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Accounting for the Size of Nations: Empirical Determinants of Secessions and the Soviet Breakup

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October 2014

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Accounting for the Size of Nations: Empirical Determinants of Secessions and the Soviet Breakup

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Abstract

Little is known about the empirical determinants of secessions, despite a rich theoretical literature on the subject. Economic theory predicts that the incentive to secede should be determined by the size of the seceding province, as well as preference heterogeneity, income inequality, the extent of democratization, and trade potential. This paper tests these assertions by treating the dissolution of the Soviet Union as a historical experiment in state breakup. I exploit regional variation in pro-secessionist protests across the 184 provinces of the Union to approximate the varying demand for secession. I find strong evidence for the existence of a trade-off between size and heterogeneity in shaping demand for secession, whereas other factors receive only qualified support. Finally, I demonstrate that the factors determining popular demand for secession are only weakly related to the extent to which local elites actually pursue a secessionist policy.

JEL classification: H40, H71

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1. Introduction

The year 2014 has good chances of going down in history as the year that separatism returned to Europe. A referendum on Scottish independence was held in September, and the regional government of Catalonia may follow suit in November. Meanwhile, Ukraine faced secessionist referenda and uprisings in a number of its regions. These developments are of interest to economists. State size may impact economic performance if state borders delineate the extent of the market. Size may also influence the type or range of public goods a government can provide. The process of secession itself may have costs too, ranging from temporary dislocations in trade relationships to political conflict and full-scale war.

Economists have developed a rich theoretical literature that helps to explain the borders of states. In this literature, state size is generally thought of as the result of a trade-off between the benefits of size and its costs (Alesina and Spolaore 1997, 2003). Benefits of size stem from fixed costs in the provision of public goods, which makes living in a small state costly to each individual taxpayer. The costs of size are due to individual heterogeneity, which reduces the utility from the consumption of public goods to those individuals located far away from the government in terms of preferences or geography. If individuals are located far enough from the source of public goods, they may gain by seceding and providing public goods themselves, even if this provision is proportionally more costly. This basic trade-off can be moderated by a number of factors. If barriers to trade are generally high and they coincide with state borders, there are additional benefits from living and doing business in a larger state (Alesina, Spolaore and Wacziarg 2000). The political regime matters too, because autocratic rulers do not bear the full costs of heterogeneity and will therefore opt for larger states. Finally, different preferences for redistribution and differential income levels between regions can be factors leading to disintegration (Bolton and Roland 1997).

Although these theoretical predictions can yield helpful insights into the formation and fragmentation of states, they have not yet been tested econometrically. Empirical efforts have been made to test the relationship between country size, openness and growth on a global level (Alesina, Spolaore and Wacziarg 2000; Spolaore and Wacziarg 2005; Rose 2006), but not the mechanism which leads to an increased number of countries, i.e. secession itself. A recent exception is Desmet et al (2011), who calibrate a model of state fragmentation to successfully postdict the sequence of exit of five Yugoslav republics from their former state. Yet the small number of republics in that historical case clearly limits the scope for any econometric exploration.

This paper attempts to fill that gap by treating the dissolution of the Soviet Union as a historical experiment to test economic theories of state break-up. I exploit extensive variation in the number and size of pro-secessionist demonstrations across the 184 provinces of the Soviet Union in the late 1980's and early 1990's to construct an estimate of the popular demand for secession.[2]

This approach has a number of distinct advantages. Firstly, the liberalizing reforms of Mikhail Gorbachev provided a historic window of opportunity for separatist protests to take place without being subject to the concerted suppression that characterized the earlier Soviet Union, or indeed some of its successor states. Furthermore, the fact that 66% of Soviet provinces saw popular demand for secession provides the number of observations required for systematic testing. The provinces' heterogeneity in terms of geographical location, ethno-linguistic composition and economic development provides variation in the explanatory variables. At the same time, the fact that all secession demands originated from the same institutional framework helps to keep a number of

[2] For the remainder of the paper, I use the terms secessionism and separatism interchangeably, to refer to the demand for an independent state as well as to the demand for far-reaching autonomy. Far-reaching autonomy encompasses demands for the territory in question to provide the public goods that are normally considered the prerogative of independent states, such as defense, or migration, trade, monetary and foreign policy.

confounding factors constant. I am also able to use demonstrations *against* secession as a useful cross-check on the results. Finally, focusing on the popular demand for secession, rather than on official acts of secession, is most appropriate when testing the theoretical literature. The theory focuses on secession by popular demand, while in practice, acts of secession may have more to do with power considerations by local elites. However, contrasting the extent of popular demand for secession with actual attempts at secession by local elites is informative, as it allows insights into the political economy of secessions. I will empirically discuss this aspect of secessions at the end of this paper.

This paper will, however, have little to say about the time dimension of protests. Although timing may offer interesting insights into the reaction of protests to particular events, the focus of this paper is on examining the structural determinants of secession demand. The dynamics of protests are thus left for later research. The approach chosen in this paper is similar in spirit to a small number of articles that have used participation in demonstrations to proxy for political views. Cicchetti et al (1971) used varying travel costs for the participants of the November 1969 protests against the war in Vietnam to derive a willingness to pay for left-wing political change. In a recent contribution, Madestam et al (2013) use attendance at Tea Party rallies to predict Republican votes in the US-midterm elections.

This paper is also related to a large body of literature that has tried to test theories of separatism and nationalism stemming from the political science literature. Most importantly, Beissinger (2002) used protest data from the Soviet Union to explain the development of an ethnically based nationalism for key Soviet minorities. A different strand of the literature has used official declarations of autonomy by Soviet and Russian provinces to provide variation in the disposition to secede (Emizet & Hezli 1995; Treisman 1997; Hale 2000). A number of authors have also used variation in vote shares for separatist parties in large cross-sections of countries (Fearon & Von Houten 2002; Sorens 2005). In addition to not all being able to offer the advantages of a multi-province historical experiment outlined above, none of these contributions tests economic theories of secession.

To preview the results, I find that the main trade-off between size and heterogeneity is strongly supported by the data. Larger territories that are more different from the center in Moscow on some ethno-linguistic or historic dimension witness a higher occurrence of separatist protests *per capita*. Moreover, the fact that size is a more important determinant of secessionist protests at the extensive rather than at the intensive margin supports the view of size as a threshold condition for state formation. The prediction that differences in income levels matter is also partially borne out. Other determinants of secession, such as potential gains from trade or redistribution only receive qualified support. I also find that popular demand for secession and actual secession attempts by regional elites seem to be determined by different sets of factors. For example, whereas heterogeneity with regard to the center strongly influences popular demand for secession, it is only weakly correlated with the degree to which local leaders actually pursue a separatist policy.

The remainder of this paper is structured as follows. The next section gives an overview of economic theories of state break-up and their main predictions. Section 3 then briefly describes the political environment in the Soviet Union and Russia in from 1985 to 1994, as well as the administrative divisions that are of interest. Section 4 uses this information to construct a disaggregated measure of separatist demand and the independent covariates. Section 5 motivates the empirical model. Part 6 shows the results of predicting popular demand for secession, whereas Section 7 contrasts popular demand for secession with secession attempts by local elites. The last section concludes and offers an outlook for further theoretical work in this field.

2. Economic theories of secession

Thinking about the determinants of secession and state size has some pedigree in economics. Robinson (1960) pondered the relationship between state size and and growth. Friedman (1977) posited that state size may be a function of the government's type of revenue, if revenue types vary in terms of efficiency. Since these early contributions, the literature has grown large and diverse, partly in response to the proliferation of independent states after the fall of the Soviet Union (see Bolton, Roland and Spolaore 1996, as well as Ruta 2005 for surveys). I constrain myself here to outlining a number of key themes in the literature, and stating the predictions they make for the determinants of secession.

The most fundamental issue a model of state size faces is to outline what the costs and benefits of being part of a unified state are. Without costs of size, every individual could be part of the same state, and without benefits of size, each individual could found their own state. Buchanan and Faith (1989) were among the first to entertain the idea that economies of scale in public goods provide a lower limit on state size. In their seminal contribution, Alesina and Spolaore (1997) model the state explicitly as a provider of one public good, where benefits of size arise from economies of scale in the provision of public goods. If per capita incomes among citizens are equal, larger states can spread the cost of funding that public good over a larger number of taxpayers, meaning that per capita costs should decrease in size. Conversely, there is a cost attached to living in a large state, because individuals' preferences are heterogeneous. This reduces their utility from the consumption of the standardized public good. For example, linguistic minorities may not gain the same utility from receiving schooling in the language of the majority as they would in their own. Alesina and Spolaore (1997) model this heterogeneity in the spirit of a Hoteling approach, where all individuals are located uniformly on a line, and geographic distance on the line is assumed to coincide with distance in preferences. The government providing the public good is located in just one place inside a country's borders. The incentive to secede should thus increase with an individual's distance to the seat of government, and it should decrease with the size of the country.

A number of variations on this basic framework have been conceived. Goyal and Staal (2004) model a similar trade-off under the restriction that provinces can secede, but not individuals. This leads to the conclusion that the incentive to secede is increasing in the size of the future state. For the purposes of this paper, where secession by provinces is a more realistic assumption than individual secession, this is a useful result.[3] Other contributions have looked more closely at the notion of heterogeneity. Olofsgård (2003) explicitly models different ethnic groups within a state, and finds that increased cultural distance also increases the likelihood of secession. Alesina, Baqir and Hoxby (2004) model a trade-off between racial heterogeneity and the size of US school districts, while Desmet et al (2011) model the heterogeneity and size trade-off for possible unions between European countries. Finally, Alesina and Reich (2013) make heterogeneity endogenous to state policy, emphasizing the observation that many states have historically sought to homogenize the preferences of their populations.

Another important theme in the literature has been the interplay of secession and the international economic environment. Contributions by Casella and Feinstein (2002) and Wei (1991) both consider the relationship between international trade, economic development and jurisdiction size, but the relationships found tend to be non-linear in the size of the market. An extension of the basic Alesina and Spolaore (1997) framework described above, developed by the authors in the same paper, is able to deliver quite sharp predictions. This extension features a positive human capital externality, while the stock of human capital depends both on domestic and foreign human capital. If borders do constitute high trade barriers to the cross-border transmission of the human capital externality, then

[3] I will consequently concentrate on the size of the province in the empirical specification, following Goyal and Staal (2004)

countries are more dependent on the size of their domestic human capital stock, and smaller countries are unlikely to be viable. Globalization decreases trade barriers and therefore mediates the size advantage of large countries, increasing secession incentives.[4] Etro (2006) reaches a similar conclusion under the assumption that trade openness is exogenously determined. For the purposes of this paper, this presents an angle to approach the issue empirically. Although seceding regions may choose their own trade policies, part of their openness is determined exogenously by geography. One might therefore expect regions close to profitable trading partners in Western Europe or Eastern Asia to be more secessionist, controlling for the size of the seceding region.

