better suited to explain Europe's rising regionalism over the past 40 years (Newhouse, 1997).

5 Data and empirical strategy

There are two basic forces in our theoretical model of state fragmentation: one tends to unite regional populations and the other divides them. Increasing distinctiveness of own regional policy preferences, for instance, is a force that can drive regions to secede whereas the benefits arising from economies of scale in the provision of government tend to unite them. In this section, we discuss how we aim to utilize this model, neatly summarized in equation 8, to analyze the present-day outcome of this tension between heterogeneity and efficiency in the provision of government in a European context.

To understand how this can be done, recall that the net gain of separation is an increasing function of the intensity of nationalist feelings, captured by the δ-parameter,

[17] Possibly due to data limitations as cross-national data on ethno-linguistic fractionalization, which they use as a proxy for preference heterogeneity, was only available for the years 1961 and 1985.

since higher values of δ increase the welfare costs of a uniform and nationally determined public policy. Following Desmet et al. (2011), this implies that we can rank regions according to the risk they pose to the union by starting from a world in which nationalism is nonexistent (corresponding to $\delta = 0$), and subsequently progressively increase the value of δ to check which regions would be the first to break away. To do so, we assume that the decision to separate is taken by majority voting at the regional level. This assumption seems reasonable when the central government is unable - or unwilling - to prevent separation through military means. Our equilibrium notion thus requires from each partitioning of regions into countries that this partition cannot be improved upon by any unilateral internal redrawal of borders:

Definition 1

A stable country, c, is a finite collection of regions, $r \in \{1, \ldots, R\}$, such that:

$$U_{m,r,c} \geq U_{m,r} \qquad \forall\ r \in c$$

where m refers to the median voter in region r.

Using this stability concept, we define the most secession-prone regions as those regions whose integration in the unified country is most sensitive to increasing nationalism. More specifically, the smaller the region-specific upper bound of δ for which definition 1 is satisfied, the smaller the extent of nationalist feelings needed for the regional median voter to favor separation and the more secession-prone the corresponding region. One important remark is that capital regions are assumed inherently stable due to the additional rents they derive from their status as capital, which always outweigh any potential welfare gains of separation (Sorens, 2008).[18]

Definition 2

For each region, r, let b_r denote the maximal value of δ for which $U_{m,r,c} \geq U_{m,r}$:

$b_r < b_s \Leftrightarrow$ region r is more secession-prone than region s.

Similarly, it is easy to see that, at the country-level, definition 1 will hold as long as $\delta < b_r\ \forall\ r \in c$. This implies that a country becomes more robust to the threat of regional instability as it becomes less sensitive to a separation from its most secession-prone region. In other words, the larger the country-specific upper bound of δ for which definition 1 is satisfied, the more secession-robust the corresponding country.

[18] That capital regions achieve the highest per capita income ratio's in a majority of European countries is testimony to this. Moreover, to our knowledge, there exists no real-world example of a capital region advocating its separation from the rest of the country.

Definition 3

Let B_c denote the country-specific vector whose r^{th} component equals b_r. Let $b_c^* = min\{B_c\}$:

$b_c^* > b_d^* \Leftrightarrow$ country c is more secession-robust than country d.

To analyze present-day regional (in)stability in Europe in terms of these stability concepts, we calibrate the model to contemporary income, tax and preference heterogeneity data for the regions under research and then run a series of 'simulated laboratory experiments'.[19] Each experiment starts with a particular, exogenously specified value of δ, which initially takes a value of 0, and an identical set of simulated participants, residing in one of the 264 regions listed in table A1, and involves a majority vote on the most preferred borders in each separate region according to equation 8. In each subsequent simulation we incrementally increase the value of δ by 0.01, thereby mimicking a general rise in nationalist sentiments throughout Europe, until the first region decides to break away. We repeat this exercise until we can rank all European regions from most to least secession-prone under definition 2 and all European countries from most to least secession-robust according to definition 3.

The parametrization of our model draws on a variety of sources. Most importantly, we extend a methodology originally developed by Schokkaert and Decancq (2013) to simulate regional income distributions by converting income data reported by respondents to the European Social Survey (Norwegian Social Science Data Services, 2016) to their corresponding monetary values. This procedure, detailed in appendix B.2, results in a sample of 406120 income observations (or 'simulated participants'), on average 1538 observations per individual region. To approximate regional preference heterogeneity, we rely on the appropriate estimates of regional political distinctiveness as defined in equation 13 and detailed in appendix B.1. The remaining data we need is fairly standard. Total national and regional income is proxied by Eurostat (2016b) data on national and regional GDP while for the tax rate, we use Eurostat (2016a) data on the ratio of government spending on public goods to total GDP.[20] All of this aims to ensure that the parameter values used in our simulated experiments over thousands of simulated participants resemble their real-world counterparts as closely as possible.

This leaves us with only one degree of freedom, namely the parameter θ. Lacking satisfactory estimates of its true value, we prefer to remain agnostic when it comes to its parametrization. Therefore, each simulation sequence makes use of equation 4 to identify θ endogenously through our exogenous choice of δ. In a sense, our approach thus boils down to a series of counterfactual analysis ('what-if'-scenarios), where we sequentially verify

[19] To paraphrase Aldy and Smyth (2014).

[20] Public goods are defined as 'general public services', 'defence', 'public order and safety', 'economic affairs' and 'environment protection'.

whether, if a certain parameter value of δ would reflect the true intensity of nationalist feelings, the corresponding region would secede under equation 8. The smaller the range of δ for which the answer is 'no', the more secession-prone the corresponding region. Table 2 summarizes the data sources used to identify the parameters included in our model, as well as their economic interpretation.

Table 2: **Parameter values, sources and economic interpretation**

Parameter	*Value*	*Source*	*Interpretation*
$Y_{c/r}$	National/regional GDP	Eurostat (2016b)	Total national/regional income
y_i	Disposible income per capita	Appendix B.2	Gross individual income
d_r	Appendix B.1	Appendix B.1	Regional political distinctiveness
t_c^*	Spending on public goods to GDP	Eurostat (2016a)	Prevailing national tax rate
δ	Exogenously manipulated	-	Intensity of nationalist feelings
θ	Endogenously identified	-	Intensity of preference for the public good

Finally, to give a sense of the country-specific estimates of the tastes for government that arise out of our model, table 3 reports the average parameter values for θ, as well as their standard errors, for parameter values of δ between between 0 and 0.63. We choose this specific range for δ because, as discussed in the next section, it is consistent with a stable map of Europe.[21] Our estimates imply that the Scandinavian countries display the most intense preference for public policy, closely mirroring their traditional characterization as high-tax high-benefit welfare systems (Kleven, 2014), whereas Eastern European countries turn out to have the most limited taste for a large public sector.

Table 3: **Estimated θ-values**

Country	$\widehat{\theta}$	*Country*	$\widehat{\theta}$	*Country*	$\widehat{\theta}$	*Country*	$\widehat{\theta}$
Denmark	0.329 (0.001)	Slovenia	0.289 (0.000)	Hungary	0.272 (0.001)	Latvia	0.264 (0.002)
Norway	0.326 (0.001)	Ireland	0.289 (0.001)	Switzerland	0.272 (0.001)	Lithuania	0.245 (0.002)
Finland	0.320 (0.001)	Estonia	0.289 (0.001)	Portugal	0.272 (0.002)	Poland	0.238 (0.001)
Sweden	0.315 (0.001)	Greece	0.286 (0.001)	Czech Republic	0.270 (0.001)	Romania	0.227 (0.001)
Austria	0.313 (0.001)	France	0.282 (0.001)	Italy	0.268 (0.001)	Bulgaria	0.226 (0.002)
Belgium	0.306 (0.002)	United Kingdom	0.281 (0.002)	Slovakia	0.268 (0.001)		
Netherlands	0.299 (0.001)	Germany	0.277 (0.001)	Spain	0.264 (0.002)		

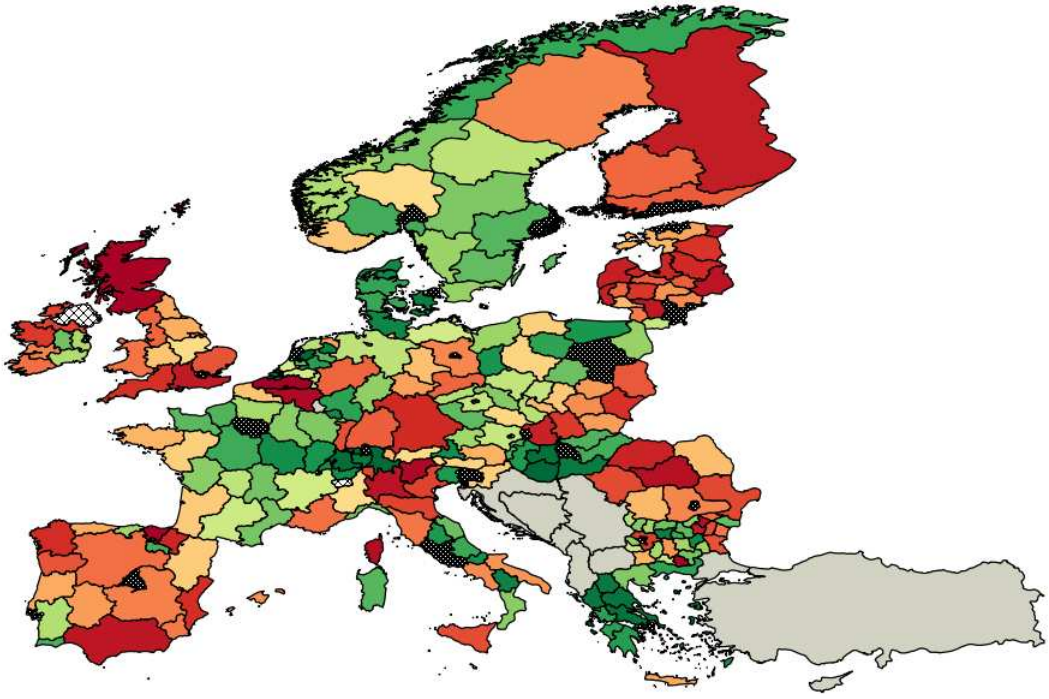
Note: This table summarizes the country-specific average θ estimates and their standard errors, when θ is estimated through equation 4 and δ is incrementally increased from 0 to 0.63 (see discussion section 5).

[21] More specifically, when δ equals 0.64, the first region in our sample breaks away, see table 4.

6 Results

Figure 2, then, visualizes what the current map of Europe looks like when viewed at through the lens of our theoretical model of state fragmentation. More specifically, this map illustrates the spatial heterogeneity in regional (in)stability by highlighting the most secession-prone regions in the darkest red while depicting the most secession-robust regions in the darkest green. Perhaps, the first thing to notice on this figure is that sensitivity to regional demand for autonomy effectively varies quite extensively across European countries. Most notably, in Western Europe there appears to be a roughly crescent-shaped discontinuous corridor of relatively strong and widespread separatist potential, stretching from Galicia over the Basque country to Cataluña in Spain, continuing in French Corsica and the Italian and Swiss Alps, following its way through Eastern Germany and Belgium before finally crossing the North Sea to end in Scotland. In Eastern Europe, sensitivity to secessionist demand is more diffuse and seems primarily tied up with the Russian minorities in Latvia and Lithuania, the Hungarian minority in Romania's Transylvanic region and the Turkish minorities in Bulgaria's northern and southern *oblasts*.

Figure 2: **Regional (in)stability in Europe**



Note: This figure visualizes the information reported in table A6, highlighting the most secession-prone regions in the darkest red and the least secesssion-prone regions in the darkest green. Excluded countries are highlighted in light gray, excluded regions are highlighted in hatched white and capital regions are depicted in dotted black.

In interpreting this figure, note that the heightened sensitivity towards secessionist tendencies in a number of Western European countries seems to be in line with their enduring processes of decentralization. In Belgium, for instance, the existence of such sensitivity would explain its historical process of evolutionary federalism that continues to this day, described by some as an infinitely repeated game between the north and the south which essentially turns Belgium into *"a quasi-empty shell"* (Gerard, 2014, p. 272). In the UK, it would explain why, in the wake of Alex Salmond's referendum defeat, more than 100 English councils demanded that more powers be devolved from Westminster, adding that *"it's Englands turn now"* (BBC, 2014). In Spain, it would explain the recent Catalan demand for fiscal autonomy and why Rajoy's subsequent refusal to accommodate this demand resulted in plans for a Catalan independence referendum (Martí, 2013).

A more detailed view on our most important results is offered in table 4, which lists the 15 most secession-prone European regions against its 15 most secession-robust territories.[22] As can be seen, Cataluña, Flanders and the Basque country are the regions currently most likely to break away in a context of rising nationalist sentiments. Consistent with these results, two of regions recently took steps to organize explicit independence referenda[23], while the statutes of the currently largest political party in Belgium clearly state an independent Flemish state as its final objective (Nieuw-Vlaamse Alliantie, 2015).

