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Appropriation and subversion: pre-communist literacy, communist party saturation, and post-communist democratic outcomes

**Article (Accepted version)
(Refereed)**

Original citation:

Lankina, Tomila V., Libman, Alexander and Obydenkova, Anastassia (2016) *Appropriation and subversion: pre-communist literacy, communist party saturation, and post-communist democratic outcomes*. [World Politics](#), 68 (2). pp. 229-274. ISSN 0043-8871

DOI: [10.1017/S0043887115000428](https://doi.org/10.1017/S0043887115000428)

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Available in LSE Research Online: April 2016

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Title page

Paper title: Appropriation and Subversion: Pre-communist Literacy, Communist Party Saturation, and Post-Communist Democratic Outcomes*

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* The authors are grateful to the editors and the three anonymous reviewers for their very useful comments and suggestions for improving the paper. We would also like to thank Nikolay Petrov for organizing a seminar discussion of an earlier version of the paper at the Higher School of Economics in Moscow, in May 2015. We are also grateful to Archie Brown for providing useful comments on the manuscript. Tomila Lankina would like to acknowledge the support and generous funding of the LSE's International Relations Department and the LSE Suntory and Toyota International Centers for Economics and Related Disciplines (STICERD) for this research; and to thank the British Academy for awarding the Mid-Career Fellowship that supported part of the research for this project. Alexander Libman appreciates the generous financial support from the International Center for the Study of Institutions and Development of the National Research University, Higher School of Economics in Moscow. Katerina Tertychnaya provided excellent research assistance. Any errors are of course solely our own.

Introduction

Twenty-five years after the collapse of communism in Europe, few scholars disagree that the past—increasingly conceptualized in terms of both pre-communist and communist histories—continues to shape post-communist states’ democratic trajectories.¹ One simple message that emerges from recent theorizing into post-communist Europe’s “multiple pasts” is that we ought to distinguish between the good and the bad legacies—also described as “assets” and “liabilities.”² Certain pre-communist legacies have arguably persisted through the communist experience into the present; facilitated or dampened resistance to communism; or had been absorbed to varying extents depending on communism’s affinity with pre-communist orders.³

Pre-communist literacy and schooling have featured prominently in this literature’s good, or “asset”-type, bundle of legacies. States possessing legacies of comparatively advanced literacy and schooling have been arguably most resistant to the anti-democratic influences of communism. Conversely, not only were formerly backward areas ostensibly more likely to regard communism in a positive light, but their record of underdeveloped pre-communist schooling also stultified the growth of democratic societal institutions and values. Furthermore, where schooling had been rudimentary, minority ethnic groups in the imperial borderlands had not been arguably extensively exposed to national myths antithetical to communism.⁴

We here propose a different mechanism that challenges the linearity of the above assumptions based on an analysis of the effect of pre-communist literacy on communist party recruitment in Russia. Rather than regarding pre-communist education as a source of latent resistance to communism, we highlight the Bolsheviks’ successful appropriation of the better-educated strata. We argue that these processes helped subvert the past democratic edge of the comparatively developed areas. This “reversal of fortune”⁵-type argument is supported by substantial sovietology scholarship pointing to the party’s preference for a selection of literate

cadre; to the over-supply of party members in sophisticated centers of learning and culture; and to the development of a vested interest in the soviet system among the *nomenklatura*.⁶

To make our case, we first explore patterns of co-variance between tsarist-era literacy and post-communist democratic variations in Russia's sub-national regions (stage one) and between regional pre-communist education and communist party saturation (stage two). Based on the results of the above analysis, we pursue mediation analysis to distinguish between the direct and indirect (through party saturation) effects of pre-communist literacy on post-communist democratic outcomes (stage three). Our linear regression analysis of author-assembled statistics from imperial Russia's first, 1897, census supports prior research: pre-communist literacy indeed has a strong positive association with post-communist democratic outcomes. Yet, mediation analysis reveals that this effect is mediated by communist party saturation in Russia's regions. Generally, we find higher party saturation levels in the formerly more literate areas. Party saturation in turn has had an apparently dampening effect on the otherwise positive effects of pre-communist education on post-communist democracy.

Our findings have wider implications for theory-building on types of legacies that might explain long-term political regime trajectories going beyond post-communist settings. Specifically, our study highlights how in particular historical contexts education can enhance, rather than undermine, authoritarian tendencies and regime consolidation. Our argument is distinct from those that focus on the socialization component of schooling—and indoctrination—under authoritarian or totalitarian systems.⁷ Rather, it highlights how in politically-fluid settings, the possession of a human capital advantage can facilitate social repositioning and (re)-deployment in the service of a new regime. As Dankwart Rustow's discussion of the education credentials of many an enabler of a 20th century dictatorial system reminds us, education may not always straightforwardly co-vary with democratic political action.⁸ As such, our argument occupies a middle ground between rationalist and culturalist

assumptions about human behavior, at the same time also nuancing the premises of classic modernization theorizing.⁹ The persistence of literacy's democratic effects over time highlights the element of stability in value reproduction, including in the reproduction of democratic values associated with modernization legacies. Yet, the *appropriation* dimension of our argument simultaneously brings out the possibility of rational responses to shifting material (and symbolic) opportunities under a new—authoritarian—system, and the concomitant processes of *subversion* of prior value and behavioral orientations. These insights in turn have implications for research on critical junctures.¹⁰ They highlight how the genesis of an entirely new order might lead to a swift modification of preferences and behaviors among the better-educated strata in ways that may not be explicable with reference to the modernization or cultural persistence strands of democracy theorizing.

Our paper is structured as follows. In the next section, we discuss the debates on the democratic effects of education legacies in post-communist settings and outline our hypotheses. Next, we perform statistical analysis of the impact of pre-communist literacy on regional party saturation and the implications of these dynamics for regional democratic governance. We then further unpack the relevant mechanisms based on an historical discussion of the links between education and communist party recruitment; and of how these legacies might impinge on regional democracy. We also provide an illustrate case study of Ivanovo, a region that typifies the appropriation and subversion patterns uncovered in our study. The final section concludes with a discussion of the implications of our analysis for historical legacies scholarship.

Debates on Education Legacies in Communist States

We here adopt Stephen Kotkin and Mark Beissinger's definition of a legacy as "a durable causal relationship between past institutions and policies on subsequent practices and beliefs,

long beyond the life of the regimes, institutions, and policies that gave birth to them.” We concur that this causal relationship can emerge “. . . often in new form and to new purpose” in situations of “a significant rupture . . . – an end to one order and the beginning of another – that the legacy is supposed to straddle.”¹¹ The emphasis in these conceptualizations on the creation of new durable phenomena out of something else in the past allows us to better capture some of the otherwise inexplicable post-communist political outcomes than if we were to employ Jason Wittenberg’s alternative influential conceptualization of a legacy as an end result of an earlier “instantation” of a similar phenomenon.¹² For instance, in our analysis, we are not simply tracing the links between pre-communist education and variations in communist education across space—essentially the same broad phenomena. Rather, we uncover how pre-communist literacy might have shaped, and helped reproduce over time, an entirely different phenomenon associated with an entirely new order—communist party recruitment. We also analyse how party saturation in turn shaped yet another phenomenon of regional democratic variations. Furthermore, by highlighting how an “asset”-type legacy might facilitate the reproduction of “liability”-type legacies we also interrogate alternative definitions that stress continuity and mutual reinforceability¹³, rather than the complexity, mutability, or even the potential for mutual cancellation¹⁴ of distinct types of legacies.

Our objective is to investigate the role of two interdependent sets of legacies—(1) the legacy of pre-communist literacy; and (2) communist party saturation—in accounting for regional post-communist democratic variations. Accordingly, our analysis covers patterns of inter-temporal reproduction, redeployment, and appropriation of human capital; and of the reproduction of values, practices, and behaviours that straddle two sets of “ruptures”¹⁵ or “critical junctures”¹⁶: (a) the rupture with the tsarist order after the Bolsheviks Revolution in 1917; and (b) the break with the communist order when the Soviet Union disintegrated in 1991.

We distinguish between two bodies of scholarship relevant to the debates on education legacies in post-communist states. The first set of studies focuses on communist education and its effects on democratic values. This scholarship encompasses the earlier paradigmatic debates between modernizers¹⁷ and proponents of the *homo sovieticus* argument.¹⁸ Those paradigm wars¹⁹ were concerned with the question of whether *communist* education would, and whether it did, in 1989-1991, lead to the collapse of communism—as classic modernization theorists would predict;²⁰ or, alternatively, whether it helped nurture anti-democratic values. As such, these debates had little to say about *pre-communist* learning and its relevance to the communist project.

The second, more recent, group of studies is less temporally “shallow”²¹ in that it broadens the scope of analysis to include pre-communist education legacies. Much of this scholarship has been limited to highlighting general continuities between pre-communist modernization and post-communist developmental and regime divergences.²² The notable exceptions to the broad historical discussions about the *longue durée* of education in post-communist Europe are the recent agenda-setting studies by Keith Darden and Anna Grzymala Busse; Grigore Pop-Eleches and Joshua Tucker; and Leonid Peisakhin.²³ These works specifically analyse how pre-communist education might have shaped receptivity or resistance to the communist project. We therefore discuss them at some length.

Darden and Grzymala-Busse argue that pre-communist schools in Austria’s imperial borderlands nurtured mass nationalist orientations antithetical to communism. By contrast, in the Russian Empire schooling had been less developed and more focused on inculcating Russian nationalist values. This arguably explains the weaker democratic proclivities in territories formerly ruled by the Russian Empire. In the study, literacy statistics are employed to proxy for schooling. Peisakhin advances a similar argument. He analyses democratic and nationalist value orientations among Ukrainian communities in formerly Austrian Galicia and

imperial Russian Volhynia and Podolia. Peisakhin's work is grounded in established theorizing on the socialization component of education.²⁴ He argues that in formerly Austrian areas, school teachers, along with family members and community leaders, may have continued to nurture values antithetical to communism that they absorbed via the educational institutions of the past order. In formerly Russian domains, particularly in Podolia, which became part of communist Ukraine in the 1920s (Galicia and Volhynia came under Polish rule in the interwar period), by contrast, the communists arguably confronted more malleable citizens. These citizens had arguably enjoyed only rudimentary schooling prior to communist rule. And, they had been subjected to imperial curricula intolerant of the ethnic minorities' nascent conceptions of nationhood. While the above studies focus more narrowly on education as an incubator of nationalist, and, by extension, anti-communist, sentiment, Pop-Eleches and Tucker are generally concerned with the democratic implications of socialization in schools. All three bodies of research also hint that a more straightforward modernization mechanism might be simultaneously at work even though they eschew framing it as such. For instance, an argument is made that "countries with high levels of pre-communist literacy and economic development. . . were less likely to equate communism with developmental progress than their counterparts in more backward pre-communist countries."²⁵ Irrespective of the particular lens taken, these studies share an emphasis on imperial education as a driver of resistance to communism.

The above work has done much to sensitize us to both the wider macro-structural modernization legacies that may have persisted through the communist period, and to illuminate the micro-societal and socialization processes of value transmission through education. We acknowledge our intellectual debt to this research. Yet, we also find the logic of the above theorizing wanting in light of the historical evidence on the over-representation of the better-educated strata not only among the "Revolutionary vanguard," but also among

the party's rank-and-file.²⁶ Prior research also tells us that many party members could trace their lineage to the better-educated groups of the pre-communist orders. These observations apply both to states at the bottom end of pre-communist modernization like Russia, and those at its top end like Hungary.²⁷

To what extent are the influences of the better-educated strata on the installation and consolidation of communist rule reflected in recent comparative scholarship? Darden and Grzymala-Busse's study investigates the *democracy-inducing* potential of pre-communist *mass* education. It does not systematically explore how education shaped recruitment into the communist party, which, as discussed in the historical section of our paper, had come to embody the soviet elite.²⁸ Pop-Eleches and Tucker likewise focus on mass value orientations. They discuss the interaction between pre-communist education and exposure to socialization in Leninist regimes in terms of the dampening effects of imperial education on the potentially democracy-corrosive influences of communism.

Peisakhin's research does feature the educated village "elites" as key reproducers of anti-communist values. Yet it also hints at the ambivalence inherent in the disjuncture between popular preferences and the political positioning of the better-educated community strata in the new communist order. The study is particularly relevant for our theory when it comes to applying it to cases where communism was an external imposition rather than being home grown. This is an important distinction qualifying the scope of our argument. We address it in greater detail in the concluding section of the paper. Peisakhin surveys both the Polish territories annexed to Ukraine in 1939 and those incorporated into the USSR in the 1920s. To begin with, he finds a high degree of continuity in the reproduction of the better-educated imperial-era community leaders in that they continued to occupy positions of influence in communist Ukraine's localities. The elite's survival of the "institutional watershed" of the imposition of communist rule is a significant finding given what we know

about communist arrests, executions, and targeted exile of regime opponents. Clearly, there had been some degree of collaboration with the regime. The ambivalence is not fully resolved in Peisakhin's study. We find for instance that while in Podolia, 73 percent of survey respondents joined the party's youth wing, the Komsomol, 33 and 44 percent of respondents joined it in Galicia and Volhynia, respectively. These are substantial numbers given the strength of anti-communist orientations in the latter two communities. While 41 percent of Podolians admitted to have been genuinely motivated by a "belief" in communism, no Galician opted for that answer, and only 6 percent of Volhynians answered it in the affirmative. The discrepancy between the share of true believers in communism and those who actually joined the Komsomol indicates that motivations for political advancement under the communist order were clearly also present among a significant stratum of even the most avowedly anti-communist societies. Accordingly, while community elite "policing" of adherence to patriotic anti-communist values is likely to have been at work, a significant proportion of the educated village strata may have simultaneously served as enablers of communist rule.

Our *appropriation and subversion* theory addresses these notable gaps and ambiguities in recent research. We accept that in ethnic minority borderlands, past literacy might have nurtured nationalist—and pro-democratic—sentiments. Because we observe the literacy-democracy link even among the overwhelmingly ethnically Russian *oblasti*, we conjecture that a straightforward modernization mechanism may also account for variations in post-communist regime outcomes. Yet, we simultaneously observe that the more literate areas supplied greater numbers of party recruits. This is why we have labeled the first part of our causal argument *appropriation*. Prior scholarship suggests that party membership may have helped nurture sentiments antithetical to democracy.²⁹ We also know that former ruling party members and their descendants have continued to enjoy access to power in many post-

communist settings.³⁰ Rather than serving as forces of latent resistance to communism, the better-educated individuals, once *appropriated* by the new regime, may have paradoxically facilitated the *subversion* of democracy in the hitherto more developed areas—our second causal claim. We therefore advance the following hypotheses:

H1: Pre-communist literacy will have a positive effect on post-communist democracy in Russia's regions.

H2: Pre-communist literacy will be positively associated with regional communist party saturation (*appropriation*).

H3: Regional party saturation will mediate the effects of pre-communist literacy on post-communist democracy (*subversion*).

Figure 1 provides a visual illustration of the hypothesized mechanisms.

[Figure 1]

To test our hypotheses, we employ the “the sub-national comparative method.”³¹ Our units of observation are the constituent regions of the Russian Federation. Russia's territories possess variable pre-communist historical legacies of literacy development and, generally, modernization. They encompass regions populated by minority ethnic groups like the Volga Germans with a record of cultural autonomy, advanced schooling, and superior levels of literacy pre-dating communism; and those populated by groups that had been overwhelmingly illiterate in the imperial period; sophisticated centers of culture and commerce like St. Petersburg; and Black Earth hamlets where serfdom survived in all but name decades after peasant emancipation.³² Regional developmental experiences under communism also varied.³³ Finally, we observe substantial regional variations on our key outcome variable, post-communist democracy.³⁴

Our within-nation research design allows us to augment earlier analyses of legacies in post-communist states. Scholars have identified the small-n problem as a significant challenge when performing cross-national analyses of post-communist political regime variations. Working with only twenty-eight or so observations places constraints on how many variables can be simultaneously included in a model. This in turn introduces the possibility of omitted variable bias.³⁵ The “legacy family” issue presents another methodological challenge. Certain “good” legacies tend to go together—as would be the case with schooling, experience of democratic governance, or, generally, modernization in Austro-Hungarian territories. Given the “bundled” nature of legacies, it becomes difficult to disentangle the effect of education from other variables when national-level data are employed.

Our analysis goes some way towards addressing these issues. First, we are able to work with seventy-seven observations corresponding to Russia’s regions. (A discussion of matching tsarist *gubernii* and post-communist regions is provided in the Supplementary Appendix, SA, S1). Second, by analyzing territories in the “legacy family” of tsarist domains, we are able to better isolate the effect of particular *sub*-legacies such as literacy, on regional governance. Barring Kaliningrad and Tyva, our seventy-seven regions have formed part of tsarist Russia and the Russian Soviet Federative Socialist Republic (RSFSR) from the 1920s onwards. Sub-national analysis of one country allows us to hold constant the effects of national-level variables like temporal exposure to communist rule and over-time shifts in the nature of ruling regimes.³⁶

We now proceed to describe our methods, variables, and data, and present results of statistical analysis.

Statistical Analysis

Mediation and moderation

We here distinguish between two main hypothetical types of relationships between imperial education and party saturation: moderation and mediation. Baron and Kenny distinguish between these two types of effects as follows.³⁷ Let us assume that the research objective is to investigate how a predictor variable X affects the outcome variable Y (here X is pre-communist education and Y is post-communist democracy). A moderator variable Z is a third variable, which affects the direction or strength of the effect of X on Y (in political science scholarship moderation is typically modeled employing interaction terms). A mediator variable Z is a variable which represents the “generative mechanism”³⁸ through which X affects Y. “Whereas moderator variables specify when certain effects will hold, mediators speak to how or why such effects occur.”³⁹ A mediator variable should therefore satisfy at least two criteria: the level of Z should be determined by the level of X, and the level of Y should be determined by the level of Z. If one blocks the causal path between X and Y through Z, the effect of X on Y could become insignificant; it is possible, however, that there is a remaining effect of X on Y (direct effect), which does not go through Z (it may go through other mediators as well). In moderator situations, there is no link between X and Z.⁴⁰

In our analysis, the variable Z is Soviet-era party saturation. The theoretical discussion in the previous section suggests the appropriateness of applying the concept of mediation rather than moderation. We argue that the communist regime *typically* appropriated the better-educated strata, leading to higher levels of party saturation in regions with comparatively high levels of pre-communist literacy. This would imply that the size of regional party organizations would correspond to pre-existing education levels in the regions; hence, pre-communist education affected post-communist democracy both directly (through persistent cultural legacies) and indirectly (because it caused party saturation in regions to be higher

and, as a result, created a different – hypothetically negative – impact of the CPSU legacy on sub-national democracy). Moderation models are, from a theoretical standpoint, unsuitable for us. These models would imply that regions with similar pre-communist literacy levels should exhibit different levels of post-communist democracy because of differences in party saturation. However, they would fail to take account of the fact that—consistent with our theory—there is likely to be modest variation in party saturation in regions with similar literacy levels. This is because CPSU saturation would have been influenced by pre-communist education levels. In addition to the conceptual rationale, there is also an empirical rationale dictating our choice of mediation models. Baron and Kenny suggest employing mediation analysis when a strong relationship exists between the predictor and outcome X and Y. They suggest that the alternative, moderation, form of analysis is appropriate for dealing with inconsistencies in relationships between these variables.⁴¹ As shown below, in our case the relationship between the two variables is strong and consistent.

Empirically, to validate the mediation mechanism, we need to, first, demonstrate that X influences Z—that is, controlling for plausible alternative explanations, party saturation is predicted by pre-communist education; second, we need to demonstrate that there is a *ceteris paribus* effect of Z on Y—that is, controlling for plausible alternative explanations, party saturation levels allow us to predict the level of post-communist regional democracy; and third, that controlling for Z, the effect of X on Y changes in magnitude.

Generally speaking, mediation analysis could be pursued employing three equations. The first model regresses the outcome variable Y on the predictor variable X and on the mediator Z, as well as on appropriate controls. The second model regresses the mediator Z on the predictor variable X. The third model regresses Y on X, but not on Z. Intuitively, combined with the first model, the regression would demonstrate how the inclusion of Z in a set of controls changes the coefficient of X. The objective of mediation analysis is to obtain

the estimates of three quantities. The indirect, or mediation, effect, measures the part of the effect of X on Y which is going through Z—that is, how change in Z, caused by change in X, affects Y. The direct effect measures the “remaining” portion of the effect of X on Y, which is not going through Z. The total effect is the full effect of X on Y through all possible pathways—that is, through Z and not through Z. Intuitively, mediation analysis decomposes the total effect into direct and indirect effects.⁴²

Baron and Kenny offered an early approach to estimating three quantities of interest for cases of a continuous mediator and outcome. Recently, Imai et al. developed a general algorithm allowing the estimation of mediation effects for different types of mediators, outcomes and models,⁴³ and implemented it in R.⁴⁴ Hicks and Tingley provided the Stata code for this algorithm.⁴⁵ Early approaches to mediation analysis typically relied on multiplication of slope coefficients of individual models described above and the evaluation of their statistical significance. These approaches suffered from two limitations: they were not applicable to non-linear models (this is less important for us, given our focus on continuous predictor and mediator variables); and were not appropriate for sensitivity analysis due to the sequential ignorability assumption. The Imai et al. approach solves these two problems. Technically, it first estimates the mediation analysis models described above for the observed values of the mediator and outcome variables; it then repeatedly simulates model parameters from their sampling distribution; and for each draw of parameters (we apply 1,000 draws) it simulates the potential values of the mediator and of the outcome, and computes the quantities of interest.⁴⁶

We employ both the Hicks and Tingley and the Imai et al. code to make sure that the choice of statistical software does not affect our results. The estimation of a mediation effect relies on the sequential ignorability assumption; in case there is a continuous mediator and a continuous outcome variables Z and Y, as in our paper, this assumption is violated if the error

terms in the first and second models described above are correlated. This assumption cannot be tested from the data, so it is advisable to perform sensitivity analysis showing how the results would change depending on the extent of correlation of error terms. Our paper implements the appropriate sensitivity analysis (SA S2).

Data and measures

Our measure of pre-communist education is population share of literates in tsarist Russia's *gubernii* (*literacy*). We obtained these data from the first imperial census of 1897.⁴⁷ Literacy is the most straightforward measure of pre-communist education absent systematic data on primary, secondary, and tertiary schooling. Literacy also tends to co-vary with another measure of pre-communist modernization for which data are readily available, urbanization.⁴⁸ Regional literacy varies in the range of 4-62 percent.

To capture regional party saturation, we employ the measure of the share of communist party members in proportion to regional adult population in 1976 (*party saturation*).⁴⁹ Party saturation is in the range of 5-15 percent of regional adult population. We obtained these data from official publications of the Communist Party of the Soviet Union (CPSU). Prior research indicates that after 1976, regional levels of party saturation have remained fairly constant.⁵⁰

To capture our key outcome variable *democracy*, we employ the indices developed by experts at two respected Russia-based think tanks, the Moscow Carnegie Center and the Independent Institute of Social Policy.⁵¹ The indices are based on expert assessments of regional democracy along ten dimensions and employing a five-point scale; the values of these dimensions are then added up to form a composite index. The lowest democracy score has the value of seventeen and the highest—forty-five. Further detail on the index is provided in SA S3. We employ the moving average democracy measure for the years 2000-2004,

thereby allowing for sufficient temporal distance from USSR's collapse in 1991. This period also precedes Vladimir Putin's re-centralization drive, which served to homogenize regional political landscapes while stopping short of completely obliterating democratic institutions in the more open regions.⁵² Earlier data for 1991-2001 are also employed to confirm that our results hold. Conceptually, the Carnegie score builds on the notion of "liberal democracy," which encompasses both its procedural and substantive aspects.⁵³

Models and results

Based on the logic of mediation analysis, we employ a three-step procedure. First, to test H1, we regress *democracy* on *literacy*, *party saturation* and a set of relevant covariates. We also run the regression without the *party saturation* variable. Our objective in this first stage is to explore how education legacies influence contemporary variations in democracy. In the language of mediation analysis, we regress the outcome Y on predictor X and mediator Z, and on the appropriate controls; and the outcome on the predictor, and on the appropriate controls. We thereby ascertain whether the predictor and mediator have any effect on the outcome and whether the effect of the predictor changes if the mediator is included in a set of covariates.