A quite different strand of the literature focuses on income differences as the primary feature of heterogeneity in the population. Buchanan and Faith (1987) show that the richer segments of the population may have an incentive to overtax the poorer segments. Because these are too poor to fund the fixed costs of a separate state, they cannot credibly threaten secession. A conclusion along similar lines is reached by Dagan and Volij (2002), who argue that richer individuals are more likely to secede from a state in the presence of extensive redistribution. An influential paper by Bolton and Roland (1997) formalized such insights in the framework of a two region model, where regions have both different income levels as well as different income distributions. In this setting, the richer region may still want to separate in order to avoid paying transfers to the other region. A more subtle effect, however, is given by the possibility that the poorer region with a more unequal income distribution may desire secession too, because it seeks to implement more redistribution than it could accomplish in the union. In other words, both differences in income levels, as well as differences in the income distribution, may drive secession.

Two themes that are intimately connected to the issues described above are the effectiveness of transfers, and the way that decisions on transfers and borders are made. On transfers, the literature is divided on whether transfers between regions or between individuals can successfully prevent secession. In the framework by Bolton and Roland (1997), this is not necessarily the case. Haimanko, Le Breton and Weber (2005) on the other hand, argue that a full-compensation scheme can prevent state break-up even in highly polarized states. With regard to the decision making mechanism used, the main interest for the purposes of this paper is the decision rule on borders. In the framework by Alesina and Spolaore (1997), the main dichotomy is between democratic and autocratic rules. If democratic procedures are used and unilateral secession is permitted, individuals located near the border may have a higher incentive to secede, because they do not fully bear the efficiency loss of smaller states, which is partly borne by those left behind in the rump state. Under dictatorship, conversely, countries will be larger because the dictator does not bear the costs of excessive heterogeneity. However, the literature does not consider the case where the seceding units are run by local “petty” dictators or revenue maximizing elites, as would seem to befit many of the regions of the late Soviet Union (Suny 1993).

3. Historical background

In order to understand the choice of data and method in the remainder of the paper, it is necessary to briefly consider the historical context of separatism in the Soviet Union, as well as the most salient features of the Soviet Union’s administrative divisions.

[4] The authors also develop this idea in a separate paper (Alesina, Spolaore and Wacziarg 2000) using a model which features actual free trade within a country rather than human capital externalities. The results are relatively similar. In applying the model to the context of the late Soviet Union, however, free trade among the regions may be too strong an assumption, while the focus on human capital is more suitable. It should be noted that the basic model delivering the trade-off between size and heterogeneity does not require free exchange, which would have rendered its application to the Soviet context more difficult.

Although much more complicated in practice, the Union's federal system can be likened to a pyramid (see figure A1 in Appendix). Its structure reflected the substantial geographical and ethno-linguistic diversity of the Soviet Union. This in turn reflected the fact that the Soviet Union was, save for the loss of Finland and Poland and the gain of Western Ukraine and some smaller territories, a geographical continuation of the multinational Russian Empire. The Empire had grown outwards from the small Grand Duchy of Moscow between the 15th and 19th centuries, gradually absorbing the multitude of smaller states and peoples on its borders. By the time of the last Soviet census in 1989, demographers counted 60 distinct nationalities with more than 100,000 members within the Soviet borders (Goskomstat 1991).

The center of this multinational Union, located in Moscow, wielded most power. Some authority was delegated to the next level, which comprised the 15 *Union republics*. These Union republics were supposed to be the "sovereign" home states for the country's 15 major nationalities. In terms of political institutions, each Union republic possessed its own state symbols, Communist Party, separate parliaments, police forces, educational institutions as well as an extensive government bureaucracy.

The units below the Union republic level, sometimes called *provinces*, comprised 159 units by the time of the 1989 census. They can be divided into two groups. Territories in the first group, called Autonomous Republics (ASSR), Autonomous Oblasts (AO) or Autonomous Okrugs (AOk), were the home territories of "minor" nationalities. Of these, the ASSRs were in theory the more senior federal units, and were supposed to receive more funding and autonomy rights, but in practice the difference seems to have been less clear (Walker 2003). The second group of provinces, those that were not ethnically defined, were called Oblasts or Krais. Nonetheless, even these units often contained substantial ethnic diversity. This was partly due to the traditional role of diasporas such as the Armenians and the Jews in the Caucasus and Central Asia, but also to Tsarist colonization and sweeping Soviet industrialization policies. These moved ethnic Russians beyond their original locations of settlement into the Baltics, Ukraine and Central Asia (Suny 1993). These regions therefore contained substantial Russian, or Russian-speaking, minorities. In some cases, such as eastern and southern Ukraine as well as northern Kazakhstan, they constituted majorities. In addition, Stalin's brutal nationality policies of the 1940s had seen the deportation of millions of Caucasian nationalities, as well as ethnic Germans and Koreans to Central Asia, where many still lived in the 1980s. However, as diaspora members, work migrants and former deportees were not considered to be "native" by Soviet policymakers, they were not given their own federal subunits in the locations where they resided.

Finally, the sub-provincial level of federal administration was made up of raions (*districts*), which included some large towns that comprised their own district. Another regional division, quite apart from the administrative division just outlined, was sometimes used for economic planning and statistical purposes. To that end, the USSR was divided into 21 *economic regions*, each of which comprised a set of provinces with a high degree of economic and historic similarity.

Soviet economic and fiscal policy interacted with this federal system in several ways. On the one hand, planners strove to equalize interregional income differences (van Selm 1997), which they tried to accomplish using direct fiscal transfers between the central Union budget and the budgets of subordinate republican governments. Through this system, the economically more developed western Union Republics became net donors to the poorer Union Republics in Central Asia, for whom direct transfers constituted 18-25% of local government revenues (Orlowski 1995). On the other hand, the Soviets also constructed a complicated system of indirect transfers, which was based on the mandatory exchange of underpriced raw materials and energy against overpriced manufactured goods. This system tended to benefit the industrial producers of consumer goods located in the Baltics and Belarus, and tended to work to the disadvantage of those regions in Russian Siberia, Azerbaijan and Central Asia that were resource abundant (Orlowski 1993). At the same time, Soviet

leaders, including Gorbachev, periodically started campaigns to emphasize economic criteria at the expense of proportional national representation in personnel decisions. This effectively worked to the advantage of ethnic Russians, who generally constituted the better educated managerial and technical elite in Soviet enterprises (Schroeder 1992). The resulting sense of discrimination was heightened by the fact that the provision of goods was generally perceived to be better in Moscow than in the periphery (Hanson 2003).

Although this federal structure clearly had the potential for conflict, open dissent in favor of secession was rare for most of Soviet rule. Stability was partly ensured by the cooption of local national elites, many of whom gained substantial discretionary power during the last decades of Soviet rule and effectively became local petty dictators (Suny 1993). Those few individuals that did dare advocating regional autonomy or even independence were confined to labor camps or psychiatric clinics. Where any form of public unrest did surface on a broader scale, as in the town of Novocherkassk in 1962, Soviet authorities did not hesitate to use lethal military force to quell the unrest. Repression was harsh, continuous, and it was predictable (Beissinger 2002).

This changed with the advent of Gorbachev, who took office in 1985. Gorbachev initiated a liberalizing reform program that encouraged free public discussions on the future of the Soviet state. This was bold by Soviet standards, and it was quickly taken up by dissidents to include discussions of regional rights and autonomy too. Gorbachev also made repeated statements emphasizing political rather than military solutions to territorial conflicts (Fowkes 1997). After the 19th Party Conference in July 1988, liberalization went beyond the rhetorical (Hale 2000). The Conference decided that the citizens of federal subjects were to select members of a new parliament, the Congress of Peoples' Deputies, based on partly competitive elections. It also called on state organs to respect citizens' legal rights, such as the right to assembly. For the first time in Soviet history, this enabled legally sanctioned demonstrations to be held (Beissinger 2003). In essence, these reforms helped to transform a narrow dissident movement into broad based popular protest (Walker 2003). Mass demonstrations advocating regional autonomy increased markedly in number and in extent, first in the Baltic states, and then elsewhere. Regional elites started calling for more autonomy too. The Estonian local Parliament, the Supreme Soviet, passed a resolution declaring the "Sovereignty of the Estonian Soviet Socialist Republic". Other regional parliaments, including within Russia itself, followed suit in the months and years afterwards. In parallel, interethnic tensions flared up in the Caucasus and Central Asia, most notably between Armenians and Azerbaijanis, where conflict quickly turned violent.

Repression did not abide completely, but shifted down markedly in its extent, and also changed qualitatively in two important respects. For one, the responsibility of policing demonstrations was moved from the central authorities to local bodies. These were in a weak position to regulate assemblies and did not have the effective means to control large crowds comprising up to 100,000 participants (Beissinger 2003). Secondly, the use of large scale military force was reserved to quell interethnic violence, rather than secessionist demonstrations. Where violence was used in attempts to control demonstrations, the initiative seems to have been taken by local officials, and the central government was quick to deny any involvement (Fowkes 1997). Effectually, the regime of repression had become weak, fragmentary and idiosyncratic.[5]

[5] The central authorities' refusal to use concerted force on a large scale was not solely due to Gorbachev's personal dislike of military repression. There were material reasons as well. Gorbachev's political program and his credibility as a reformist leader hinged on liberalization and the rule of law. When force was used, as in Tbilissi in 1989, it usually backfired in the face of subsequent public outrage (Beissinger 2003). Senior military leaders were also wary of using the army for internal means. Morale was low among ordinary soldiers, and dodging the draft was common. In effect, the Soviet Army had neither the means nor the will to control the extent of the popular uprisings of the late 1980s (Fowkes 1997).

The official end of the Soviet Union in December 1991 did not stop the tide of separatist demonstrations. Separatist protests had already begun to spread to lower level federal units at the same time as they had engulfed the 15 Union Republics. Accordingly, a number of provinces, especially in the Caucasus, demanded their individual secession. Moreover, the Baltic States and Ukraine faced pressure from Russian minorities. Russia itself faced secessionist demands from many of its regions, with Tatarstan and the North Caucasian provinces being the most significant in terms of popular local support (Treisman 1997).[6] The Russian government had been astonishingly supportive of these regional separatisms. Yeltsin, at that time already Russian president, famously told Russia's autonomous regions to "Take all the sovereignty you can swallow" in August 1990 (Walker 2003). Only in the course of the years 1994-1996 were these secessionist movements gradually contained as the central Russian government concluded a series of power sharing treaties with individual provinces (Hughes 2002). In the case of Chechnya, the conflict escalated into war in 1994.

In sum, the time period between 1988 and 1994 can be taken to present a unique opportunity to study the determinants of secession within the framework of a single state, relatively unconfounded by the distortions of large scale military repression.