Table 4: **Most/least secession-prone European regions**

Most secession-prone				*Least secession-prone*			
#	*NUTS*	*Region*	$\widehat{b_r}$	#	*NUTS*	*Region*	$\widehat{b_r}$
1	ES51	Cataluña	0.64	...	...	...	...
2	BE2	Flemish region	0.84	224	DK02	Sjælland	9.85
3	ES21	País Vasco	0.96	225	CH06	Zentralschweiz	10.14
4	UKM	Scotland	1.12	226	HU33	Southern Great Plain	10.71
5	BG425	Kardzhali	1.29	227	EL53	Dytiki Makedonia	10.74
6	PT30	Região Autónoma da Madeira	1.39	228	EL54	Ipeiros	10.76
7	ITH9	Trentino-Alto Adige/Südtirol	1.46	229	EL61	Thessalia	10.90
8	BE3	Walloon region	1.53	230	EL64	Sterea Ellada	10.95
9	PT20	Região Autónoma dos Açores	1.80	231	HU21	Central Transdanubia	11.80
10	BG324	Razgrad	1.88	232	EL41	Voreio Aigaio	12.14
11	FR83	Corse	1.93	233	CH02	Espace Mittelland	12.46
12	RO12	Centru	1.95	234	EL62	Ionia Nisia	12.48
13	EE007	Kirde-Eesti	2.02	235	CH05	Ostschweiz	13.44
14	ITC4	Lombardia	2.18	236	NL23	Flevoland	13.83
15	LV005	Latgale	2.39	237	HU23	Southern Transdanubia	13.97
...	...	...	...	238	CH03	Nordwestschweiz	16.24

Note: This table lists the 15 most and least secession-prone regions in Europe, according to the stability concept summarized in definition 2. For the full results, see table A6.

The top of this list also contains a number of other notorious separatist and autonomist

[22] The full numerical results are listed in table A6.
[23] The Basque country in 2008, Cataluña in 2014.

regions: Scotland, which held its own independence referendum just two years ago; Corsica, a well-known example of violent separatism where separatist groups retorted to bombing campaigns to advocate greater autonomy for the island; and the Northern-Italian regions of Südtirol and Lombardia, where the Euro-crisis is believed to have fueled separatist demands which even led the South Tyrolean Economics Minister to propose that South Tyrol *"buys its freedom"* from Italy, demanding *"full autonomy"* in return (Spiegel, 2012).

Moreover, our results also shed some light on strong popular demand for regional autonomy in the under-researched Eastern European area. Examples include Bulgaria's Turkish minorities in Razgrad and Kardzhali, where separatist demonstrations in 2012 provoked Bulgarian nationalists to demand that the ethnic Turkish Movement for Rights and Freedoms (DPS) be declared unconstitutional (Novitine, 2012).[24] Another example is the Hungarian minority in the Romanic Transylvanic region, a region passed back and forth between Hungary and Romania four times the last century and regarded by each as national territory, where the Democratic Union of Hungarians in Romania (UDMR) recently held unofficial referendums on territorial autonomy in three of its eastern districts (Koszorus, 2009).[25] Similarly, in Estonia's Kirde-Eesti region, where the Russian population constitutes close to 75% of the total population, a vote in favor of autonomy in 1993 was halted by the Estonian state, making it *"wary of losing its grip on sovereignty within EU integration"* (Aalto, 2006, p. 72).

Turning to the other extreme, Nordwestschweiz in Switzerland turns out to be the European region that is currently the least likely to secede, followed by Hungarian Southern Transdanubia and Dutch Flevoland. Other countries well represented in the bottom of this list include Greece and Denmark.

Finally, we can use these region-specific results to characterize the robustness to increasing nationalism of all of the countries under research. As discussed in the previous section, this can be done by ranking countries on their sensitivity to the secession of their most secession-prone region. The results, detailed in table 5, illustrate that, according to this measure, Spain, Belgium and the United Kingdom rank as currently being the most sensitive to regional instability whereas Denmark, Hungary and Slovenia show up as the most secession-robust countries in Europe.

[24] Two years earlier, the leader of the Bulgarian-nationalist Ataka party claimed that *"there is a serious threat that the Kardhzali district could be separated from Bulgaria"* (Novitine, 2010).

[25] Interestingly, the chairman of the UDMR recently stated that *"the independence of Kosovo is a precedent that all EU countries with an ethnic minority should pursue"* (Spiegel, 2008).

Table 5: **Least/most secession-robust European countries**

Least secession-robust				*Most secession-robust*			
#	*Country*	*Most sensitive region*	$\widehat{B_c}$	#	*Country*	*Most sensitive region*	$\widehat{B_c}$
1	Spain	Cataluña	0.64	14	Germany	Bayern	3.15
2	Belgium	Flemish region	0.84	15	Poland	Podkarpackie	3.43
3	United Kingdom	Scotland	1.12	16	Ireland	West	3.61
4	Bulgaria	Kardzhali	1.29	17	Switzerland	Ticino	3.82
5	Portugal	Região Autónoma da Madeira	1.39	18	Sweden	Upper Norrland	4.46
6	Italy	Trentino-Alto Adige/Südtirol	1.46	19	Netherlands	Groningen	4.85
7	France	Corse	1.93	20	Greece	Kriti	4.9
8	Romania	Centru	1.95	21	Austria	Steiermark	4.98
9	Estonia	Kirde-Eesti	2.02	22	Czech republic	Moravsosleszko	5.03
10	Latvia	Latgale	2.39	23	Norway	Agder and Rogaland	5.15
11	Lithuania	Kaunas County	2.54	24	Slovenia	Vzhodna Slovenija	5.27
12	Finland	Pohjois- ja Itä-Suomi	2.64	25	Hungary	Northern Hungary	7.47
13	Slovakia	Western Slovakia	2.95	26	Denmark	Syddanmark	7.83

Note: This table ranks European countries from least to most secession-robust, according to the stability concept summarized in definition 3.

7 Conclusion

This paper draws on key insights from the existing literature on regional (in)stability to analyze the political and economical forces that shape regional incentives to secede. Tracing the interrelations between these forces in a model that is considerably broader than usual, we largely confirm existing findings but also point out potential stabilizing effects of preference heterogeneity. The intuition behind the latter result is that preference heterogeneity in the rest of the country, by reducing the utility derived from public policy, serves as a mechanism lowering national tax rates thereby reducing the fiscal gains of separation for the wealthy. To be able to apply the model, a subsequent section proposes a novel indicator of regional political distinctiveness which captures the extent of regionally deviating policy preferences as the discrepancy between regional and national electoral behavior. It is shown that, according to this index, European regional preference heterogeneity has persistently intensified over the past 40 years, which may explain the rise in European regionalism that took place within the same time frame. Finally, this paper is the first to validate the empirical implications of this theoretical framework for a broad set of European regions. We illustrate how, on the whole, our results tend more to confirm than to contradict our theoretical model of state fragmentation, lending further credibility to its capacity of explaining spatial heterogeneity in regional (in)stability in a European context.

Possibilities for future research include a further validation of the model, verifying its ability to account for spatial heterogeneity in regionalist demand in other parts of the

world. Another fruitful avenue would be to extend the basic model to incorporate the decentralized structure of government, which would connect our model to the literature on fiscal decentralization. Furthermore, one could verify the robustness of the results with respect to alternative political arrangements. As the recent Catalan debacle illustrates, the assumption of regions unilaterally deciding on their most preferred borders may not hold in practice. Therefore, it could be interesting to investigate to what extent a democratic central government could increase secession-robustness by imposing alternative decision mechanisms, such as subjecting the decision to separate to a country-wide, as opposed to a regional, independence referendum.[26] With respect to the proposed index of regional political distinctiveness, one potential issue lies in the symmetric treatment of political parties. Hence, its accuracy may be improved by assigning weights to the political distances between different party programs.

Finally, a more ambitious research agenda would include making this static model dynamic, to analyze how differential (expected) growth rates or asymmetrical shocks influence regional incentives to separate. Moreover, making this deterministic model probabilistic would serve to assess the degree of uncertainty associated with the here-mentioned channels of regional (in)stability. In this regard, it would be interesting to verify how the various regional characteristics laid out in the basic model influenced the probability to vote 'yes' in those regions participating in the recent independence referendums in Scotland and Catalonia.

[26] Note that the central government in Madrid considered the Catalan independence referendum unconstitutional, claiming that under the 1978 constitution *"all Spaniards must be consulted on issues of sovereignty"* (Washington Post, 2014).

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A Decomposing the net gain of independence

The general expression for the net gain of secession summarized in equation 8 makes it difficult to identify which channels primarily determine the decision to secede. This section demonstrates how this general expression can be decomposed into its underlying components. Subsequently, it relies on this decomposition to identify and interpret the primary channels determining the incentives to secede. Finally, it demonstrates that both the AS-model, which abstracts from income heterogeneity, and the BR-model, which ignores heterogeneity in policy preferences, are two special cases of this more general model.

A.1 Decomposition

Starting from equation 8, we had that

$$\Delta_{i,r,c} = (t_c^* - t_r^*)\, y_i + \frac{(t_r^* Y_r)^\theta - (1-d_r)^\delta\, (t_c^* Y_c)^\theta}{\theta} \tag{14}$$

Substituting for the expressions of the national and regional tax rates, summarized in equations 4 and 6 respectively, we can rewrite this as

$$\begin{aligned}
\Delta_{i,r,c} &= \left(\left[\frac{(1-d^*)^\delta}{y^*} \right]^{\frac{1}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} - \left[\frac{1}{y^{**}} \right]^{\frac{1}{1-\theta}} Y_r^{\frac{\theta}{1-\theta}} \right) y_i + \frac{\left(\left[\frac{Y_r}{y^{**}} \right]^{\frac{1}{1-\theta}} \right)^\theta - (1-d_r)^\delta \left(\left[\frac{(1-d^*)^\delta Y_c}{y^*} \right]^{\frac{1}{1-\theta}} \right)^\theta}{\theta} \\
&= \left(\frac{(1-d^*)^{\frac{\delta}{1-\theta}}\, Y_c^{\frac{\theta}{1-\theta}}}{{y^*}^{\frac{1}{1-\theta}-}} - \frac{Y_r^{\frac{\theta}{1-\theta}}}{{y^{**}}^{\frac{1}{1-\theta}}} \right) y_i + \frac{Y_r^{\frac{\theta}{1-\theta}}}{{y^{**}}^{\frac{\theta}{1-\theta}}} - \frac{(1-d_r)^\delta\, (1-d^*)^{\frac{\delta\theta}{1-\theta}}\, Y_c^{\frac{\theta}{1-\theta}}}{\theta {y^*}^{\frac{\theta}{1-\theta}}} \\
&= \left(\frac{(1-d^*)^{\frac{\delta}{1-\theta}}\, Y_c^{\frac{\theta}{1-\theta}} {y^{**}}^{\frac{1}{1-\theta}} - Y_r^{\frac{\theta}{1-\theta}} {y^*}^{\frac{1}{1-\theta}}}{(y^* y^{**})^{\frac{1}{1-\theta}}} \right) y_i + \frac{Y_r^{\frac{\theta}{1-\theta}} {y^*}^{\frac{\theta}{1-\theta}} - (1-d_r)^\delta\, (1-d^*)^{\frac{\delta\theta}{1-\theta}}\, Y_c^{\frac{\theta}{1-\theta}} {y^{**}}^{\frac{\theta}{1-\theta}}}{\theta\, (y^* y^{**})^{\frac{\theta}{1-\theta}}}
\end{aligned}$$

$$= \left(\frac{\theta \left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}}}{\theta y^* y^{*\frac{\theta}{1-\theta}} y^{**} y^{**\frac{\theta}{1-\theta}}} \right) y_i + \frac{Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d_r\right)^{\delta} \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{\theta \left(y^* y^{**}\right)^{\frac{\theta}{1-\theta}}}$$

$$= \left(\frac{1}{\theta \left[y^* y^{**}\right]^{\frac{\theta}{1-\theta}}} \right) \left[\left(\frac{\theta \left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}}}{y^* y^{**}} \right) y_i + Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d_r\right)^{\delta} \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right]$$

Letting $A = \left(\frac{1}{\theta [y^* y^{**}]^{\frac{\theta}{1-\theta}}} \right)$ and $B = \left(\frac{\theta(1-d^*)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}}}{y^* y^{**}} \right) y_i$, we have that

$$= A \left(B + Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d_r\right)^{\delta} \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right) + A \left(Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} \right)$$

$$= A \left(B + y^{*\frac{\theta}{1-\theta}} \left[Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}} \right] + Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d_r\right)^{\delta} \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right) + \left(\left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} - \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right)$$

$$= A \left(B + y^{*\frac{\theta}{1-\theta}} \left[Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}} \right] + \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \left[1 - \left(1-d_r\right)^{\delta} \right] + Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right)$$