Next, we test H2 to ascertain whether imperial education shaped regional party saturation. Therefore, in the second stage of our analysis, we employ *party saturation* as our dependent variable. Our key right hand variable of interest in these regressions is *literacy*. The control variables capture other contemporaneous influences on the supply and demand aspects of party saturation. In the language of mediation analysis, we regress the mediator Z on predictor X. This is also a crucial stage for ascertaining whether the moderator or the mediator model is more appropriate for our analysis. Should we find significant correlation between Z and X, we can be confident that the mediation model, which we regard as more appropriate given our conceptual framework, is also appropriate from the point of view of data analysis.

Next, we proceed to the third stage of our analysis to test H3. At this stage we compute the direct, the indirect, and the total effects employing the procedures described above, and perform sensitivity analysis. Thus, at this stage we perform the mediation analysis, while in stages one and two we justify the applicability of the approach. The important empirical questions for us are whether the total effect of *literacy* on *democracy* remains significant and positive once we incorporate the mediating influence of *party saturation*, and how large the decline of the total effect is once *party saturation* is taken into account.

In the first stage of our analysis we employ all regions for which data are available and exclude those with missing data like Chechnya and the administratively low-ranked autonomous *okruga*. We also exclude Tyva and Kaliningrad, which had not been part of the Russian Empire. In the second stage, we exclude all autonomous *oblasti* and *okruga* for which data are not available. We employ the same set of regions in our third step, since in mediation analysis the samples in both the regressions predicting the mediator and the final outcome variables should be identical.

Table 1 reports the findings from the first stage of analysis. Data for all control variables, except for data for the main explanatory variables discussed above—*literacy*, *party saturation*, and *democracy*—are obtained either from the official Russian State Statistics Service, *Rosstat* (and averaged over 2000-2004), or from the 2002 Russian State Census. The SA S4 contains summary statistics for all the variables.

The following control variables are employed. We include measures of income per capita and education as proxies for post-communist regional development; these may co-vary with democracy.⁵⁴ To account for regional ethnic variations, we include the measure of the share of ethnic Russians as a proportion of regional population; we also employ a dummy variable that takes the value of one if a region has the status of republic and zero otherwise. Prior research indicates that ethnically-defined republics and “Russian” regions with *oblast*

status containing large ethnic minority populations tend to score lower on regional democracy indices.⁵⁵ Because of the hypothesized links between resource dependence and regime variations, we also incorporate the measure of total volume of regional oil and gas extraction⁵⁶; we take the logarithm of this value plus one (to keep regions with zero oil and gas extraction in our sample) to reduce the impact of outliers. Finally, we control for geographic distance in kilometers between regional capitals and Moscow. This variable captures possible variations in the intensity of federal control over distant territories; and the heterogeneity of regional population preferences, which could also have an impact on regional politics.

[Table 1]

Table 1 presents the results for the first set of (eight) regressions. The first four models include only *literacy*, that is, they regress the outcome Y on the predictor X; the next four models include both the *literacy* and *party saturation* variables (regression of Y on X and Z). In each set of the four models, the first is the baseline model; the second and the third models drop either the *republic* or the *Russians* variables to deal with possible multicollinearity; the last model replaces the 2000-2004 *democracy* with the 1991-2001 democracy measure.⁵⁷

The results for our key variables are consistent across the various specifications. Regions with legacies of comparatively advanced literacy have significantly higher democracy scores. When we exclude *party saturation*, an increase of 1 percent point in *literacy* increases *democracy* values by on average 0.15 points. When we include *party saturation*, a 1 percent point increase in *literacy* results in an over 0.3 point increase in *democracy*. Thus, in line with the mediation assumption, controlling for *party saturation* consistently changes the effect of *literacy*. In fact, in line with our reasoning, if we block the

path from pre-communist education to post-communist democracy through party saturation (by controlling for this variable), we obtain a larger *ceteris paribus* effect of pre-communist literacy. The effects for the 1990s are almost identical to those for the 2000s. At the same time, we find that *party saturation* has a significant negative effect on *democracy*. A 1 percentage point increase in party membership has the effect of a reduction in the regional democracy score of 2.5 points. We perform additional robustness checks (SA S5) and obtain similar results.

We now move to the second stage of our analysis, to test for the effects of *literacy* on *party saturation*. Control variables capturing additional factors potentially affecting the supply and demand side of party membership in the 1970s are also included. Specifically, we control for population size and urbanization. Larger urbanized regions might have been prioritized in national planning, while also being desirable places of residence.⁵⁸ We also include a dummy variable for regions located on the USSR's external borders. Strategically important frontier regions tended to house military bases; many career military officers also resided in these areas. Prior research indicates that joining the CPSU was particularly "easy" for military personnel.⁵⁹ We also include a dummy variable that takes the value of one for regions with ethnic groups that suffered repression and re-settlement under Stalin, and zero otherwise.⁶⁰ The record of repressions may have limited the demand for party membership, while the soviet leadership might have also discriminated against repressed groups when reviewing membership applications.⁶¹ We also employ alternative operationalizations of the legacy of repressions (SA S5). Because low party membership was generally characteristic of ethnic minorities, we include a control variable of population share of ethnic Russians in 1979. Considering that regional income, which might serve as a proxy for overall well-being, might co-vary with career choices and progression,⁶² it is also important for us to capture the effects of this variable. Unfortunately, Soviet statistical compilations did not report regional

income data. They provide information on average salaries, but in a planned economy monetary salary constitutes an imperfect proxy of well-being. A large proportion of revenue had been redistributed in material form such as privileged access to consumption goods and services. We include a control for 1975 income in one of the specifications. In another model we employ the best available proxy for Soviet-era well-being, infant mortality in 1970.⁶³ As part of our robustness checks (SA S5) other indicators of well-being are also employed. We also control for communist education using the measure of share of population with university degrees in 1979. Including this variable allows us to disentangle the effects of pre-communist and communist, respectively, education legacies. Communist and pre-communist education may co-vary, so we exclude communist education in model 2. The results are reported in Table 2.

[Table 2]

The results indicate a statistically significant positive correlation between *literacy* and *party saturation*, confirming the presence of the hypothesized *appropriation* mechanism. A 1 percentage point increase in the share of literates in the late 19th century leads to an increase in party saturation of 0.075–0.110 percentage points. We also find urbanization to be associated with lower *party saturation* in one of the models, but only after we include the communist education variable in the regressions. Larger population size is also associated with lower party saturation levels. Repressions have a negative and significant effect in one of the specifications. Infant mortality is negatively associated with party saturation. We also find that “Russian” *oblasti* had on average high party saturation levels. These results are robust to additional checks (SA S5). The key finding from these regressions is that pre-communist

literacy has a significant positive effect on party saturation—that is, *X* is a significant predictor for *Z*.

We now present results of mediation analysis (third stage). As noted above, *literacy* is employed as a treatment, *party saturation* as the mediator, and *democracy* as the outcome variable. Control variables are included in specifications (1) of Tables 1 and 2. For the estimated direct effect, the total effect, and the mediation effect, we report the 95 percent confidence intervals to establish the significance of the results. Table 3 provides the results for the aggregated democracy score and for each of its sub-components. The mediation effect is, as expected, negative and equal to -0.211; the direct effect is positive and equal to 0.336. Both effects are significant at the 5 percent level. Thus, *literacy* has a positive direct effect, and a negative indirect effect going through the mechanism of *party saturation*, on *democracy*. The total effect is the sum of these two effects; it is not significantly different from zero. This is in line with H3. We find a large, positive and significant direct effect of pre-communist literacy on regional democracy. This result, however, is almost entirely offset by the large, negative and significant effect of communist legacies of party saturation. Specifically, a 1 percentage point increase in *literacy* in the baseline specification reduces *democracy* by 0.21 points through an indirect effect—that is, through *party saturation*—, while simultaneously increasing *democracy* by 0.36 points through a direct positive effect. Our findings are robust to most of the alternative specifications (SA S5), thereby confirming the hypothesized *appropriation and subversion* mechanism accounting for regional democratic variations. We also show that outliers have no impact on our results (SA S6); and that they hold when individual components of the democracy index are employed (SA S7).

[Table 3]

To further nuance our analysis, we created a typology of regions corresponding to the hypothesised *appropriation and subversion* patterns; and those that deviate from the “norm” and therefore warrant additional tests to ascertain what variables might account for these “anomalous” patterns (Table 4). Type 1 and 2 regions are representative of the appropriation patterns uncovered in our study, namely of the co-variance between literacy and party saturation. Type 1 regions featuring high literacy and high party saturation include the developed Central Russia and Volga basin territories like Ryazan, Samara, and Saratov; and the Far Eastern territories of Khabarovsk and Primorskiy. The Type 2 regions featuring comparatively low literacy and low party saturation encompass the less developed Central Russia and Volga basin territories; and several “ethnic” republics. Out of our seventy seven regions, sixty—the vast majority— belong to these two types (for a visual representation of this pattern, see SA S8).

Type 3 and 4 regions do not correspond to the general pattern uncovered in our study: some high literacy regions feature comparatively low party saturation (Type 3), while some regions with comparatively low literacy are characterized by relatively high levels of party saturation (Type 4). Examples of the very few regions corresponding to Type 3 are Karelia and Nizhniy Novgorod. Type 4 features rural Black Earth regions and several Central Russian provinces. Note that in the low literacy Types 2 and 4 regions, higher levels of party saturation appear to suppress democracy ratings even further than what we would expect if we looked solely at these regions’ imperial literacy statistics. A comparison of outcomes in Type 1 and 3 regions also indicates that greater party saturation appears to negatively affect democratic performance in regions with comparatively high levels of imperial literacy. As such, the “anomalous cases” corroborate the hypothesized negative effects of party saturation on democracy—the subversion part of our argument. We also perform supplementary analysis to further ascertain factors accounting for deviations from expected party saturation levels

(SA S9); and to establish whether in “deviating” regions party membership may also *moderate* (in what would be different from a *mediating* effect) past literacy legacies (SA S10).

Appropriation and Subversion Unpacked

What are the precise causal mechanisms accounting for the observed appropriation and subversion patterns? How can we explain the apparent inter-temporal reproduction of past human capital effects in Russia’s regions given the known record of post-revolutionary exodus of the intelligentsia; the class-based witch-hunt against non-proletarian cadre; and Stalinist purges? And how do we account for the apparently detrimental implications of party saturation for regional democracy? To address these questions, we here provide an historical discussion of the role of education in the Bolsheviks’ recruitment strategies; and of the mechanisms linking party saturation and poor regional democratic performance. This account is supplemented with an illustrative case study of Ivanovo, a region typifying the *appropriation and subversion* patterns.

The link between education and party recruitment became evident early on, from the very first days of Bolshevik rule; and it persisted, in fact becoming more pronounced, over time.⁶⁴ It is well-known that the Revolution led to an exodus of the—highly educated—upper echelons of Tsarist society. Nevertheless, many privileged families remained in Russia, as did scores of the literate upwardly mobile citizens of the lower estates. Modernization scholarship⁶⁵ would lead us to expect that the relatively enlightened strata that did remain in Russia after 1917 would have constituted the pillars of a future democratic society. This expectation is supported when we look at regional voting results during Imperial Russia’s haphazard experiments with parliamentary democracy in 1906-1917. The electoral records indicate that the more literate *gubernii* tended to elect parliamentarians from the party that

best represented a democratic choice—the Constitutional Democratic Party (*kadety*).⁶⁶ Why, then, did the comparatively well-educated strata flock into the Bolshevik party after 1917? Admittedly, many among the service professionals and intelligentsia, not to mention the nobility, deplored the new regime. Yet, substantial numbers from even among the more privileged groups were genuinely drawn to the Bolsheviks' socially progressive, "modern" message.⁶⁷ Scores among middle class professionals—in a sentiment epitomized in Boris Pasternak's novel *Doctor Zhivago*—were simply eager to get on with normal lives in a country that they loved and that desperately needed their skills. For many—including the upwardly mobile peasants engaged in "bourgeois" occupations—, party membership had come to represent survival and a way to instrumentally conceal tarnished pasts.⁶⁸ Soviet archives from the 1920s are replete with records of passport fraud, appeals against "bourgeois" social labelling, or the acquisition of temporary status as factory worker—so as to acquire income, social mobility, and basic dignity under the Leninist regime.⁶⁹

What did it mean to have a "comparative" educational advantage in post-Revolutionary Russia? How did the party members' educational credentials compare to those of the society at large? And to what extent did these credentials reflect pre-Revolutionary social stratification? On the eve of the Revolution, only 40 percent of population aged over eight was literate.⁷⁰ The 1926 census revealed that one out of two Soviet citizens aged over eight remained illiterate. A 1911 survey showed that only 44.2 percent of the Empire's 8-11 year olds were enrolled in primary schools.⁷¹ By contrast, in 1919, the level of illiteracy among party members was roughly 3 percent; 92 percent had completed at least four years of formal schooling.⁷² Although roughly 7 percent of party members had completed ten years of secondary schooling or higher education, "this was still some 20-30 times the percentage in the population at large."⁷³ As T.H. Rigby notes, the party "was [thus] an essentially literate organization functioning in a semiliterate society."⁷⁴

Not only was there a “significant correlation between literacy and party membership..., [but] both variables also correlate[ed] positively with a third—upward occupational mobility.”⁷⁵ On the eve of the Revolution, education credentials largely continued to mirror Peter the Great’s 18th Century estates system. The estates distinguished between peasants; townsmen (*meshchane*); nobility; clergy; merchants; the educated non-nobles (*raznochintsy*); and “others.”⁷⁶ The nobility and clergy estates predominated among recipients of secondary and post-secondary education. By contrast, the education of the peasant estate was patchy and largely limited to rural primary schooling. Nevertheless, Russia’s 19th century education reforms contributed to the gradual accumulation of peasant human capital and acquisition of white-collar occupations.⁷⁷ Clearly, the estates inadequately reflected the turn-of-the-century industrialization, urbanization, and social mobility processes.⁷⁸ Rigby’s analysis of pre-Revolutionary backgrounds of provincial soviet officials provides some indication as to the estate origins of party members.⁷⁹ Nearly a quarter of senior Soviet provincial officials in 1921 reportedly occupied positions in tsarist government or private bureaucracies and are therefore likely to have hailed from the relatively privileged estates. Another large category of new party recruits did come from the lowest—peasant—estate. However, these “peasant” recruits tended to have already held non-manual jobs, such as “petty functionary” by 1914, “thus showing themselves to have already been upwardly mobile under the old order.”⁸⁰ (Additional data on party members’ imperial backgrounds is presented in SA S11).

There was apparently a systematic urban-rural dimension to the way in which imperial social and educational stratification was reproduced among party entrants. Depending on the level of administrative authority, both the tsarist professionals—, that is, those with secondary and higher education credentials—and the upwardly mobile literates of peasant origin with four years of primary schooling—, would have been advantaged in the process.⁸¹ Our literacy

statistics capture the *combined* size of these different strata. Georgi Derluguian notes that in some national republic centres, the “intellectual capital” through the decades of Soviet rule remained concentrated among “old families that could be traced back to the pre-communist gentry, bourgeoisie, and intelligentsia.”⁸² We also know that the imperial intellectual elite—often of noble origin—under the Bolshevik regime continued to staff prestigious academic institutions like the Russian Academy of Sciences in St. Petersburg.⁸³ Such a significant concentration of high-status imperial elite is unlikely to have been the feature of provincial capitals of the RSFSR’s regions. In the early 1920s, tsarist civil servants, and those engaged in “middling” professions requiring at least secondary education of the *meshchane* or *raznochintsy* estates, such as teacher, doctor, journalist, or statistician, were apparently advantaged in party recruitment in *guberniya* capitals. At the lower, *uezd*, territorial level, corresponding to small towns and villages, the party tended to recruit larger numbers of those listed in imperial censuses as “peasants.”⁸⁴ As noted above, the “peasant” category often included the literate urban and rural white-collar stratum.

The skills of the privileged elite and professionals; and of the literate “middling” strata of more humble origin were in high demand for the simple reason that the regime set itself the goal of rapid modernization of a backward semi-literate country. Yet, the party’s recruitment of the latter, “middling” sort of upwardly mobile individuals is particularly important for our story, so we discuss it here at some length. The Soviet regime claimed that in the 1920s and 1930s it rapidly transformed the lowest social strata like factory workers and illiterate peasants into the “*new soviet-trained intelligentsia*”⁸⁵ (as distinct from the *old* intelligentsia of noble or otherwise privileged origin). Over time, the simple criterion for assigning the intelligentsia label became *current* occupation of a non-manual job. It was often employed interchangeably (and inconsistently) with *sluzhashchie*, though “intelligentsia” tended to refer to writers, teachers, doctors, lawyers, statisticians, technicians; and *sluzhashchie* (officials;

office workers)—to clerical workers.⁸⁶ To counter the claim that imperial human capital played no role in the Bolsheviks' cultivation of the strata that will end up colonizing the CPSU, we here unpack the process of the genesis of this *new* Soviet intelligentsia using the example of education policy. In their drive to bring education to the illiterate masses, the Bolsheviks faced significant challenges in finding appropriately educated *educators*. Scores of teacher training courses were set up to address the shortage of teachers and lecturers with appropriate qualifications. An analysis of teacher training in the Middle Volga *gubernii* in the 1920s reveals that these “red teachers” (*krasnye uchitelya*) were required to possess at least secondary education and prior experience of teaching.⁸⁷ In Penza, 31.1 percent of teachers—the largest category—possessed imperial *gymnasia* certificates; others had been educated in teacher seminaries, other religious schools, and in tsarist secondary and vocational training institutions.⁸⁸ While many of these teachers hailed from the privileged estates, others did not have trouble passing the ideological bar of “humble” origins. By 1917, the provincial education sector had come to be dominated by two estates: the *meshchane* and “peasants.” Historically, it was typical for *meshchane* to pursue white-collar professions. By contrast, the “peasants” had been transitioning into non-manual occupations as part of more recent, *bottom-up*, modernization processes in the countryside. These processes however spanned several decades, beginning with peasant emancipation in 1861.⁸⁹ What Soviet propaganda tended to obscure is that it is such representatives of the lower estates—largely trained for, and socialized in, white-collar occupations under the *old* regime—that will make the quick leap into the status of “*new* soviet-trained intelligentsia.” The regime could not create this “intelligentsia” from scratch, in a top-down fashion, and virtually overnight even if it wanted to.

We observe substantial regional variations in the extent to which such opportunities for appropriation of both the would-be *new* and the *old* intelligentsia presented themselves to

the Bolsheviks. Certain *gubernii* in Central Russia, the Middle Volga, Urals, and Western Siberia had become by the end of the 19th century hubs of industry and manufacturing, spurring the process of movement of peasants to cities. These processes also affected the supply-and-demand aspects of education.⁹⁰ Many peasants-turned factory workers and -white collar clerks were eager to acquire literacy and numeracy essential for success in the new economy; industry owners also had incentives to set up factory schools to increase labor productivity. Historically, in a trend that predates Russia's industrialization, the provision of secondary schooling also varied. The Middle Volga cities of Saratov and Samara for instance boasted prestigious *gymnasia* founded by German colonists who settled in Russia in the 18th century.⁹¹ Some *gubernii* also possessed universities like the Kazan Imperial University; the Samara Teacher Training Institute; and the Imperial Saratov University, founded in 1804, 1911, and 1909, respectively (and still existing under modified name and structure). Not only did the Bolsheviks eagerly appropriate the infrastructure of these establishments, but they also relied on existing faculty to provide instruction in them.⁹² By contrast, party records from the less developed areas convey the Bolsheviks' sense of desperation in finding cadre from among the "culturally"- or otherwise -"backward" groups with literacy rates in the single digits.⁹³

Throughout the 1920s, and in particular towards the end of the decade, in 1928-1929, the regime made active efforts to secure a more robust representation in the party of those actually engaged in farm and factory labor. It did not take long however for the Bolsheviks to realize the adverse implications of the marginalization of skilled individuals engaged in non-manual occupations for the fulfillment of the regime's ambitious developmental goals. Following the disappointing results of the first Five Year Plan (1928-1932), with its high labor turnover and low productivity, Stalin proclaimed: "No working class in history had managed without its own intelligentsia." Stalin's speech was part of a carefully orchestrated

attack on “equality mongering”; it represented a turning point in the party’s relaxation of class-based recruitment criteria.⁹⁴ To what extent did Stalin’s subsequent purges put a break on the recruitment of cadre with human capital advantages acquired during the tsarist order? In the Appendix (SA S12), we discuss recent historiography on the purges and the toll that they took on party cadre and wider society. Nevertheless, we also provide evidence of the reproduction of provincial educated cadre as the purges subsided.⁹⁵ Supplementary statistical analysis incorporating the effects of repressions against particular ethnic groups also confirms the robustness of our findings (SA S5).