4. Data and key variables

(i) Dependent variable: Secessionist protests

There are two ways to quantify the regional separatism of the late Soviet period described in the previous section. The first possibility focuses on official acts of autonomy. This can be done by either counting the number of separatist declarations and laws passed by regional authorities in each province, as done by Treisman (1997), or by exploiting variation in the timing of the autonomy declarations as in Emizet and Hezli (1995), Hale (2000) and Suesse (2014). A second possibility is to count secessionist demonstrations, which utilizes data collected by Beissinger (2003). For the purposes of testing theories of secession, the second approach may be the more appropriate. As mentioned before, demonstrations are more likely to reflect an underlying popular demand for secession than official declarations. This holds especially in the late Soviet and post-Soviet context, where the link between regional leaders and popular will is likely to be tenuous. Protest data may therefore be regarded as a second best option, in the absence of reliable and extensive polling data. Protests have the additional advantage of providing ample variation in both time and space, as well as variation in size. They can also provide some information on the participants themselves, and they allow for the expression of multidimensional demands.

The database assembled and made available by Beissinger (2003) covers 5,584 demonstrations that took place across the territory of the Soviet Union between December 1986 and December 1992. Demonstrations were recorded regardless of their demands, based solely on them receiving mention in the independent domestic or international press, underground *samizdat* publications, government archives or official police reports.[7] For each demonstration, the location of the event, its starting date, the duration, the organizers, and the number of participants are recorded. Where it was available, some information on the identity of the protesters, such as "workers" or "Kazakhs", was

[6] It is important to note that the phenomenon of separatism within Russia in the early 1990's was not confined to those ethnically defined regions seeking independence. There was also the parallel movement towards regional autonomy and localism from the very "Russian" parts of Siberia, that felt neglected by Moscow economically (Hughes 2002).

[7] The exact definition of a demonstration employed by Beissinger (2003) is that of any voluntary gathering of individuals exceeding 100 persons, which is open to the public, and whose primary aim is to peacefully advance or advocate a political demand or opinion. This does include demonstrations that turned violent, for example because of police actions. It does not include gatherings whose primary aim was to inflict violence, such as lootings, pogroms, or armed uprisings, whose determinants are likely to be quite distinct from demonstrations.

also recorded, as well as the number of those arrested, injured or killed during the event. If more than one source of data was available for a demonstration, averages were taken to arrive at an estimate for the number of participants or casualties. Most importantly, the database lists up to five demands for each protest. These cover a broad array of issues that people in the late Soviet Union were concerned about. Some demands are targeted at instances of official corruption or directed against particular politicians; others complain of rising prices or shortages, others seek economic liberalization or the correction of historical injustices, or the restoration of the Church. Some advocate a return to Stalinism, and some demands are overtly racist.

In coding these protests into an indicator of separatism, I first excluded all those protests that did not feature at least one demand explicitly calling for a change in international political boundaries or a fundamental change in the boundaries or rights of a federal subunit. Vague demands that implied a general feeling of nationalism, or those that aired cultural or historical concerns remotely connected to statehood, were also excluded. The guiding principle used is that a demand should imply a clear change in the level of government providing public goods. In cases where this was difficult to determine, a judgment was made by looking at the identity of the protesters, the organizers' political program, and the historical and locational context of the protest. As a next step, irredentist calls for boundary changes, i.e. those calling for the unification of two territories, were excluded if they did not at the same time advocate secession from the USSR or its Union republics. Finally, calls for the exit of Russia as a whole from the Soviet Union were excluded. These are a priori difficult to frame in terms of the economic theory of secession, as a Russian exit would not change any region's distance to the government. This selection decision affects only a very small number of cases.

This leaves 1,880 demonstrations for the analysis. These need to be divided further according to the combination of state size and heterogeneity that they advocate. Two criteria are used. The first is according to the territory whose secession is advocated (province, or Union republic). The second criterion divides the data into a narrow "secession" category, where nothing less than the complete exit of a territory is demanded, and a broader "autonomy" category. The autonomy category includes demands such as that a territory be given economic or legal sovereignty, that it be granted its own armed forces, currency etc. This yields three groups, which are partially overlapping due to the fact that one demonstration can enter several groups. Thus the variable SECREP describes protests advocating secession of a Union republic from the Union, AUTREP calls for far-reaching autonomy of a Union republic from the Union. Finally AUTPROV is the broadest category, calling for the far-autonomy of any province in the Soviet Union.

Anti-secessionist protests are coded in the same manner, defined as gatherings opposing any of the demands described before. This adds another 361 demonstrations to the analysis. These variables and their descriptive statistics are displayed in Table A1 (all tables are located in the Appendix).

All protests are aggregated to the level of the provinces, which constitute the fundamental unit of analysis in this paper. Even when the exit demand for a Union republic is analyzed, the variation in demand at the level of the republic's provinces can provide useful insights. Provinces are defined as they appear in the Soviet census of 1989 (Goskomstat 1991) and correspond to the middle level in the federal hierarchy described in section 3 and figure A1. I add the 15 capital cities of Union republics (which are technically not provinces of their own) as separate units, given the fact that they are both in terms of their economic structure as well as in their ethno-linguistic composition often quite different from the surrounding countryside. Capitals may also be a particularly attractive and visible place to protest, and may therefore see more than their normal share of demonstrations. I also add the so-called "republican districts", which are districts immediately surrounding a capital, as separate units. I control for the area surrounding the capitals and for the capitals itself in the empirical analysis with the dummies OBLAST and CAPITAL.

In total, there are 184 "provinces". Of these, 121 witness demonstrations advocating some form of independence or autonomy, while 57 see anti-secessionist protests. A total of 28 provinces do not see any protests at all. The distribution of protests across provinces is depicted in maps A1-A4. The pattern appears to corroborate the historiographical literature (Fowkes 1997, Walker 2003): separatist protests are high in the Baltics, Ukraine and the Caucasus both in absolute numbers as well as shares of the population. Within Ukraine, the western regions and the Crimea were proportionally more separatist. Remarkably, eastern Ukraine does not seem to witness a high share of anti-separatist protests. Demonstrations in Central Asia seem to be confined to the republican capitals and the regions surrounding the Fergana Valley. Within Russia, a protest belt stretching from Tatarstan almost to Lake Baikal stands out.

(ii) Independent variables

The main explanatory variables of interest are size and heterogeneity. Size should be the size of the state people demand in their protests. For those regressions testing the exit of Union republics, the republic population from the 1989 census, POPREP, is the natural choice. For the AUTPROV regression, where some provinces seek exit from the Union on their own, and some in combination with others, POPADMIN accords the provincial population to any Russian province and any ethnically defined unit outside of Russia, and the republican population to the rest. This reflects the fact that Russia has most regionally defined units, and reflects the supposition from the literature that ethnically defined units may a priori be more likely to secede on their own rather than in conjunction with others. POP25AUT follows a different approach and gives each province their respective republican population, except those provinces that see more than 25% of protests advocating autonomy for that particular province.

An additional complication is that treating population size as being synonymous with country size is dependent on the assumption of equal and exogenous incomes for all citizens in the basic model by Alesina and Spolaore (1997). The Soviet Union may have come closer to this assumption than most other polities, but income differences did exist within Socialism too. Controlling for per capita income is therefore necessary. Unfortunately, income estimates are not available on a provincial level. Soviet income data are also not deemed to be very reliable, as accounting standards differed between republics, and wages were not a good indicator of actual income. A better indicator is per capita consumption, which takes income from unregistered sources into account (Mitra and Yemtsov 2006).[8] It has the additional benefit that it is recorded on a provincial level. One drawback might be that it does not take regionally varying savings rates into account. This could be an issue, given the fact that savings in the Soviet Union were largely "forced", i.e. caused by a limited availability of goods, which might be region specific. I therefore adjust the consumption figure using the ratio of money incomes to retail sales collected from household budget surveys for the level of Union republics by Kim and Shida (2014). The resulting variable INCOMEPC confirms to what one would expect for the period: It is higher in the more industrial and urban areas of the Baltics, whereas it reaches its lowest values in the underdeveloped areas of the Northern Caucasus and Central Asia. It also reaches high values in those areas of Siberia heavily engaged in oil production that see the employment of a highly subsidized labor force.

This variable also allows a test of Bolton and Roland's (1997) hypothesis that income differences matter for separatism. Similarly, the contention that differences in the income distribution matter for the incentive to separate is tested by including a variable DEVGINI, which is the deviation of a

[8] Consumption includes all goods sold though the state and private („cooperative") retail sector. It also includes food distributed by the state, but excludes consumption of immobile goods, primarily housing and utilities. These can be taken to be constant in the Soviet context. Data sources are the republics' statistical yearbooks for the year 1989 (Goskomstat 1990b). In those cases where values were only available for 1988, the corresponding values for 1989 were imputed using the average consumption growth rate for the republic.

republic's Gini-coefficient from the Union mean using data from Alexeev and Gaddy (2005). Unfortunately, this variable is only available on the level of the Union republic.

Heterogeneity between the center and the periphery can have many components, which are not easy to measure. The most straightforward measure, which is closest to the model but possibly not to reality, is geographical distance. I use the great circle distance between a provincial capital and Moscow in GEODIS. I also calculate the difference between the distance to Moscow and the distance to the Union republic capital from the perspective of each province. Another dimension of heterogeneity alluded to in the literature is ethnic differentiation between a province and the seat of government. Accordingly, I compare the composition of each province's population by nationality as recorded in the 1989 census to the composition of the Union center (ETHDIS) using a Finger and Kreinin (1979) similarity index.[9] Another aspect of heterogeneity is linguistic distance, which reflects the fact that some languages are in terms of their grammatical structure, syntax and vocabulary more similar than others. This can be seen as a rough proxy for the ease of interaction between speakers of different languages. I follow Fearon and von Houten (2002) in using a classification schemes from linguistics (Lewis 2013), which categorizes languages into branches and sub branches based on their innate grammatical and lexicographic traits. Linguistic similarity is then defined as the position of the last common node of two languages in this language family tree. This is then converted into an opposite measure of linguistic distance, LANGDIS. I take the majority language spoken in a province as my point of reference. This may be relevant in the Soviet context, as the main language spoken does not always coincide with the national group constituting the majority in a region. The difference in the main reflects the tendency of some non-Russian nationals, especially in Ukraine and Belarus, to speak Russian as their native language.

Although the Soviet Union was theoretically an atheist state, religion was practiced widely. Historically, the treatment especially of Muslim minorities had been a salient issue in Russian imperial history (Kappeler 2001). Religion can therefore be seen as another important cleavage. I include a dummy variable MUSLIM if a region has a Muslim population of more than 30%, based on the 1979 census.