Subsequently, let $C = y^{*\frac{\theta}{1-\theta}} \left[Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}} \right] + \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \left[1 - \left(1-d_r\right)^{\delta} \right]$ and substitute for B such that

$$= A \left(C + \left(\frac{\theta \left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}}}{y^* y^{**}} \right) y_i + Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}} - \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \right)$$

$$= A \left(C + \frac{Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y^{**} - \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^* y^{**\frac{1}{1-\theta}} + \theta \left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} y_i - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y_i}{y^* y^{**}} \right)$$

By letting $D = \frac{1}{y^* y^{**}}$, we can write

$$= A\left(C + D\left(Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y^{**} - (1-d^*)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^* y^{**\frac{1}{1-\theta}} + \theta (1-d^*)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} y_i - \theta Y_r^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y_i\right)\right) + AD\left(Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y^* - Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} y^*\right)$$

$$= A\left(C + D\left(Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} \left[y^{**} - y^*\right] + \theta y_i y^{*\frac{1}{1-\theta}} \left[Y_c^{\frac{\theta}{1-\theta}} - Y_r^{\frac{\theta}{1-\theta}}\right] + Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{1}{1-\theta}} \left[y^* - \theta y_i\right] + (1-d^*)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{1}{1-\theta}} \left[(1-d^*)^{\delta} \theta y_i - y^*\right]\right)\right)$$

Substituting for C and D, we get that

$$= A\left(y^{*\frac{\theta}{1-\theta}} \left[Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}}\right] + (1-d^*)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}} \left[1 - (1-d_r)^{\delta}\right] + \frac{Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}}}{y^{**}} \left[y^{**} - y^*\right] + \frac{\theta y_i y^{*\frac{\theta}{1-\theta}}}{y^{**}} \left[Y_c^{\frac{\theta}{1-\theta}} - Y_r^{\frac{\theta}{1-\theta}}\right]\right.$$
$$\left. + \frac{Y_c^{\frac{\theta}{1-\theta}} y^{*\frac{\theta}{1-\theta}}}{y^{**}} \left[y^* - \theta y_i\right] + \frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{y^*} \left[(1-d^*)^{\delta} \theta y_i - y^*\right]\right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1 - \theta \frac{y_i}{y^{**}}\right] \left[\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right] + \left[1 - \frac{y^*}{y^{**}}\right] + \frac{y^* - \theta y_i}{y^{**}} + (1-d^*)^{\frac{\delta\theta}{1-\theta}} \left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}} \left[1 - (1-d_r)^{\delta}\right] + \frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}} \left[(1-d^*)^{\delta} \theta y_i - y^*\right]\right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1 - \theta \frac{y_i}{y^{**}}\right] \left[\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right] + \left[1 - \frac{y^*}{y^{**}}\right] + \frac{y^* - \theta y_i}{y^{**}} + \frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}} \left[y^* - (1-d_r)^{\delta} y^*\right] + \frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}} \left[(1-d^*)^{\delta} \theta y_i - y^*\right]\right)$$
$$+ A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}} y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}} \left[(1-d^*)^{\delta} y^* - (1-d^*)^{\delta} y^*\right]\right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1-\theta\frac{y_i}{y^{**}}\right] \left[\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right] + \left[1-\frac{y^*}{y^{**}}\right] + \frac{y^*-\theta y_i}{y^{**}} + \frac{(1-d^*)^{\frac{\delta\theta}{1-\theta}}\, y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}} \left[(1-d^*)^{\delta}\left[\theta y_i - y^*\right] + y^*\left[(1-d^*)^{\delta} - (1-d_r)^{\delta}\right]\right] \right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1-\theta\frac{y_i}{y^{**}}\right] \left[\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right] + \left[1-\frac{y^*}{y^{**}}\right] + (y^*-\theta y_i)\left[\frac{1}{y^{**}} - \frac{(1-d^*)^{\frac{\delta}{1-\theta}}\, y^{**\frac{\theta}{1-\theta}}}{y^{*\frac{1}{1-\theta}}}\right] + (1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}}\left[1-\frac{(1-d_r)^{\delta}}{(1-d^*)^{\delta}}\right] \right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1-\theta\frac{y_i}{y^{**}}\right] \left[\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right] + \left[1-\frac{y^*}{y^{**}}\right] + (1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}}\left[1-\frac{(1-d_r)^{\delta}}{(1-d^*)^{\delta}}\right] + \left(1-\theta\frac{y_i}{y^*}\right)\left[\frac{y^*}{y^{**}} - (1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}}\right] \right)$$

$$= A\left(Y_c y^*\right)^{\frac{\theta}{1-\theta}} \left(\left[1-\theta\frac{y_i}{y^{**}}\right] \left\{\frac{Y_r^{\frac{\theta}{1-\theta}}}{Y_c^{\frac{\theta}{1-\theta}}} - 1\right\} + \left\{1-\frac{y^*}{y^{**}}\right\} + (1-d^*)^{\frac{\delta}{1-\theta}}\left\{\frac{y^{**}}{y^*}\right\}^{\frac{\theta}{1-\theta}}\left[1-\frac{(1-d_r)^{\delta}}{(1-d^*)^{\delta}}\right] \right.$$
$$\left. + \left(\frac{y^*}{y^{**}}\right)\left(1-\theta\frac{y_i}{y^*}\right)\left[1-(1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^*}{y^{**}}\right)^{\frac{1}{1-\theta}}\right] \right)$$

Finally, letting $\varphi_1 = \frac{Y_c^{\frac{\theta}{1-\theta}}}{\theta y^{**\frac{\theta}{1-\theta}}} > 0$, $\varphi_2 = (1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^{**}}{y^*}\right)^{\frac{\theta}{1-\theta}} \geq 0$ and $\varphi_3 = \frac{y^*}{y^{**}} > 0$ allows us to rewrite expression 8 as

$$\Delta_{i,r,c} = \varphi_1\left(\left[\theta\frac{y_i}{y^{**}} - 1\right]\left\{1-\left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}}\right\} + \left\{1-\frac{y^*}{y^{**}}\right\} + \varphi_2\left\{1-\frac{(1-d_r)^{\delta}}{(1-d^*)^{\delta}}\right\} + \varphi_3\left[1-\theta\frac{y_i}{y^*}\right]\left\{1-(1-d^*)^{\frac{\delta}{1-\theta}}\left(\frac{y^{**}}{y^*}\right)^{\frac{1}{1-\theta}}\right\}\right)$$

A.2 Interpretation

Equation 9 identifies four important determinants of regional incentives to secede: an *economic cost* of separation, induced by a loss in economies of scale; a *political gain* of separation, attained by the move towards a government closer to the people; a *tax base effect*, which depends on the income differential between the national and regional median voters; and a *redistributive effect*, which critically hinges on the similarity of individual fiscal preferences and those of the regional and national median voters.

$$\Delta_{i,r,c} = \varphi_1 \left(\left[\theta \frac{y_i}{y^{**}} - 1 \right] \overbrace{\left\{ 1 - \left(\frac{Y_r}{Y_c} \right)^{\frac{\theta}{1-\theta}} \right\}}^{\text{economic cost}} + \varphi_2 \overbrace{\left\{ 1 - \frac{(1-d_r)^{\delta}}{(1-d^*)^{\delta}} \right\}}^{\text{political gain}} + \overbrace{\left\{ 1 - \frac{y^*}{y^{**}} \right\}}^{\text{tax base effect}} \right.$$

$$\left. + \varphi_3 \left[1 - \theta \frac{y_i}{y^*} \right] \underbrace{\left\{ 1 - (1-d^*)^{\frac{\delta}{1-\theta}} \left(\frac{y^{**}}{y^*} \right)^{\frac{1}{1-\theta}} \right\}}_{\text{redistributive effect}} \right)$$

The *economic cost* of separation is driven by the economy of scale loss in the provision of government induced by declaring independence. Noting that, by assumption, $\left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}} < 1$, this efficiency loss of separation entails differing welfare effects for poorer and richer agents. Hence agents with income levels y_i not exceeding $\frac{y^{**}}{\theta}$, such that $\theta \frac{y_i}{y^{**}} - 1 \leq 0$, experience an economy of scale cost of separation which is decreasing in the relative size of the region, $\frac{Y_r}{Y_c}$. For this reason, except for the richest agents, the incentives to secede are increasing regional size. A more subtle effect is that for agents with income levels exceeding $\frac{y^{**}}{\theta}$, the economy of scale loss of separation translates into a net economic gain of separation. The intuition behind this result is that the efficiency loss of separation induces a post-independence reallocation towards private spending, bringing post-independence tax rates more in line with their fiscal preferences. That secession may function as an instrument to curb tax pressures also explains the slightly counter-intuitive implication that incentives to secede are decreasing in the size of the future state for the richest agents.

The *political gain* of separation captures the welfare gain of a government closer to the people. Recalling that $\varphi_2 \geq 0$, it is easy to see that an increase in the distinctiveness of the own region's policy preferences, d_r, unambiguously increases the incentive to secede. Note, however, that the political gain of secession is decreasing in the degree of preference heterogeneity in the rest of the country, d^*. Indeed, the tax-reducing effect of increasing preference heterogeneity in the rest of the country[27] may serve as a mechanism to neutralize the political gain of secession, by reducing the total amount of resources that potentially flow to unwanted government programs. Whether the presence of preference

[27] Stemming from the reduction in the utility derived from public good consumption, see equation 4.

heterogeneity in the rest of the country effectively reduces incentives to secede, however, critically depends on fiscal preferences, as we will discuss below.

The *tax base effect* of separation, then, captures the income differential between the median tax voters at the regional and the national levels. When this differential is positive, there is an additional benefit of separation since richer regions would no longer need to provide tax transfers to poorer regions post-secession. When this differential is negative, there is an additional cost of separation due to the adverse impact on the tax base.

The *redistributive effect* of separation, finally, depends on the similarity of fiscal preferences. Whenever the income level of the regional median tax voter sufficiently lies above the income level of the national median tax voter, such that $y^{**} > \frac{y^*}{(1-d^*)^\delta}$, the net gain of secession is increasing in individual income, y_i, while the opposite is true when $y^{**} < \frac{y^*}{(1-d^*)^\delta}$. In other words, when individual fiscal preferences most closely resemble those of the regional median tax voter, there is an additional fiscal benefit of separation. Interestingly, this redistributive effect also depends on the presence of preference heterogeneity in the country, d^*, which puts a downward pressure on national tax rates. For rich agents ($y_i \geq \frac{y^*}{\theta}$), the degree of preference heterogeneity in the unified country plays a stabilizing role by bringing national tax rates more in line with their fiscal preferences, decreasing their net gain of separation. In contrast, a general rise in preference heterogeneity increases the gain of separation for poor agents ($y_i \leq \frac{y^*}{\theta}$), by further increasing the discrepancy between their preferred and actual government size in the unified country.

Note that preference heterogeneity in the rest of the country thus reduces both political as well as redistributive gains of separation for the richest agents, while poorer agents trade of the potentially beneficial effects of reducing incongruent, nationally determined government policies against their preference for more government intervention. More specifically, note that the contribution of country-level preference heterogeneity, d^*, to the incentive to secede turns negative whenever $\frac{\partial \Delta_{i,r,c}}{\partial d^*} < 0$ or, equivalently,

$$\frac{\partial \left(\left[\frac{(1-d^*)^\delta}{y^*} \right]^{\frac{1}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} - \left[\frac{1}{y^{**}} \right]^{\frac{1}{1-\theta}} Y_r^{\frac{\theta}{1-\theta}} \right) y_i + \frac{\left(\left[\frac{Y_r}{y^{**}} \right]^{\frac{1}{1-\theta}} \right)^\theta - (1-d_r)^\delta \left(\left[\frac{(1-d^*)^\delta Y_c}{y^*} \right]^{\frac{1}{1-\theta}} \right)^\theta}{\theta}}{\partial d^*} < 0$$

$$\frac{\delta}{1-\theta} \frac{(1-d^*)^{\frac{\delta-1+\theta}{1-\theta}}}{{y^*}^{\frac{1}{1-\theta}}} Y_c^{\frac{\theta}{1-\theta}} y_i (-1) - \frac{\delta\theta}{1-\theta} \frac{(1-d_r)^\delta (1-d^*)^{\frac{\delta\theta-1+\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}}{\theta {y^*}^{\frac{\theta}{1-\theta}}} (-1) < 0$$

$$\frac{\delta (1-d^*)^{\frac{\delta-1+\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}}{(1-\theta) {y^*}^{\frac{1}{1-\theta}}} \left((1-d_r)^\delta (1-d^*)^{\frac{\delta\theta-\delta}{1-\theta}} y^* - y_i \right) < 0$$

$$y_i > \left(\frac{1-d_r}{1-d^*} \right)^\delta y^*$$

A.3 Special cases

It is useful to point out that this broad model of state fragmentation encompasses several existing models as special cases. To see this, first consider the seminal AS-model, which abstracts both from income heterogeneity as well as differing fiscal preferences and derives optimal state size as the result of a trade-off of scale economies against heterogeneity costs. In the context of our model, assuming income heterogeneity plays no role in determining regional incentives to secede boils down to assuming that $y_i = y^* = y^{**} = y$, while ignoring the potential relevance of differing fiscal preferences is achieved by exogenizing tax rates, such that $t_c^* = t_r^{**} = t$. In this special case, equation 8 reverts to the AS-model since

$$\begin{aligned}\Delta_{i,r,c}^{AS} &= (t-t)\,y + \frac{(tY_r)^{\theta} - (1-d_r)^{\delta}\,(tY_c)^{\theta}}{\theta} \\ &= \frac{(tY_r)^{\theta} - (1-d_r)^{\delta}\,(tY_c)^{\theta}}{\theta} \\ &= \frac{(tY_r)^{\theta}}{\theta}\left[1 - (1-d_r)^{\delta}\left(\frac{tY_c}{tY_r}\right)^{\theta}\right]\end{aligned}$$

Such that, by letting $\varphi_4 = \frac{(tY_r)^{\theta}}{\theta} > 0$, we obtain that

$$\Delta_{i,r,c}^{AS} = \varphi_4 - \underbrace{\{1-d_r\}^{\delta}}_{\text{political gain}}\ \underbrace{\left\{\frac{Y_c}{Y_r}\right\}^{\theta}}_{\text{economic cost}}$$

It is easy to verify that the incentive to secede is now unambiguously increasing in the relative size of the region, $\frac{Y_r}{Y_c}$, as well as in the own region's degree of preference heterogeneity, d_r, but independent of the degree of preference heterogeneity in the rest of the country, consistent with the prior findings of AS.