While we are able to establish patterns of reproduction of the imperial-era’s better-educated strata in the party in the 1920s-1930s, no comparable statistics on pre-Revolutionary backgrounds of party recruits exist for later time periods; from the late 1930s, party records started to feature exclusively soviet class and occupational labels like *intelligentsia*, *worker*, *kolkhoznik*.⁹⁶ To better understand patterns of reproduction of human capital in party recruitment, we here discuss the wider processes of inter-generational transmission of social and educational advantage in soviet society. Most scholars accept that the Soviet modernization project did succeed in socially elevating large numbers of individuals of modest origin.⁹⁷ Nevertheless, research on communist social stratification has found a greater degree of continuity in the intergenerational transmission of preference for higher education among white-collar strata than among manual workers. Thus, both in the USSR⁹⁸ and Hungary,⁹⁹ children of manual workers elevated to white-collar status often reverted to “proletarian” occupations or became college drop-outs thus putting a break on Soviet-engineered processes of social mobility. By contrast, those born to parents with white-collar occupations were far more likely to complete higher education.¹⁰⁰ In the Institute of Red Professors—the academy meant to train ideologically robust cadre—, in 1921-1930, the majority of students commandeered from “peasant” and “proletarian” jobs ended up being

among the ranks of some 90 percent (!) drop-outs from the course. By contrast, it is students with “non-proletarian” backgrounds who tended to persevere in completing it.¹⁰¹ Inkeles notes: “It is certainly not accidental that since 1938 the Soviet Union has not published statistics on the social composition of the student body in higher educational institutions, since at that time. . . it was already true that the children of the intelligentsia and employees constituted 47 per cent of the student body although the group made up only some 17 per cent of the total population.”¹⁰² Clearly, parental values help explain the intergenerational transmission of cultural capital much like they would in other contexts.¹⁰³ State policy however also shaped social mobility in ways that went against official ideology. In 1922, to stem the tide of peasants moving into cities, the Bolsheviks instituted the *propiska* system of residential registration, thereby tying rural populations to collective farms.¹⁰⁴ The introduction in 1932 of a “social position” (worker, *kolkhoznik*) entry in passports, served to further rigidify class distinctions in society.¹⁰⁵ The tuition fees instituted between 1940 and 1956 for secondary and higher education were prohibitive for many manual workers.¹⁰⁶

In turn, party membership helped reproduce education and status inequalities insofar as it conferred social advantages like access to good schools, elite holiday camps, and scarce material goods.¹⁰⁷ Rigby argues that CPSU had come to embody the Soviet elite, though “an elite of a rather peculiar kind: one in which representation is ensured for all major segments of Soviet society. . . and at all levels of employment.”¹⁰⁸ Early on, however, we observe a form of “reciprocal representation between the CPSU membership and those categories of Soviet citizens who *prima facie* stand high with respect to prestige, remuneration or power (emphasis original).” Thus, in 1959, “the chances of a white-collar worker [entering the party] were six or seven times as great”¹⁰⁹ as that of a collective farmer. We also know that father’s education and prestige of occupation positively correlated with party recruitment.¹¹⁰

We now turn to unpacking the mechanisms accounting for the subversion patterns uncovered in our statistical analysis. As already noted, our party data encompass officials working in party and soviet structures; and “lay” members in various other occupations. Prior scholarship helps illuminate how both of these sets of actors might have a bearing on regional democratic outcomes. Specifically, we distinguish between (1) *political elite and bureaucracy* theorizing on the governance effects of reproduction of communist-era leadership and street-level functionaries; and theorizing on the (1) *societal* effects of party saturation, specifically those related to individual values and behavior.¹¹¹

One simple way of conceptualizing the influence of party functionaries on governance is in terms of their “know-how”—their values and *modi operandi*. Prior research found a considerable degree of reproduction of party *apparatchiki* in post-communist regional power structures; furthermore, many had commenced their careers as early as the 1970s.¹¹² As Gerald Easter discusses, Brezhnev’s stability of cadre policy from the 1960s onwards ensured a high degree of regional bureaucratic continuity.¹¹³ Joel Moses found that by the 1980s, those born in the region or those who had spent a considerable time working there were much more likely to staff regional party and soviet bodies than non-natives.¹¹⁴ The policy helped nurture entrenched cliques of regional bosses who used their positions to dish out patronage to supporters and penalize dissenters. These features of governance characteristic of many clientelistic settings¹¹⁵ overlapped with the soviet model of “democratic centralism” and expectation of bureaucratic and societal compliance with top-down decision making. To use Grzymala-Busse’s apt term, these are the kinds of “usable pasts” that regional party functionaries would apply to post-soviet governance.¹¹⁶ Gorbachev’s *perestroika* may have generated nascent shoots of other potentially usable pasts—those of merit in recruitment, accommodation with civil society, and tolerance of dissent. Yet, we know that regional cliques were often successful at resisting Gorbachev’s attempts to break their power.¹¹⁷

Another by-product of the reproduction of cadre in regional power structures is control over key regional resources. Regional functionaries were often trained in local institutes that prepared competent cadre for specific regional industries. They also frequently moved between regional party and soviet work and managerial roles in local enterprises. In the post-soviet period, not only were these local bosses in an excellent position to re-colonize regional governments, but—because of their industry know-how and contacts—to control the process of privatization of enterprises. Access to industry resources coupled with positions in regional governments would in turn facilitate the construction of powerful political machines.

Our second suggested causal mechanism linking party saturation to poor democratic outcomes relates to value orientations and behavior of “lay” members. These rank-and-file members may have pursued occupations unrelated to careers in the party *apparat*. As party ticket holders, however, they would have received greater exposure to routinized forms of political participation than non-members. In fact, activism in official youth groups like the Komsomol was sine qua non for party admission. Public opinion surveys have shown that former party members are less likely to espouse democratic values than non-members.¹¹⁸ Clearly, while many had to feign enthusiasm for communism to join the party and thereby secure a promotion, others appear to have actually internalized the regime values. Socialization in “compliant political activism”¹¹⁹ is in turn likely to be among the societal pasts accounting for lack of civic activism in Russia’s less democratic regions.¹²⁰ Party saturation might also indirectly affect the viability and strength of autonomous organizations in society.¹²¹ In regions with large numbers of party cadre, we would expect high levels of both self-policing and societal policing of *mezzo*-structures that might articulate oppositional interests.¹²² Our supplementary statistical analysis (SA S13) provides further support for the hypothesized bureaucracy and societal channels.

Ivanovo: A Typical Case

The Ivanovo region typifies the appropriation and subversion patterns uncovered in our study. As such, it further illuminates the above-discussed mechanisms linking imperial literacy, party saturation, and democracy. Ivanovo is a small region on the Volga River located North-east of Moscow, with a population of about 1,255.5 people.¹²³ In the Imperial period, present-day Ivanovo had been part of the Ivanovo-Voznesenskiy Industrial District, which covered Vladimir and Kostroma *gubernii*. Ivanovo city was founded in 1871 when the Ivanovo village, which specialised in textile artisanry, was merged with the textile industry town of Voznesensk. Ivanovo's soil conditions were unfavourable for the development of agriculture. As in other such regions, many peasants engaged in trades that facilitated the development of manufacturing and commerce. By the end of the 19th century, Ivanovo-Voznesensk became "the Manchester of Russia," famed for textile manufacturing. Industrialization went hand in hand with human capital development. The Vladimir *guberniya*, of which Ivanovo formed part, featured among Russia's "leaders in primary education."¹²⁴ As in the other modernizing regions, the new bourgeoisie—epitomised by the Garelin dynasty of textile magnates—took pride in civic activism and philanthropy (*metsenatstvo*). In 1847, Yakov Petrovich Gerelin (1820-1890) became Mayor of Ivano-Voznesensk. In addition to opening a school for his factory workers, he founded a public library, a public hospital, a school for boys, and a gymnasium for girls.¹²⁵

The fate of two institutions: the gymnasium for girls (now a high school specialising in English language); and the Ivanovo Polytechnic Institute, illustrates the typical pattern of appropriation—and subversion—that unfolded to a greater or lesser extent across Russia after the Bolsheviks took power. The gymnasium had been founded in 1878. The school curriculum covered seven years of instruction; a special 8th grade was optional for girls aspiring to become teachers. In 1918, the Bolsheviks turned the gymnasium into a co-ed

school and retained the imperial teaching staff.¹²⁶ Some of the school's imperial-era female alumni subsequently became prominent oblast party workers.¹²⁷ The regional party boss (1972-1985) Vladimir Kluev hailed from the school; as did one of the heads of oblast administration in the 1990s, Adolf Laptev.¹²⁸ The Riga Polytechnic Institute, founded in 1862 and evacuated to Ivanovo during World War I, represented the Bolsheviks' another appropriation of an imperial institution. In 1930, the Polytechnic's departments were expanded to form the Agricultural; Chemistry; Textile; and Energy Institutes.¹²⁹ Among the Institute's appropriated faculty was Vsevolod Keldysh, a noble. His son, Mstislav Keldysh, the famed soviet academician, studied in the Ivanovo gymnasium.

The Bolsheviks built on Ivanovo's industrial heritage, turning it into a textile production centre of USSR-wide significance. Throughout the Soviet decades, the imperial educational establishments served as training platforms for local cadre that would be engaged in Ivanovo's textile industries and party work. Leading experts on Russia's regional politics have characterised Ivanovo's post-communist development in terms of a strong degree of cadre, policy and political continuity with the communist period. Ivanovo's "*polnovlastnyy khozyain*" (whole-scale owner) between 1972 and the onset of *perestroika* in 1985, a "tough party apparatchik of the old-fashioned mould," had been a native of the region with strong ties to the textile industry.¹³⁰ An outsider appointed to run the oblast in 1985 did not last very long as he appeared "soft" and "moderate" compared to his native predecessor. By 1990, Ivanovo was back in the hands of native *nomenklaturshiki*, who had cut their teeth as professionals and managers in the textile industry and party work. The pliant regional legislative council had come to be packed with industry directors—in the mid 1990s constituting some 50 percent of the deputy ranks; and heads of local administrations—some 25 percent.¹³¹ Even against the background of national-level democratic politics of the early 1990s, Ivanovo continued to feature communist-era functionaries at the helm of power. For instance, the governor

Vladislav Tihomirov had previously served as Chairman and First secretary of the oblast's party executive committee.¹³² In 2000, Tikhomirov was succeeded by another regional insider, Vladimir Tikhonov, a formerly high-ranking party functionary and manager of one of Ivanovo's largest textile enterprise, *Shuyskie sitsy*. Tikhonov was among the few regional bosses bold enough to protest President Putin's policy of appointing governors in the mid-2000s. So entrenched was his power that—in a case covered in the national press—the Kremlin resorted to dispatching FSB officers to depose him. He was eventually forced to sign his resignation papers in bed, in Ivanovo's neurological hospital.¹³³

In the post-communist period, Ivanovo's entrenched networks of party officials, who had made their careers moving between positions as enterprise managers and *raykom* and *obkom* party bureau chiefs, turned into effective political machines. Former Communist bosses continued to maintain soviet-era styles of centralised decision making, for instance requiring the participation of regional executives in trade deals involving local textile companies.¹³⁴ The strong ties between regional leaders and industry served to lubricate these machines and to crowd out political dissent. Thus, enterprise managers refrained from financially supporting opposition groups, while also ensuring the political docility of enterprise employees by threatening punitive measures should they not vote as instructed. Independent media outlets like the *Ivanovo Press* newspaper reported being threatened with lawsuits by Tikhonov for publishing material critical of regional officials. Independent media critical of regional government also complained that they receive no sponsorship from textile companies considering the latter's strong ties to regional bosses.¹³⁵

Soviet-style co-optation of society and workforce into quasi-official organizations and ritualised forms of “participation” in governance had been also widespread. During *perestroika*, when such practices were already scorned upon, Ivanovo became notorious for delegating its textile workers to sit on official party and soviet congresses and meetings,

thereby “symbolizing the participation of workers in the management of the state.”¹³⁶ Ivanovo’s citizen passivity remained a consistent feature of its political landscape. Even at the height of political upheaval in Russia, in 2011-2012, when thousands of protesters took to the streets in anti-regime protests in many regions, an opposition website tracking social activism in Russia’s regions (namarsh.ru) recorded only one protest for Ivanovo.¹³⁷

Discussion

The preceding analysis has highlighted how pre-communist education can paradoxically contribute to the subversion of regional democratic potential. Our paper supports earlier research indicating a positive association between pre-communist literacy and post-communist democracy. Yet, we also find that the effect of pre-communist literacy is mediated by communist party recruitment. The communists tended to be more likely to be recruited in areas that had been better developed at the time of the imposition of Bolshevik rule. We explained these patterns with reference to the higher human capital of the more developed areas; these areas could supply larger numbers of recruits to the regime desperate to get itself up and running. These party recruits and their descendants were engaged in the collective effort to promote the USSR’s top-down modernization drive. As the system matured, they became progressively devoid of the values that classic modernization theorists associate with bottom-up modernization processes. Not all of the developed locales of course suffered the fate of being cannibalized by the party. Some of the historically developed regions had comparatively low levels of party saturation.¹³⁸

Our study nuances earlier scholarship on the links between pre-communist literacy and post-communist political regime variations. We find that literacy matters even outside of the contexts where it could proxy for institutional autonomy to develop curricula inculcating children with nationalist myths and particular cultural values.¹³⁹ Our analysis of Russia points

to a more straightforward modernization explanation: even absent nationalist curricula in minority areas, and even in the context of an absolutist monarchy, literacy can help kick-start a bundle of socio-economic processes and value orientations that can survive the socially-homogenizing communist experiment. We also find, contra Pop-Eleches and Tucker,¹⁴⁰ that education obtained before communism may not always serve to promote resistance to authoritarianism. Instead, it could endow the better-educated strata with a survival edge under the new regime and with enhanced opportunities to cement it.

Scope conditions of course have to be carefully considered when postulating the external validity of our findings.¹⁴¹ These scope restrictions in particular apply to our first causal claim—appropriation. Among Soviet puppet regimes in Europe, one does encounter many a “fervent communist[s] who played a key role in establishing communist rule.”¹⁴² In Hungary, the relatively benign regime installed after the 1956 uprising even enjoyed a degree of genuine popular appeal.¹⁴³ Nevertheless, whether communism had been home-grown or represented “an alien, inferior imposition by a suspect regional superpower”¹⁴⁴ is bound to have mattered for social receptivity to communist dogma.

We also ought to be sensitive to variations in *pre*-communist legacies among communist states. Pre-communist national identities, civic consciousness, societal organization, and other variables that could be linked to the political-cultural aspects of the reproduction of legacies; and the peculiarities of political, economic, and religious institutions, are likely to have influenced the extent to which the better-educated strata could be appropriated by communist rulers.¹⁴⁵ These legacies also likely affected the bargaining strength of individuals and groups as they negotiated their social position in the new order.¹⁴⁶ Furthermore, East-West developmental variations conditioned over centuries by proximity to centers of trade and growth¹⁴⁷ and by more recent 20th century processes of Europeanisation¹⁴⁸ also matter. These variations may have well determined whether

communism would be regarded in a positive light among potential converts to Marxist-Leninist faith or invidiously compared with the developmental fruits in the capitalist West.¹⁴⁹

The temporal scope of communism is also likely to have mattered for societal incentives to be appropriated by the new regime.¹⁵⁰ By the 1950s, even the true believers—as epitomized by the Yugoslav communist Milovan Djilas—were having their misgivings about Stalinist rule.¹⁵¹ For those who joined the party not as an act of faith, but as a means of career advancement, the relaxation of the totality of state rule over society following de-Stalinization also perhaps meant a relaxation of incentives to blend into the regime. Yet, we also know that some degree of opportunism in party applications, particularly among the better educated, had been present in Soviet satellite states throughout the decades of communist rule. As Pop-Eleches notes in discussing communist legacies in Europe, “while Party membership itself was not mandatory, it was nevertheless a crucial precondition for many professional careers and was therefore much more frequent among university graduates.”¹⁵² Although a number of caveats are in order when applying our analysis to other settings, clearly, appropriation should be considered alongside other “shared” features of communism.¹⁵³

When it comes to the subversion component of our argument, recent scholarship makes us even more confident in extending our findings to other post-communist countries, though here too important qualifiers apply. Studies have found that the length of communist rule matters for the propensity of the general citizenry to embrace democracy.¹⁵⁴ As Herbert Kitschelt notes, in states where communism spanned only two generations, the older generation could “draw on skills and experiences never quite lost during communism.”¹⁵⁵ Nevertheless, survey research has revealed that across the universe of post-communist cases, educated citizens are far less likely to espouse democratic values than those in societies with comparable levels of education that had not experienced communism.¹⁵⁶ In analyzing specifically the links between party membership and post-communist democratic values and

practices, Grzymala-Busse rightly argues that we ought to be sensitive to the substantial variations among communist countries in ruling party recruitment strategies, policy reform, and a record of accommodation with society.¹⁵⁷ Yet, we also know that there was something about the nature of involvement in the activities of official communist organizations that may account for the generally less-democratic value orientations of former party cadre in many communist settings.¹⁵⁸

Our study is also relevant to historical legacies theorizing going beyond post-communist contexts. It highlights the importance of studying the incentives, preferences, and value orientations of actors transcending the narrow group of top decision makers, but nevertheless essential for the survival—or subversion—of a post-critical juncture order. While social and educational background and long-term value orientations might be sound predictors of preferences and behaviors under a normal political equilibrium, politically and socially fluid contexts might lead to a shift in preferences for social and political action among particular social strata. So, ours is a plea for the broadening of analytical focus in studies of historical watershed events transcending the preoccupation with “key political actors” that we discern in Giovanni Capocchia and Daniel Kelemen’s influential paper on critical junctures.¹⁵⁹ Our study also serves as an endorsement of Daniel Ziblatt and Grzegorz Ekiert’s point about the need to focus on *continuities*—in our case in the relative social positioning of the literate strata—and the *literati*—in the pre- and post-critical juncture orders. These continuities might be obscured by an exclusive focus on *rupture*.¹⁶⁰ We therefore need new theory and further empirical work in other contexts. The theory should help further illuminate how during regime-transformative critical junctures, citizens’ education credentials might help solidify support for an emerging autocratic regime, or help erode the quality of, or even subvert, a nascent democratic one, in ways that are at odds with earlier theorizing. This is an agenda for future research.

Tables and Figures

Table 1. Determinants of sub-national democracy, OLS

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|--------------------|----------------------|----------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| Democracy indicator, period | 2000-2004 | 2000-2004 | 2000-2004 | 1991-2001 | 2000-2004 | 2000-2004 | 2000-2004 | 1991-2001 |
| Party saturation, 1970s | | | | | -2.428*** (0.691) | -2.385*** (0.673) | -2.587*** (0.695) | -2.679*** (0.649) |
| Literacy, 1897 | 0.134* (0.073) | 0.130* (0.073) | 0.166** (0.079) | 0.169** (0.081) | 0.309*** (0.070) | 0.307*** (0.070) | 0.347*** (0.074) | 0.370*** (0.079) |
| Education, 2002 | 0.027 (0.254) | 0.019 (0.263) | -0.131 (0.291) | 0.078 (0.269) | 0.130 (0.209) | 0.130 (0.205) | -0.0004 (0.239) | 0.153 (0.206) |
| Income, 2000-2004 | 0.321 (0.496) | 0.293 (0.511) | 0.387 (0.611) | -0.0001 (0.001) | 0.758* (0.414) | 0.758* (0.407) | 0.844 (0.510) | 0.001 (0.001) |
| Share of ethnic Russians, 2002 | 0.142** (0.054) | 0.108*** (0.033) | | 0.179*** (0.051) | 0.124** (0.054) | 0.133*** (0.032) | | 0.155*** (0.052) |
| Dummy republic | 2.174 (2.848) | | -3.821* (1.927) | 4.114 (2.569) | -0.638 (2.784) | | -5.994*** (1.764) | 0.929 (2.484) |
| Distance from Moscow | -0.196 (0.208) | -0.216 (0.209) | -0.300 (0.209) | -0.143 (0.217) | -0.267 (0.220) | -0.261 (0.215) | -0.362 (0.219) | -0.221 (0.225) |
| Log oil and gas extraction, 2000-2004 (measured in coal equivalent) | 1.122** (0.506) | 1.067** (0.508) | 0.800 (0.551) | 0.999** (0.497) | 0.352 (0.529) | 0.381 (0.510) | 0.024 (0.553) | 0.116 (0.497) |
| Constant | 12.994* (6.687) | 16.541*** (5.214) | 27.811*** (3.518) | 8.160 (6.786) | 29.167*** (7.919) | 27.921*** (5.822) | 43.008*** (5.327) | 26.769*** (7.824) |
| Observations | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| R-squared | 0.324 | 0.317 | 0.245 | 0.344 | 0.459 | 0.458 | 0.399 | 0.506 |

Note: Robust standard errors in parentheses. *** significant at 1% level; ** 5%; * 1%. In specification (4) and (8) oil and gas extraction and income for 1995-2001.

Table 2. Determinants of party saturation (CPSU membership in proportion to regional population) in the 1970s, OLS

| | (1) | (2) | (3) | (4) |
|--------------------------------|------------------------|---------------------|------------------------|------------------------|
| Literacy, 1897 | 0.084*** (0.019) | 0.111*** (0.023) | 0.081*** (0.018) | 0.075*** (0.019) |
| Population, 1977 | -0.0003*** (0.0001) | -0.0002 (0.0002) | -0.0003*** (0.0001) | -0.0003*** (0.0001) |
| Urbanization, 1977 | -0.018 (0.013) | 0.005 (0.012) | -0.009 (0.014) | -0.027** (0.012) |
| Border region (USSR) | -0.263 (0.362) | -0.030 (0.368) | -0.130 (0.371) | -0.284 (0.334) |
| Repressed by Stalin | -1.160 (0.720) | -0.736 (0.765) | -1.290** (0.609) | -0.416 (0.722) |
| Infant mortality, 1970 | -0.032 (0.025) | -0.013 (0.030) | | 0.005 (0.028) |
| Education, 1979 | 0.327*** (0.111) | | 0.341*** (0.116) | 0.375*** (0.103) |
| Monthly salary, 1975 | | | -0.004 (0.004) | |
| Share of ethnic Russians, 1979 | | | | 0.024*** (0.006) |
| Constant | 7.219*** (0.980) | 6.408*** (1.293) | 6.540*** (0.729) | 4.889*** (1.108) |
| Observations | 71 | 71 | 71 | 71 |
| R-squared | 0.613 | 0.515 | 0.613 | 0.670 |

Note: See Table 1.

Table 3. Mediation analysis, 2000-2004

| Dependent variable | Effect | Mean | 95% confidence interval | |
|--------------------|---------------|--------|-------------------------|--------|
| Democracy | ACME | -0.211 | -0.368 | -0.087 |
| | Direct effect | 0.336 | 0.200 | 0.468 |
| | Total effect | 0.125 | -0.033 | 0.278 |

Note: ACME stands for average causal mediation effect.

Table 4. Examples of regions with distinct combinations of pre-communist and communist legacies and their democracy score

| | |
|--|--|
| <p>Type 1:</p> <p>High literacy High CPSU member saturation</p> <p>Average democracy score: 30.2 Average literacy: 29.3 Average party saturation: 9.9 Number of regions: 25</p> <p>Examples: Ryazan, Saratov, Samara, Tula, Tver, Vladimir, Volgograd, Yaroslav, Rostov, Novgorod, Ivanovo, Kostroma, Kamchatka, Khabarovsk, Primorskiy</p> | <p>Type 2:</p> <p>Low literacy Low CPSU member saturation</p> <p>Average democracy score: 27.7 Average literacy: 14.1 Average party saturation: 7.1 Number of regions: 35</p> <p>Examples: Astrakhan, Bashkortostan, Belgorod, Krasnodar, Irkutsk</p> |
| <p>Type 3:</p> <p>High literacy Low CPSU member saturation</p> <p>Average democracy score: 36.8 Average literacy: 22.5 Average party saturation: 7.6 Number of regions: 6</p> <p>Examples: Arkhangelsk, Karelia, Komi, Chelyabinsk, Nizhniy Novgorod</p> | <p>Type 4:</p> <p>Low literacy High CPSU member saturation</p> <p>Average democracy score: 26.6 Average literacy: 16.4 Average party saturation: 9.0 Number of regions: 11</p> <p>Examples: Kaluga, Kursk, Orel, Penza, Pskov, Smolensk, Tambov, Ulyanovsk, Vologda, Voronezh</p> |

Note: Cutoff values are 8.35 percent for party saturation and 20.00 percent for literacy (i.e., the means of both variables).