Finally, it may be that heterogeneity of preferences does not coincide with measurable indices of ethno-linguistic differentiation or geography, but rather reflects some unobservable cultural norms that are specific to particular societies. The literature on secession has posited that the state can seek to homogenize these norms, for example through the education system or the bureaucracy, in what is sometimes called "nation building" (Alesina and Reich 2013). If this is true, the longer a society is part of a particular state, the more similar its preferences should become to those of the state's government. I take up this idea by constructing an index HISTRUS detailing the length of time in which a province has historically been part of the Soviet Union or one of its predecessor states, the Russian Empire or the Grand Duchy of Moscow. To accomplish this, I record the first time a province came under the influence of the Moscow or St Petersburg government using standard histories of Russian imperialism (Kappeler 2001) and colonialism (Breyfogle et al 2007) and the Great Soviet Encyclopedia (1978). Wherever possible, I take the date that corresponds most closely to the point in history when physical Muscovite, Russian or Soviet presence began, either through direct conquest or through permanent settlement. In those cases where Russian presence was fragmentary due to the presence of enduring resistance by native peoples, such as in the North Caucasus or Bashkiria, I also record the date at which the resistance was finally subdued to arrive at a more conservative estimate HISTRUSLATE. I remove any years in which the province was temporarily not part of the

[9] The distance between populations *i* and *j* is calculated as 1 - ETHSIM, where

$$ETHSIM_{ij} = \sum_{k} \min\left[\left(\frac{x_{i,k}}{\sum_i N_i}\right), \left(\frac{x_{j,k}}{\sum_j N_j}\right)\right]$$

where $x_{i,k}$ is the population of nationality *k* in province *i* and N_i is the total population in that province. The ETHDIS index takes values between 0 and 1, where 0 denotes completely identical populations.

Russian or Soviet state, such as was the case for the Baltic states during the interwar period. Both estimates are discounted backwards from 1987 using a discount rate of 1% per year to give more weight to recent years. This reflects both the notion that memories of distant statehood should fade in time, as well as the idea that modern states with developed institutions might be better at "nation building" than their early modern predecessors. I experiment with different discount rates, ranging from 0.1% to 10% per year.

The literature also emphasizes the role of transfers, which the center can employ to compensate regions for not seceding. As described earlier, there existed direct budgetary and indirect trade transfers in the USSR. Both are only available on a Union republican level. I calculate DIRECTSUB as net transfers in rubles per head of the republican population based on the data in Orlowski (1995). Indirect transfers can be approximated on a provincial level. To accomplish this, I take the total output of a province's processed food and light industries (Goskomstat 1990b), whose products were the most overvalued in the Soviet trading system. I then calculate the implicit subsidy received in the production of these goods using the republic specific ratio of world prices to domestic prices for that industrial category from Orlowski (1993). The resulting measure INDIRECTSUB is imperfect, because information on the whole industrial structure of a province is not available. It is therefore not possible to gauge the extent to which a province might also have been producing underpriced goods, such as energy or investment goods, so that the variable cannot be interpreted as a measure of *net* subsidies. It does, however, have the advantage of being calculated for the provincial level.

Lastly, trading opportunities may be important in shaping incentives to secede, because they allow smaller countries to raise their welfare level in the absence of large internal markets. Some of the opportunity to trade is determined by geography and may therefore be exogenous to the policy decision of a country. One simple way to model this is to include a dummy ENCLAVE if a region is completely enclosed, without access to the sea, by another country in the event of secession. This would present a case of very high trade costs. Similarly, changes in the terms of trade can to some degree be viewed as exogenous from the perspective of the small post-Soviet republics. As they entered world markets, their import and export prices had to adjust to world market prices. The variable TRADECHANGE uses contemporary forecasts of the change in the terms of trade based on 1989 domestic and world prices from Tarr (1994). In addition, I take into account that republics could be expected to reorient their trade away from the other Soviet republics to trade more with the rest of the world after secession. I do this by adjusting TRADECHANGE with contemporary forecasts on trade reorientation based on gravity models as collected by van Selm (1997). This takes into account that the Baltic regions could be expected to have good trading opportunities with large Western European countries, whereas that option was geographically less readily available to the Central Asian republics. This variable is only available on the level of the Union republics.

All other variables are based on the 1989 census. These include the share of the population with a university degree, EDU, the share of workers, WORK, and the share of the population of working age, AGE. Finally, the population density of a province (DENS) is taken from Goskomstat (1990a).

5. Method

The main dependent variables of interest are the number of protests, or the number of participants in protests. Given that the dependent variable can take 0-values, estimation by Ordinary Least Squares is not suitable and count data methods are to be preferred. These should be based on a probability distribution that reflects the underlying process generating the counts (Winkelmann 2008). In the present application, this excludes the benchmark model often used in counts, the Poisson distribution. The Poisson distribution is a single parameter model based on the assumption of equidispersion, i.e. mean and variance equivalence. The protest data, on the other hand, exhibits counts with variances that exceed the mean substantially and that are therefore overdispersed. Models based on the Negative Binomial distribution suggest themselves as an alternative. These

allow for a dispersion parameter α that is not constrained to 0.[10] Additionally, the Negative Binomial allows for the modelling of individual heterogeneity and certain types of occurrence dependence. This may be particularly appropriate in the present setting, where the occurrence of protests at a given time may partly depend on their occurrence in previous periods, for example because of true contagion effects (Cameron and Trivedi 2013).

An additional problem is presented by the relatively large number of zero realizations in the data. For example, AUTPROV, which records protests demanding far-reaching autonomy for a province from the Union, shows 63 provinces, or 35% of the total, without this type of protest. In these cases, hurdle models or zero-inflated models can be used. Hurdle models treat the occurrence of zero's as a fundamentally different process from the realization of the non-zero's, while zero-inflated models do not have that restriction (Winkelmann 2008). In the context of protest data, it seems plausible to allow for zero realizations to be both an indicator of a very low propensity to secede, as well the outcome of an altogether different process. I therefore use a zero-inflated model. The occurrence of zero's, i.e. protests at the extensive margin, are modelled with a logit. I include three variables in the baseline logit. The variables ARREST and VIOLENCE model the absence of protests as the result of repression by authorities in a particular province, using information from all protests, including those unrelated to separatism. ARREST measures the number of those arrested in that province during any other protest for the entire period, while VIOLENCE is a categorical variable reflecting whether physical violence was used by authorities to contain or disperse protests during the period. This allows me to gauge whether a threat of repression existed in a particular province that may have prevented any separatist protests from taking place. In addition, I include the size of the province POPPROV in the logit, and sometimes measures of heterogeneity. These allow for zero's to be an indicator of very low demand for secession.[11]

Meanwhile, protests at the intensive margin are modeled using the negative binomial described above. In each specification, I include one measure of population size and one measure of population heterogeneity, as well as per capita income, to model the basic trade-off between size and heterogeneity described in the literature. Additional variables emphasized in the secession literature and control variables are included on a case by case basis.

Before estimation can proceed, the counts need to be adjusted for exposure to population size (Winkelmann 2008). In large populations, a larger number of protests is to be expected mechanically. I therefore express all protests as well as participants in protests as a share of the provincial population. The additional inclusion of population as a variable in the regression then permits a test of proportionality. If the coefficient on population is significantly different from 0, this implies protests increase in population size above what would be expected due to exposure. This would then be a vindication of the theory on the benefits of state size.

Controlling for other elements of exposure is more intricate. Because the regions in the sample are at different stages in their demographic transition, there are discernible differences in the age structure between provinces. The southern provinces in Central Asia have a high proportion of the population under the age of 15, while central Russian provinces exhibit a high share of citizens above the age of 60. Because children and the elderly are less likely to engage in street protests, I include a variable measuring the share of the population aged 15-60 as a robustness check. I do not include this in the baseline specification, however, as the size of the working age population is to some degree collinear

[10] The results reported in the empirical section confirm an estimated α that is always different from 0 at the 1% level, indicating that overdispersion is indeed present. Specifically, I model this dispersion using a Negbin 2 model (Cameron and Trivedi 2013) which models the conditional variance ω as a function of the estimated dispersion parameter α and the quadratic mean: $\omega_i = \mu_i + \alpha\mu_i^2$.

[11] The choice of the zero-inflated binomial with this specification over the regular binomial is supported by a Vuong test, which accords a superior fit to the zero-inflated model at the 1% level

with indicators of total output. I do control for other factors that might influence protest turnout. These include population density DENS, which could affect the economic cost of attending protests (Cichetti et al 1971). The share of the population with a tertiary degree, EDU, controls for the possibility that well educated populations might be better informed about political events and therefore more likely to attend political protests (Schussman and Soule 2005).[12] Lastly, I control for the administrative status of a province with a dummy ADMIN, which takes a value of 1 for territories with a "special" status such as ASSRs or AOs. This reflects Walker's (2003) contention that the legal status of a region mattered in the late Soviet Union in bestowing political legitimacy onto an independence movement. This variable is also included in some logit regressions to capture the effect that zero realizations could reflect the low administrative status of the province. However, as high administrative status was generally allocated to territories with a large ethnic minority, this variable also reflects some degree of population heterogeneity.

A final point to note is the possibility of spatial error dependence. This can be a problem in geographical studies such as this one, where unobserved shocks or heterogeneity can easily influence geographically close units in a similar manner. I therefore cluster all standard errors around 29 roughly homogenous regions, each comprising several provinces. These largely follow the Soviet division of the Union into economic planning regions described earlier and therefore seem most appropriate.[13] I also include fixed effects on the level of the four macro-regions (Central Asia, Caucasus, Baltics and Moldova, as well as the three slavic Republics). These capture the general tendency of protests to be higher in the Baltics and the Caucasus, which may be due to factors unrelated to the theory of secession.

6. Results I: The determinants of secessionism

Table A2 shows the results of predicting all protests advocating far reaching autonomy or secession of a province from the Union, either by itself or in conjunction with other provinces. The results confirm the role of size in shaping incentives to separate. POPAUT is continuously statistically significant across specifications in increasing the number of protests at the intensive margin. The effect is weaker when the provincial population is only allocated as a size variable to those provinces exhibiting significant separatist activity (POP25), but it still persists. It should be remembered that the size effect appears here despite the protest count being normalized by population size. Population size is also significant, and its coefficient is stronger, in decreasing the likelihood of a zero-occurrence. This implies that a lack of size is more important in determining whether a province strives for autonomy at all (the extensive margin), than in predicting the magnitude of separatist demand. This sounds reasonable, if we interpret a certain threshold state size as being necessary to pay for the fixed costs of public goods provision, as the theory suggests. On average, adding 1 million to a province's population doubles the odds of the province engaging in any kind of separatism ($1000000*\exp(1.8) \approx 2$). However, the size of the coefficient on population on the intensive margin is very small. Judging by the coefficient on the number of participants in regression (G), in a hypothetical population of 10 million, it takes another 10 million additional citizens to gain ten additional protesters, after controlling for exposure to population size.