As noted in section 1, this basic AS-model has been extended in several directions. To demonstrate how these extensions can be incorporated, consider the important contribution of endogenizing tax rates in the original AS-model[28], which allows to account for the potentially destabilizing effect of differing fiscal views. To understand the ramifications of this extension, we suitably adapt the basic AS-model by endogenizing tax rates[29], finding that

$$\Delta_{i,r,c}^{AS,t^*} = \left(\frac{(1-d^*)^{\frac{\delta}{1-\theta}}\,Y_c^{\frac{\theta}{1-\theta}} - Y_r^{\frac{\theta}{1-\theta}}}{y^{\frac{1}{1-\theta}}}\right) y + \frac{Y_r^{\frac{\theta}{1-\theta}} - (1-d_r)^{\delta}\,(1-d^*)^{\frac{\delta\theta}{1-\theta}}\,Y_c^{\frac{\theta}{1-\theta}}}{\theta y^{\frac{\theta}{1-\theta}}}$$

[28] See, for instance, Goyal and Staal (2004) and Etro (2006, Appendix B).
[29] In line with most of this literature, we still abstract from income heterogeneity.

$$
\begin{aligned}
&= \left(\frac{1}{\theta y}\right)\left[\theta\left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} + Y_r^{\frac{\theta}{1-\theta}} - \left(1-d_r\right)^{\delta}\left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}\right] \\
&= \left(\frac{1}{\theta y}\right)\left[\theta\left(1-d^*\right)^{\frac{\delta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}} - \theta Y_r^{\frac{\theta}{1-\theta}} + \left(Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}}\right)\right. \\
&\quad \left. + Y_c^{\frac{\theta}{1-\theta}} + \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}\left[1-\left(1-d_r\right)^{\delta}\right] - \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}\right] \\
&= \left(\frac{1}{\theta y}\right)\left[\left(Y_r^{\frac{\theta}{1-\theta}} - Y_c^{\frac{\theta}{1-\theta}}\right) + Y_c^{\frac{\theta}{1-\theta}}\left[1-\left(1-d_r\right)^{\delta}\right] + \theta\left(Y_c^{\frac{\theta}{1-\theta}} - Y_r^{\frac{\theta}{1-\theta}}\right) + \left(1-\theta\right) Y_c^{\frac{\theta}{1-\theta}}\right. \\
&\quad \left. + \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}} Y_c^{\frac{\theta}{1-\theta}}\left[\left(1-d^*\right)^{\delta}\theta - 1\right] + \left(1-d^*\right)^{\frac{\delta\theta}{1-\theta}}\left[\left(1-d^*\right)^{\delta} - \left(1-d^*\right)^{\delta}\right]\right] \\
&= \left(\frac{Y_c^{\frac{\theta}{1-\theta}}}{\theta y}\right)\left[\left(1-\theta\right)\left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}}\left[1-\left(\frac{Y_c}{Y_r}\right)^{\frac{\theta}{1-\theta}}\right] + \left(1-d^*\right)^{\frac{\delta}{1-\theta}}\left[1-\frac{\left(1-d_r\right)^{\delta}}{\left(1-d_r\right)^{\delta}}\right]\right. \\
&\quad \left. + \left(1-\theta\right)\left[1-\left(1-d^*\right)^{\delta}\right]\right]
\end{aligned}
$$

Subsequently, by letting $\varphi_5 = \frac{Y_c^{\frac{\theta}{1-\theta}}}{\theta y} > 0$, $\varphi_6 = \left(1-\theta\right)\left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}} \geq 0$, $\varphi_7 = \left(1-d^*\right)^{\frac{\delta}{1-\theta}} \geq 0$ and $\varphi_8 = \left(1-\theta\right) \geq 0$, we arrive at

$$
\Delta_{i,r,c}^{AS,t^*} = \varphi_5\left[\varphi_6 \underbrace{\left\{1-\left(\frac{Y_c}{Y_r}\right)^{\frac{\theta}{1-\theta}}\right\}}_{\text{economic cost}} + \varphi_7 \underbrace{\left\{1-\frac{\left(1-d_r\right)^{\delta}}{\left(1-d^*\right)^{\delta}}\right\}}_{\text{political gain}} + \varphi_8 \underbrace{\left\{1-\left(1-d^*\right)^{\delta}\right\}}_{\text{redistributive effect}}\right]
$$

In line with the basic AS-model, there is an economic cost of separation, which is unambiguously decreasing in relative regional size ($\frac{Y_r}{Y_c}$), as well as a political gain of separation, which is unambiguously increasing in the degree of preference heterogeneity present in the own region (d_r). In contrast to the basic model, however, the introduction of endogenous taxation implies that the net gain of separation now also depends on the degree of preference heterogeneity in the rest of the country, d^*. More specifically, agents now trade off the discrepancy between actual and preferred government size that arises due to regionally differing levels of preference heterogeneity against the beneficial effect of reduced public spending, which decreases the relative importance of regionally tailored public policy altogether. Finally, note that this framework still abstracts from any heterogeneity in income, explaining the absence of any tax base effect.

Alternatively, the BR-model ignores heterogeneity in policy preferences and focuses on redistributive conflicts as a potential source of secessionist tendencies, revealing inter-regional income distribution differentials as the primary force driving regional instability. In the absence of preference heterogeneity, which implies that $d^* = d_r = 0$, equation 9 reverts to the BR-model summarized by

$$\Delta^{BR}_{i,r,c} = \varphi_1 \left(\left[1 - \theta \frac{y_i}{y^*}\right] \underbrace{\left\{ \frac{y^*}{y^{**}} - \left(\frac{y^*}{y^{**}}\right)^{\frac{\theta}{1-\theta}} \right\}}_{\text{political effect}} + \left[\theta \frac{y_i}{y^{**}} - 1\right] \underbrace{\left\{ 1 - \left(\frac{Y_r}{Y_c}\right)^{\frac{\theta}{1-\theta}} \right\}}_{\text{efficiency effect}} + \underbrace{\left\{ 1 - \frac{y^*}{y^{**}} \right\}}_{\text{tax base effect}} \right)$$

Borrowing their terminology, absent preference heterogeneity, regional incentives to secede depend only on a political effect, an efficiency effect and a tax base effect. The political effect, partially reflected in the first term, crucially depends on the similarity in fiscal preferences such that incentives to secede are increasing in individual income, y_i, whenever the income level of the regional median tax voter exceeds that of the national median tax voter, $y^{**} > y^*$. In addition, the efficiency effect implies that for the majority of the population, namely those agents with income levels below $\frac{y^{**}}{\theta}$, the efficiency loss of separation ($\frac{Y_r}{Y_c}$) increases the secession cost. The presence of income heterogeneity also induces a tax base effect: whenever $y^{**} < y^*$, there is an additional cost of separation due to the reduction in the tax base.

B Data construction and sources

To analyze spatial heterogeneity in regional (in)stability in Europe in terms of the theoretical model outlined in equation 8, we calibrate its parameters to reflect the contemporary economic situation in the regions involved as closely as possible. This appendix first details how we quantify the political distinctiveness of regional policy preferences, which are defined in equation 13, and subsequently outlines the procedure followed to simulate regional income distributions. Data sources of the other variables involved in our empirical application are listed in table 2.

B.1 Regional political distinctiveness

To characterize the historical evolution of the territorial structuring of party voting behavior in Europe, we draw on a wide variety of electoral resources and population statistics to ensure a time series that is as complete as possible. This section first describes in more detail how historical regional party preferences are reconstructed, which are necessary to compute the inter-regional political distances defined equation 12. Subsequently, it describes the procedure followed to compute the historical regional population shares utilized to translate these inter-regional political distances into estimates of the political distinctiveness of regional policy preferences, according to equation 13. Table A1 provides an overview of the regions and election years included in our analysis.

B.1.1 Historical electoral data

In general, to construct country-specific historical time series of regional party vote shares, we mainly rely on the constituency-level electoral results of national elections to the lower house as reported by Caramani (2004) and Brancati (2007), aggregate the results at the territorial levels of the relevant present-day NUTS-regions and subsequently maximally extend these figures forward using the more recent electoral information contained in Norwegian Centre for Research Data (2016) and Álvarez-Rivera (2016).

More specifically, in a first step, we collect historical information on the constituency-level number of party votes for all available competing parties. We only collect information on votes for specific parties, ignoring votes for 'unknown', 'other' or 'miscellaneous' parties as well as postal and invalid votes. In case of plural voting, where possible, we aggregate votes according to the 'one man, one vote'-principle while only taking into account the first-ballot results during multiple-ballot elections. Additionally, to obtain estimates of party votes in constituencies with uncontested elections, we assume that the winning party received all valid votes expressed in the constituency whenever this data is available, and otherwise approximate this information by multiplying the average fraction of valid votes in total eligible votes in the other available constituencies in the country with the number of eligible votes in the constituency under consideration. Finally, any remaining missing

figures are linearly interpolated whenever this was feasible.[30]

Subsequently, to give the data a historic continuity, these historical constituency-level electoral results are aggregated at the levels of the relevant present-day NUTS regions (Eurostat, 2015). To maximally accommodate any breaks in the continuity of the underlying territorial units, a concordance table is constructed for each available election year to recombine historical electoral constituencies into their respective present-day NUTS regions.[31] Territorial units that historically formed a part of the national territory, but later split off, are assigned an 'artificial' NUTS classification code, and are thus included in the computation of the index of regional political distinctiveness.

Finally, these regional time series are maximally extended forward using more recent electoral data sources such as Norwegian Centre for Research Data (2016) and Álvarez-Rivera (2016). Since these data sources fully report regional electoral outcomes according to NUTS regions, this extension is relatively straightforward. Table A2 provides a breakdown of all relevant data sources and describes the specific data construction procedure utilized by country.

B.1.2 Historical population statistics

Gathering information on the historical population sizes of the European regions considered in our analysis, we mainly rely on the historical demographic data of administrative divisions reported by Lahmeyer (2006), aggregate the results to reflect the territorial structure of the relevant present-day NUTS-regions and extend these time series forward utilizing the more recent information contained in Eurostat (2016b).

More specifically, in a first step, we collect historical information on the population figures of European administrative divisions. Subsequently, we construct country-specific concordance tables to aggregate these historical administrative divisions into the relevant contemporary NUTS regions.[31] After linearly interpolating missing observations, we consider regional population growth rates in several alternative data sources to maximally extend existing trajectories forward.[32] Table A3 provides further details and a breakdown of the data sources by country.

B.2 Regional income distributions

To simulate regional income distributions, we follow Schokkaert and Decancq (2013) and depart from the most recent income information contained in the ESS (Norwegian Social Science Data Services, 2016) to simulate regional income distributions. More specifically, this information is collected through a specific question asking respondents to "*please tell*

[30] Note that both uncontested and missing electoral results are extremely rare and generally restricted to a small number of electoral constituencies in a small number of pre-1900 election years, see table A2.

[31] Due to space limitations, we do not report the concordance tables utilized in our analysis. These are available upon request.

[32] The overlapping regional population trajectories of all data sources are highly correlated, thus it does not really matter which data source is selected to extend the baseline time series forward.

me which letter describes your household's total income, after tax and compulsory deductions, from all sources?". Respondents make use of country- and wave-specific showcards, typically containing 10 income decile values, to indicate their estimated position in the national income distribution.

In a first step, to minimize any potential biases resulting from sampling errors or non-response, we weigh individual answers based on the post-stratification weights provided by the ESS. In practice, this is achieved by duplicating individual answers the number of times given by the rounded value of 100 times their associated post-stratification weight. For example, a respondent with a post-stratification weight of 1.23456 would have his or her total household income appearing 123 times in the expanded dataset. This ensures that these 'simulated agents' maximally replicate the distributions of age-group, gender and education that are actually observed in the populations of the regions involved.