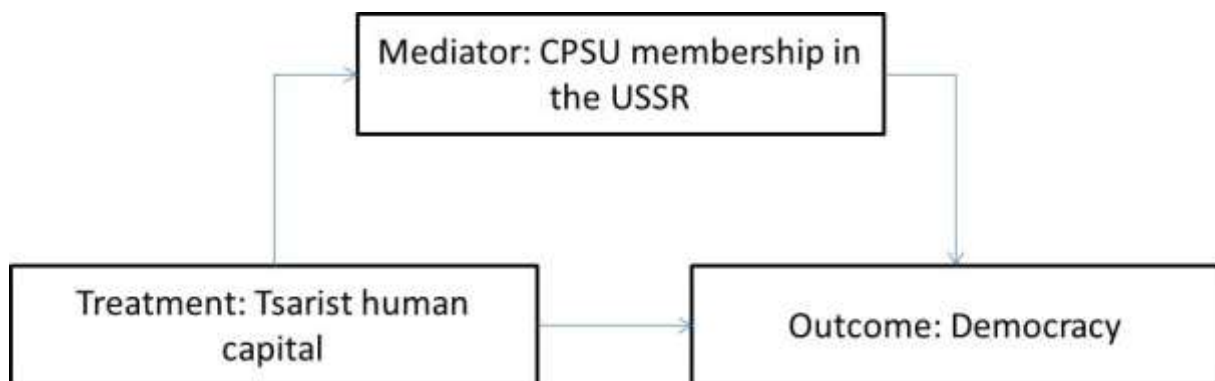


Figure 1: Pre-Communist and Communist Legacies and Democratic Variations

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Notes

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- ¹ LaPorte and Lussier 2011; Ekiert and Ziblatt 2013; Pop-Eleches and Tucker 2013; Kotkin and Beissinger 2014.
- ² Kotkin and Beissinger 2014.
- ³ Kopstein 2003; Pop-Eleches and Tucker 2013.
- ⁴ Darden and Grzymala-Busse 2006; Peisakhin 2013.
- ⁵ Acemoglu, Johnson et al. 2002.
- ⁶ Rigby 1968; Szelényi 1987; Wong 1996.
- ⁷ Linz 2000; Pop-Eleches and Tucker 2013.
- ⁸ Rustow 1966.
- ⁹ Almond and Verba 1963; Lipset 1959. For a discussion of the application of political culture approaches to the study of communist and post-communist politics, see also Brown 2005.
- ¹⁰ Capoccia and Kelemen 2007; Ekiert and Ziblatt 2013.
- ¹¹ Kotkin and Beissinger 2014, 7-8.
- ¹² Wittenberg 2012.
- ¹³ Janos 1994; Ekiert and Ziblatt 2013.
- ¹⁴ Kotkin and Beissinger 2014.
- ¹⁵ Ibid.
- ¹⁶ Capoccia and Kelemen 2007.
- ¹⁷ Lipset and Dobson 1972; Parkin 1972; Hahn 1991.
- ¹⁸ Siniavsky 1988; Jowitt 1992.
- ¹⁹ Gerber 2000.
- ²⁰ Lerner 1958; Lipset 1959; Almond and Verba 1963; Rustow 1970; Inkeles 1983.
- ²¹ Kitschelt 2003.
- ²² Janos 2000.
- ²³ Pop-Eleches and Tucker 2013; Darden and Grzymala-Busse 2006; Peisakhin 2013.
- ²⁴ Bourdieu and Passeron 1990; Breen and Jonsson 2005.
- ²⁵ Pop-Eleches and Tucker 2013.
- ²⁶ Jowitt 1992; Fitzpatrick 1993.
- ²⁷ Rigby 1968; Wong 1996.
- ²⁸ But see Grzymala-Busse 2002.
- ²⁹ McAllister and White 1995; Geishecker and Haisken-DeNew 2004.
- ³⁰ Hanley, Yershova et al. 1995; Hanson 1995; Kryshtanovskaya and White 1996; Bird, Frick et al. 1998; Hanley 1999; Gerber 2000, 2003; Grzymala-Busse 2002; Geishecker and Haisken-DeNew 2004; Matonyte 2009.
- ³¹ Snyder 2001. See also Lankina and Getachew 2012a, 2012b.
- ³² Koch 1977; Leonard 2011.
- ³³ Moses 1981; Libman and Obydenkova 2014.
- ³⁴ McMann and Petrov 2000; Lankina 2004; Lankina and Getachew 2006, 2008; Obydenkova 2008; Obydenkova and Libman 2012.
- ³⁵ Darden and Grzymala-Busse 2006; Pop-Eleches 2007; Pop-Eleches and Tucker 2013.
- ³⁶ Jowitt 1992; Pop-Eleches and Tucker 2013.
- ³⁷ Baron and Kenny 1986.
- ³⁸ Ibid., 1173.
- ³⁹ Ibid., 1176.
- ⁴⁰ In fact, interaction term models may be problematic due to multicollinearity if the predictor and moderator are highly correlated.
- ⁴¹ Baron and Kenny 1986.

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- ⁴² For a discussion of recent applications of this method, see MacKinnon, Fairchild et al. 2007; MacKinnon, Coxé et al. 2012; Pearl 2012.
- ⁴³ Imai, Keele et al. 2010a, 2010b, 2011.
- ⁴⁴ Tingley, Yamamoto et al. 2014.
- ⁴⁵ Hicks and Tingley 2011.
- ⁴⁶ Hicks and Tingley 2011.
- ⁴⁷ Troynitskiy 1905.
- ⁴⁸ Lankina 2012.
- ⁴⁹ While party membership and regional population data are available for 1976, adult population data are available for 1979 only (the most proximate year). For reliability purposes, we compute the share of party members in the regional population as a whole employing 1976 data. The general results do not change.
- ⁵⁰ Obydenkova and Libman 2014; Libman and Obydenkova 2015. For regions that had been split into several entities in the 1990s, we assign party membership values from the original RSFSR region. We perform a robustness check to ensure that this does not significantly affect our results.
- ⁵¹ Petrov 2005.
- ⁵² Reisinger and Moraski 2009.
- ⁵³ Bollen 1993.
- ⁵⁴ Furman 1999. As our education measure we employ the population share of university graduates, since in Russia secondary schooling is mandatory.
- ⁵⁵ Gel'man 1999; Hale 2007.
- ⁵⁶ Ross 2001.
- ⁵⁷ Unlike the 2000-2004 score, the 1991-2001 score was constructed retrospectively, in the early 2000s.
- ⁵⁸ Rigby 1968. But see Marks 2004.
- ⁵⁹ Harris 1986. Active servicemen are not included since they were not listed in regional party organizations; data on deployment of Soviet troops are not available.
- ⁶⁰ Ingushetia, Kalmykia, Kabardino-Balkaria, and Karachaevo-Cherkessia.
- ⁶¹ Jones and Grupp 1984; Pohl 2000.
- ⁶² Millar 1992.
- ⁶³ Hicks and Streeten 1979.
- ⁶⁴ Witt 1961; Rigby 1968; Fitzpatrick 1993.
- ⁶⁵ Lipset 1959.
- ⁶⁶ Ivanov, Komzolova et al. 2008.
- ⁶⁷ Haimson 1988; Balzer 1996.
- ⁶⁸ Fitzpatrick 1993, 755.
- ⁶⁹ Fitzpatrick 1979, 1993; Volkov 1999.
- ⁷⁰ In 1914. Rigby 1968, 400.
- ⁷¹ Eklof 1986, 285.
- ⁷² According to a 1919 survey. Rigby 1968, 401-403.
- ⁷³ According to a 1922 survey. Rigby 1990, 28.
- ⁷⁴ Rigby 1968, 400.
- ⁷⁵ Rigby 1968, 404.
- ⁷⁶ Rigby 1990, 36.
- ⁷⁷ Eklof 1986.
- ⁷⁸ Haimson 1988; Fitzpatrick 1993; Balzer 1996.
- ⁷⁹ Rigby 1990, 36.
- ⁸⁰ Ibid., 39.

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- ⁸¹ Ibid., 29, 37.
- ⁸² Derluguian 2005, 148.
- ⁸³ Graham 1967.
- ⁸⁴ Rigby 1990, 37.
- ⁸⁵ Fainsod 1970, 268.
- ⁸⁶ Rigby 1990, 28, 31.
- ⁸⁷ Varlamenkov 2008, 352.
- ⁸⁸ Ibid.
- ⁸⁹ Eklof 1986, 190.
- ⁹⁰ Brooks 1985.
- ⁹¹ Koch 1977.
- ⁹² Varlamenkov 2008.
- ⁹³ Martin 2001, 126; Rigby 1968.
- ⁹⁴ Inkeles 1950, 465.
- ⁹⁵ In discussing the purges, we are mindful of Ian Lustick's plea for transparency and discernment in working with historical sources. Lustick 1996.
- ⁹⁶ Witt 1961; Rigby 1968.
- ⁹⁷ Fitzpatrick 1979; Volkov 1999.
- ⁹⁸ Volkov 1999.
- ⁹⁹ Róbert 1991.
- ¹⁰⁰ See also H. 1966; Parkin 1969; Lane 1973; Nove 1975.
- ¹⁰¹ Kozlova 1997.
- ¹⁰² Inkeles 1950.
- ¹⁰³ Bourdieu and Passeron 1990.
- ¹⁰⁴ Fuchs and Demko 1977; Leonard 2011.
- ¹⁰⁵ Fitzpatrick 1993.
- ¹⁰⁶ Witt 1961, 64.
- ¹⁰⁷ As in other communist states. Djilas 1983; Gryzmala-Busse 2002, 53.
- ¹⁰⁸ Rigby 1968, 412.
- ¹⁰⁹ Ibid., 413.
- ¹¹⁰ Also in other Warsaw Pact countries, though less so in Czechoslovakia. Wong 1996.
- ¹¹¹ We also explore electoral dynamics as one potential channel of societal impact of party saturation on democratization, but do not find evidence that party membership affected electoral behavior (SA S9).
- ¹¹² Hanley, Yershova et al. 1995; Kryshstanovskaya and White 1996; Gelman, Ryzhenkov et al. 2003; ICSID 2014; Obydenkova and Libman 2014; Libman and Obydenkova 2015.
- ¹¹³ Easter 2000, 169.
- ¹¹⁴ Moses 1981, 86.
- ¹¹⁵ Kitschelt and Wilkinson 2007; Hale 2015.
- ¹¹⁶ Gryzmala-Busse 2002.
- ¹¹⁷ Roeder 1991.
- ¹¹⁸ Finifter and Mickiewicz 1992; Dalton 1994; Rohrschneider 1994; Bahry, Boaz et al. 1997; Miller, Hesli et al. 1997. But see Gibson, Duch et al. 1992; Mishler and Rose 1997; Letki 2004.
- ¹¹⁹ Bahry and Silver 1990, 832. (As distinct from, say, "counter-culture"-type activities. See Dalton 1994).
- ¹²⁰ Gibson, Duch et al. 1992; Jowitt 1992; Mishler and Rose 1997; Pop-Eleches and Tucker 2013.
- ¹²¹ Pop-Eleches and Tucker 2013.

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- ¹²² Evans and Whitefield 1993.
- ¹²³ McFaul and Petrov 1998 (part 1).
- ¹²⁴ Eklof 1986, 74.
- ¹²⁵ <http://ivgazeta.ru/read/15851>, accessed April 27, 2015; see also Gruzdev 2011.
- ¹²⁶ http://dic.academic.ru/dic.nsf/enc_biography/32050/Гарелин, accessed April 27, 2015.
- ¹²⁷ Darya Bobrovitskaya. 2008. "Stareyshaya v Ivanove, odna iz luchshikh v Rossii." *Ivanovskaya gazeta*, January 29. Available at: <http://dlib.eastview.com/browse/doc/13402045>, accessed April 27, 2015.
- ¹²⁸ For instance, Olga Varentsova. http://www.in3p.ru/showObject/record_70:outFull.htmlhttp://www.in3p.ru/showObject/record_70:outFull.html, accessed May 17, 2015; Kuznetsova 2006.
- ¹²⁹ On regional party leaders, see <http://www.cursiv.ru/?publication=16922>, accessed April 27, 2015.
- ¹³⁰ <http://ivgpu.com/about-the-university/>, accessed April 27, 2015.
- ¹³¹ McFaul and Petrov 1998 (part 1), 520.
- ¹³² Ibid., 520.
- ¹³³ McFaul and Petrov 1998 (part 1).
- ¹³⁴ *Kommersant* 18 July 2005; Libman and Obydenkova 2014.
- ¹³⁵ Author telephone interview with the head of one of Ivanovo's textile enterprises (anonymous), July 23, 2010.
- ¹³⁶ Author interviews, July 2010.
- ¹³⁷ McFaul and Petrov 1998 (part 1), 520.
- ¹³⁸ Author dataset.
- ¹³⁹ Rigby 1968.
- ¹⁴⁰ Darden and Grzymala-Busse 2006; Peisakhin 2013.
- ¹⁴¹ Pop-Eleches and Tucker 2013.
- ¹⁴² Kotkin and Beissinger 2014.
- ¹⁴³ Darden and Grzymala-Busse 2006, 102.
- ¹⁴⁴ Wittenberg 2006, 11.
- ¹⁴⁵ Darden and Grzymala-Busse 2006, 102.
- ¹⁴⁶ Elster, Offe et al. 1998; Kitschelt 2003; Bunce 2005; Darden and Grzymala-Busse 2006; Wittenberg 2006.
- ¹⁴⁷ Kitschelt 2003, 62.
- ¹⁴⁸ Ekiert and Hanson 2003, 32; Janos 2000; Derluguian 2005.
- ¹⁴⁹ Kopstein and Reilly 2000.
- ¹⁵⁰ Darden and Grzymala-Busse 2006.
- ¹⁵¹ Ekiert and Hanson 2003; Kotkin and Beissinger 2014.
- ¹⁵² Djilas 1983.
- ¹⁵³ Pop-Eleches 2014, 42. See also Szelényi 1987; Wong 1996.
- ¹⁵⁴ Kotkin and Beissinger 2014.
- ¹⁵⁵ Kitschelt 2003; Kotkin and Beissinger 2014.
- ¹⁵⁶ Kitschelt 2003, 60.
- ¹⁵⁷ Pop-Eleches and Tucker 2013; Pop-Eleches 2014.
- ¹⁵⁸ Grzymala-Busse 2002.
- ¹⁵⁹ Pop-Eleches 2014, 42.
- ¹⁶⁰ Capoccia and Kelemen 2007.
- ¹⁶¹ Ekiert and Ziblatt 2013.

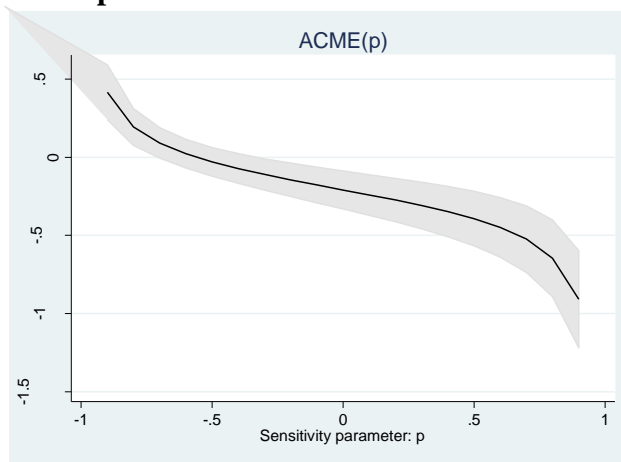
SUPPLEMENTARY APPENDIX (FOR PUBLICATION ONLINE)**Appendix S1: Matching imperial *gubernii* and communist and post-communist Russia's regions**

There were forty-six *gubernii* in tsarist Russia, the territories of which now form part of the Russian Federation. After the Bolshevik Revolution, many *gubernii* were split into several regions. To ensure inter-temporal observational equivalence, if a *guberniya* had been divided into several entities in the post-communist period, the latter were assigned the values of the original *guberniya*. Scholars who have sought to match imperial with communist and post-communist data estimating the percentage share of imperial regions included in post-communist administrative territories found the differences to be modest for most regions. The largest differences were in Western Siberia and Ukraine (not part of our study). We address the Siberian data issue by tracing which *gubernii* had been split into multiple regions. On recent attempts to match regional imperial and communist population statistics, see (Kumo, Morinaga et al. 2007). See also (Leasure and Lewis 1966)

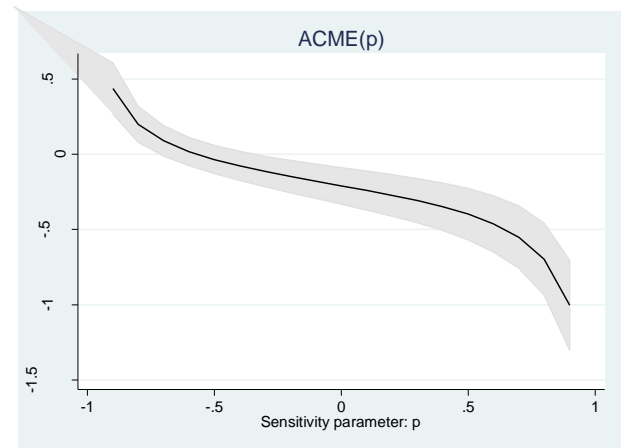
Appendix S2: Sensitivity analysis

The results of mediation analysis are sensitive to the sequential ignorability assumption. To ascertain the extent to which our estimations would be affected by violations of this assumption, we run sensitivity analysis for all of the specifications. Below we report two sets of indicators. First, we report a series of graphs, showing how the estimation of the indirect effect would change conditional on the ρ – a parameter measuring the correlation of error terms in the equations employed to perform the analysis. Second, we report the value of ρ for which the indirect effect would become equal to zero. If ρ were close to zero, the results would not be very trustworthy: it would mean that if there was an omitted confounding variable, which exhibited even a very low level of correlation with the outcome and the mediator variables, the mediation effect would actually be zero. In our case, we observe that for almost all of the specifications, most of the possible ρ values (this indicator, as any correlation coefficient, varies between minus one and one) yield a significant and negative indirect effect of pre-communist literacy on post-communist democracy through party saturation. The ρ , for which the indirect effect is equal to zero, mostly varies between -0.5 and -0.3. It means that one would require omitted confounding variables with relatively high effects on both the mediator and the outcome to render the mediation effect equal to zero: this is unlikely given the large number of covariates we employed in different specifications to check the validity of our results (see also Backer 2015 for a similar discussion of sensitivity analysis). Therefore, we can be confident of the validity of our appropriation and subversion hypothesized mechanism under a broad set of assumptions. For comparative purposes, note that for the baseline specification, the correlation coefficient of the estimated residuals is 0.016; this value should not be interpreted as a valid statistical test though, since the key assumption is not testable.

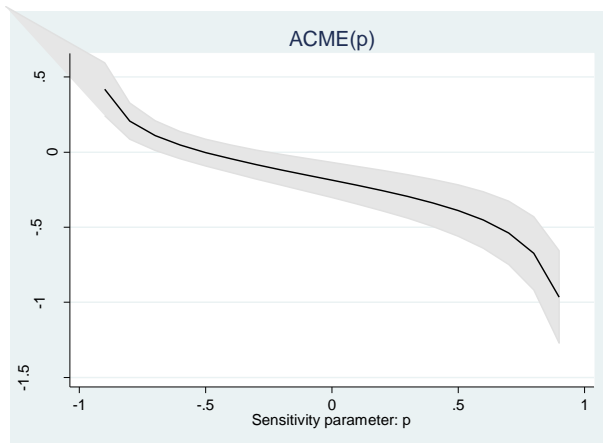
S2.1: Sensitivity analysis for baseline regressions and robustness checks: effects of ρ on the predicted mediator effect



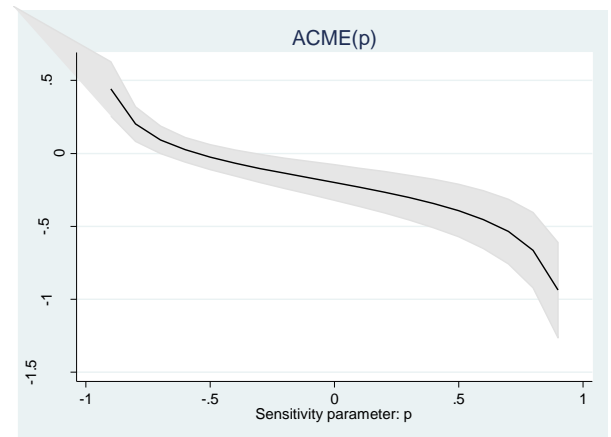
Baseline specification



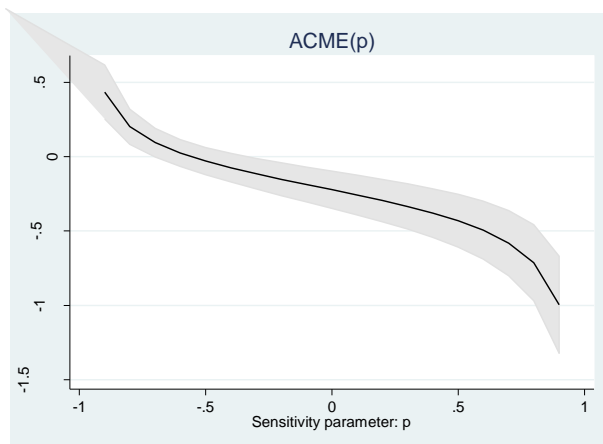
Drop education from the set of control variables



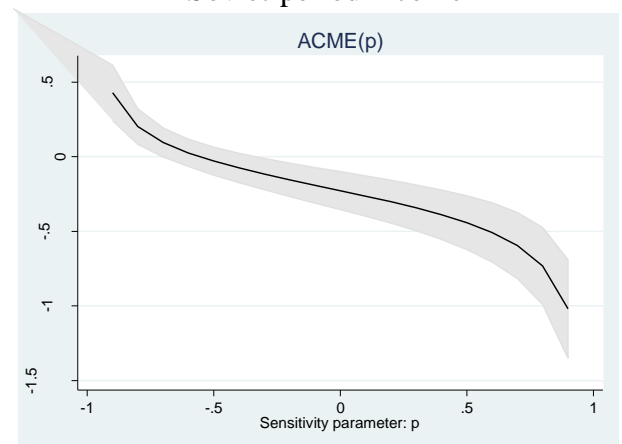
Drop income from the set of control variables



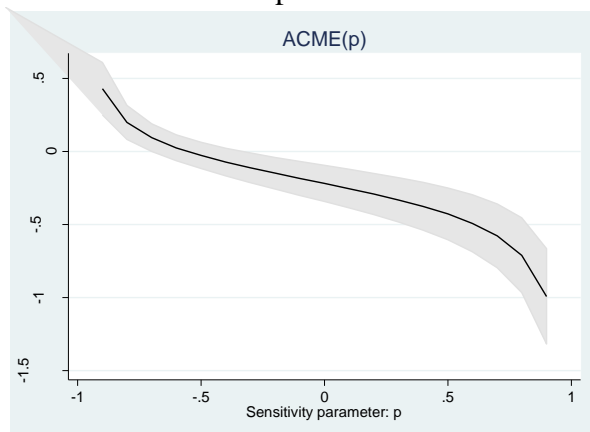
Employ monthly salary (1975) as a proxy for Soviet-period income



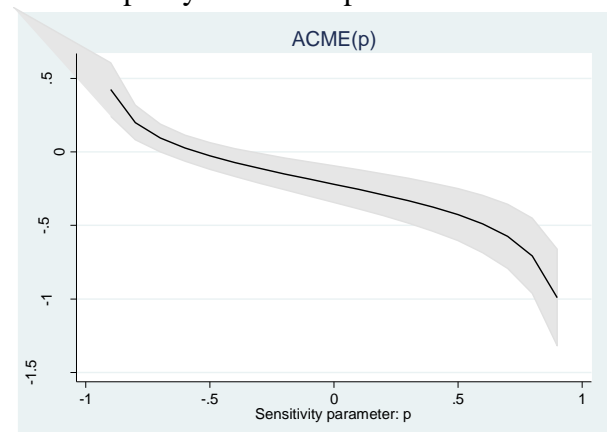
Employ income per capita (1985) as a proxy for Soviet-period income



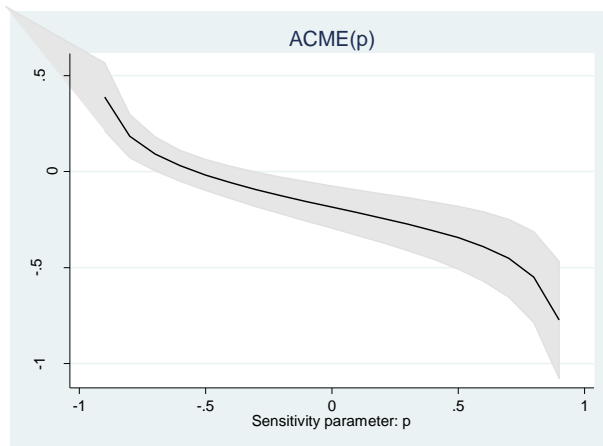
Employ housing construction per capita as a proxy for Soviet-period income