[12] In addition, the theory on the relationship between openness to trade and the incentive to secede is sometimes formulated conditional on the level of human capital, as in Alesina and Spolaore's 1997 model. Other variables mentioned in the protest literature as affecting individual participation in protests, such as marital status or unemployment (Schussman and Soule 2005), can assumed to be invariant across provinces in this (Soviet) setting. It may also be worth stating that although I include variables such as education or the share of workers as controls, my interest is not in inferring individual behaviour based on these aggregate variables, which could constitute an ecological fallacy.

[13] I deviate from this division in allowing each Baltic and Central Asian Union republic to form their own separate region, thus reflecting the increasing importance of republican boundaries during the period under study (Suesse 2014). I also separate the more industrialized and russified parts of Ukraine and Kazakhstan from the rest of the republic. In addition, the Fergana valley provinces are separated from Uzbekistan.

Of the variables proxying population heterogeneity, LANGDIS and HISTRUSLATE are significant across all specifications (only for LANGDIS shown). Apparently, language is a more salient marker of heterogeneity in this context than nationality (ETHDIS).[14] The magnitude of the effects indicate that, for example, a province with a Ukrainian-speaking majority would expect 4 more separatist protests than an otherwise similar Russian-speaking region. The effect of historically being part of the Russian state, though statistically significant, seems smaller in decreasing separatism. For example, a province that that became firmly part of the Russian Empire in the mid-18th Century, such as Donetsk, can expect only one protest less than a territory that became part of the Soviet Union after World War II, such as Lviv. The statistical and economic significance of HISTRUSLATE is unaffected by the choice of different definitions and discounting rates.

The existence of the trade-off between size and heterogeneity is further supported if anti-autonomy protests are used as a dependent variable (not shown). In that case, smaller regions that are more similar to Moscow along ethno-linguistic lines are associated with more protests against regional autonomy. This reflects the activity of Russian-speaking populations in Ukraine and the Baltics.

The impact of income per capita INCOMEPC on secessions is positive in most specifications, as the theory would predict, but its statistical significance is relatively weak. Other determinants that can be measured on a provincial level, such as indirect subsidies received, do not seem to influence the disposition to secede. Similarly, the status as an enclave, which presumably would entail very high trade costs in the event of secession, does not seem to affect popular demand either.

The logit equation predicting the extensive margin of protests accords a strong role to the ARREST variable, indicating that a certain proportion of the zero observations were not due to a low propensity to secede, but rather due to a threat of repression. However, the exercise of VIOLENCE by authorities seems to have had the opposite effect, that of increasing the likelihood of a secessionist protest taking place. This is to some extent in accordance with the historical literature, which emphasizes the role of the public backlash against Soviet authorities after cases in which violence was used in an attempt to quell protests (Beissinger 2003). The inclusion of any of the heterogeneity variables in the logit does not change the picture, and heterogeneity indicators in the logit are never significant. Interestingly, the effects of repression on protests vanish if anti-autonomy protests are used as a dependent variable.

A slightly different approach is used in table A3, where only protests demanding full independence, rather than those advocating autonomy, are taken into account. Additionally, the specification used here only considers calls for the exit of a Union Republic from the Soviet Union. The results are broadly similar to those discussed previously. Protests in a province are still increasing in population size, in this case the size of the republic's population. The size of the population coefficient on the intensive margin is greater by a factor of roughly 10.[15] Furthermore, different indicators of heterogeneity are not significant. Instead of linguistic distance, geographical distance plays a larger role. This is unchanged if ethnic, linguistic or geographic distances are calculated not as absolute distances from the province to Moscow, but rather as distances to Moscow relative to distances to the republican capitals.

The greatest difference to the previous set of specifications is the absence of a significant coefficient on per capita income. One explanation could be that richer provinces are more likely to seek independence on their own, rather than as part of the larger Union republics analyzed here.

[14] The effect of ethnic heterogeneity does become significant once the ADMIN control is dropped. As explained before, special administrative status in the Soviet Union was generally only given to regions with a resident ethnic minority.

[15] This could conceivably be due to the fact there is no controlling for population at the extensive margin in this case. As all Union Republics were large enough to cross the minimum size threshold, any size variable in the logit turns out to be insignificant.

Differences in the income distributions DEVGINI also do not seem to play a role, and neither do projected changes in trade volumes TRADECHANGE. Direct subsidies, on the other hand, seem to be a factor in reducing secessionist demands. Loyalty is not cheap, however. The avoidance of one secessionist protest in a province would cost the central government 250 rubles in transfers per capita, or about one third of the mean income of a Central Asian laborer. Incidentally, this is about the size of the per capita transfers that were actually paid out to Central Asian republics. By comparing regressions (M) and (O), it is also clear that the government can only buy off independence protests, while demands in favor of autonomy for the republics are unaffected.

The performance of the logit is generally weaker in the A3 specifications, indicating that the role of repression was lower. As in the previous specifications, adding measures of heterogeneity does not add anything to explaining the extensive margin of secessionism. In general, the results in tables A2 and A3 are robust to controlling for differences in the age distribution, social composition of the labor force, or religion, at the intensive and the extensive margin. Unsurprisingly, the results are statistically much stronger across the board if regional clustering is abandoned.

7. Results II: Popular demand and autocratic decisions

The Soviet experiment also allows a comparison of the popular demand for secession in a region and the extent to which the region's leaders actually pursued a secessionist policy. This comparison may be of interest for a number of reasons. First of all, the literature posits that democracies and autocracies should behave differently when determining the size of states. Under this perspective, we can interpret the protest data as predicting the theoretical outcome under perfect democracy, while actual secession policy shows the outcome under autocratic regimes.[16] Secondly, if state size matters economically or politically, we might be more interested in the determinants of actual attempts to secede, rather than the determinants of popular demand for secession. There are many reasons why popular demand and policy decisions need not be synonymous, even in democracies. Politicians or ruling elites may be maximizing different utility functions, or operating under different constraints, than their constituents. They may also have different sources or quality of information about the benefits or costs of secession.

One way of measuring decisions to separate is to count the number of separatist declarations made by provincial governments. I construct this variable DECLARATIONS using data from Treisman (1997). The data conveys the number of times provincial authorities issued official declarations asserting that province's right to its own constitution, an independent foreign policy, its own currency or similar demands for far-reaching autonomy or independence. It can therefore be seen as the analogue to the regression results in table A2. The variable is restricted to Russian provinces and only counts declarations up to 1994, the year when the Russian center began to gain back control over the provinces. Because overdispersion is empirically less of a problem with this variable, I use a Poisson model instead of the Negbin 2 variant employed earlier. Even though 27 provinces issue declarations of autonomy, the proportion of zero's is larger here than for the protest counts. I do therefore employ a Zero-Inflated version of the Poisson distribution. The variables entering the logit equation predicting the extensive margin are the same as those that are used to predict the intensive margin of secession.[17]

[16] This assumes that regional leaders were autocrats. In practice, not all provinces under study here were full autocracies. Still, even in the earliest democratizer, Estonia, elections did not get underway until February 1990, while other Baltic and Western republics joined the democratic process much later. In effect, most regions were ruled by unelected officials, many of whom were (previous) members of the regional Communist Parties (Roeder 1991).

[17] Clearly, there is little sense in incorporating the variables depicting local repression in this context

The results are shown in table A4. Although size and heterogeneity are observed to matter for the pursuit of separatist policy, there are important differences between these results and those obtained earlier using the protest data. First, size is always strongly significant in predicting the intensive margin, while its significance is weaker in predicting the decision whether to engage in any separatist activity at all. The difference between the coefficients on the intensive and extensive margins is also smaller than before. Secondly, the role of heterogeneity is much weaker. It is only significant in influencing the decision to engage in any separatist policy, but not in predicting its extent. The only occasion where heterogeneity is strongly significant on the intensive margin (T) shows its sign to be reversed. After controlling for the fact that the leaders of Muslim polities are much more likely to engage in separatist policies in the first place, this aspect of heterogeneity is negatively correlated with the extent that these policies are pursued.[18] Thirdly, income per capita is not or negatively related to separatist policy, the opposite of what was found in the case of the protests. Fourthly, the enclave variable is strongly significant in these regressions, while it was not so in previous exercises, indicating that such a status is connected with lower separatist policy.

There are several ways in which one could interpret these results. They can be taken to support the theoretical literature claiming that the result of decisions on border changes differ under autocratic and democratic rules. The observation that heterogeneity seems to matter less to rulers than the size of the state (i.e. a Leviathan's future tax base) can be squared with that strand of thought. However, it is not immediately clear why income per capita would not be positively related to separatist policy. Additionally, the results suggest that some threshold level of heterogeneity with regard to the center is still required for leaders to engage in separatist policy. Whether this is because leaders appealing to the rights of ethnic self-determination find it easier to shore up some modicum of domestic support for autonomy is difficult to answer in the present context. The threshold function of heterogeneity is somewhat reduced if controls for administrative status are introduced (not shown), suggesting that local leaders are constrained somewhat by the amount of resources granted to them by the federal system.

The reason why enclave status only matters for autocratic decision making can also be answered from different perspectives. It would be consistent with supposing that leaders are better informed about the costs of such a secession resulting in enclave status than the populace. A less benevolent explanation could center on revenue maximizing politicians-turned-entrepreneurs accumulating rents from internal trade, who would therefore be hesitant to move to a scenario that would starkly reduce trade. There is indeed evidence that special interest groups with linkages across regional borders captured local governments to assure the free movement of goods across regions in Post-Soviet Russia (Guriev et al 2010).

A check on the robustness of these results is provided by exploiting the timing of sovereignty declarations in the whole of the Soviet Union, using data on the date of the declaration from Hale (2000). In the late Soviet context, sovereignty declarations were used by territories to state their legal autonomy from the center, and often preceded independence declarations. An early timing of this declaration is often taken by historians and political scientists as an indication of a high propensity to secede (Emizet and Hezli 1995). The dependent variable is calculated as the number of weeks from the liberalizing 19th Party Conference to the issuance of the declaration. I use a hazard model, which is able to account for the fact that the dependent variable is time dependent.

The results in table A3 are consistent with those from table A4 and support the notion that separatist policy is determined differently from popular demand for separatism. Although size is significant across specifications in increasing the likelihood of an early exit, most measures of heterogeneity are not, and geographical distance exhibits the wrong sign. As in the previous exercise, the status as an

[18] It should be remembered that including heterogeneity variables into the logit in the regression in tables A2 and A3 did not downgrade the role of heterogeneity in the main regression in any way.

enclave reduces separatist policy. A puzzling feature is the role of indirect subsidies to industries, which increase the likelihood of an early exit. This persists after controlling for the share of workers to exclude the possibility of this estimate being driven by differences in the spread of industry. The same puzzling connection appears for direct subsidies (not shown), which had reduced the popular demand for secessionism. However, regression (O) also showed that the effect of subsidies in decreasing secession incentives only held for demands for full independence. As the indicator used here, SOVEREIGNTY, is closer to an indicator of autonomy than to one of independence, this could partly explain the puzzle.