Subsequently, relying on the answers in this expanded dataset, we convert each reported position to its corresponding monetary value (in euros). For the first nine deciles, implicitly assuming a uniform income distribution within each separate decile, we select the midpoint of each income decile. The monetary value corresponding to the 10^{th} decile is constructed such that the simulated S80/S20 income quintile share ratio in each country corresponds exactly to their actual S80/S20 income quintile share ratio, as reported by Eurostat (2016c).[33] Finally, we divide this simulated distribution of disposable household income by the reported number of household members to arrive at estimates of the per capita income level of each simulated agent in our dataset.

This procedure allows us to approximate the actual income distributions in 260 European regions. For the four remaining regions not included in any of the ESS-waves (the Italian region of Molise, the Portuguese regions of Açores and Madeiras and Corsica in France), the income distributions are taken to be the same as those of the region with the most similar average income level in their respective countries. Table A4 provides a breakdown of the ESS waves and corresponding years utilized in this procedure by country.

[33] In Denmark, aplying this procedure to the most recently available ESS wave yields an estimate of the monetary value associated with the 10^{th} income decile that lies below the estimated monetary value associated with the 9^{th} decile. Therefore, we simulate regional income distributions in Denmark relying on the previous ESS wave.

Table A1: **Regional electoral data**

Country	*Regional units*	*NUTS*	*Electoral data*	*# Elections*	*Excluded*
Austria (AT)	9 bundesländer	2	1891-2014	29	-
Belgium (BE)	3 régions	1	1847-2014	65	-
Bulgaria (BG)	27 oblasts	3	1990-2014	9	-
Czech Republic (CZ)	8 oblasts	2	1990-2013	8	-
Denmark (DK)	5 regioner	2	1849-2015	64	Faroe Islands**
Estonia (EE)	5 groups of counties	3	1992-2011	6	-
Finland (FI)	4 storområden	2	1907-2015	37	Åland*
France (FR)	23 régions	2	1894-2012	21	4 départements d'outre mer**
(West-)Germany (DE)	16 länder	1	1871-2013	37	-
Greece (EL)	13 perifereies	2	1926-2012	25	-
Hungary (HU)	7 tervezési-statisztikai régiók	2	1990-2014	7	-
Ireland (IE)	8 statistical regions	3	1922-2011	27	-
Italy (IT)	19 regioni	2	1876-2013	27	Valle d'Aosta*
Latvia (LV)	6 statistical regions	3	1993-2014	8	-
Lithuania (LT)	10 counties	3	2000-2012	4	-
Netherlands (NL)	12 provincies	2	1897-2012	33	-
Norway (NO)	7 regions	2	1882-2013	35	-
Poland (PL)	16 vovoidships	2	1991-2011	7	-
Portugal (PT)	7 comissões de coordenação regional	2	1975-2015	15	-
Romania (RO)	8 regiuni	2	1990-2012	7	-
Slovakia (SK)	4 oblasts	2	1990-2012	8	-
Slovenia (SI)	2 Kohezijske regije	2	1992-2011	6	-
Spain (ES)	19 comunidades/ciudades autónomas	2	1977-2015	12	-
Sweden (SE)	8 riksområden	2	1911-2014	32	-
Switzerland (CH)	7 regions	2	1848-2015	50	-
United Kingdom (UK)	11 statistical regions	1	1832-2015	44	Northern Ireland*

Note: This table summarizes the data coverage of the regional regional electoral and demographic data underlying figure 1. The general data construction procedure is outlined in appendix B.1, while tables A2 and A3 provide a more detailed description of country-specific data sources and construction methods.
* = excluded due to non-existing overlap with the national political party landscape; ** = excluded due to limited data availability.

Table A2: **Electoral data availability by country**

Austria (NUTS 2)

Code	*Länder*	*1897-1911*	*1919-2008*	*Code*	*Länder*	*1897-1911*	*1919-2008*
AT11	Burgenland	[1]	x	AT90	Böhmen	x	
AT12	Niederösterreich	x	x	AT91	Bukowina	x	
AT13	Wien	[2]	x	AT92	Dalmatien	x	
AT21	Kärnten	x	x	AT93	Galizien	x	
AT22	Steiermark	x[3]	x	AT94	Görz und Gradisca	x	
AT31	Oberösterreich	x	x	AT95	Istria	x	
AT32	Salzburg	x	x	AT96	Krain	x	
AT33	Tirol	x	x	AT97	Mähren	x	
AT34	Vorarlberg	x	x	AT98	Silezia	x	
				AT99	Triest	x	

1891-1986, Caramani (2004); 1990-2008, Norwegian Centre for Research Data (2016); 2014, Álvarez-Rivera (2016).
997 party-constituency/region-year observations: 100% non-missings.
[1] Burgenland returned to Austria in 1921, first election in 1923.
[2] Disaggregated data on Vienna unavailable in imperial period.
[3] Includes Slovenian parts of the Duchy of Styria in the imperial period.

Belgium (NUTS 2)

Code	*Provincie*	*1848-2014*	*Code*	*Provincie*	*1848-2014*
BE10	Région de Bruxelles-Capitale	x[4,5]	BE31	Brabant Wallon	x[4]
BE21	Antwerpen	x[4,5]	BE32	Hainaut	x[4]
BE22	Limburg	x[4,5]	BE33	Lige	x[4]
BE23	Oost-Vlaanderen	x[4,5]	BE34	Luxembourg	x[4]
BE24	Vlaams-Brabant	x[4,5]	BE35	Namur	x[4]
BE25	West-Vlaanderen	x[4,5]			

1847-1987 Caramani (2004); 1991-2010 Norwegian Centre for Research Data (2016); 2014 Álvarez-Rivera (2016).
7481 party-constituency/region-year observations: 99.5% non-missings, 0.13% uncontested results approximated, 0.37% results linearly interpolated.
[4] Post-1968, votes are aggregated over party families, after Belgian political parties split in Flemish and Walloon wings (Caramani, 2004, p.153).
[5] 2007 election: votes for the CD&V-NVA coalition are distributed to CD&V and NVA according to the regional number of preference votes.

Bulgaria (NUTS 3)

Code	*Podregiony*	*1990-2014*	*Code*	*Podregiony*	*1990-2014*
BG311	Vidin	x	BG341	Burgas	x
BG312	Montana	x	BG342	Sliven	x
BG313	Vratsa	x	BG343	Yambol	x
BG314	Pleven	x	BG344	Stara Zagora	x
BG315	Lovech	x	BG411	Stolitsa	x
BG321	Veliko Tarnovo	x	BG412	Sofia	x
BG322	Gabrovo	x	BG413	Blagoevgrad	x
BG323	Ruse	x	BG414	Pernik	x
BG324	Razgrad	x	BG415	Kyustendil	x
BG325	Silistra	x	BG421	Plovdiv	x
BG331	Varna	x	BG422	Haskovo	x
BG332	Dobrich	x	BG423	Pazardzhik	x
BG333	Shumen	x	BG424	Smolyan	x
BG334	Targovishte	x	BG425	Kardzhali	x

1990, Bochsler (2010) ; 1991-2005, Kollman, Caramani, Backer, and Lublin (2014) ; 2009-2014, Norwegian Centre for Research Data (2016).
6640 party-constituency/region-year observations: 100% non-missings.

Czech Republic (NUTS 2)

Code	*Oblasti*	*1990-2013*	*Code*	*Oblasti*	*1990-2013*
CZ01	Praha	x	CZ05	Severovýchod	x
CZ02	Střední Čechy	x	CZ06	Jihovýchod	x
CZ03	Jihozápad	x	CZ07	Střední Morava	x[6]
CZ04	Severozápad	x	CZ08	Moravskoslezsko	x[6]

1990-2006, Kollman et al. (2014) ; 2010, Norwegian Centre for Research Data (2016); 2013 Álvarez-Rivera (2016).
1568 party-constituency/region-year observations: 100% non-missings.
[6] Morava & Moravskoslezsko votes reported aggregately between 1990-1998.

Denmark (NUTS 3)

Code	*Landsdele*	*1849-2014*	*Code*	*Landsdele*	*1849-2014*
DK011	Byen København	x	DK031	Fyn	x
DK012	Københavns omegn	x	DK032	Sydjylland	x
DK013	Nordsjælland	x	DK041	Vestjylland	x
DK014	Bornholm	x	DK042	Østjylland	x
DK021	Østsjælland	x	DK050	Nordjylland	x
DK022	Vest- og Sydsjælland	x			

1849-1988 Caramani (2004); 1990-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
10528 party-constituency/region-year observations: 90.16% non-missings, 1.83% uncontested results approximated, 8.01% results linearly interpolated.

Estonia (NUTS 3)

Code	*Groups of Maakond*	*1990-2013*	*Code*	*Groups of Maakond*	*1990-2013*
EE001	Põhja-Eesti	x	EE007	Kirde-Eesti	x
EE004	Lääne-Eesti	x	EE008	Lõuna-Eesti	x
EE006	Kesk-Eesti	x			

1992-2011, Norwegian Centre for Research Data (2016).
380 party-constituency/region-year observations: 100% non-missings.

Finland (NUTS 2)

Code	*Storområden*	*1907-1939*	*1945-2015*	*Code*	*Storområden*	*1907-1939*	*1945-2015*
FI19	Länsi-Suomi	x	x	FI1D	Pohjois- ja Itä-Suomi	x	x
FI1B	Helsinki-Uusimaa	x	x	FI20	Åland	x	x
FI1C	Etelä-Suomi	x	x	FI91	Viipurin	x	[7]

1907-1987 Caramani (2004); 1991-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
3168 party-constituency/region-year observations: 100% non-missings.
[7] Lost to Soviet Union after World War II.

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continued

France[8] (NUTS 2)

Code	*Régions*	*1893*	*1917-2012*	*Code*	*Régions*	*1893*	*1917-2012*
FR10	Île de France	x	x	FR61	Aquitaine	x	x
FR21	Champagne-Ardenne	x	x	FR62	Midi-Pyrénées	x	x
FR22	Picardie	x	x	FR63	Limousin	x	x
FR23	Haute-Normandie	x	x	FR71	Rhône-Alpes	x	x
FR24	Centre	x	x	FR72	Auvergne	x	x
FR25	Basse-Normandie	x	x	FR81	Languedoc-Roussillon	x	x
FR26	Bourgogne	x	x	FR82	Provence-Alpes-Côte d'Azur	x	x
FR30	Nord - Pas-de-Calais	x	x	FR83	Corse	x	x
FR41	Lorraine	x	x	FRA1	Guadeloupe	x	x
FR42	Alsace	x	x	FRA2	Martinique	x	x
FR43	Franche-Comté	x[9]	x	FRA3	Guyane	x	x
FR51	Pays de la Loire	x	x	FRA4	La Réunion	x	x
FR52	Bretagne	x	x	FRA5	Mayotte	x	x
FR53	Poitou-Charentes	x	x				

1894, Avenel (1894); 1910-1988 Caramani (2004); 1993-2002, Norwegian Centre for Research Data (2016); 2007-2012, Álvarez-Rivera (2016).

14048 party-constituency/region-year observations: 100% non-missings.

[8] Electoral results missing between 1894-1910.

[9] Excluding Territoire-de-Belfort.

Germany[10] (NUTS 2)

Code	*Regierungsbezirke*	*1871-1912*	*1919-1933*	*1949-2013*	*Code*	*Regierungsbezirke*	*1871-1912*	*1919-1933*	*1949-2013*
DE11	Stuttgart	x	x	x	DEA2	Köln	x	x	x
DE12	Karlsruhe	x	x	x	DEA3	Münster	x	[12]	x
DE13	Freiburg	x		x	DEA4	Detmold	x		x
DE14	Tübingen	x		x	DEA5	Arnsberg	x	[12]	x
DE21	Oberbayern	x	x	x	DEB1	Koblenz	x	x	x
DE22	Niederbayern	x	x	x	DEB2	Trier	x		x
DE23	Oberpfalz	x		x	DEB3	Rheinhessen-Pfalz	x	x	x
DE24	Oberfranken	x		x	DEC0	Saarland	x		x
DE25	Mittelfranken	x	x	x	DED2	Dresden	x	x	x[13]
DE26	Unterfranken	x		x	DED4	Chemnitz	x	x	x[13]
DE27	Schwaben	x		x	DED5	Leipzig	x	x	x[13]
DE30	Berlin	x	x	x[13]	DEE0	Sachsen-Anhalt	x	x	x[13]
DE40	Brandenburg	x	x	x[13]	DEF0	Schleswig-Holstein	x	x	x
DE50	Bremen	x		x	DEG0	Thüringen	x	x	x[13]
DE60	Hamburg	x	x	x	DEZ1	Ostpreußen	x	x	
DE71	Darmstadt	x	x	x	DEZ2	Westpreußen	x		
DE72	Gießen	x		x	DEZ3	Greater Poland	x	[12]	
DE73	Kassel	x	x	x	DEZ4	Kujawsko-Pomorskie	x	[12]	
DE80	Mecklenburg-Vorpommern	x	x	x[13]	DEZ5	Lower Silesia	x	x	
DE91	Braunschweig	x	x[11]	x	DEZ6	Opole	x	x	
DE92	Hannover	x	x	x	DEZ7	Silesia	x		
DE93	Lüneburg	x	[12]	x	DEZ8	Syddanmark	x		
DE94	Weser-Ems	x	[12]	x	DEZ9	Alsace	x		
DEA1	Düsseldorf	x	x	x					

1871-1987 Caramani (2004); 1990-2009, Norwegian Centre for Research Data (2016); 2013, Der Bunderwahlleiter (2016).