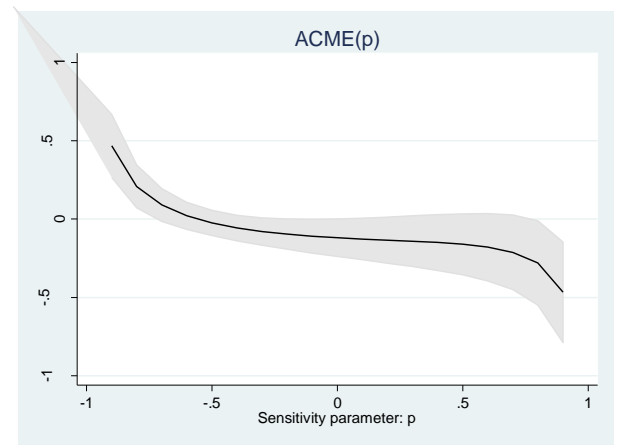
Employ doctors per capita as a proxy for Soviet-period income



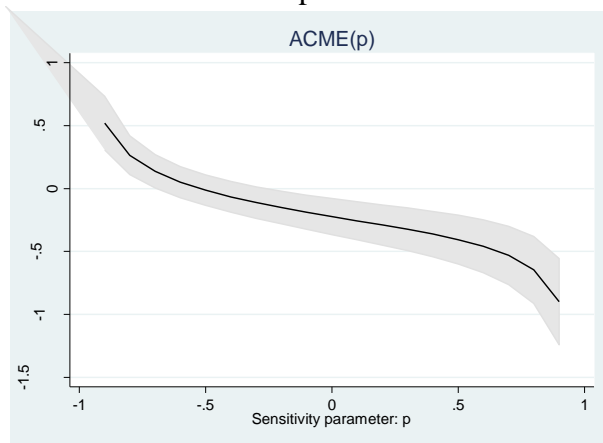
Employ retail trade as a proxy for Soviet-period income



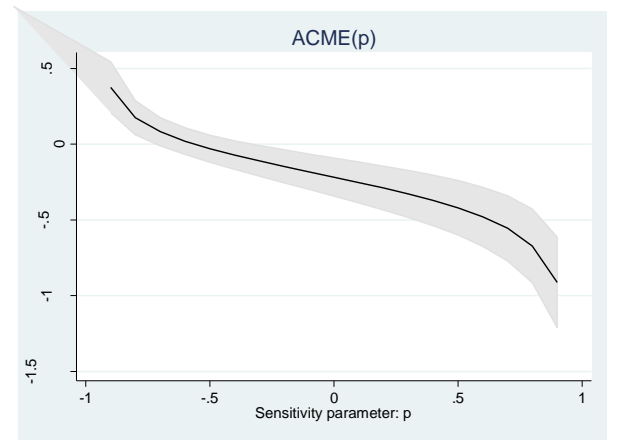
Control for Soviet-period ethnic structure



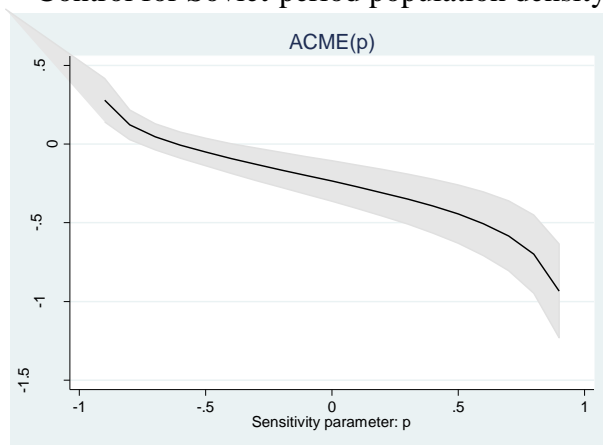
Control for Tzarist social structure



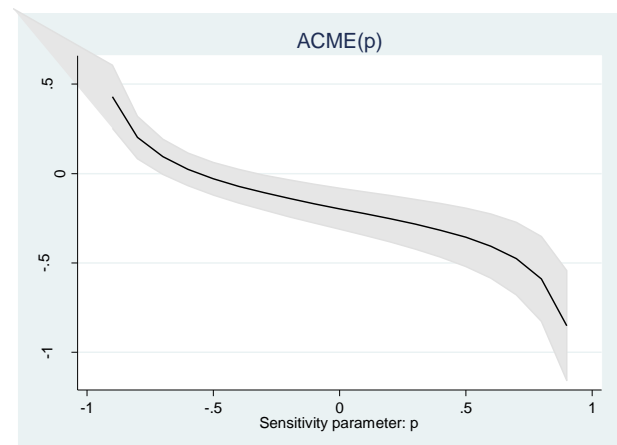
Control for Soviet-period population density



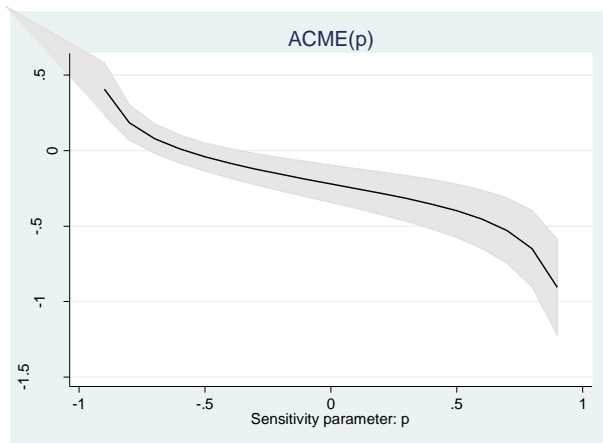
Control for Soviet industrial structure



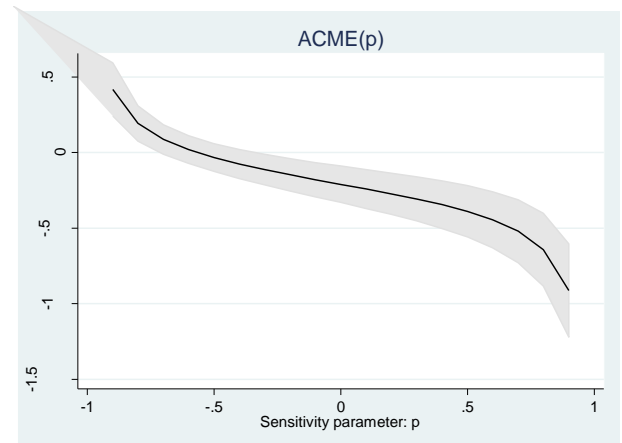
Employ democracy index 1991-2001



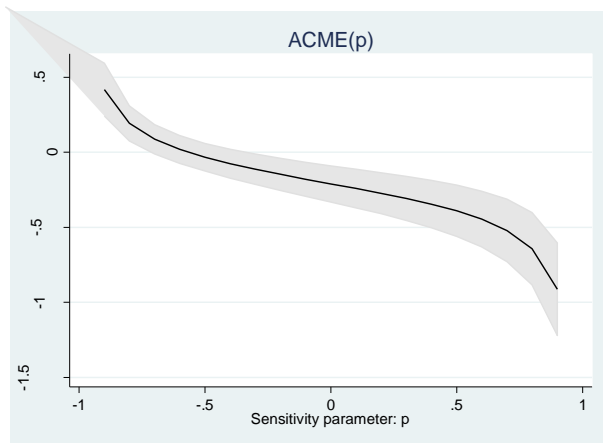
Control for urbanization 2000-2004



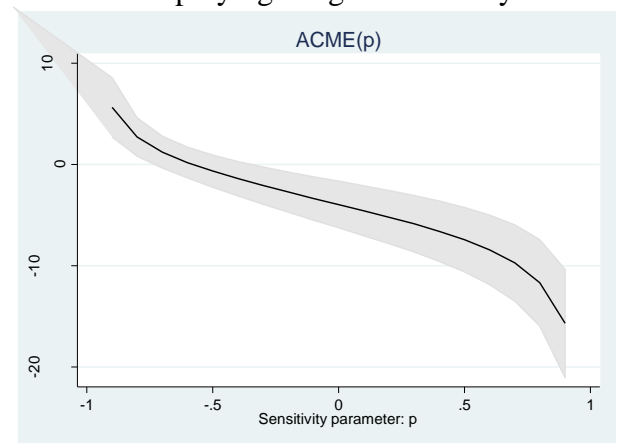
Control for oil and gas extraction per unit of regional GDP in 2000-2004



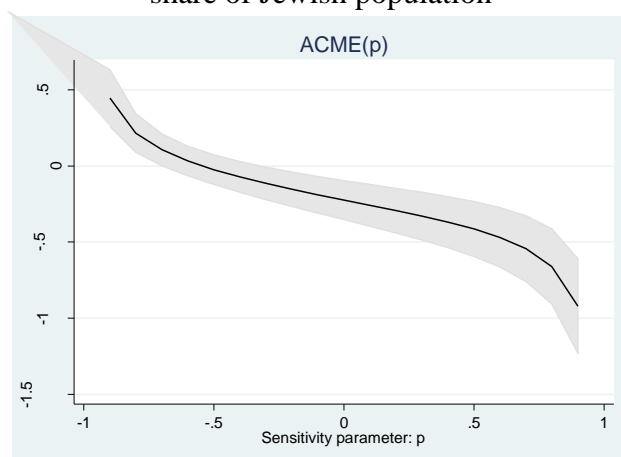
Control for the legacy of repression against ethnic groups by employing the measure of population share of these groups instead of employing a regional dummy



Control for the legacy of repression against ethnic groups by employing the measure of population share of these groups, as well as the share of Jewish population



Binary treatment



Control for the legacy of repression against ethnic groups by employing a dummy for regions from which particular ethnic groups had been deported irrespective of whether these groups returned to their regions of origin or not

S2.2: Sensitivity analysis for baseline regressions and robustness checks: effects of rho on the predicted mediator effect: the value of rho at which the mediator effect is equal to zero

| Specification | rho, at which ACME = 0 |
|---|------------------------|
| Baseline specification | -0.347 |
| Robustness checks | |
| Drop 2002 education from the set of control variables | -0.348 |
| Drop 2000-2004 income from the set of control variables | -0.333 |
| Employ monthly salary (1975) as a proxy for Soviet-period income | -0.379 |
| Employ income per capita (1985) as a proxy for Soviet-period income | -0.391 |
| Employ housing construction per capita as a proxy for Soviet-period income | -0.384 |
| Employ doctors per capita as a proxy for Soviet-period income | -0.399 |
| Employ retail trade as a proxy for Soviet-period income | -0.392 |
| Control for Soviet-period ethnic structure | -0.335 |
| Control for tsarist social structure | -0.273 |
| Control for Soviet population density | -0.296 |
| Control for Soviet industrial structure | -0.317 |
| Employ democracy index, 1991-2001 | -0.369 |
| Control for oil and gas extraction per unit of regional GDP in 2000-2004 | -0.370 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups instead of employing a regional dummy | -0.331 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups, as well as the share of Jewish population | -0.332 |
| Control for the legacy of repression against particular ethnic groups by employing a dummy for regions from which these ethnic groups had been deported irrespective of whether these groups returned to their regions of origin or not | -0.327 |
| Control for urbanization 2000-2004 | -0.344 |
| Binary treatment | -0.288 |

Appendix S3: Components of the democracy index

- Autonomy of municipalities from the regional government;
- Civil society (strength of non-governmental organizations, opportunities for social activism, direct democracy);
- Corruption (in particular, political corruption, e.g., vote-buying);
- Economic liberalization (use of economic tools by the incumbent to control the region);
- Elites (pluralism of elites; mechanisms of power transfer);
- Free, fair, and competitive elections;
- Independent media;
- Regional political openness (political transparency and ease of access for actors from outside the region);
- Political pluralism (presence of stable key parties in the regional legislature);
- Regional political organization (balance of power and independence of the executive, legislative and judicial branches of power, protection of civil rights, electoral manipulations, manipulations of appointments).

Appendix S4: Summary statistics

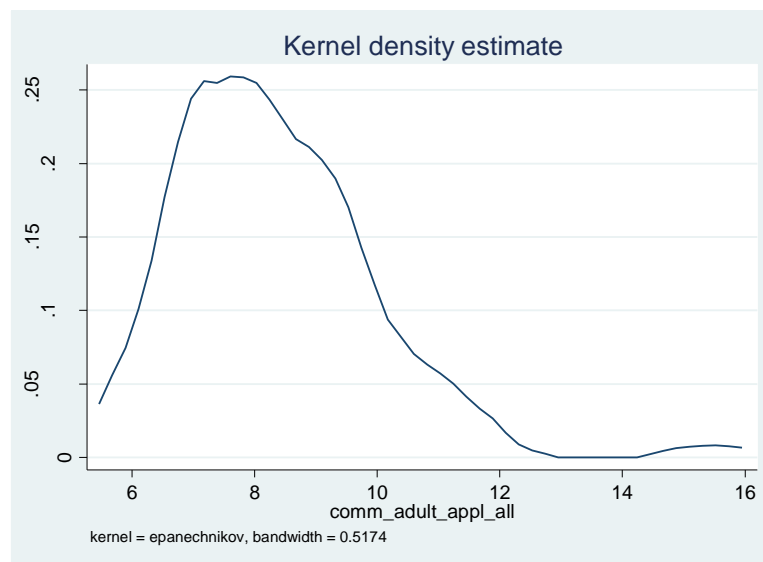
| Variable | Units | No.obs. | Mean | St.dev. | Min. | Max. |
|--|--------------------------|----------------|-------------|----------------|-------------|-------------|
| Coal output (1975) | millions of tons | 79 | 4.82 | 16.83 | 0.00 | 137.00 |
| Democracy (1991-2001) | NA | 79 | 27.95 | 6.23 | 14.00 | 45.00 |
| Democracy (2000-2004) | NA | 79 | 29.01 | 6.28 | 17.00 | 45.00 |
| Democracy (McMann) | NA | 57 | 3.77 | 32.56 | -79.00 | 94.00 |
| Distance to Helsinki | thousands of km | 77 | 2.36 | 1.82 | 0.32 | 7.16 |
| Distance to Moscow (alternative) | thousands of km | 79 | 1.79 | 1.88 | 0.00 | 6.78 |
| Distance to Moscow (Rosstat) | thousands of km | 79 | 2.37 | 2.75 | 0.00 | 11.88 |
| Doctors per capita (1976) | per 10,000 people | 73 | 32.92 | 10.75 | 20.90 | 88.30 |
| Dummy Islamic region | NA | 79 | 0.09 | 0.29 | 0.00 | 1.00 |
| Dummy repressed peoples (baseline regression) | NA | 79 | 0.05 | 0.22 | 0.00 | 1.00 |
| Dummy repressed peoples (including regions to which repressed groups did not return) | NA | 79 | 0.18 | 0.38 | 0.00 | 1.00 |
| Dummy republic (2000s) | NA | 79 | 0.25 | 0.44 | 0.00 | 1.00 |
| Dummy Soviet borders | NA | 73 | 0.18 | 0.39 | 0.00 | 1.00 |
| Education (1979) | % | 79 | 6.16 | 2.35 | 4.30 | 19.70 |
| Education (2002) | % | 79 | 17.20 | 3.61 | 11.20 | 35.97 |
| Fiscal transfers (2000-2004) | % | 79 | 27.38 | 18.52 | 1.11 | 79.06 |
| Housing construction (1976) | sq. meters per capita | 73 | 0.43 | 0.08 | 0.29 | 0.72 |
| Income per capita (1985) | RUR | 79 | 2.15 | 17.85 | 0.08 | 158.80 |
| Income per capita (2000-2004) | thousands RUR | 79 | 3.48 | 1.95 | 1.13 | 14.81 |
| Infant mortality (1970s) | NA | 79 | 23.89 | 4.93 | 14.80 | 42.10 |
| Literacy (1890s) | % | 77 | 20.00 | 9.78 | 4.10 | 62.60 |
| Log oil and gas (2000-2004) | Log (1+ coal equivalent) | 79 | 0.65 | 1.26 | 0.00 | 6.93 |
| Monthly salary (1975) | RUR | 79 | 156.08 | 53.19 | 107.00 | 400.00 |
| Number of civic protests (2007-2012) | NA | 77 | 8.74 | 12.39 | 0.00 | 69.00 |
| Number of economic protests (2007-2012) | NA | 77 | 7.43 | 8.47 | 0.00 | 45.00 |
| Number of political protests (2007-2012) | NA | 77 | 14.05 | 14.43 | 0.00 | 74.00 |
| Number of social protests (2007-2012) | NA | 77 | 8.39 | 11.89 | 0.00 | 69.00 |

| | | | | | | |
|---|--------------------------|----|---------|---------|--------|----------|
| Openness to foreign trade | % | 79 | 1.43 | 1.37 | 0.09 | 10.95 |
| Outsiders (1890s) | % | 77 | 8.39 | 3.88 | 1.40 | 18.00 |
| Party saturation (1970s) | % | 79 | 8.35 | 1.58 | 5.98 | 15.43 |
| Peasants (1890s) | % | 77 | 76.53 | 21.41 | 7.70 | 97.20 |
| Petty bourgeoisie (<i>meshchane</i>) (1890s) | % | 77 | 6.98 | 4.19 | 1.30 | 22.10 |
| Population (1977) | thousands of people | 73 | 1857.38 | 1378.13 | 258.00 | 7819.00 |
| Population (2000-2004) | thousands of people | 79 | 1820.56 | 1619.62 | 53.60 | 10313.80 |
| Population density (1977) | people per sq. km | 71 | 31.59 | 38.61 | 0.30 | 300.80 |
| Presidential visits (2000-2004) | NA | 79 | 1.75 | 3.59 | 0.00 | 25.00 |
| Retail trade (1976) | thousands RUR per capita | 73 | 0.89 | 0.22 | 0.48 | 1.87 |
| Share of bureaucrats in the regional population | % | 79 | 10.42 | 5.20 | 2.88 | 39.77 |
| Share of bureaucrats with long tenure | % | 79 | 0.40 | 0.06 | 0.27 | 0.57 |
| Share of ethnic Russians (1979) | % | 79 | 78.83 | 20.71 | 11.64 | 98.08 |
| Share of ethnic Russians (2002) | % | 79 | 76.89 | 23.81 | 1.19 | 96.56 |
| Share of formerly repressed peoples | between 0 and 1 | 79 | 0.02 | 0.09 | 0.00 | 0.65 |
| Share of formerly repressed peoples and Jewish people | between 0 and 1 | 79 | 0.03 | 0.09 | 0.00 | 0.65 |
| Share of Muslims in the regional population (2012) | % | 77 | 5.23 | 13.36 | 0.00 | 83.00 |
| Share of state-owned enterprises (2000-2004) | % | 79 | 15.96 | 6.26 | 2.25 | 38.88 |
| Steel output (1975) | thousands tons | 79 | 1010.65 | 3403.23 | 0.00 | 24777.00 |
| Social well-being (2007) | NA | 79 | 43.44 | 18.23 | 1.00 | 100.00 |
| Territory (2000s) | millions sq. km | 79 | 0.22 | 0.47 | 0.00 | 3.10 |
| Urbanization (1977) | % | 73 | 65.27 | 13.40 | 39.00 | 100.00 |
| Urbanization (2000-2004) | % | 79 | 69.07 | 12.87 | 26.06 | 100.00 |

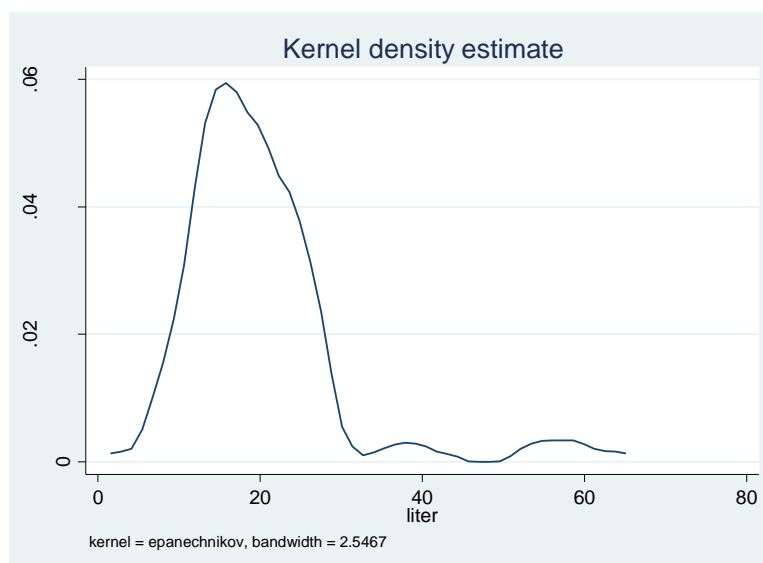
Note: oil and gas extraction recomputed in coal equivalent as extraction of oil in the region, millions of tons, * 1.4 plus extraction of gas in the region, billions of cubic meters * 1.2

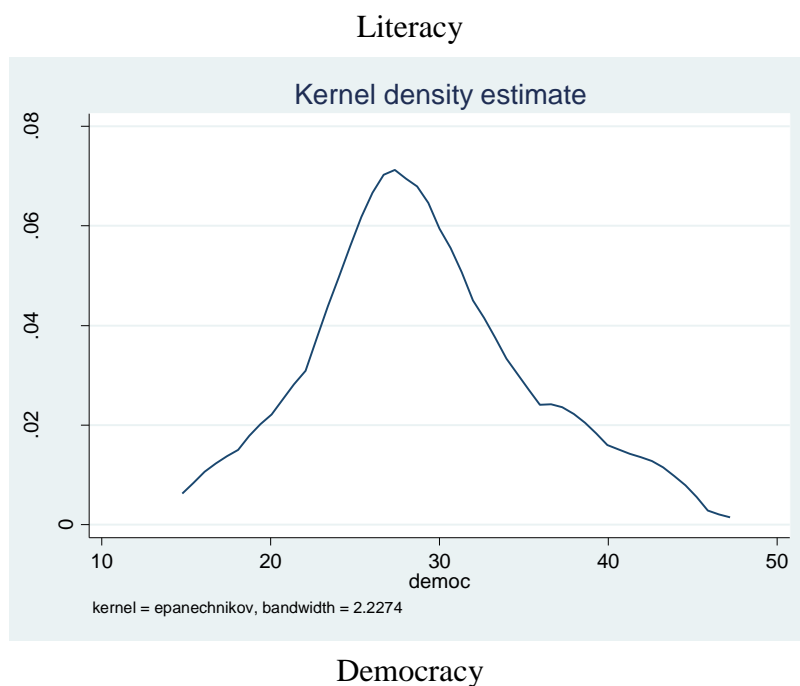
Distribution of key variables

Below we report the kernel density estimators for all of the three key variables employed in our analysis. The democracy index does not appear to have pronounced outliers: it is hardly surprising, since it had been constructed specifically for Russia's regions. We find that on both the literacy and CPSU membership measures however there are a number of outliers. The range of literacy in imperial Russia's *gubernii* is between 4.1 percent and 62.6 percent, but there are only four regions with literacy exceeding 40 percent. These outlier regions are Moscow, St. Petersburg, and regions in the vicinity of the two metropolises. The regional party membership share as a proportion of adult population varies between 5.98 percent and 15.43 percent. Again, there is only one region in which party saturation exceeds 12 percent: the City of Moscow; in five regions it is higher than 11 percent: Kaliningrad, Tver, Kamchatka, St. Petersburg and Leningradskaya Oblast. The presence of outliers has to be taken into account in our econometric models. In what follows, we therefore perform a number of specific tests dealing with the potential influence of outliers on our findings.