8. Summary and implications of findings

This paper has found evidence for the existence of a trade-off between size and population heterogeneity in the formation of states. This evidence stems from examining 1,880 pro-secessionist protests across the 184 provinces of the Soviet Union. Additionally, some evidence has been found that supports the role of interregional differences in per capita income and direct transfers in shaping incentives to secede. Two additional insights on the determinants of secessionist demand emerge from this empirical exercise, which could be relevant for future theoretical work in this area.

Firstly, this paper has shown that the factors determining the demand for secessions differ at the intensive and the extensive margin. While the benefits of size matter mainly in determining the occurrence of secessionist demand, heterogeneity of the local population with regard to the center shapes the intensity of secessionist demand. Theoretical work could take up this insight, for example by allowing separatist behavior to be costly, so that individuals can decide how many resources to devote to this type of activity. In that case, predictions could differ from the current class of models that tends to see decisions on secession as binary choices.

Secondly, the empirical evidence suggests that popular demand for secession and actual secessionist policy are determined by different factors. Our understanding of state stability and breakup may therefore benefit from a set of models that are able to incorporate both the causes of demand for secessions as well as the conditions under which these demands are transmitted into actual policy. Such an approach could combine both self-interested citizens and self-interested local elites into a framework that could shed more light on the political economy of secession attempts.

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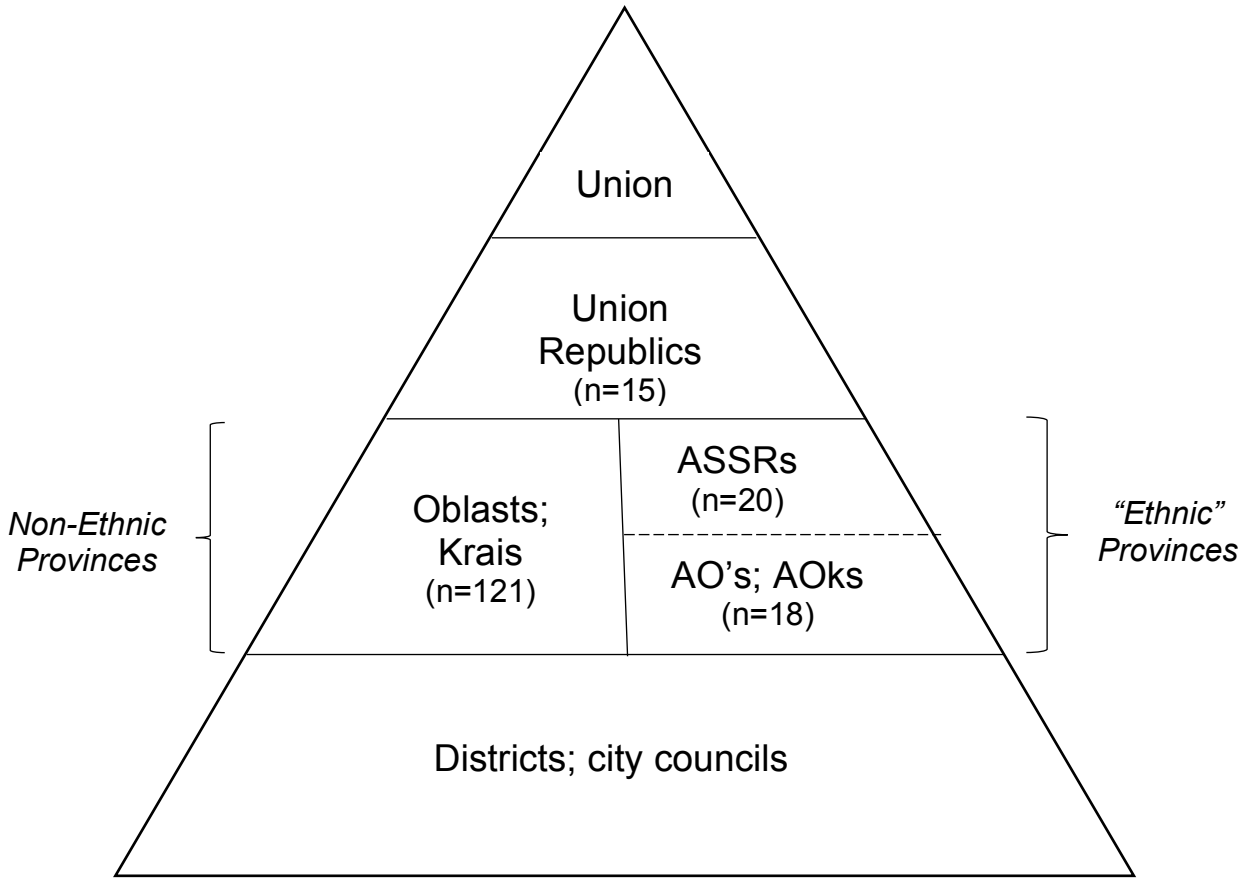
A. Appendix: Figures, Tables and Maps

Figure A1 The Soviet Union's federal hierarchy according to the 1989 census



Source: author

Table A1 Descriptive statistics

Dependent variables	Description	Observations	Mean	Standard deviation	Minimum	Maximum
SECREP	Pro republican secession	184	*70.6*	140.1	*0*	633
AUTREP	Pro republican autonomy	184	*154.7*	188.8	*0*	875
AUTPROV	Pro provincial autonomy	184	*229.4*	241.2	*0*	1000
ANTISEC	Anti-secession	184	*34.0*	71.5	*0*	400
PSECREP	Participants pro-secession	184	*93935*	209274	*0*	950522
PAUTPROV	Participants pro-autonomy	184	*242544*	306689	*0*	1000000
DECLARATIONS	Separatist declarations	87	*1.16*	2.27	*0*	11
SOVEREIGNTY	Timing of sovereignty declaration	128	*76.6*	54.1	*19*	163
Independent variables						
POPPROV	Provincial population	184	*1552948*	1266788	*24769*	8875579
POPREP	Republican population	15	*80897733*	64284368	*1565662*	147021869
POPAUT	Population of republic /province	184	*11874308*	17140128	*24769*	51452034
POP25	Population of separatist regions	184	*10123666*	16157368	*24769*	51452034
GEODIS	Distance to Moscow (km)	184	*1854*	1465	*0*	6781
ETHDIS	Distance to Moscow (nationality)	184	*0.50*	0.35	*0*	0.99
LANGDIS	Linguistic distance to Moscow	184	*1.41*	1.73	*0*	4
HISTRUS	Length under Russian rule I	184	*83.6*	14.9	*34.7*	98.9
HISTRUSLATE	Length under Russian rule II	184	*82.4*	15.3	*34.7*	98.9
MUSLIM	Muslim population > 30%	184	*0.27*	0.44	*0*	1
INCOMEPC	Income per capita (rubles)	184	*10607*	4332	*2594*	27498
DEVGINI	Deviation of Gini from mean	15	*0.028*	0.012	*0.01*	0.064
INDIRECTSUB	Indirect subsidies per cap (rubles)	184	*461*	293	*22*	2335
DIRECTSUB	Direct subsidies per cap (rubles)	15	*42*	99.5	*-15*	677
TRADECHANGE	Projected trade volume change	15	*7.71*	9.51	*-16.3*	16.9
ENCLAVE	Enclave after secession	184	*0.22*	0.42	*0*	1
DENS	Population density	184	*322*	1049	*0.032*	6150
EDU	Share of pop with tertiary degree	184	*0.075*	0.033	*0.025*	0.225
WORK	Workers as share of population	184	*0.59*	0.073	*0.39*	0.72
AGE	Share of population aged 15-60	184	*0.60*	0.04	*0.47*	0.70
ADMIN	Status as ASSR/ OA/ OAk	184	*0.21*	0.41	*0*	1
CAPITAL	Capital of Union Republic	184	*0.087*	0.28	*0*	1
OBLAST	Territory surrounding capital	184	*0.027*	0.16	*0*	1
ARREST	Number arrested at protests	184	*61.1*	262.3	*0*	2449
VIOLENCE	Protests with violent repression	184	*7.37*	19.3	*0*	178

Sources and further definitions: see text

Table A2 Determinants of number of pro-autonomy protests, provincial level, Soviet Union 1987-1992 (Zero-Inflated Negative Binomial)

Dependent variable: number of protests AUTPROV adjusted for exposure to population (POPPROV)	(A)		(B)		(C)		(D)		(E)		(F)		(G)		(G) **Dependent variable: Participants PAUTPROV, adjusted for exposure to population (POPPROV)**	
POPAUT	3.1e-08***	*4.49*	1.7e-08*	*1.66*	2.7e-08***	*3.75*	2.0e-08***	*4.52*			2.8e-08***	*3.96*	2.3e-08***	*3.15*	5.2e-08***	*3.63*
POP25									2.0e-08*	*1.95*						
GEODIS	0.00011	*1.48*														
ETHDIS			0.947	*1.27*												
LANGDIS					0.26**	*2.17*			0.27**	*2.19*	0.25**	*2.14*	0.24**	*2.10*	0.51**	*3.79*
HISTRUSLATE							-0.020***	*-3.93*								
INCOMEPC	6.5e-06	*0.12*	0.7e-06	*1.36*	0.00010**	*2.05*	0.6e-06	*1.37*	0.9e-06*	*1.75*	0.00011**	*2.08*	0.00010**	*1.98*	0.6e-06	*0.69*
INDIRECTSUB											-0.00026	*-1.00*				
ENCLAVE													-0.41	*-1.27*		
EDU	10.08*	*1.87*	11.10**	*2.25*	5.54	*0.91*	12.06**	*2.37*	9.11	*1.12*	5.41	*0.90*	5.08	*0.80*	-13.28	*-1.33*
DENS	8.6e-06	*0.07*	0.6e-06	*0.57*	0.00015	*1.14*	6.5e-06	*0.06*	0.00018	*1.28*	0.00017	*1.24*	0.00017	*1.24*	0.00028	*1.33*
ADMIN	1.52***	*5.13*	1.21***	*2.80*	1.07***	*2.94*	1.36***	*4.03*	0.80***	*2.17*	1.05***	*2.83*	0.99***	*2.72*	1.56***	*3.36*
CAPITAL	0.60	*0.86*	0.13	*0.23*	0.36	*0.53*	0.14	*0.22*	-0.15	*-0.17*	0.40	*0.58*	0.49	*0.72*	3.66***	*3.52*
OBLAST	0.24	*0.26*	0.37	*0.42*	0.12	*0.13*	0.25	*0.29*	0.36	*0.35*	0.12	*0.12*	0.15	*0.16*	-0.95	*-0.82*
Logit (predict 0)																
ARREST	0.0021***	*2.58*	0.0021***	*2.63*	0.0021***	*2.57*	0.0021***	*2.58*	0.0021***	*2.60*	0.0021***	*2.56*	0.0021***	*2.49*	0.0018***	*2.39*
VIOLENCE	-0.66***	*-4.13*	-0.65***	*-4.25*	-0.65***	*-4.13*	-0.65***	*-4.23*	-0.65***	*-4.15*	-0.65***	*-4.11*	-0.65***	*-4.12*	-0.58***	*-3.89*
POPPROV	-1.8e-06***	*-3.00*	-1.8e-06***	*-3.09*	-1.8e-06***	*-3.07*	-1.8e-06***	*-3.03*	-1.8e-06***	*-3.06*	-1.8e-06***	*-3.07*	-1.8e-06***	*-2.97*	-1.7e-06***	*-2.87*
ADMIN	-0.96	*-1.39*	-0.97	*-1.43*	-0.97	*-1.42*	-0.97	*-1.42*	-0.98	*-1.42*	-0.97	*-1.42*	-0.97	*-1.41*	-0.94	*-1.35*
Regional fixed effects	yes		yes		yes		yes		yes		yes		yes		yes	
P > chi2	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Log Likelihood	-673.827		-673.627		-670.805		-669.169		-679.122		-670.805		-669.403		-1404.815	
N (0 obs)	183 (63)		183 (63)		183 (63)		183 (63)		183 (63)		183 (63)		183 (63)		183 (63)	