43530 party-constituency/region-year observations: 100% non-missings.

[10] We do not distinguish between CDU and CSU votes.

[11] 1919 electoral results missing.

[12] 1919 electoral results available.

[13] 1949-1987 not available (East Germany under Soviet occupation).

Greece[14] (NUTS 2)

Code	*Perifereies*	*1926-2012*		*Code*	*Perifereies*	*1926-2012*
EL30	Attica	x		EL54	Epirus	x
EL41	North Agean	x[15]		EL61	Thessaly	x
EL42	South Agean	x		EL62	Ionian Islas	x
EL43	Kreta	x	*	EL63	Western Greece	x
EL51	Eastern Macedonia & Thrace	x[15]		EL64	Central Greece	x
EL52	Central Macedonia	x		EL65	Peloponnese	x
EL53	Western Macedonia	x[15]				

1926-1989 Caramani (2004); 1990-2012, Norwegian Centre for Research Data (2016).

7003 party-constituency/region-year observations: 100% non-missings.

[14] Electoral results of the 1933 & 1950 elections dropped due to "significant errors in the official publication" Caramani (2004, p.469).

[15] 1952 electoral results missing.

Hungary (NUTS 3)

Code	*Megyék*	*1992-2014*	*Code*	*Megyék*	*1992-2014*
HU101	Budapest	x	HU233	Tolna	x
HU102	Pest	x	HU311	Borsod-Abaúj-Zemplén	x
HU211	Fejér	x	HU312	Heves	x
HU212	Komárom-Esztergom	x	HU313	Nógrád	x
HU213	Veszprém	x	HU321	Hajdú-Bihar	x
HU221	Győr-Moson-Sopron	x	HU322	Jász-Nagykun-Szolnok	x
HU222	Vas	x	HU323	Szabolcs-Szatmár-Bereg	x
HU223	Zala	x	HU331	Bács-Kiskun	x
HU231	Baranya	x	HU332	Békés	x
HU232	Somogy	x	HU333	Csongrád	x

1990-2010, Norwegian Centre for Research Data (2016); 2014 Álvarez-Rivera (2016).

1900 party-constituency/region-year observations: 100% non-missings.

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Ireland (NUTS 3)

Code	*Region*	*1922-2011*	*Code*	*Region*	*1922-2011*
IE011	Border	x	IE022	Mid-East	x
IE012	Midland	x	IE023	Mid-West	x
IE013	West	x	IE024	South-East	x
IE021	Dublin	x	IE025	South-West	x

1922-1989 Caramani (2004); 1992-2011, Norwegian Centre for Research Data (2016).
5472 party-constituency/region-year observations: 99.63% non-missings, 0.37% uncontested results approximated.

Italy (NUTS 2)

Code	*Region*	*1876-2013*	*Code*	*Region*	*1876-2013*
ITC1	Piemonte	x	ITG2	Sardegna	x
ITC2	Valle d'Aosta/Vallée d'Aoste	x[16]	ITH3	Veneto	x
ITC3	Liguria	x	ITH4	Friuli-Venezia Giulia	x[18]
ITC4	Lombardia	x	ITH5	Emilia-Romagna	x
ITF1	Abruzzo	x[17]	ITH9	Trentino-Alto Adige/Südtirol	x[18]
ITF2	Molise	x[17]	ITI1	Toscana	x
ITF3	Campania	x	ITI2	Umbria	x
ITF4	Puglia	x	ITI3	Marche	x
ITF5	Basilicata	x	ITI4	Lazio	x
ITF6	Calabria	x	ITZ1	Zadar	x[19]
ITG1	Sicilia	x			

1876-1996 Caramani (2004); 2001-2006, Álvarez-Rivera (2016); 2008-2013, Norwegian Centre for Research Data (2016).
25240 party-constituency/region-year observations: 100% non-missings.
16 Became an autonomous province of Italy in 1944: only available after 1944.
17 Abruzzo & Molise votes reported aggregately between 1876-1913.
18 Became a part of Italy after World War I as a result of the Treaties of Paris: only available after 1919.
19 Constituency formed in the interbellum, but lost after World War II. Only available in 1921.

Latvia (NUTS 3)

Code	*Statistiskie re?ioni*	*1993-2014*	*Code*	*Statistiskie re?ioni*	*1993-2014*
LV003	Kurzeme	x	LV007	Pierīga	x
LV005	Latgale	x	LV008	Vidzeme	x
LV006	Rīga	x	LV009	Zemgale	x

1993-2011, Norwegian Centre for Research Data (2016); 2014 Centrala Vlšanu Komisija (2016).
5240 party-constituency/region-year observations: 100% non-missings.

Lithuania (NUTS 3)

Code	*Apskritys*	*2000-2012*	*Code*	*Apskritys*	*2000-2012*
LT001	Alytaus apskritis	x	LT006	Šiauli? apskritis	x
LT002	Kauno apskritis	x	LT007	Tauragés apskritis	x
LT003	Klaipėdos apskritis	x	LT008	Telšių apskritis	x
LT004	Marijampolės apskritis	x	LT009	Utenos apskritis	x
LT005	Panevėžio apskritis	x	LT00A	Vilniaus apskritis	x

2000-2012, Norwegian Centre for Research Data (2016).
4402 party-constituency/region-year observations: 100% non-missings.

Netherlands (NUTS 2)

Code	*Provincies*	*1897-2012*	*Code*	*Provincies*	*1897-2012*
NL11	Groningen	x	NL31	Utrecht	x
NL12	Friesland	x	NL32	Noord-Holland	x
NL13	Drenthe	x[20]	NL33	Zuid-Holland	x
NL21	Overijssel	x	NL34	Zeeland	x[20]
NL22	Gelderland	x	NL41	Noord-Brabant	x
NL23	Flevoland	x[21]	NL42	Limburg	x[20]

1897-1979 Caramani (2004); 1994-2012, Norwegian Centre for Research Data (2016).
5551 party-constituency/region-year observations: 100% non-missings.
20 Electoral results missing in 1917.
21 The artificial island of Flevoland (completed in 1968) became a separate Dutch province in 1986: only available after 1986.

Norway (NUTS 2)

Code	*Regions*	*1882-2013*	*Code*	*Regions*	*1882-2013*
NO01	Oslo og Akershus	x	NO05	Vestlandet	x
NO02	Hedmark og Oppland	x	NO06	Trøndelag	x
NO03	Sør-Østlandet	x	NO07	Nord-Norge	x
NO04	Agder og Rogaland	x			x

1882-1989 Caramani (2004); 1993-2013, Norwegian Centre for Research Data (2016).
5803 party-constituency/region-year observations: 100% non-missings.

Poland (NUTS 2)

Code	*Województwa*	*1991-2011*	*Code*	*Województwa*	*1997-2011*
PL11	łódzkie	x	PL41	Wielkopolskie	x
PL12	Mazowieckie	x	PL42	Zachodniopomorskie	x
PL21	Małlopolskie	x	PL43	Lubuskie	x
PL22	Śląskie	x	PL51	Dolnośląskie	x
PL31	Lubelskie	x	PL52	Opolskie	x
PL32	Podkarpackie	x	PL61	Kujawsko-pomorskie	x
PL33	Świętokrzyskie	x	PL62	Warmińsko-mazurskie	x
PL34	Podlaskie	x	PL63	Pomorskie	x

1991-2011, Norwegian Centre for Research Data (2016); 1997 Kollman et al. (2014).
2624 party-constituency/region-year observations: 100% non-missings.

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Portugal (NUTS 2)

Code	*Comissões de Cooperação*	*1882-2013*	*Code*	*Comissões de Cooperação*	*1882-2013*
PT11	Norte	x	PT18	Alentejo	x
PT15	Algarve	x	PT20	Região Autónoma dos Açores	x
PT16	Centro (PT)	x	PT30	Região Autónoma da Madeira	x
PT17	Área Metropolitana de Lisboa	x			

1975-1987 Caramani (2004); 1991-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
2739 party-constituency/region-year observations: 100% non-missings.

Romania (NUTS 2)

Code	*Regiuni*	*1990-2012*	*Code*	*Regiuni*	*1990-2012*
RO11	Nord-Vest	x	RO31	Sud - Muntenia	x
RO12	Centru	x	RO32	Bucuresti - Ilfov	x
RO21	Nord-Est	x	RO41	Sud-Vest Oltenia	x
RO22	Sud-Est	x	RO42	Vest	x

1990-2012, Norwegian Centre for Research Data (2016).
3120 party-constituency/region-year observations: 100% non-missings.

Slovakia (NUTS 2)

Code	*Oblasti*	*1990-2012*	*Code*	*Oblasti*	*1990-2012*
SK01	Bratislavský kraj	x	SK03	Stredné Slovensko	x
SK02	Západné Slovensko	x	SK04	Východné Slovensko	x

1990-2010, Norwegian Centre for Research Data (2016); 2012, Álvarez-Rivera (2016).
616 party-constituency/region-year observations: 100% non-missings.

Slovenia (NUTS 2)

Code	*Kohezijske regije*	*1992-2011*	*Code*	*Kohezijske regije*	*1992-2011*
SI01	Vzhodna Slovenija	x	SI02	Zahodna Slovenija	x

1992-2011, Norwegian Centre for Research Data (2016).
912 party-constituency/region-year observations: 100% non-missings.

Spain (NUTS 2)

Code	*Comunidades*	*1992-2011*	*Code*	*Comunidades*	*1992-2011*
ES11	Galicia	x	ES43	Extremadura	x
ES12	Principado de Asturias	x	ES51	Catalua	x
ES13	Cantabria	x	ES52	Comunidad Valenciana	x
ES21	País Vasco	x	ES53	Illes Balears	x
ES22	Comunidad Foral de Navarra	x	ES61	Andaluc´a	x
ES23	La Rioja	x	ES62	Región de Murcia	x
ES24	Aragón	x	ES63	Ceuta	x
ES25	Comunidad de Madrid	x	ES64	Melilla	x
ES41	Castilla y León	x	ES70	Canarias	x
ES42	Castilla-La Mancha	x			

1977-1996 Caramani (2004); 2000-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
8870 party-constituency/region-year observations: 100% non-missings.

Sweden (NUTS 2)

Code	*Riksområden*	*1911-2014*	*Code*	*Riksområden*	*1911-2014*
SE11	Stockholm	x	SE23	Västsverige	x
SE12	Östra Mellansverige	x	SE31	Norra Mellansverige	x
SE21	Småland med öarna	x	SE32	Mellersta Norrland	x
SE22	Sydsverige	x	SE33	Övre Norrland	x

1911-1988 Caramani (2004); 1991-2010, Norwegian Centre for Research Data (2016); 2014, Álvarez-Rivera (2016).
4758 party-constituency/region-year observations: 100% non-missings.

Switzerland[22] (NUTS 2)

Code	*Regions*	*1848-2015*	*Code*	*Regions*	*1848-2015*
CH01	Lake Geneva region	x	CH05	Eastern Switzerland	x
CH02	Espace Mittelland	x	CH06	Central Switzerland	x
CH03	Northwestern Switzerland	x	CH07	Ticino	x[23]
CH04	Zurich	x			

1848-1987 Caramani (2004); 1991-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
4386 party-constituency/region-year observations: 100% non-missings.
[22] Due to the outbreak of World War II, there were no elections in nine of the 25 cantons: Appenzell Ausserrhoden, Lucerne, Neuchâtel, Schwyz, Solothurn, Ticino, Valais, Vaud and Zug.
[23] Electoral results missing in 1919 (see [22]).

United Kingdom[23] (NUTS 1)

Code	*Region*	*1832-1918*	*1922-2015*	*Code*	*Region*	*1832-1918*	*1922-2015*
UKC	North East	x	x	UKJ	South East	x	x
UKD	North West	x	x	UKK	South West	x	x
UKE	Yorkshire & the Humber	x	x	UKL	Wales	x	x
UKF	East Midlands	x	x	UKM	Scotland	x	x
UKG	West Midlands	x	x	UKN	Northern Ireland	x	x
UKH	East of England	x	x	UKZ	Ireland	x	
UKI	London	x	x				

1848-1987 Caramani (2004); 1991-2011, Norwegian Centre for Research Data (2016); 2015, Álvarez-Rivera (2016).
72488 party-constituency/region-year observations: 94.76% non-missings, 1.33% uncontested results approximated.
[23] 68 missing constituency-level election results, scattered between 1832-1945. All pertain to small constituencies.