Party saturation





Appendix S5: Robustness checks

Description of robustness checks

Stage 1

- We replace distance to Moscow with the variable of distance to Helsinki, capital of the closest established West European democracy. Prior research has found that geographic proximity to Western Europe might influence the democratic development of Russia's regions. Regions located in greater proximity to the West might receive more EU aid aimed at democracy promotion; there may be also other diffusion processes at work facilitating "linkages" between Western regions and their democratic counterparts in the West (Lankina and Getachew 2006; Lankina and Getachew 2008; Levitsky and Way 2006). We also run a regression controlling for both distance to Moscow and to Helsinki. Distances to Moscow and to Helsinki are highly correlated though (correlation coefficient of 0.969). For distance to Moscow we use two proxies: one extracted from the official Rosstat publications and one from standard Internet mapping sources; both are highly correlated and yield similar results.
- It is possible that both pre-Soviet and Soviet modernization and contemporary democracy are influenced by the significance that the federal center attaches to a particular region. To capture this otherwise unobserved characteristic we count how often the region had been visited by the federal president in 2000-2004 and add this variable to the set of controls. We also replicate the above regressions excluding Krasnodar Krai (the region is known to be a favored holiday destination for Russia's presidents) and St. Petersburg, which are visited particularly often by national leaders.
- Some scholars have posited links between economic statism and democratization (Fish 2005). We capture the potential economic statism effect by employing the measure of the share of state-owned enterprises in the total number of enterprises in the region and add this control to the set of covariates.
- Considering the hypothesized links between religion and democracy; the potential effects of belonging to faith organizations on CPSU membership; and possible links between religion and literacy in the tsarist period (Lankina 2012), we control for (1) the variable (dummy) for regions with traditionally large Muslim populations; (2) and the variable of share of Muslims in the regional population (based on a 2012 survey by FOM – one of Russia's most prominent centers for the study of public opinion).
- Dependence on federal funding and availability of fiscal transfers might have a bearing on sub-national democracy (Gervasoni 2010). We therefore also control for federal fiscal transfers as measured by their share in total regional expenditures.
- Urbanization has been employed as an alternative proxy for modernization. We therefore control for regional urbanization levels (employing Rosstat data).
- Since one of the components of the Russian regional democracy index is municipal autonomy, which could be influenced by regional size and population, we include measures of territory in kilometers and population as additional control variables.
- Openness to foreign trade might co-vary with democratization, though the direction of the relationship is uncertain (Milner and Mukherjee 2010). We therefore employ a measure of the share of foreign trade in regional GDP in our additional specifications.
- Education in 2002 might be correlated with tsarist-era education. To ensure that multicollinearity is not an issue, we experimented with excluding the 2002 education measure from our regressions.

- Because of spatial continuity in modernization patterns, the 2000-2004 income variable might co-vary with tsarist-era education, as well as with CPSU membership saturation. We therefore experimented with excluding the 2000-2004 income variable.
- Considering that the dependent variable can be interpreted as an ordered one, we re-estimated our baseline regression using ordered logit.
- We employ alternative proxies for CPSU membership saturation: (a) the measure of the share of CPSU members in the total population of a region instead of party share in the adult population; (b) a dummy variable for regions with above-average CPSU membership saturation; (c) a dummy variable for regions with CPSU membership saturation above the median.
- We also employ alternative proxies for pre-communist literacy: (a) a dummy variable for regions with above-average levels of pre-communist literacy; (b) and a dummy variable for regions with pre-communist literacy above the median level.
- Alternative proxies of democracy to those of the Carnegie index are also employed: 1) the expert opinion survey democracy measures reported in McMann (McMann 2006); 2) measures obtained by subtracting from the baseline Carnegie index the sub-components measuring economic liberalization and corruption, which may be beyond the scope of the concept of democracy; 3) measures obtained by subtracting from the baseline Carnegie index the sub-indicator of municipal autonomy, which is particularly relevant for democracy at the sub-national level; 4) the democracy measure employed by Reuter and Buckley (2014), in which only six sub-components of the Carnegie index are retained.
- We employ different samples: 1) a reduced sample obtained after excluding all of the ethnically-defined regions with republic status, which during the Soviet period had the status of autonomous okrugs and therefore were part of higher-level regions (thus, we had no data on the size of the party organization in these regions and had to assume that the share of CPSU members in their population was the same as that in their parent regions); 2) a sample obtained after excluding St. Petersburg City and Leningradskaya oblast, which during the Soviet period formed part of a single region (in the main regressions, we assumed that both regions had the same CPSU saturation levels; another rationale for experimenting with excluding St. Petersburg is that the region had been an outlier in terms of literacy during the tsarist period); 3) a sample obtained by dropping the City of Moscow, which had a very high number of party members and which is also an outlier in terms of high literacy levels during the Tsarist period.
- Use robust regression estimator (`rreg` command in Stata) to reduce the impact of outliers on our estimations.
- Instead of taking logs of oil and gas output in the region, we employ the ratio of the value of oil and gas output in the region to the regional gross domestic product. The indicator is computed as follows: we multiply the total extraction of oil by the average export price of oil in USD and the total extraction of gas by the average export price of gas in USD. This value (in millions of USD) is divided by regional gross domestic product (in thousands of USD). The data on oil and gas extraction and GDP are from Rosstat; the data on export prices are from the Central Bank of Russia. Export prices for oil are reported in barrel and oil extraction in tons; to recompute tons into barrels we employ BP conversion tables.

Stage 2

- Instead of the two baseline proxies of well-being employed in the paper—monthly salary in 1975 and infant mortality—we employ alternative proxies: housing construction per capita in 1976; number of medical doctors per capita in 1976; and total retail trade in 1976. All of these measures capture regional quality of life (access to social services may

be even more important than monetary income in the Soviet Union, where most benefits were allocated through direct redistribution and not through trade). We also employ the measure of average income per capita in 1985.

- We experimented with adding variables that would allow us to control for the effects of pre-communist social structure in the *gubernii*. In particular, we employ the measures of regional population share of those listed in the 1897 First Imperial Census as peasants; those listed as petty bourgeoisie/ town dwellers (*meshchane*); and those in the category of “outsiders,” that is, migrants residing outside of the region in which they had been born. Historians have suggested that these imperial census categories are an imperfect representation of imperial Russia’s rapidly changing and fluid society at the turn of the century (Balzer 1996; Fitzpatrick 1993; Haimson 1988). Nevertheless, absent more accurate data, we include these admittedly imperfect measures because, as we discuss in the qualitative analysis part of the paper, pre-Revolutionary social origins may have influenced the likelihood and patterns of Communist Party recruitment in the period immediately after the Bolshevik Revolution. This effect could have persisted over the communist decades.
- Pre-communist literacy levels were higher in areas with high population density. At the same time, CPSU membership could be also affected by the density variable due to the imperatives of having separate party organizations in municipalities. We therefore control for population density (number of people per square kilometer of regional territory) as of January 1, 1978 (Moscow and Leningrad were excluded due to lack of data).
- Since the dependent variable of this regression is bound from above and from below (100% and 0%, respectively), which could create problems when estimating OLS, we use a log-odds transformation of the dependent variable.
- We experimented with employing different transformations of the CPSU saturation variable and literacy variable (as in tests for Stage 1); if the dependent variable becomes binary, we use both logit and OLS to estimate our regressions.
- We also employ different samples: (a) Drop the City of Moscow with very high CPSU membership saturation; drop tsarist literacy given that Moscow had been an outlier in terms of high literacy levels during the tsarist period; (b) Drop St. Petersburg and Leningradskaya oblast, which during the Soviet period formed part of a single region (in the full sample, we assumed that both regions had the same levels of CPSU member saturation); furthermore, St. Petersburg is an outlier in terms of imperial-era literacy.
- Hypothetically, we may observe a curvilinear effect of pre-communist literacy on CPSU membership (for a discussion of the presence of such a curvilinear effect under Brazil’s authoritarian regime, see (Geddes and Zaller 1989). For instance, it is possible that both those highly educated (because they may be politically more discerning or otherwise disagree with the communist doctrine on ideological grounds), and those least educated (because illiteracy may have limited exposure to communist print media featuring propaganda), members of the past order might have been less amenable to cooptation by the new regime. We estimate specification (1) adding the squared share of literates term.
- Soviet rules for admission into the party varied for those employed in different branches of the economy and, among those engaged in manual occupations, were particularly favorable for industrial workers. Precise regional data on employment by industry during the Soviet period is not available. We replicate our regressions controlling for extraction of coal and steel production in 1975, thereby capturing the effect of traditional “heavy industries.”
- We use the robust regression estimator, as in the Stage 1.
- We employ an alternative approach to compute the variable proxying for the legacy of repression against ethnic groups in particular regions. To begin with, our objective is to

ascertain the share of regional populations (in the 1970s) belonging to ethnic groups that had suffered deportations and possibly career constraints. If the region had a high share of these groups prior to deportation, but these groups did not return to their native regions after Stalin's death and partial rehabilitation, the fact of repressions should not affect party membership. The original dummy variable that we employed was constructed according to these criteria; but it took only those regions into account, to which the repressed groups returned and which received the status of an ethnic autonomy. In some cases, the return of repressed groups was not followed by the granting of autonomy status; the repressed groups may have also failed to return to their native lands. As part of our robustness checks, we devise a proxy to deal with this problem. Specifically, we employ the 1979 census data to compute for each region the share of populations belonging to repressed groups, namely the Koreans, Germans, Finns, Greeks, Kalmyks, Karachaevs, Chechens, Ingush, Balkars, Crimean Tatars, and Meskhetian Turks. This measure is then employed in lieu of the dummy variable for regions that had suffered repressions against particular ethnic groups. A similar measure is also devised for Jewish populations, considering the known semi-official practice of anti-Semitism in the Soviet Union. Note that the results employing these measures should be interpreted with caution considering that members of the repressed and discriminated groups may have sought to conceal their ethnic origins.

- We also introduce a dummy variable for regions in which the repressed groups had been residing originally rather than regions to which they were resettled. In this case our objective is different: we seek to find out whether the *interruption* of population continuity between pre-communist and communist periods had an impact on regional party saturation. In some regions the repressed groups, which failed to return to their native lands, represented a large fraction of pre-communist literates. One example of such a group, as discussed in the paper, is the Volga Germans; generally, many ethnic Germans failed to return to the Volga regions after deportations to Central Asia. In the Saratov and Volgograd *oblasti*, which cover the former territories of the Volga German Republic, in 2002 ethnic Germans comprised only 0.45% and 0.63% of the population, respectively. (These low numbers are likely to be a reflection of recent emigration to Germany, among other factors). We create a dummy variable that takes the value of one for regions in which historically the following groups resided: Ingermanland Finns, Volga Germans, Koreans, Pontian Greeks, Kalmyks, Karachaevs, Chechens, Ingush and Balkars (the other repressed groups resided originally outside of the RSFSR territories included in our analysis), and zero otherwise. We obtain a list of fourteen regions: Ingushetia, Kabardino-Balkaria, Kalmykia, Karelia, Karachaevo-Cherkessia, Khabarovsk *krai*, Primorsky *krai*, Leningradskaya *oblast*, St. Petersburg, Krasnodar *krai*, Saratov *oblast*, Volgograd *oblast*, Stavropol *krai* and Pskov *oblast*. We then employ this dummy variable instead of the original measure capturing regions which had been populated by repressed peoples and which were later allowed to return.

Stage 3

- We replicate most of the robustness checks described above.
- We also run a specification with binary treatment: our measure of literacy share is replaced with a dummy variable with the value of 1 if literacy is above the mean in the sample and 0 otherwise.
- We re-estimate all regressions employing the Imai et al. code in R, to demonstrate that the use of statistical software (R or Stata) has no impact on our results.

Results

S5.1: This Table presents results of additional robustness checks for Stage 1 (only beta coefficients and standard errors of key covariates are reported)

| Check | Effect of literacy | Effect of CPSU membership |
|--|---------------------|---------------------------|
| Control for distance to Helsinki | 0.253*** (0.065) | -2.631*** (0.685) |
| Control for distance to Helsinki, drop distance to Moscow | 0.294*** (0.068) | -2.488*** (0.688) |
| Use alternative proxy of distance to Moscow | 0.308*** (0.070) | -2.472*** (0.696) |
| Control for distance to Helsinki, use alternative proxy of distance to Moscow | 0.221*** (0.075) | -2.333*** (0.706) |
| Control for the national regime's perception of significance of a particular region | 0.314*** (0.076) | -2.455*** (0.731) |
| Control for the national regime's perception of significance of a particular region, drop Krasnodar (Sochi) and St. Petersburg | 0.221*** (0.075) | -2.334*** (0.706) |
| Control for the impact of economic statism | 0.253*** (0.071) | -1.995*** (0.624) |
| Control for Muslim populations (dummy) | 0.311*** (0.067) | -2.347*** (0.694) |
| Control for Muslim populations (share of Muslims) | 0.324*** (0.072) | -2.479*** (0.686) |
| Control for federal fiscal transfers | 0.278*** (0.071) | -2.155*** (0.638) |
| Control for regional size and population | 0.331*** (0.070) | -2.114*** (0.695) |
| Control for trade openness | 0.322*** (0.085) | -2.507*** (0.737) |
| Control for urbanization | 0.247*** (0.072) | -2.253*** (0.614) |
| Exclude the 2002 education control variable | 0.324*** (0.062) | -2.388*** (0.681) |
| Exclude the 2000-2004 income control variable | 0.315*** (0.076) | -2.155*** (0.644) |
| Ordered logit | 0.100*** (0.030) | -0.660** (0.319) |
| Employ a different proxy of party saturation (binary variable based on mean CPSU membership) | 0.225*** (0.067) | -4.205*** (1.695) |
| Employ a different proxy of saturation (binary variable based on median CPSU membership) | 0.224*** (0.064) | -4.242*** (1.551) |
| Employ a different proxy for literacy (binary variable based on mean literacy) | 5.383*** (1.315) | -2.485*** (0.706) |
| Employ a different measure of literacy (binary variable based on median literacy) | 6.354*** (1.224) | -2.533*** (0.617) |
| Employ an alternative measure of democracy (McMann index) | 1.824*** (0.432) | -11.318*** (4.069) |

| | | |
|--|---------------------|----------------------|
| Employ an alternative measure of democracy (exclude economic liberalization and corruption from the index) | 0.239*** (0.059) | -1.998*** (0.629) |
| Employ an alternative measure of democracy (exclude municipal autonomy from the index) | 0.289*** (0.063) | -2.243*** (0.624) |
| Employ an alternative measure of democracy (from the index, as in Reuter and Buckley 2014) | 0.189*** (0.045) | -1.520*** (0.498) |
| Employ a different sample (exclude regions that formed part of larger administrative regions in the Soviet period) | 0.336*** (0.069) | -2.478*** (0.659) |
| Employ a different sample (exclude St. Petersburg and Leningradskaya oblast) | 0.302*** (0.087) | -2.427*** (0.692) |
| Employ a different sample (exclude the City of Moscow) | 0.288*** (0.070) | -2.191*** (0.698) |
| Control for oil and gas extraction per unit of regional GDP | 0.311*** (0.069) | -2.593*** (0.671) |
| Robust regressions | 0.311*** (0.094) | -2.287*** (0.643) |

S5.2: Summary of additional robustness checks, Stage 2 (only beta coefficients and standard errors of key covariates are reported)

| Check | Effect of literacy |
|--|---|
| Control for well-being employing alternative measures (housing construction) | 0.091*** (0.019) |
| Control for well-being employing alternative measures (doctors per capita) | 0.088*** (0.019) |
| Control for well-being employing alternative measures (retail trade) | 0.088*** (0.018) |
| Control for well-being employing alternative measures (1985 income per capita) | 0.090*** (0.019) |
| Control for Tsarist social structure | 0.048* (0.026) |
| Control for population density | 0.102*** (0.023) |
| Log-odds transformation | 0.011*** (0.002) |
| Employ a different proxy of party saturation (binary variable based on mean CPSU membership), OLS | 0.027*** (0.007) |
| Employ a different proxy of party saturation (binary variable based on mean CPSU membership), logit | 0.465*** (0.109) |
| Employ a different proxy of party saturation (binary variable based on median CPSU membership), OLS | 0.025*** (0.006) |
| Employ a different proxy of party saturation (binary variable based on median CPSU membership), logit | 0.483*** (0.120) |
| Employ a different proxy of literacy (binary variable based on mean literacy) | 1.587*** (0.333) |
| Employ a different proxy of literacy (binary variable based on median literacy) | 1.348*** (0.400) |
| Employ a different sample (exclude St. Petersburg and Leningradskaya oblast) | 0.085*** (0.028) |
| Employ different sample (exclude the City of Moscow) | 0.084*** (0.014) |
| Curvilinear effect (reported the effect of linear and of squared terms sequentially). Note: maximum of the parabola is achieved at the level of literacy equal to 98.5%, which is above the literacy level of any region in our sample. Hence, for the actually observed values of literacy, the effect of literacy on CPSU membership is positive and significant | 0.197*** (0.064) -0.002* (0.001) |
| Control for Soviet industrial structure | 0.088*** (0.020) |
| Control for the legacy of repression against ethnic groups by employing the measure of population share of these groups instead of employing a regional dummy | 0.085*** (0.019) |
| Control for the legacy of repression against ethnic groups by employing the measure of population share of these groups, as well as share of Jewish population | 0.085*** (0.019) |
| Control for the legacy of repression against ethnic groups by employing a dummy for regions from which particular ethnic groups had been deported irrespective of whether these groups returned to their regions of origin or not | 0.090*** (0.017) |
| Robust regressions | 0.084*** (0.018) |

S5.3: Summary of additional robustness checks on Stage 3

| Specification | Effect | Mean | 95% confidence interval | |
|--|---------------------------------------|--------------------------|---------------------------|--------------------------|
| Drop education 2002 from the set of control variables | ACME Direct effect Total effect | -0.222 0.336 0.113 | -0.414 0.221 0.000 | -0.068 0.450 0.201 |
| Drop income 2000-2004 from the set of control variables | ACME Direct effect Total effect | -0.196 0.342 0.147 | -0.369 0.198 0.054 | -0.055 0.486 0.239 |
| Employ monthly salary (1975) as a proxy for Soviet-period income | ACME Direct effect Total effect | -0.202 0.336 0.134 | -0.352 0.200 -0.017 | -0.083 0.468 0.285 |
| Employ income per capita (1985) as a proxy for Soviet-period income | ACME Direct effect Total effect | -0.224 0.336 0.112 | -0.385 0.200 -0.049 | -0.095 0.468 0.265 |
| Employ housing construction per capita as a proxy for Soviet-period income | ACME Direct effect Total effect | -0.228 0.336 0.108 | -0.394 0.200 -0.055 | -0.096 0.468 0.263 |
| Employ doctors per capita as a proxy for Soviet-period income | ACME Direct effect Total effect | -0.221 0.336 0.115 | -0.380 0.200 -0.046 | -0.093 0.468 0.268 |
| Employ retail trade as a proxy for Soviet-period income | ACME Direct effect Total effect | -0.221 0.336 0.115 | -0.378 0.200 -0.045 | -0.094 0.468 0.266 |
| Control for Soviet-period ethnic structure | ACME Direct effect Total effect | -0.190 0.336 0.146 | -0.368 0.200 0.054 | -0.060 0.468 0.226 |
| Control for Tsarist social structure | ACME Direct effect Total effect | -0.117 0.336 0.220 | -0.278 0.200 0.048 | 0.004 0.468 0.398 |
| Control for Soviet population density | ACME Direct effect Total effect | -0.230 0.324 0.094 | -0.452 0.173 -0.030 | -0.066 0.470 0.199 |
| Control for Soviet industrial structure | ACME Direct effect | -0.215 0.336 | -0.380 0.200 | -0.093 0.468 |

| | | | | |
|--|---------------|--------|--------|--------|
| | Total effect | 0.121 | -0.044 | 0.272 |
| Employ democracy index 1991-2001 | ACME | -0.233 | -0.401 | -0.107 |
| | Direct effect | 0.395 | 0.234 | 0.552 |
| | Total effect | 0.162 | -0.018 | 0.329 |
| Control for oil and gas extraction per unit of regional GDP in 2000-2004 | ACME | -0.221 | -0.379 | -0.097 |
| | Direct effect | 0.337 | 0.204 | 0.467 |
| | Total effect | 0.116 | -0.042 | 0.272 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups instead of employing a regional dummy | ACME | -0.212 | -0.368 | -0.088 |
| | Direct effect | 0.336 | 0.200 | 0.468 |
| | Total effect | 0.124 | -0.033 | 0.277 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups, as well as share of Jewish population | ACME | -0.212 | -0.368 | -0.088 |
| | Direct effect | 0.336 | 0.200 | 0.468 |
| | Total effect | 0.124 | -0.033 | 0.276 |
| Control for urbanization in 2000-2004 | ACME | -0.201 | -0.353 | -0.092 |
| | Direct effect | 0.258 | 0.119 | 0.409 |
| | Total effect | 0.057 | -0.119 | 0.221 |
| Binary treatment | ACME | -3.982 | -6.919 | -1.603 |
| | Direct effect | 5.539 | 2.951 | 8.054 |
| | Total effect | 1.557 | -1.596 | 4.493 |
| Control for the legacy of repression against particular ethnic groups by employing a dummy for regions from which particular ethnic groups had been deported irrespective of whether these groups returned to their regions of origin or not | ACME | -0.226 | -0.381 | -0.100 |
| | Direct effect | 0.336 | 0.200 | 0.468 |
| | Total effect | 0.111 | -0.047 | 0.259 |