Source: author. Definitions: see text and Table A1

z-statistics are in 2nd column for each specification, clustered standard errors for all regressions. Clustering by economic region (29 clusters). Inflation equation predicts occurrence of 0's using logit. Both logit and main regression contain constants.

** significant at the 10%-level, ** significant at the 5%-level, *** significant at the 1%-level*

Table A3 Determinants of number of pro-independence protests, republican level, Soviet Union 1987-1992 (Zero-Inflated Negative Binomial)

Dependent variable: number of protests SECREP adjusted for exposure to population (POPPROV)	(H)		(I)		(J)		(K)		(L)		(M)		(N) **Dependent variable: Participants PSECREP adjusted for exposure to population (POPPROV)**		(O) **Dependent variable: number of protests AUTREP adjusted for exposure to population (POPPROV)**	
POPREP	1.0e-07***	*4.01*	1.3e-07***	*3.81*	1.1e-07***	*4.17*	1.1e-07***	*4.44*	1.1e-07***	*4.54*	1.1e-07***	*4.23*	3.0e-07***	*8.01*	4.5e-08**	*2.23*
GEODIS	0.002***	*2.58*														
ETHDIS			2.24	*1.12*												
LANGDIS					-0.39	*-1.21*										
HISTRUS							-0.032***	*-8.43*	-0.033***	*-6.49*	-0.031***	*-8.34*	-0.051**	*-9.86*	-0.23**	*-5.51*
INCOMEPC	0.1e-06	*0.10*	0.3e-06	*0.28*	0.0001	*0.92*	0.1e-06	*0.10*	0.2e-06	*0.17*	0.3e-06	*0.32*	0.00024*	*1.89*	0.9e-06	*1.10*
DEVGINI									13.60	*0.80*						
DIRECTSUB											-0.004***	*-5.87*	-0.008***	*-23.8*	0.8e-06	*0.08*
TRADECHANGE											0.054	*0.52*				
EDU	12.90	*1.10*	13.54	*1.29*	13.90	*1.14*	14.18	*1.54*	18.34	*1.61*	10.91	*1.15*	-13.72	*-0.94*	10.04**	*2.33*
DENS	0.0007*	*1.70*	0.0011**	*2.13*	0.0006	*1.41*	0.0008*	*1.91*	0.00076*	*1.86*	0.00081**	*2.56*	0.00034***	*7.01*	-1.0e-06	*-0.47*
CAPITAL	-0.23	*-0.15*	-0.51	*-0.38*	0.31	*0.22*	-0.14	*-0.12*	-0.69	*-0.52*	-0.17	*-0.14*	-0.74	*-0.36*	0.47	*0.71*
OBLAST	-1.84***	*-6.31*	-2.24***	*-5.64*	-2.40***	*-5.02*	-1.59***	*-6.62*	-1.55***	*-5.51*	-1.52***	*-6.56*	-1.75***	*-4.38*	-0.99**	*-2.29*
Logit (predict 0)																
ARREST	-5.56***	*-3.36*	0.0008	*1.08*	0.006**	*2.23*	-4.54	*-1.34*	-0.021	*-0.78*	0.0033	*0.97*	0.0010**	*2.04*	0.0013	*1.11*
VIOLENCE	-4.67***	*-3.15*	-3.04*	*-1.79*	-1.39**	*-2.52*	-0.68	*-0.29*	-0.58	*-1.05*	-1.01*	*-1.66*	-0.15	*-0.88*	-0.58***	*-2.76*
HISTRUS									-0.015	*-0.58*			0.001	*0.03*		
Regional fixed effects	yes		yes		yes		yes		yes		yes		yes		yes	
P > chi2	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	
Log Likelihood	-281.847		-284.137		-283.794		-277.868		-277.312		-273.600		-627.021		-356.211	
N (0 obs)	97 (47)		97 (47)		97 (47)		97 (47)		97 (47)		97 (47)		97 (47)		97 (39)	

Source: author. Definitions: see text and table A1

z-statistics are in 2nd column for each specification, clustered standard errors for all regressions. Clustering by economic region (18 clusters). Inflation equation predicts occurrence of 0's using logit. Both logit and main regression contain constants. All regressions exclude Russia

** significant at the 10%-level, ** significant at the 5%-level, *** significant at the 1%-level*

Table A4 Determinants of number of pro-autonomy declarations, provincial level, Russia 1992-1994 (Zero-Inflated Poisson)

Dependent variable: DECLARATIONS	(P)		(Q)		(R)		(S)		(T)	
POPPROV	5.5e-07***	*5.55*	5.9e-07***	*4.39*	5.7e-07***	*5.34*	5.1e-07***	*6.06*	7.2e-07***	*5.30*
POP25										
GEODIS	-0.2e-06	*-0.49*								
ETHDIS			-0.19	*-0.22*						
LANGDIS					0.062*	*1.76*				
HISTRUSLATE							0.028	*1.57*		
MUSLIM									-0.50***	*-2.96*
INCOMEPC	-0.2e-06	*-1.40*	-0.4e-06	*-0.90*	-1.3e-06	*-0.06*	-0.0001**	*-2.09*	-0.7e-06**	*-1.98*
ENCLAVE	-0.85***	*-3.29*	-0.90***	*-2.69*	-0.85***	*-2.72*	-1.08***	*-5.68*	-1.05***	*-5.20*
Logit (predict 0)										
POPPROV	1.1e-06**	*2.46*	6.1e-06*	*1.72*	1.4e-06	*1.55*	1.3e-06**	*2.42*	2.6e-06***	*3.68*
GEODIS	0.8e-06	*0.42*								
ETHDIS			-59.86***	*-2.81*						
LANGDIS					-8.05***	*-16.16*				
HISTRUSLATE							0.08	*0.81*		
MUSLIM									-32.74***	*-14.98*
ENCLAVE	0.0051	*0.01*	-3.6	*-1.49*	-0.65	*-0.98*	-0.41	*-0.55*	-0.76	*-0.88*
INCOME	-0.9e-06	*-0.73*	-0.8e-06	*-0.55*	-0.9e-06	*-0.75*	-1e-06	*-0.81*	-0.9e-06	*-0.31*
Regional fixed effects	-		-		-		-		-	
P > chi2	0.000		0.000		0.000		0.000		0.000	
Log Likelihood	-92.859		-57.717		-81.813		-90.600		-77.206	
N (0 obs)	86 (59)		86 (59)		86 (59)		86 (59)		86 (59)	

Source: author. Definitions: see text and table A1

z-statistics are in 2nd column for each specification, clustered standard errors for all regressions. Clustering by economic region (11 clusters). Inflation equation predicts occurrence of 0's using logit. Both logit and main equation contain constants.

** significant at the 10%-level, ** significant at the 5%-level, *** significant at the 1%-level*

Table A5 Timing of sovereignty declarations, provincial and republican level, Soviet Union, 1988-1991 (Log relative hazard, Weibull distribution)

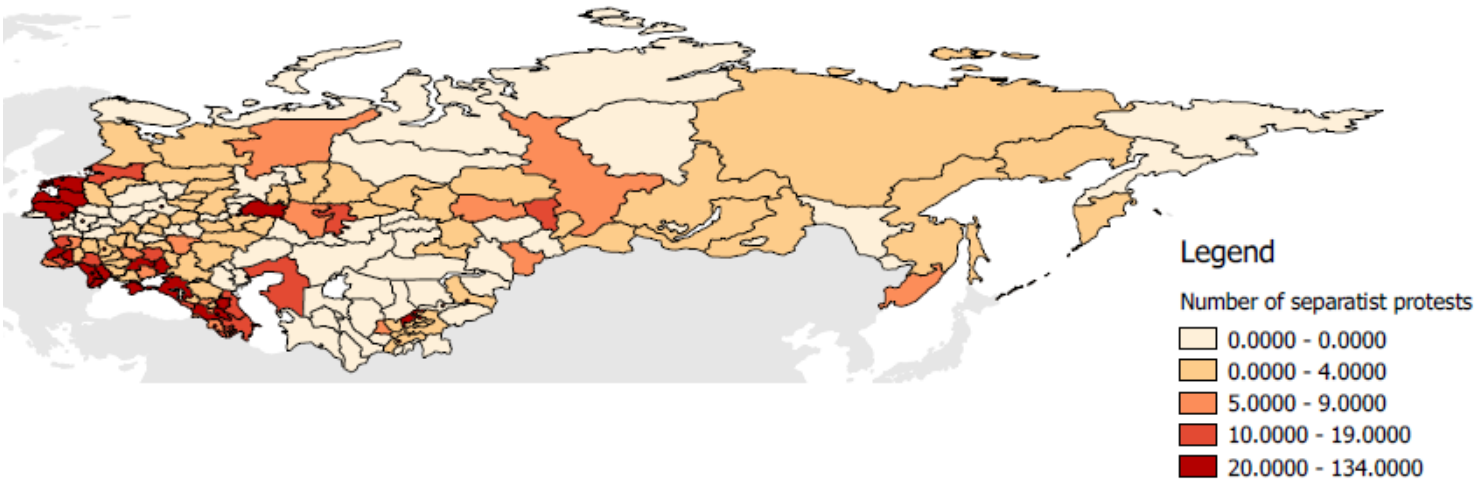
Dependent variable: SOVEREIGNTY	(U)		(V)		(W)		(X)		(Y)	
POPAUT	1.4e-07**	*2.28*	1.5e-08***	*2.66*	2.1e-08***	*3.64*	1.8e-08***	*3.34*	1.7e-08***	*2.88*
POP25										
GEODIS	-0.00015*	*-1.88*								
ETHDIS			1.37**	*2.56*						
LANGDIS					0.12	*1.61*				
HISTRUSLATE							0.004	*0.55*		
MUSLIM									-0.22	*-0.73*
INCOMEPC	-0.1e-06	*-0.40*	0.3e-06	*0.94*	0.1e-06	*0.32*	-0.2e-06	*-0.85*	-0.4e-06	*-1.01*
INDIRECTSUB	0.0012***	*2.96*	0.0012***	*2.99*	0.0013***	*3.23*	0.0011***	*2.95*	0.0011***	*2.72*
ENCLAVE	-0.90**	*-2.05*	-0.25	*-0.71*	-0.45	*-1.35*	-0.61*	*-1.82*	-0.65*	*-1.88*
WORK	0.12	*0.11*	1.24	*1.00*	0.42	*0.36*	-0.10	*-0.09*	-0.06	*-0.05*
EDU	0.93	*0.27*	2.06	*0.62*	1.53	*0.45*	1.88	*0.56*	2.73	*0.79*
CONS	-35.2***	*-13.2*	*-32.6****	*-13.2*	*-33.5****	*-13.2*	*-32.8****	*-13.2*	*-32.4****	*-13.2*
Regional fixed effects	-		-		-		-		-	
LR > chi2	0.000		0.000		0.000		0.000		0.000	
Log Likelihood	37.68		39.14		37.12		35.98		36.09	
N	128		128		128		128		128	