Note: This table provides a country breakdown of (historical) territorial structure, data sources and construction methods of the regional party preferences utilized to compute historical inter-regional political distances (see discussion appendix B.1.1 and equation 12).

Table A3: **Regional demographic data**

Country	Data source		
	Lahmeyer (2006)	*Eurostat (2016b)*	*Cambridge Econometrics (2016)*
Austria	1527-1999	2000-2015	
Belgium	1801-1999	2000-2015	
Bulgaria		1990-2015	
Czech Republic		1992-2015	1990-1991
Denmark*	1901-2003	2007-2015	
Estonia		2000-2015	
Finland	1905-1989	1990-2015	
France	1891-1989	1990-2015	
Germany**	1838-1999	2000-2015	
Greece***	1971-1989	1990-2015	
Hungary	1988-1999	2000-2015	
Ireland	1656-1990	1991-2015	
Italy	1861-1989	1990-2015	
Latvia	1989-2000	2001-2015	
Lithuania	2000-2015		
Netherlands	1796-1999	2000-2015	
Norway	1801-1999	2000-2015	
Poland		1990-2015	
Portugal	1878-1991	1992-2015	
Romania	1989-1994	1995-2015	
Slovakia		2000-2015	1990-1999
Slovenia		2002-2014	1991-2002
Spain	1926-1999	2000-2015	
Sweden	1830-1999	2000-2015	
Switzerland	1838-1989	1990-2015	
United Kingdom	1801-1989	1990-2015	

Note: This table provides a country breakdown of data sources and construction methods of historical regional population shares of the NUTS regions listed in table A1 (see discussion appendix B.1.2 and equation 13.).
* Pre-1901 regional population for Denmark is missing. Constant population shares assumed between 1849-1901.
** Saarland population prior to 1919 approximated by the sum of the populations of the following cities: Saarbrücken, Merzig, Neunkirchen, Saarlouis, Sankt Wendel.
*** Pre-1971 regional population for Greece is missing. Constant population shares assumed between 1926-1971.

Table A4: **Regional income data**

Country	*ESS wave*	*Year*	*#*	*Country*	*ESS wave*	*Year*	*#*
Austria	7	2014	13345	Ireland	6	2012	17997
Belgium	7	2014	15898	Italy[4]	6	2012	6151
Bulgaria	6	2012	18765	Lithuania	5	2010	14861
Switzerland	7	2014	13113	Latvia	4	2008	15931
Czech Republic	7	2014	15107	Netherlands	6	2012	15002
Germany	7	2014	26343	Norway	5	2010	14629
Denmark[1]	6	2012	13847	Poland	6	2012	14845
Estonia	6	2012	19558	Portugal[5]	7	2014	12559
Greece	5	2010	18500	Romania	4	2008	17163
Spain[2]	7	2014	15117	Sweden	7	2014	16260
Finland	7	2014	19006	Slovenia	3	2006	11744
France[3]	6	2012	18164	Slovakia	6	2012	12344
Hungary	7	2014	12064	United Kingdom	7	2014	17807

Note: This table provides a breakdown of the ESS waves utilized to simulate regional income distributions and the number of 'simulated participants' for each separate country in our sample (see discussion appendix B.2).
[1] ESS wave 6 used instead of ESS wave 7, see [33].
[2] Only aggregate data for Ceuta & Mellilla: simulated income distribution are assumed to be representative for both regions.
[3] Corsica not included in any ESS wave: approximated by simulated income distribution of Auvergne.
[4] Molise not included in any ESS wave: approximated by simulated income distribution of Sardegna.
[5] Açores and Madeiras not included in any ESS wave: approximated by simulated income distribution of Algarve and Alentejo respectively.

Table A5: **Present-day regional political distinctiveness in Europe: full results**

#	*NUTS*	*Region*	$\widehat{d_r}$	#	*NUTS*	*Region*	$\widehat{d_r}$
1	BG425	Kardzhali	0.573	133	BG332	Dobrich	0.152
2	PT30	Região Autónoma da Madeira	0.561	134	FR43	Franche-Comté	0.152
3	ES51	Cataluña	0.502	135	LT001	Alytus County	0.151
4	PT20	Região Autónoma dos Açores	0.496	136	FR23	Haute-Normandie	0.151
5	ES21	País Vasco	0.483	137	ITG2	Sardegna	0.15
6	UKM	Scotland	0.481	138	NL42	Limburg	0.149
7	FR83	Corse	0.479	139	IE012	Midland	0.149
8	BG324	Razgrad	0.432	140	ITI3	Marche	0.148
9	ITH9	Trentino-Alto Adige/Südtirol	0.403	141	BG322	Gabrovo	0.148
10	CH07	Ticino	0.399	142	FR81	Languedoc-Roussillon	0.147
11	BG334	Targovishte	0.318	143	ITF1	Abruzzo	0.147
12	EE007	Kirde-Eesti	0.314	144	DE2	Bayern	0.147
13	ES22	Comunidad Foral de Navarra	0.302	145	PL34	Podlaskie	0.147
14	BE1	Brussels-Capital Region	0.294	146	CH04	Zurich	0.147
15	BE3	Walloon region	0.263	147	NO06	Trøndelag	0.146
16	RO12	Centru	0.252	148	BG331	Varna	0.146
17	ES64	Ciudad Autónoma de Melilla	0.249	149	EL54	Ipeiros	0.145
18	ES43	Extremadura	0.247	150	BG314	Pleven	0.145
19	ES11	Galicia	0.243	151	DEC	Saarland	0.145
20	BG325	Silistra	0.243	152	ITC3	Liguria	0.144
21	LV005	Latgale	0.243	153	ITI2	Umbria	0.144
22	BG333	Shumen	0.242	154	EE008	Lõuna-Eesti	0.143
23	ES63	Ciudad Autónoma de Ceuta	0.241	155	EL42	Notio Aigaio	0.142
24	DE3	Berlin	0.24	156	BG323	Ruse	0.14
25	FR42	Alsace	0.237	157	SE11	Stockholm	0.14
26	ES70	Canarias	0.229	158	SK01	Bratislava Region	0.139
27	UKL	Wales	0.228	159	PL21	Malopolskie	0.137
28	ES53	Illes Balears	0.223	160	FR26	Bourgogne	0.137
29	BG412	Sofia	0.22	161	EL62	Ionia Nisia	0.136
30	DE4	Brandenburg	0.219	162	BG321	Veliko Tarnovo	0.136
31	CZ01	Prague	0.218	163	ITH4	Friuli-Venezia Giulia	0.136
32	PL32	Podkarpackie	0.216	164	CH03	Nordwestschweiz	0.136
33	FR63	Limousin	0.216	165	BG413	Blagoevgrad	0.135
34	UKK	South West	0.214	166	AT33	Tirol	0.135
35	ES42	Castilla-La Mancha	0.214	167	BG423	Pazardzhik	0.135
36	ES62	Región de Murcia	0.214	168	FI1C	Etelä-Suomi	0.134
37	LV003	Kurzeme	0.214	169	PT18	Alentejo	0.133
38	IE011	Border	0.213	170	FR24	Centre	0.133
39	DED	Sachsen	0.213	171	AT13	Wien	0.132
40	DE5	Bremen	0.212	172	ITI4	Lazio	0.131
41	LT004	Marijampolé County	0.212	173	PL63	Pomorskie	0.131
42	LV008	Vidzeme	0.211	174	IE024	South-East	0.131
43	DEE	Sachsen-Anhalt	0.211	175	DE1	Baden-Württemberg	0.131
44	DEG	Thüringen	0.21	176	BG315	Lovech	0.13
45	UKC	North East	0.209	177	NL34	Zeeland	0.13
46	CH01	Région lémanique	0.209	178	BG411	Stolitsa	0.129
47	DE8	Mecklenburg-Vorpommern	0.204	179	PL42	Zachodniopomorskie	0.129
48	ES41	Castilla y León	0.204	180	NO04	Agder and Rogaland	0.129
49	FI1D	Pohjois- ja Itä-Suomi	0.203	181	BG421	Plovdiv	0.128
50	LT007	Tauragè County	0.203	182	NL13	Drenthe	0.128
51	BG415	Kyustendil	0.203	183	ITC1	Piemonte	0.128

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52	ES61	Andalucía	0.203	184	EL53	Dytiki Makedonia	0.128
53	EL43	Kriti	0.202	185	IE022	Mid-East	0.128
54	ES23	La Rioja	0.2	186	AT22	Steiermark	0.127
55	LT00A	Vilnius County	0.199	187	CZ08	Moravsosleszko	0.127
56	UKJ	South East	0.198	188	SE31	North Middle Sweden	0.124
57	IE013	West	0.198	189	FI19	West Finland	0.124
58	ES30	Comunidad de Madrid	0.198	190	NO01	Oslo and Akershus	0.123
59	CH06	Zentralschweiz	0.197	191	NO07	Northern Norway	0.123
60	ES12	Principado de Asturias	0.196	192	BG342	Sliven	0.123
61	SE33	Upper Norrland	0.195	193	IE025	South-West	0.122
62	BG312	Montana	0.192	194	RO42	Vest	0.122
63	ES13	Cantabria	0.19	195	NL21	Overijssel	0.122
64	ES24	Aragón	0.189	196	BG344	Stara Zagora	0.122
65	ES52	Comunidad Valenciana	0.189	197	FR71	Rhône-Alpes	0.121
66	PL31	Lubelskie	0.189	198	PT15	Algarve	0.121
67	LT008	Telsiai County	0.187	199	SK03	Central Slovakia	0.12
68	LT009	Utena County	0.186	200	SE21	Smland and the islands	0.119
69	PL33	Swietokrzyskie	0.185	201	FR10	Île de France	0.118
70	ITG1	Sicilia	0.185	202	EE001	Põhja-Eesti	0.118
71	BG311	Vidin	0.184	203	DEB	Rheinland-Pfalz	0.117
72	BG414	Pernik	0.184	204	EL63	Dytiki Ellada	0.117
73	LT006	Siauliai County	0.183	205	CZ04	Northwestern Switzerland	0.116
74	BE2	Flemish region	0.183	206	DE9	Niedersachsen	0.116
75	NO02	Hedmark and Oppland	0.181	207	PL43	Lubuskie	0.115
76	BG424	Smolyan	0.181	208	DEF	Schleswig-Holstein	0.115
77	AT34	Vorarlberg	0.18	209	EL61	Thessalia	0.114
78	UKI	London	0.18	210	EL30	Attiki	0.114
79	IE023	Mid-West	0.18	211	RO41	Sud-Vest Oltenia	0.113
80	FR52	Bretagne	0.18	212	RO32	Bucuresti-Ilfov	0.113
81	LV006	Riga	0.179	213	PL62	Warminsko-mazurskie	0.112
82	FI1B	Helsinki-Uusimaa	0.179	214	NO05	Western Norway	0.109
83	NL11	Groningen	0.178	215	PL41	Wielkopolskie	0.109
84	FR82	Provence-Alpes-Côte d'Azur	0.177	216	PT17	Lisboa	0.109
85	UKH	East of England	0.176	217	CZ07	Central Moravia	0.106
86	IE021	Dublin	0.176	218	NL32	Noord-Holland	0.106
87	FR21	Champagne-Ardenne	0.174	219	EL64	Sterea Ellada	0.106
88	BG313	Vratsa	0.174	220	NL31	Utrecht	0.106
89	BG422	Haskovo	0.174	221	DEA	Nordrhein-Westfalen	0.106
90	FR22	Picardie	0.174	222	DE7	Hessen	0.106
91	BG341	Burgas	0.173	223	DK01	Hovedstaden	0.105
92	UKD	North West	0.173	224	RO22	Sud-Est	0.105
93	LV009	Zemgale	0.172	225	PL51	Dolnoslaskie	0.105
94	RO11	Nord-Vest	0.172	226	CZ02	Central Bohemia	0.104
95	LT003	Klaipèda County	0.171	227	NL41	Noord-Brabant	0.103
96	FR61	Aquitaine	0.171	228	AT12	Niederösterreich	0.103
97	NL12	Friesland	0.17	229	EL52	Kentriki Makedonia	0.103
98	ITH5	Emilia-Romagna	0.17	230	PL11	Lodzkie	0.102
99	ITF4	Puglia	0.169	231	PL61	Kujawsko-pomorskie	0.102
100	DE6	Hamburg	0.169	232	SK02	Western Slovakia	0.101
101	SE32	Middle Norrland	0.169	233	PL22	Slaskie	0.101
102	EE006	Kesk-Eesti	0.168	234	SE22	South Sweden	0.101
103	ITI1	Toscana	0.167	235	PT16	Centro	0.1
104	FR72	Auvergne	0.167	236	AT32	Salzburg	0.1
105	LV007	Pieriga	0.167	237	NO03	South Eastern Norway	0.099