Note: see Table 3

S5.4: Mediation analysis employing the Imai et al. code in R (for baseline regressions and robustness checks)

| Specification | Effect | Mean | 95% confidence interval | | p-value |
|--|---------------|--------|-------------------------|--------|---------|
| Baseline specification | ACME | -0.207 | -0.346 | -0.091 | 0.00 |
| | Direct effect | 0.338 | 0.171 | 0.500 | 0.00 |
| | Total effect | 0.131 | -0.038 | 0.301 | 0.12 |
| Robustness checks | | | | | |
| Drop education 2002 from the set of control variables | ACME | -0.211 | -0.343 | -0.099 | 0.00 |
| | Direct effect | 0.334 | 0.180 | 0.485 | 0.00 |
| | Total effect | 0.123 | -0.043 | 0.279 | 0.14 |
| Drop income 2000-2004 from the set of control variables | ACME | -0.187 | -0.320 | -0.074 | 0.00 |
| | Direct effect | 0.340 | 0.167 | 0.514 | 0.00 |
| | Total effect | 0.153 | -0.016 | 0.319 | 0.08 |
| Employ monthly salary (1975) as a proxy for Soviet-period income | ACME | -0.201 | -0.341 | -0.093 | 0.00 |
| | Direct effect | 0.337 | 0.161 | 0.503 | 0.00 |
| | Total effect | 0.137 | -0.028 | 0.305 | 0.12 |
| Employ income per capita (1985) as a proxy for Soviet-period income | ACME | -0.223 | -0.363 | -0.109 | 0.00 |
| | Direct effect | 0.339 | 0.173 | 0.512 | 0.00 |
| | Total effect | 0.116 | -0.060 | 0.286 | 0.20 |
| Employ housing construction per capita as a proxy for Soviet-period income | ACME | -0.229 | -0.391 | -0.103 | 0.00 |
| | Direct effect | 0.333 | 0.159 | 0.503 | 0.00 |
| | Total effect | 0.104 | -0.071 | 0.275 | 0.24 |
| Employ doctors per capita as a proxy for Soviet-period income | ACME | -0.216 | -0.356 | -0.094 | 0.00 |
| | Direct effect | 0.335 | 0.170 | 0.505 | 0.00 |
| | Total effect | 0.119 | -0.056 | 0.289 | 0.19 |
| Employ retail trade as a proxy for Soviet-period income | ACME | -0.218 | -0.364 | -0.101 | 0.00 |
| | Direct effect | 0.334 | 0.154 | 0.508 | 0.00 |
| | Total effect | 0.116 | -0.079 | 0.287 | 0.20 |
| Control for Soviet-period ethnic structure | ACME | -0.183 | -0.308 | -0.080 | 0.00 |
| | Direct effect | 0.333 | 0.157 | 0.502 | 0.00 |
| | Total effect | 0.150 | -0.013 | 0.314 | 0.09 |
| Control for tsarist social structure | ACME | -0.119 | -0.256 | -0.004 | 0.00 |
| | Direct effect | 0.339 | 0.172 | 0.514 | 0.05 |

| | | | | | |
|---|---------------|--------|--------|--------|------|
| | Total effect | 0.220 | 0.031 | 0.425 | 0.02 |
| Control for Soviet population density | ACME | -0.221 | -0.387 | -0.088 | 0.00 |
| | Direct effect | 0.322 | 0.133 | 0.508 | 0.00 |
| | Total effect | 0.101 | -0.083 | 0.280 | 0.27 |
| Control for Soviet industrial structure | ACME | -0.222 | -0.365 | -0.102 | 0.00 |
| | Direct effect | 0.343 | 0.165 | 0.515 | 0.00 |
| | Total effect | 0.122 | -0.058 | 0.292 | 0.20 |
| Employ democracy index 1991-2001 | ACME | -0.224 | -0.375 | -0.105 | 0.00 |
| | Direct effect | 0.399 | 0.226 | 0.565 | 0.00 |
| | Total effect | 0.175 | 0.012 | 0.345 | 0.04 |
| Control for oil and gas extraction per unit of regional GDP in 2000-2004 | ACME | -0.221 | -0.359 | -0.105 | 0.00 |
| | Direct effect | 0.393 | 0.227 | 0.562 | 0.00 |
| | Total effect | 0.173 | 0.006 | 0.344 | 0.04 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups instead of employing a regional dummy | ACME | -0.212 | -0.348 | -0.094 | 0.00 |
| | Direct effect | 0.334 | 0.158 | 0.500 | 0.00 |
| | Total effect | 0.123 | -0.058 | 0.286 | 0.17 |
| Control for the legacy of repression against particular ethnic groups by employing the measure of population share of these groups, as well as share of Jewish population | ACME | -0.208 | -0.340 | -0.091 | 0.00 |
| | Direct effect | 0.335 | 0.166 | 0.505 | 0.00 |
| | Total effect | 0.127 | -0.042 | 0.301 | 0.16 |
| Control for urbanization 2000-2004 | ACME | -0.197 | -0.355 | -0.075 | 0.00 |
| | Direct effect | 0.259 | 0.041 | 0.409 | 0.02 |
| | Total effect | 0.062 | -0.191 | 0.218 | 0.55 |
| Binary treatment | ACME | -3.980 | -6.870 | -1.750 | 0.00 |
| | Direct effect | 5.550 | 2.770 | 8.220 | 0.00 |
| | Total effect | 1.580 | -1.470 | 4.700 | 0.29 |
| Control for the legacy of repression against particular ethnic groups by employing a dummy for regions from which the ethnic groups had been deported irrespective of whether these groups returned to their regions of origin or not | ACME | -0.226 | -0.379 | -0.101 | 0.00 |
| | Direct effect | 0.337 | 0.161 | 0.517 | 0.00 |
| | Total effect | 0.111 | -0.066 | 0.283 | 0.22 |

Note: see Table 3

Appendix S6: Impact of outliers on the results of the estimation

The distribution of both literacy and party saturation is characterized by a number of outliers (see Appendix S3). We address this issue in the following ways. Already in the robustness checks for stages 1 and 2 of our analysis we re-ran our regressions employing the so-called robust regression estimator in Stata, which is meant to be less sensitive to outliers (Appendix S5). In what follows we also perform a number of further tests:

- Remove the first and the last 5-percentiles of the distribution of the literacy and of the party saturation indicators from the sample;
- Remove 5 percent observations with the highest value of literacy and of party saturation (we pay particular attention to high values because this is where most outliers appear to be concentrated);
- Remove observations with very high literacy and party saturation values based on a visual inspection of the distribution of the key variables.

None of these tests change our results in a substantial way.

S6.1: Changes in the results of Stage 1 after removing outliers

| Check | Effect of literacy | Effect of party saturation |
|--|---------------------|----------------------------|
| Exclude 5% and 95% percentiles of party saturation | 0.236** (0.110) | -2.146** (0.824) |
| Exclude 5% and 95% percentiles of literacy | 0.485** (0.192) | -2.554*** (0.805) |
| Exclude 95% percentile of party saturation | 0.311*** (0.109) | -2.463*** (0.742) |
| Exclude 95% percentile of literacy | 0.331** (0.131) | -2.294*** (0.747) |
| Exclude regions with party saturation exceeding 9% | 0.468*** (0.149) | -3.621*** (0.926) |
| Exclude regions with literacy exceeding 35% | 0.401*** (0.144) | -2.441*** (0.756) |

S6.2: Changes in the results of Stage 2 after removing outliers

| Check | Effect of literacy |
|--|---------------------|
| Exclude 5% and 95% percentiles of party saturation | 0.114*** (0.021) |
| Exclude 5% and 95% percentiles of literacy | 0.123*** (0.040) |
| Exclude 95% percentile of party saturation | 0.112*** (0.022) |
| Exclude 95% percentile of literacy | 0.105*** (0.026) |
| Exclude regions with party saturation exceeding 9% | 0.053** (0.023) |
| Exclude regions with literacy exceeding 35% | 0.121*** (0.027) |

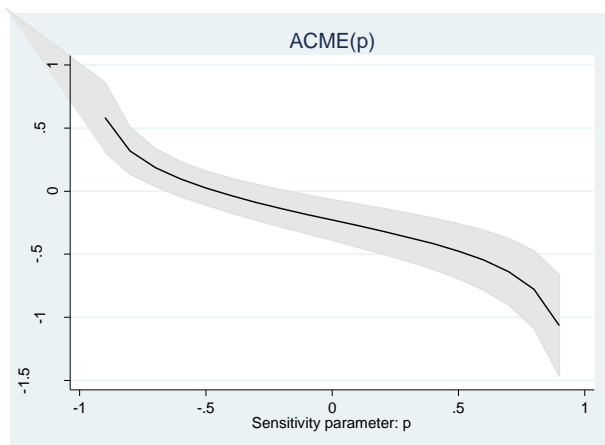
S6.3: Changes in the results of Stage 3 after removing outliers

| Specification | Effect | Mean | 95% confidence interval | |
|--|---------------|--------|-------------------------|--------|
| Exclude 5% and 95% percentiles of party saturation | ACME | -0.230 | -0.444 | -0.060 |
| | Direct effect | 0.258 | 0.039 | 0.471 |
| | Total effect | 0.028 | -0.197 | 0.241 |
| Exclude 5% and 95% percentiles of literacy | ACME | -0.332 | -0.650 | -0.097 |
| | Direct effect | 0.444 | 0.082 | 0.796 |
| | Total effect | 0.112 | -0.234 | 0.490 |
| Exclude 95% percentile of party saturation | ACME | -0.256 | -0.458 | -0.097 |
| | Direct effect | 0.336 | 0.123 | 0.543 |
| | Total effect | 0.080 | -0.143 | 0.305 |
| Exclude 95% percentile of literacy | ACME | -0.266 | -0.504 | -0.089 |
| | Direct effect | 0.363 | 0.102 | 0.616 |
| | Total effect | 0.097 | -0.153 | 0.364 |
| Exclude regions with party saturation exceeding 9% | ACME | -0.252 | -0.516 | -0.035 |
| | Direct effect | 0.510 | 0.214 | 0.797 |
| | Total effect | 0.258 | -0.088 | 0.637 |
| Exclude regions with literacy exceeding 35% | ACME | -0.323 | -0.595 | -0.121 |
| | Direct effect | 0.451 | 0.184 | 0.710 |
| | Total effect | 0.128 | -0.135 | 0.409 |

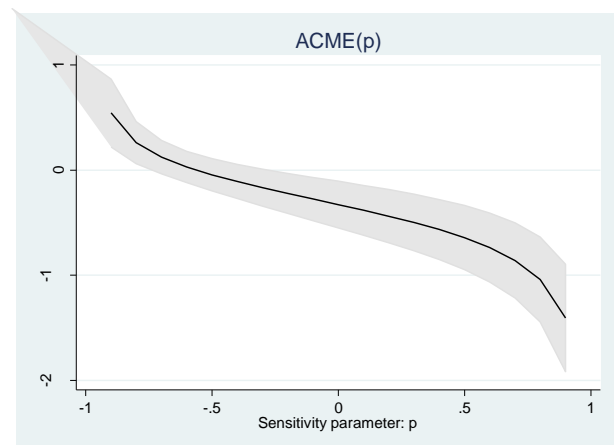
Note: see Table 3

S6.4: Sensitivity analysis

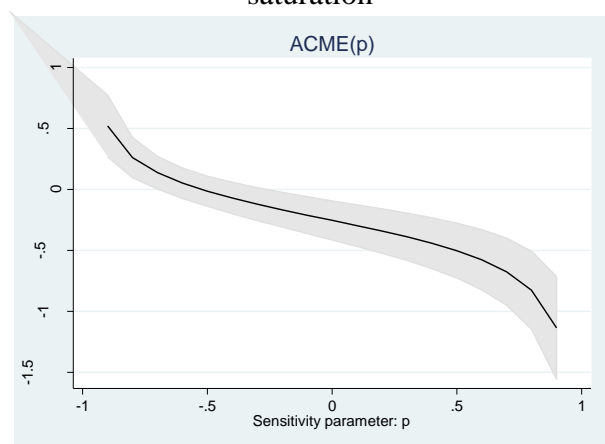
| Specification | rho, at which ACME = 0 |
|--|------------------------|
| Exclude 5% and 95% percentiles of party saturation | -0.223 |
| Exclude 5% and 95% percentiles of literacy | -0.248 |
| Exclude 95% percentile of party saturation | -0.289 |
| Exclude 95% percentile of literacy | -0.289 |
| Exclude regions with party saturation exceeding 9% | -0.425 |
| Exclude regions with literacy exceeding 35% | -0.304 |



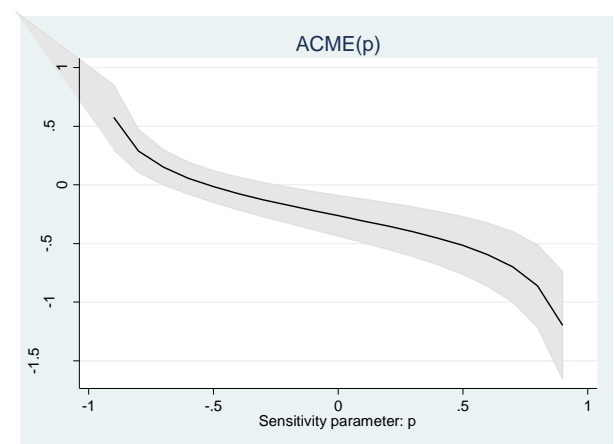
Exclude 5% and 95% percentiles of party saturation



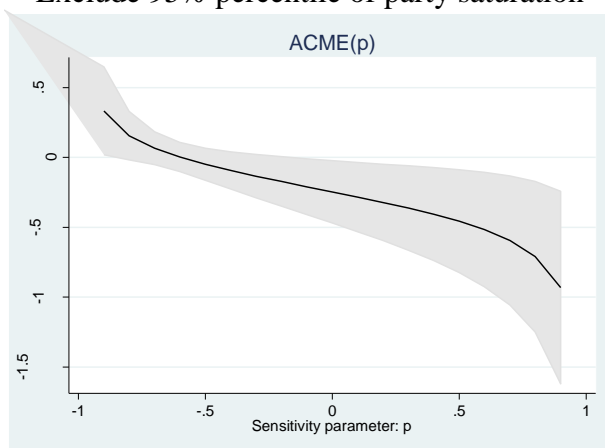
Exclude 5% and 95% percentiles of literacy



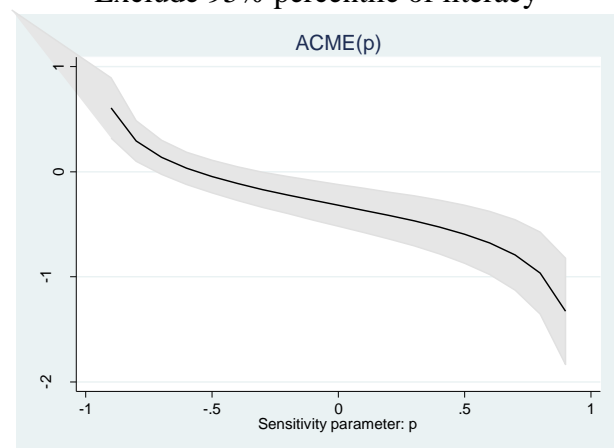
Exclude 95% percentile of party saturation



Exclude 95% percentile of literacy



Exclude regions with party saturation exceeding 9%



Exclude regions with literacy exceeding 35%

Appendix S7: Effects for individual sub-components of the democracy index

We here replicate our estimations in which we employed the composite democracy index, for individual sub-components of this index. Table S7.1 replicates the Table 1 of the main part of the paper for each of these sub-components. The general results do not change, regardless of which of the dimensions we employ. The regressions suggest that party saturation has a negative effect on all of the dimensions of the index, with the exception of electoral freedoms. At the same time, we find that regions with comparatively higher levels of pre-communist literacy have higher democracy scores irrespective of which sub-indicator of the index is employed, with the exception of the municipal autonomy and composition of elites sub-components of the democracy index.

Table S7.2 estimates the mediation analysis model for each of the sub-components. The results are not substantively different. With the exception of the elections sub-component, the indirect effect is always significantly different from zero and negative; with the exception of the municipal autonomy and composition of regional elites sub-components of the democracy index, the direct effect is significantly different from zero and positive. The total effect is insignificant at the 5 percent level, except for elections, where it is significant and positive. This is hardly surprising: for this variable the CPSU legacy appears to have no effect; this is important in terms of identifying the mechanisms of the persistence of the party saturation legacy. Overall, again, the positive direct effect of literacy on democracy is offset by the negative indirect effect of party saturation. The magnitude of the direct and indirect effects is of course smaller than for the aggregate index, since the index itself varies on a smaller scale (from 1 to 5). Specifically, we find a direct effect in the magnitude of 0.02 – 0.04 and an indirect effect of minus 0.01 – 0.03, depending on the specification.

S7.1: The effect of communist and pre-communist legacies on various aspects of democracy, 2000-2004, OLS

| Dimension | Share of CPSU members | | Literacy | |
|-------------------------|-----------------------|---------|----------|---------|
| | beta | s.e. | beta | s.e. |
| Openness | -0.264** | (0.100) | 0.038*** | (0.010) |
| Elections | -0.137 | (0.100) | 0.028*** | (0.011) |
| Pluralism | -0.254*** | (0.088) | 0.025*** | (0.009) |
| Media | -0.359*** | (0.102) | 0.038*** | (0.009) |
| Economic liberalization | -0.229*** | (0.079) | 0.039*** | (0.010) |
| Civil society | -0.282*** | (0.105) | 0.036*** | (0.011) |
| Political organization | -0.294*** | (0.081) | 0.031** | (0.012) |
| Elites | -0.224*** | (0.081) | 0.023 | (0.014) |
| Corruption | -0.200** | (0.084) | 0.030** | (0.012) |
| Municipal autonomy | -0.185** | (0.088) | 0.019 | (0.012) |

Note: See Table 1. All other covariates of specification (1), Table 1, included in the regressions.

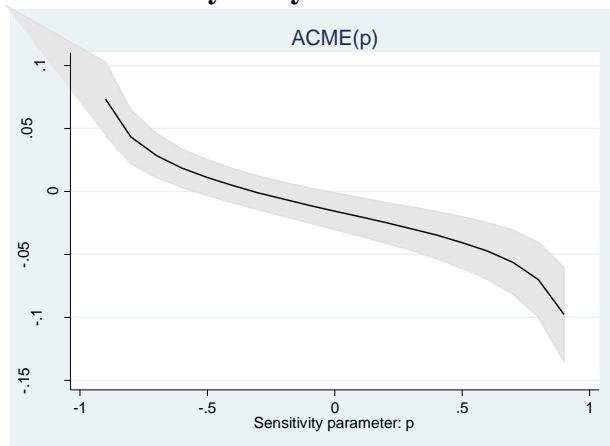
S7.2: Mediation analysis for various dimensions of democracy

| Dimension | Effect | Mean | 95% confidence interval | |
|-------------------------|---------------|--------|-------------------------|--------|
| Openness | ACME | -0.023 | -0.043 | -0.007 |
| | Direct effect | 0.042 | 0.023 | 0.061 |
| | Total effect | 0.019 | -0.002 | 0.039 |
| Elections | ACME | -0.011 | -0.030 | 0.003 |
| | Direct effect | 0.035 | 0.016 | 0.054 |
| | Total effect | 0.024 | 0.004 | 0.043 |
| Pluralism | ACME | -0.024 | -0.042 | -0.010 |
| | Direct effect | 0.027 | 0.011 | 0.043 |
| | Total effect | 0.003 | -0.016 | 0.023 |
| Media | ACME | -0.031 | -0.054 | -0.014 |
| | Direct effect | 0.039 | 0.021 | 0.056 |
| | Total effect | 0.008 | -0.015 | 0.029 |
| Economic liberalization | ACME | -0.024 | -0.042 | -0.009 |
| | Direct effect | 0.042 | 0.024 | 0.058 |
| | Total effect | 0.018 | 0.000 | 0.036 |
| Civil society | ACME | -0.028 | -0.051 | -0.010 |
| | Direct effect | 0.038 | 0.016 | 0.059 |
| | Total effect | 0.010 | -0.013 | 0.032 |
| Political organization | ACME | -0.026 | -0.045 | -0.012 |
| | Direct effect | 0.031 | 0.008 | 0.054 |
| | Total effect | 0.005 | -0.015 | 0.028 |
| Elites | ACME | -0.021 | -0.041 | -0.007 |
| | Direct effect | 0.027 | -0.002 | 0.055 |
| | Total effect | 0.006 | -0.025 | 0.038 |
| Corruption | ACME | -0.018 | -0.034 | -0.005 |
| | Direct effect | 0.031 | 0.008 | 0.052 |
| | Total effect | 0.013 | -0.004 | 0.032 |
| Municipal autonomy | ACME | -0.016 | -0.033 | -0.002 |
| | Direct effect | 0.022 | -0.001 | 0.045 |
| | Total effect | 0.006 | -0.013 | 0.027 |

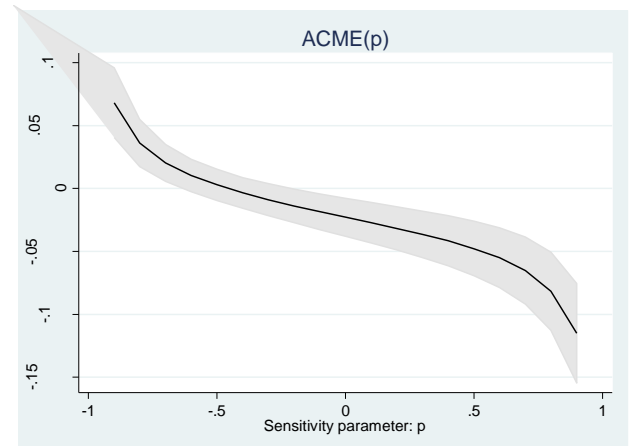
S7.3: Robustness checks: Estimation of S8.2 employing the R code devised by Imai et al.

| Dimension | Effect | Mean | 95% confidence interval | | p-value |
|-------------------------|---------------|--------|-------------------------|--------|---------|
| Openness | ACME | -0.023 | -0.041 | -0.008 | 0.00 |
| | Direct effect | 0.042 | 0.018 | 0.065 | 0.00 |
| | Total effect | 0.019 | -0.004 | 0.042 | 0.10 |
| Elections | ACME | -0.011 | -0.028 | 0.003 | 0.12 |
| | Direct effect | 0.033 | 0.009 | 0.061 | 0.01 |
| | Total effect | 0.022 | -0.001 | 0.047 | 0.07 |
| Pluralism | ACME | -0.021 | -0.038 | -0.007 | 0.00 |
| | Direct effect | 0.029 | 0.005 | 0.052 | 0.01 |
| | Total effect | 0.008 | -0.015 | 0.031 | 0.50 |
| Media | ACME | -0.031 | -0.050 | -0.014 | 0.00 |
| | Direct effect | 0.041 | 0.017 | 0.064 | 0.00 |
| | Total effect | 0.010 | -0.016 | 0.034 | 0.39 |
| Economic liberalization | ACME | -0.018 | -0.036 | -0.005 | 0.00 |
| | Direct effect | 0.042 | 0.019 | 0.067 | 0.00 |
| | Total effect | 0.024 | 0.001 | 0.046 | 0.04 |
| Civil society | ACME | -0.024 | -0.042 | -0.009 | 0.00 |
| | Direct effect | 0.038 | 0.014 | 0.061 | 0.00 |
| | Total effect | 0.014 | -0.010 | 0.036 | 0.24 |
| Political organization | ACME | -0.027 | -0.045 | -0.013 | 0.00 |
| | Direct effect | 0.032 | 0.014 | 0.051 | 0.00 |
| | Total effect | 0.005 | -0.014 | 0.026 | 0.60 |
| Elites | ACME | -0.200 | -0.039 | -0.005 | 0.01 |
| | Direct effect | 0.027 | 0.000 | 0.052 | 0.05 |
| | Total effect | 0.007 | -0.018 | 0.031 | 0.56 |
| Corruption | ACME | -0.018 | -0.034 | -0.005 | 0.01 |
| | Direct effect | 0.030 | 0.009 | 0.053 | 0.01 |
| | Total effect | 0.012 | -0.011 | 0.033 | 0.27 |
| Municipal autonomy | ACME | -0.016 | -0.035 | -0.003 | 0.02 |
| | Direct effect | 0.021 | -0.003 | 0.047 | 0.10 |
| | Total effect | 0.005 | -0.018 | 0.028 | 0.69 |