Source: author. Definitions: see text and table A1

z-statistics are in 2nd column for each specification. All coefficients are unexponentiated

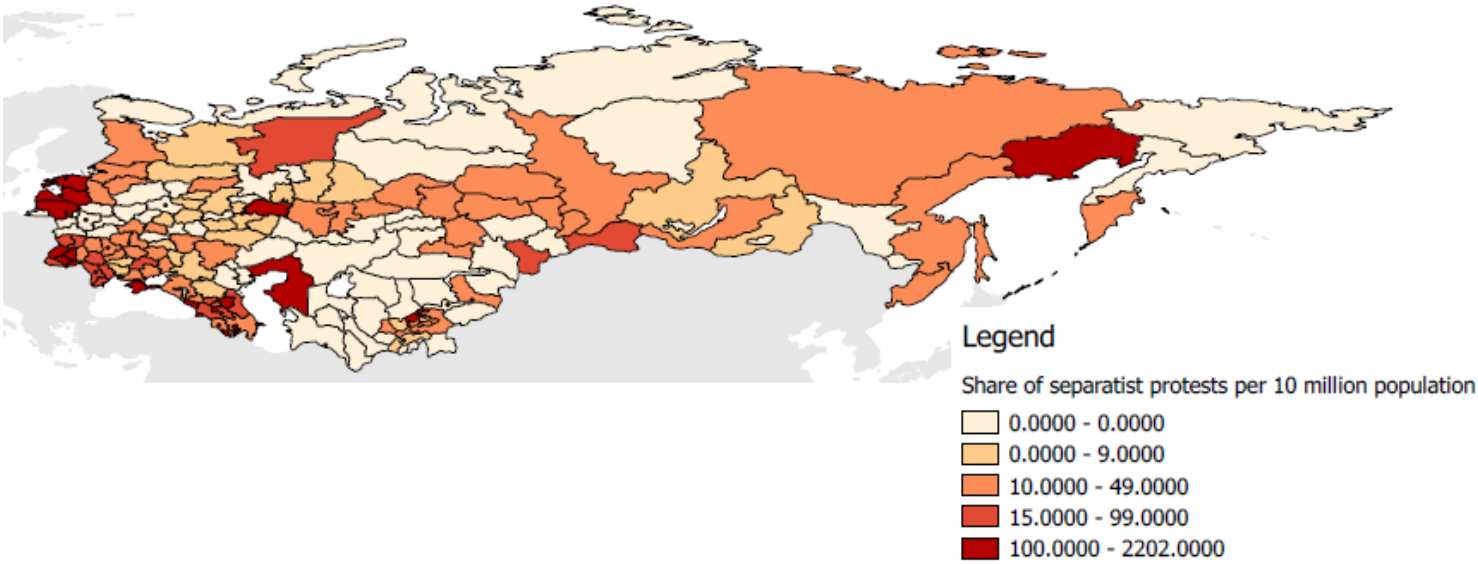
** significant at the 10%-level, ** significant at the 5%-level, *** significant at the 1%-level*

Map A1 Number of pro-autonomy demonstrations (AUTPROV), provincial level, Soviet Union, 1987-1992



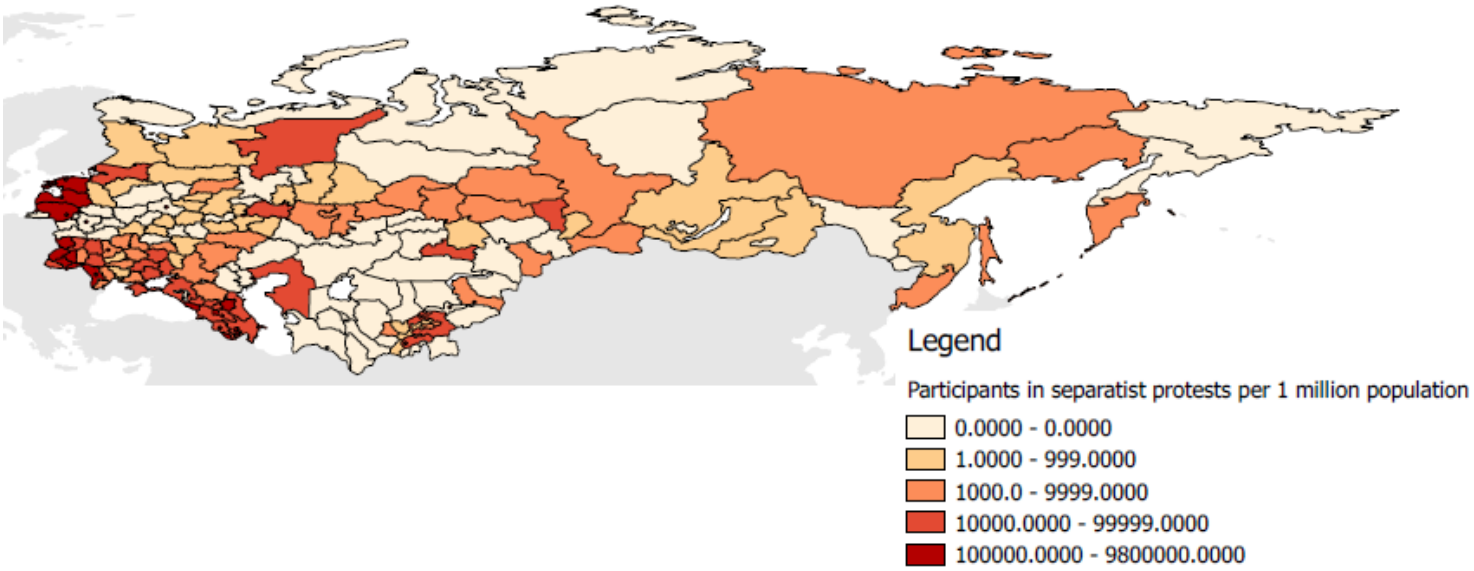
Source: author.

Map A2 Share of pro-autonomy demonstrations (AUTPROV) per 10 million population, provincial level, Soviet Union, 1987-1992



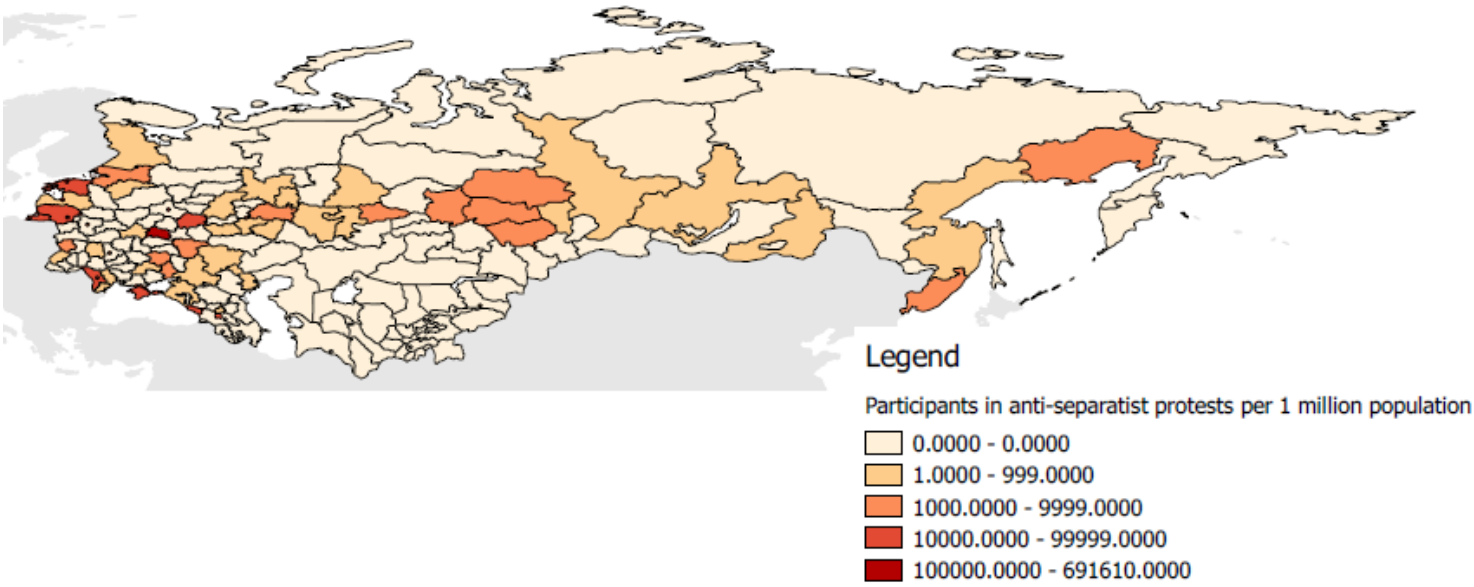
Source: author.

Map A3 Share of participants in pro-autonomy demonstrations (PAUTPROV), per 1 million population, provincial level, Soviet Union, 1987-1992



Source: author.

Map A4 Share of participants in anti-autonomy demonstrations (ANTISEC), per 1 million population, provincial level, Soviet Union, 1987-1992



Source: author.

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