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106	EL51	Anatoliki Makedonia, Thraki	0.167	238	NL23	Flevoland	0.098
107	FR53	Poitou-Charentes	0.166	239	PL12	Mazowieckie	0.098
108	CH02	Espace Mittelland	0.166	240	CZ06	Southeast	0.097
109	FR30	Nord - Pas-de-Calais	0.164	241	DK02	Sjælland	0.097
110	ITF3	Campania	0.164	242	DK05	Nordjylland	0.096
111	ITF6	Calabria	0.163	243	HU31	Northern Hungary	0.095
112	ITC4	Lombardia	0.163	244	RO31	Sud-Muntenia	0.093
113	FR62	Midi-Pyrénées	0.163	245	RO21	Nord-Est	0.093
114	CH05	Ostschweiz	0.163	246	HU10	Central Hungary	0.092
115	ITH3	Veneto	0.162	247	AT31	Oberösterreich	0.09
116	FR25	Basse-Normandie	0.162	248	CZ03	Southwest	0.09
117	UKE	Yorkshire and the Humber	0.161	249	CZ05	Northeast	0.089
118	FR51	Pays de la Loire	0.16	250	SK04	Eastern Slovakia	0.089
119	PL52	Opolskie	0.159	251	NL22	Gelderland	0.089
120	EL65	Peloponnisos	0.159	252	SE12	East Middle Sweden	0.086
121	BG343	Yambol	0.159	253	HU32	Northern Great Plain	0.085
122	AT11	Burgenland	0.158	254	NL33	Zuid-Holland	0.084
123	AT21	Kärnten	0.157	255	PT11	Norte	0.083
124	UKF	East Midlands	0.157	256	SI02	Zahodna Slovenija	0.082
125	FR41	Lorraine	0.155	257	SE23	West Sweden	0.082
126	UKG	West Midlands	0.155	258	HU22	Western Transdanubia	0.078
127	ITF5	Basilicata	0.154	259	DK03	Syddanmark	0.077
128	EE004	Lääne-Eesti	0.154	260	DK04	Midjylland	0.073
129	EL41	Voreio Aigaio	0.154	261	SI01	Vzhodna Slovenija	0.072
130	LT005	Panevèzys County	0.153	262	HU33	Southern Great Plain	0.062
131	ITF2	Molise	0.153	263	HU23	Southern Transdanubia	0.06
132	LT002	Kaunas County	0.152	264	HU21	Central Transdanubia	0.059

Note: This table provides an overview of the regional political distinctiveness of all regions in our sample (computation & data sources: see discussion section 3 and appendix B.1).

Table A6: **Regional (in)stability in Europe: full results**

#	*NUTS*	*Region*	$\widehat{b_r}$	#	*NUTS*	*Region*	$\widehat{b_r}$
1	ES51	Cataluña	0.64	120	ITC1	Piemonte	5.54
2	BE2	Flemish region	0.84	121	NL41	Noord-Brabant	5.66
3	ES21	País Vasco	0.96	122	NL33	Zuid-Holland	5.66
4	UKM	Scotland	1.12	123	DE8	Mecklenburg-Vorpommern	5.67
5	BG425	Kardzhali	1.29	124	FR71	Rhne-Alpes	5.69
6	PT30	Região Autónoma da Madeira	1.39	125	BG415	Kyustendil	5.71
7	ITH9	Trentino-Alto Adige/Südtirol	1.46	126	FR62	Midi-Pyrénées	5.71
8	BE3	Walloon region	1.53	127	BG424	Smolyan	5.72
9	PT20	Região Autónoma dos Açores	1.8	128	NL42	Limburg	5.78
10	FR83	Corse	1.87	129	AT12	Niederösterreich	5.82
11	BG324	Razgrad	1.88	130	LT001	Alytus County	5.82
12	RO12	Centru	1.95	131	PL52	Opolskie	5.84
13	EE007	Kirde-Eesti	2.02	132	CZ02	Central Bohemia	5.86
14	ITC4	Lombardia	2.18	133	PL51	Dolnoslaskie	5.98
15	LV005	Latgale	2.39	134	FR63	Limousin	6
16	ES61	Andalucía	2.51	135	DE9	Niedersachsen	6.03
17	LT002	Kaunas County	2.54	136	SE32	Middle Norrland	6.08
18	UKJ	South East	2.61	137	CZ07	Central Moravia	6.09
19	FI1D	Pohjois- ja Itä-Suomi	2.64	138	NL12	Friesland	6.09
20	BG334	Targovishte	2.65	139	CZ04	Northwestern Switzerland	6.11
21	LV003	Kurzeme	2.75	140	BG311	Vidin	6.11
22	LT003	Klaipèda County	2.94	141	PT18	Alentejo	6.17
23	SK02	Western Slovakia	2.95	142	IE024	South-East	6.21
24	RO11	Nord-Vest	2.96	143	ES63	Ciudad Autónoma de Ceuta	6.26
25	ES22	Comunidad Foral de Navarra	2.99	144	NO05	Western Norway	6.31
26	LV007	Pieriga	3.03	145	IE022	Mid-East	6.33
27	LV008	Vidzeme	3.1	146	FR22	Picardie	6.34
28	DE2	Bayern	3.15	147	BG423	Pazardzhik	6.34
29	ES11	Galicia	3.22	148	BG313	Vratsa	6.37
30	ES52	Comunidad Valenciana	3.27	149	BG344	Stara Zagora	6.43
31	UKK	South West	3.32	150	AT31	Oberösterreich	6.44
32	PL32	Podkarpackie	3.43	151	ES13	Cantabria	6.44
33	EE008	Lõuna-Eesti	3.53	152	BG343	Yambol	6.45
34	LT006	Siauliai County	3.6	153	PL42	Zachodniopomorskie	6.49
35	IE013	West	3.61	154	SE23	West Sweden	6.5
36	ES70	Canarias	3.62	155	PL34	Podlaskie	6.56
37	SK03	Central Slovakia	3.62	156	SE22	South Sweden	6.74
38	BG412	Sofia	3.63	157	BG414	Pernik	6.75
39	ITH3	Veneto	3.66	158	BG323	Ruse	6.76
40	IE011	Border	3.66	159	DE7	Hessen	6.77
41	ITH5	Emilia-Romagna	3.68	160	FR21	Champagne-Ardenne	6.8
42	CH07	Ticino	3.82	161	FR53	Poitou-Charentes	6.8
43	RO22	Sud-Est	3.83	162	ITF6	Calabria	6.8
44	RO42	Vest	3.84	163	BG312	Montana	6.82
45	ITG1	Sicilia	3.85	164	CZ05	Northeast	6.87
46	BG333	Shumen	3.87	165	EL52	Kentriki Makedonia	6.92
47	FR42	Alsace	3.88	166	FR41	Lorraine	6.98
48	BG341	Burgas	3.96	167	SE31	North Middle Sweden	7.01
49	UKH	East of England	4	168	NO06	Trøndelag	7.05
50	PT11	Norte	4	169	FR81	Languedoc-Roussillon	7.07
51	PL31	Lubelskie	4.01	170	ITC3	Liguria	7.07

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52	FI1C	Etelä-Suomi	4.02	171	BG422	Haskovo	7.1
53	DE1	Baden-Württemberg	4.03	172	FR72	Auvergne	7.12
54	LV009	Zemgale	4.03	173	IE012	Midland	7.16
55	DEA	Nordrhein-Westfalen	4.07	174	BG314	Pleven	7.19
56	DED	Sachsen	4.07	175	PL11	Lodzkie	7.2
57	UKD	North West	4.07	176	ITI3	Marche	7.21
58	FI19	West Finland	4.08	177	NL31	Utrecht	7.23
59	LT008	Telsiai County	4.08	178	BG332	Dobrich	7.27
60	BG325	Silistra	4.09	179	SE21	Småland and the islands	7.28
61	ES41	Castilla y León	4.12	180	BG321	Veliko Tarnovo	7.31
62	IE025	South-West	4.14	181	CZ03	Southwest	7.31
63	FR82	Provence-Alpes-Cte d'Azur	4.14	182	FR25	Basse-Normandie	7.38
64	UKL	Wales	4.21	183	NL21	Overijssel	7.39
65	ITI1	Toscana	4.27	184	ITG2	Sardegna	7.41
66	BG331	Varna	4.3	185	SE12	East Middle Sweden	7.43
67	ES62	Región de Murcia	4.34	186	FR23	Haute-Normandie	7.45
68	LT004	Marijampolé County	4.37	187	HU31	Northern Hungary	7.47
69	ES42	Castilla-La Mancha	4.41	188	AT11	Burgenland	7.47
70	IE023	Mid-West	4.42	189	PT15	Algarve	7.49
71	RO31	Sud-Muntenia	4.46	190	ES23	La Rioja	7.5
72	SE33	Upper Norrland	4.46	191	HU32	Northern Great Plain	7.67
73	DE4	Brandenburg	4.54	192	NO03	South Eastern Norway	7.68
74	ITF3	Campania	4.55	193	BG322	Gabrovo	7.74
75	LT009	Utena County	4.58	194	FR24	Centre	7.76
76	PL21	Malopolskie	4.6	195	ITF1	Abruzzo	7.79
77	ES53	Illes Balears	4.61	196	DK03	Syddanmark	7.83
78	LT005	Panevèzys County	4.68	197	NO07	Northern Norway	7.9
79	ITF4	Puglia	4.72	198	DK04	Midjylland	7.94
80	BG421	Plovdiv	4.74	199	PL61	Kujawsko-pomorskie	7.95
81	PL33	Swietokrzyskie	4.77	200	EL51	Anatoliki Makedonia, Thraki	7.96
82	ES43	Extremadura	4.79	201	DEB	Rheinland-Pfalz	7.97
83	SK04	Eastern Slovakia	4.82	202	EL63	Dytiki Ellada	8.1
84	DEG	Thüringen	4.85	203	NL22	Gelderland	8.13
85	NL11	Groningen	4.85	204	EL65	Peloponnisos	8.16
86	EE006	Kesk-Eesti	4.86	205	HU22	Western Transdanubia	8.17
87	EL43	Kriti	4.9	206	ITH4	Friuli-Venezia Giulia	8.27
88	UKC	North East	4.9	207	ITI2	Umbria	8.43
89	ES12	Principado de Asturias	4.93	208	PL62	Warminsko-mazurskie	8.48
90	PT16	Centro	4.93	209	FR43	Franche-Comté	8.6
91	UKE	Yorkshire and the Humber	4.94	210	PL43	Lubuskie	8.73
92	AT22	Steiermark	4.98	211	EL42	Notio Aigaio	8.73
93	BG413	Blagoevgrad	4.98	212	ITF2	Molise	8.76
94	FR52	Bretagne	4.99	213	AT32	Salzburg	8.81
95	AT34	Vorarlberg	5.01	214	FR26	Bourgogne	8.81
96	EE004	Lääne-Eesti	5.02	215	CH01	Région lémanique	8.89
97	RO41	Sud-Vest Oltenia	5.02	216	BG342	Sliven	9.14
98	CZ08	Moravsosleszko	5.03	217	DK05	Nordjylland	9.31
99	LT007	Tauragè County	5.04	218	DEC	Saarland	9.39
100	RO21	Nord-Est	5.06	219	DEF	Schleswig-Holstein	9.41
101	DEE	Sachsen-Anhalt	5.09	220	NL34	Zeeland	9.42
102	DE6	Hamburg	5.11	221	ITF5	Basilicata	9.43
103	UKG	West Midlands	5.12	222	NL13	Drenthe	9.64
104	FR30	Nord - Pas-de-Calais	5.14	223	BG315	Lovech	9.66
105	NO04	Agder and Rogaland	5.15	224	DK02	Sjælland	9.85

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106	PL22	Slaskie	5.17	225	CH06	Zentralschweiz	10.14
107	FR61	Aquitaine	5.18	226	HU33	Southern Great Plain	10.71
108	ES24	Aragón	5.23	227	EL53	Dytiki Makedonia	10.74
109	DE5	Bremen	5.27	228	EL54	Ipeiros	10.76
110	SI01	Vzhodna Slovenija	5.27	229	EL61	Thessalia	10.9
111	FR51	Pays de la Loire	5.43	230	EL64	Sterea Ellada	10.95
112	PL63	Pomorskie	5.43	231	HU21	Central Transdanubia	11.8
113	ES64	Ciudad Autónoma de Melilla	5.47	232	EL41	Voreio Aigaio	12.14
114	AT21	Kärnten	5.47	233	CH02	Espace Mittelland	12.46
115	PL41	Wielkopolskie	5.47	234	EL62	Ionia Nisia	12.48
116	CZ06	Southeast	5.48	235	CH05	Ostschweiz	13.44
117	AT33	Tirol	5.51	236	NL23	Flevoland	13.83
118	UKF	East Midlands	5.51	237	HU23	Southern Transdanubia	13.97
119	NO02	Hedmark and Oppland	5.54	238	CH03	Nordwestschweiz	16.24

Note: This table ranks all included European region from most to least secession-prone, according to the stability concept summarized in definition 1 (see discussion section 5).