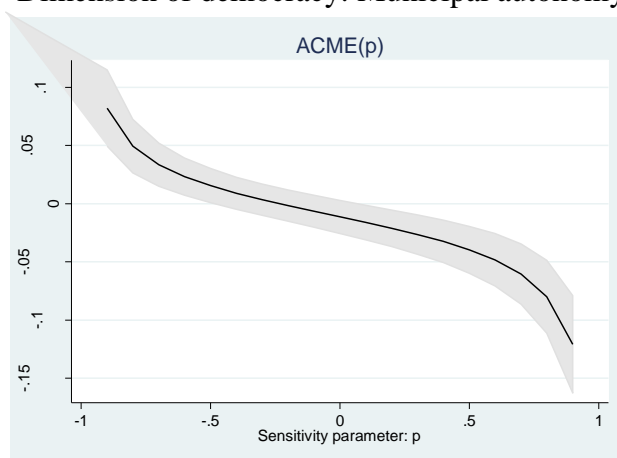
S7.4: Sensitivity analysis



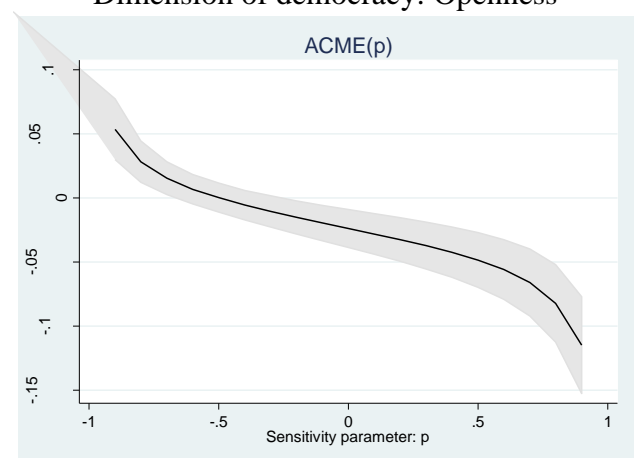
Dimension of democracy: Municipal autonomy



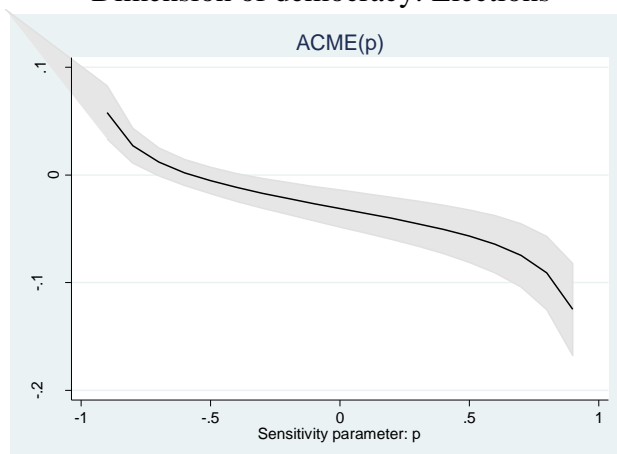
Dimension of democracy: Openness



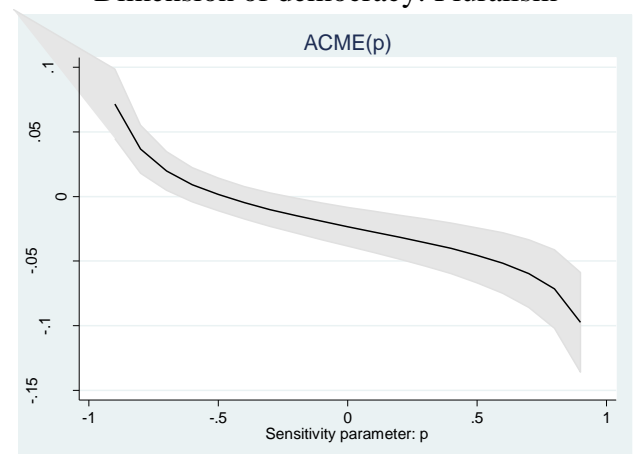
Dimension of democracy: Elections



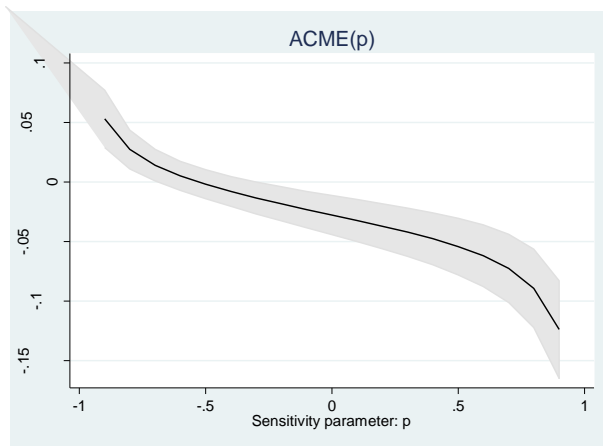
Dimension of democracy: Pluralism



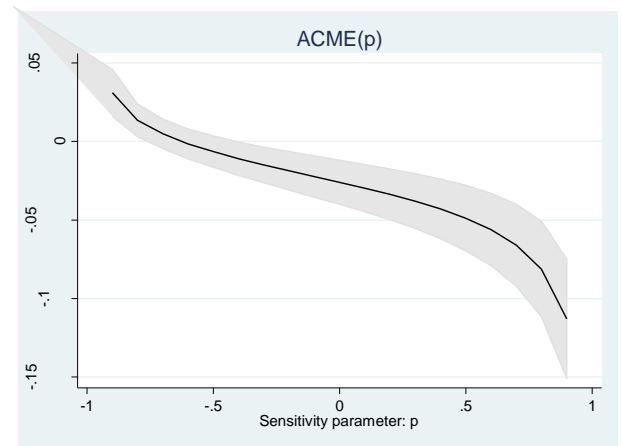
Dimension of democracy: Media



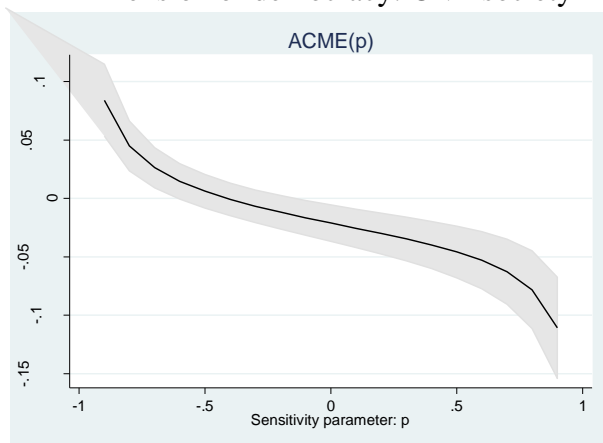
Dimension of democracy: Economic liberalization



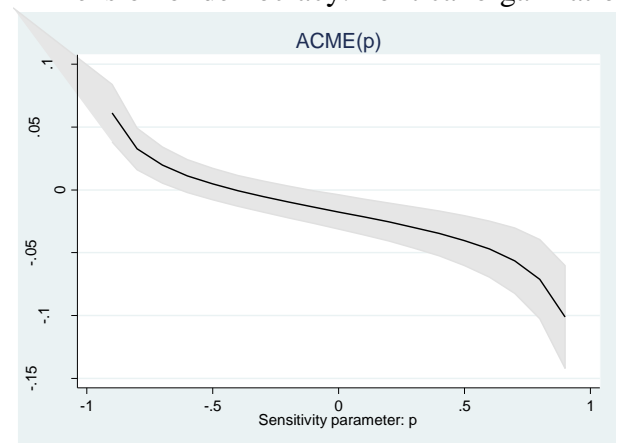
Dimension of democracy: Civil society



Dimension of democracy: Political organization



Dimension of democracy: Elites

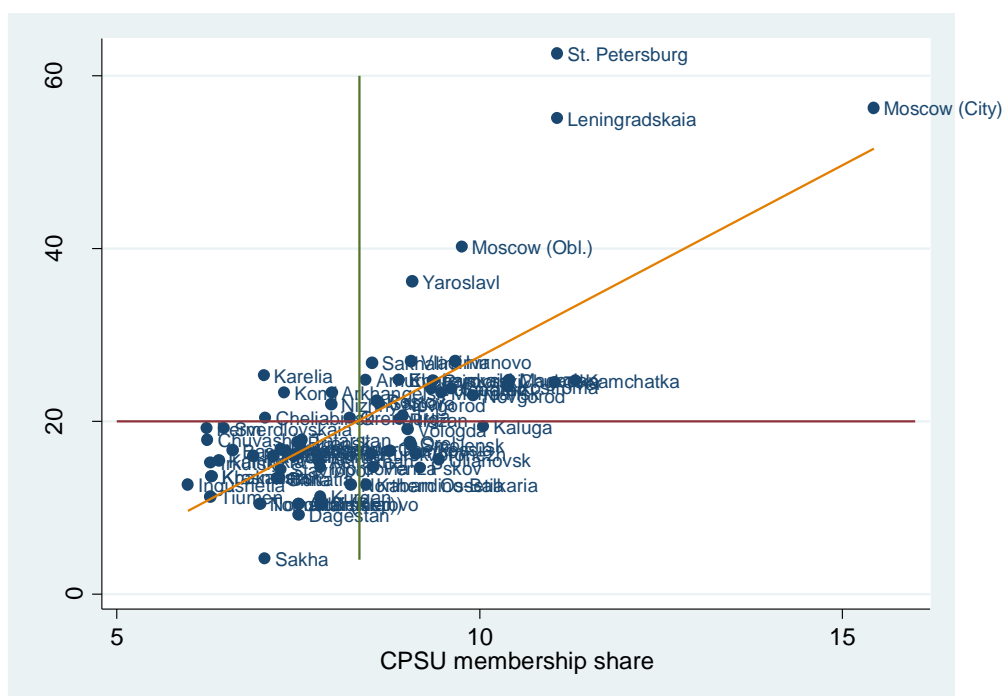


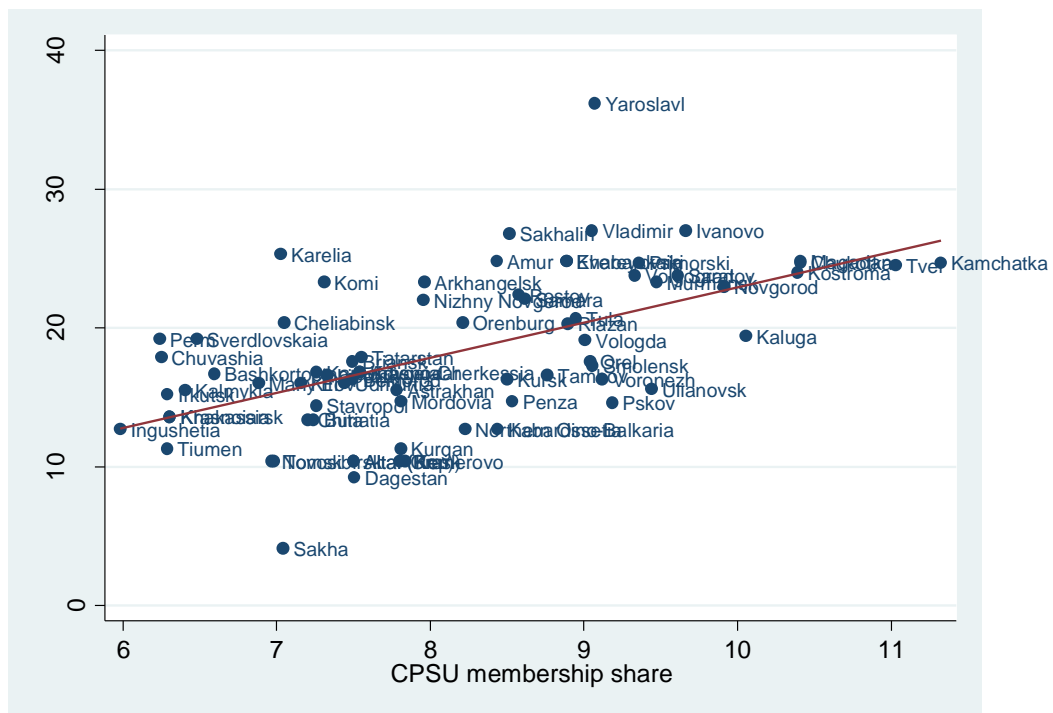
Dimension of democracy: Corruption

| Dimension | rho, at which ACME = 0 |
|-------------------------|------------------------|
| Openness | -0.290 |
| Elections | -0.187 |
| Pluralism | -0.272 |
| Media | -0.386 |
| Economic liberalization | -0.302 |
| Civil society | -0.346 |
| Political organization | -0.515 |
| Elites | -0.261 |
| Corruption | -0.370 |
| Municipal autonomy | -0.151 |

Appendix S8: Visual representation of the co-variance between party saturation and pre-communist literacy

The following two graphs visually illustrate the presence of a strong link between CPSU membership levels and pre-communist literacy. The first graph represents a scatterplot of all regions for these two variables. Vertical and horizontal lines separate the image into four areas based on the means of CPSU membership and pre-communist literacy, respectively. The correlation between the two variables is very strong and only a few regions belong to the categories of “high CPSU membership – low literacy” and “high literacy – low CPSU membership.” Considering that the figure is influenced by a few outliers (which, as our analysis in S6 shows, do not change our results), we also create another figure, excluding the outliers. It is evident that most of the observations are located close to the regression line. Pre-communist literacy thus remains a good predictor of regional party saturation levels.





Appendix S9: Factors altering the effect of literacy on levels of party saturation

In what follows, we investigate which factors account for the “under-performance” or “over-performance” of regions with respect to party saturation considering their imperial-era literacy levels. We employ two procedures for these purposes. We begin by devising two dummy variables. The first takes the value of one for Type 3 outlier regions. The second is equal to one for Type 4 outliers. We then regress these variables on a set of potentially relevant covariates. Specifically, we regress the outlier variables on the following communist-era variables: (a) population density and population size; (b) production of coal and steel; (c) dummy for regions located on the borders of the USSR; (d) share of ethnic Russians; and (e) infant mortality as a proxy for quality of life. The regressions are estimated using logit because the dependent variable is binary.

We find that the likelihood of becoming a Type 3 region is significantly higher if the level of steel production in a region is high. An illustrative example of a region with historically well-developed mining industry is Chelyabinsk, which had been the industrial powerhouse of the Urals well before the Bolshevik Revolution. In fact, most of the region’s towns originated as early as the 17th century and were linked to the development of iron and steel mining in the Urals Mountains (McFaul and Petrov 1998). Generally, throughout the USSR, Rigby (1968) found that regions specialising on mining and metallurgy tended to have relatively low party saturation levels despite being highly urbanized. These patterns help nuance our understanding of the links between indicators that conventionally capture modernization processes, and party recruitment.¹ For instance, Ukraine’s Kharkov and Dnepropetrovsk regions had been more party saturated than the heavily mining Donbass (Donetsk and Lugansk oblasts) even though the former had far larger rural populations than the latter. Employment as a mining worker is associated with hardship and occupational hazards. Party membership among miners would not have been regarded as a means for career progression in the same way that would have been the case for occupations requiring more advanced skills and having greater social prestige. At the same time, quality of life factors whereby centres of mining were perceived as less-desirable places to live, would account for lower numbers of cadre who would want to be parachuted into these regions from outside (Rigby 1968).²

¹ Thus, in Soviet Ukraine, regions that historically developed as centres of commerce, culture, or leisure like Crimea and Odessa also had disproportionately high concentrations of party members. In fact Crimea was found to be Ukraine’s most party saturated province (Rigby 1968).

² Another potentially significant factor accounting for low levels of party saturation is the presence of high-tech industries, as well as of closed cities (which often went together). The Chelyabinsk region had several such “numbered” cities with no names: Chelyabinsk-65, Chelyabinsk-70, etc. For understandable reasons, data on the precise share of scientists employed in these closed cities are not available, so we cannot conclusively ascertain the significance of this variable for all regions. However, we find interesting parallels between Chelyabinsk and another Type 3 (high literacy, low party saturation) region, namely Nizhniy Novgorod (Nizhegorodskaya oblast). Like Chelyabinsk, the Type 3 Nizhegorodskaya oblast had been a hub of industrial development and trade already in the 19th century. During the Soviet period, the Nizhny Novgorod city emerged as the USSR’s leading centre of science and high the development of technologies. At the same time, the city of Sarov, which became the closed city of Arzamas-16, turned into the USSR’s “capital of nuclear research” (McFaul and Petrov 1998, Vol. 2, 696). By the mid-1990s, science and science-related spheres, along with culture and the arts, constituted the second largest sources of regional employment after industry. Party membership statistics by research discipline indicate that hard sciences and engineering had been among the least party saturated areas of research. For instance, while in 1947, 17 percent of engineering professors were CPSU members, 58 professors in the social sciences and philosophy possessed CPSU membership cards (Rigby 1968, 445). Derluguian (2005, 110) notes that “hard” sciences represented “the main breeding ground for liberal dissidents, . . . especially the advanced fields of nuclear research and space exploration. During the 1950s and 1970s, these scholarly communities [along with other professions like linguists] enjoyed privileged funding, exceptionally high public acclaim, and relatively unrestricted intellectual exchanges with their Western colleagues.” The pursuit of such

We also find that the likelihood of becoming a Type 4 region is significantly higher for regions with high population density. Furthermore, regions with a high share of ethnic Russians in their population also had a significantly higher likelihood of being a Type 4 region (conversely, regions with non-Russian minority groups were less likely to have high levels of party saturation). The results with regard to population density partially corroborate the patterns that Rigby (1968) uncovered in analyzing regional variations in party recruitment in the USSR. For instance, he found that in rural areas, party organizations tended to be linked to village soviets—that is, to territorial administrative centers—rather than to production units like the *Kolkhozy* (collective farms). Accordingly, we may infer from these patterns that sparsely populated regions with correspondingly low densities of administrative centres would feature comparatively low levels of party saturation (Rigby 1968, 292). The reverse would be true for densely populated regions with many towns that would each have a party administrative body attached to it. The result for regions with minority ethnic groups likewise corroborate the patterns suggested in Rigby’s (1968) USSR-wide analysis of party recruitment, namely that party recruitment levels often tended to be lower in the “ethnic” republics and autonomies due to issues of self-selection or discrimination against particular groups (though some “ethnic” groups—notably Georgians and Armenians—did feature high party membership levels (Rigby 1968, 378)). These general patterns would also explain why the few “ethnic” regions that featured comparatively high literacy in the imperial period—Karelia and Komi—ended up among the Type 3 regions (high literacy-low saturation).

“obscure interests... beyond the focus of official Marxist-Leninist ideology... helped to foster cohesive communities with a sense of professional dignity and kinship with the intellectual community outside the USSR. It is no small matter that such disciplines normally required a familiarity with esoteric concepts and at least a basic knowledge of foreign languages, which tended to deter administrative careerists” (Derluguian 2005, 110-111). Some self-selection is thus likely to have been at work in that the dissident minded often chose technical professions unburdened with ideological dogma. Rigby (1968, 446) also speculates that “... a more permissive attitude” might have been at work towards “first rate scholars, allowing them to avoid the burdens and distractions of party membership which are pressed more insistently on their humbler colleagues[?].”

S9.1: Factors predicting whether a region would become a Type 3 or Type 4 region (logit estimates)

| | Type 3 region | Type 4 region |
|--------------------------------|----------------------|---------------------|
| Population | 0.0001 (0.000) | -0.001** (0.001) |
| Population density | -0.024 (0.028) | 0.019* (0.011) |
| External border of the USSR | 0.094 (1.278) | |
| Infant mortality | -0.003 (0.095) | 0.039 (0.084) |
| Share of ethnic Russians | -0.015 (0.026) | 0.044** (0.020) |
| Steel production | 0.0002** (0.0001) | -0.0002 (0.0003) |
| Coal production | -0.014 (0.023) | -0.231 (0.207) |
| Constant | -1.079 (4.912) | -4.426 (2.874) |
| Observations | 69 | 58 |
| Pseudo R-squared | 0.141 | 0.223 |

Note: robust standard errors applied. Soviet-era variables applied. The number of observations is lower than in Table 2 since some observations are excluded as completely determined.

Next, we run our baseline regression with party saturation levels as the dependent variable and literacy as the right-hand variable, but introduce interaction terms between literacy and the key variables described above. We find the following interaction terms to be significant: (a) steel production (it is negative, again, showing that regions with a large steel industry had lower CPSU membership for a given literacy level); (b) the share of ethnic Russians (it is positive, suggesting that in the “ethnic” regions comparable levels of literacy resulted in lower CPSU saturation levels); (c) two of the four indicators of repressed ethnic groups: share of repressed ethnic groups in the current regional population; and regions (dummy variable) that suffered repressions (irrespective of whether the peoples subjected to repressions subsequently resettled again in the region or not). The result for the first indicator of repression suggests that if the share of repressed groups in a region had been larger, the Soviet government showed less interest in coopting the educated strata of these groups, or that these educated strata were more reluctant to accept the offer of cooptation. The result with regard to the second indicator of repression suggests that in some cases the repressed ethnic groups may have represented a large proportion of literates before the Revolution, but that repression made the link between literacy and party saturation weaker. An example of an ethnic group with high literacy levels, as discussed in SA S5, is the Volga Germans. The Volga Germans had been deported to Central Asia, but many of the deportees remained in Central Asia as late as the 1990s and then emigrated to Germany as part of the country’s program to repatriate ethnic Germans to their historical homeland.

S10.2: Interaction terms between literacy and other variables

| | |
|---|-----------------------|
| Steel production | -0.0005* (0.0003) |
| Coal production | 0.002 (0.003) |
| External border of the USSR | 0.003 (0.031) |
| Population density | 0.009 (0.013) |
| Infant mortality | 0.002 (0.005) |
| Share of ethnic Russians | 0.002* (0.001) |
| Population | 0.000007 (0.00001) |
| Dummy repressed ethnic groups (baseline specification) | -0.479 (0.304) |
| Share of repressed ethnic groups in the regional population | -0.852* (0.467) |
| Share of repressed ethnic groups and Jewish people in the regional population | -0.620 (0.598) |
| Dummy for regions, from which particular ethnic groups had been deported, irrespective of whether these groups returned to their regions of origin or not | -0.063** (0.028) |

Note: the regressions are estimated using all control variables listed in Table 2, model (1). Furthermore, we add to regressions the baseline terms required to obtain the interaction terms: for example, in the model estimating the impact of the interaction term between literacy and population density, we add population density to the set of covariates as well. In case of coal and steel production, we employ all of the control variables listed in Table 2, model (1) and simultaneously add the following variables: (a) coal production; (b) steel production; (c) interaction term between coal production and literacy; (d) interaction term between steel production and literacy.

Appendix S10: Moderating effect of CPSU saturation

The findings presented in the main body of the paper appear to confirm—both conceptually and empirically—that mediation analysis is appropriate for the purposes of this study: the potential mediator is strongly correlated with the predictor, and the effect of the predictor on the outcome variable is significant and robust. Nevertheless, we also perform moderation analysis directly, employing the interaction terms. The rationale for employing the moderation analysis is as follows. In addition to observations “on the line” of the regression of party saturation on literacy, there is also a small number of regions located “off the line,” that is, regions in which levels of party saturation do not co-vary with literacy. Our theory suggests that the number of these regions should be very small (these are anomalous cases as discussed in Appendix S9). Our empirical observations confirm that in this small group of regions, as compared to the rest of the sample, a different mechanism may be at work linking pre-communist education and post-communist democracy.

The moderation analysis would allow us to ascertain how “over-performance” or “under-performance” in party saturation levels affected the way pre-communist literacy influenced post-communist democratic governance. It is possible to conjecture that in regions where party saturation turned out to be lower than what we would expect given past literacy levels, the legacy of pre-communist education would have persisted to a greater extent and the “appropriation-and-subversion” mechanism would not have been in evidence; thus, in these regions, we would expect the positive impact of pre-communist literacy on post-communist democratization to be stronger. On the other hand, if the magnitude of party saturation were substantially higher than what we would expect given past literacy levels, we may conjecture that the positive effect of pre-communist education would be constrained to a particularly large extent. This is because, hypothetically, the educated strata under such a scenario would experience particularly strong pressures (stemming from high levels of party saturation) to adjust their behaviors to conform to the new environment. This line of argumentation suggests a possible moderation effect of party saturation on the impact of pre-communist literacy on post-communist democratization. This effect should be present only in regions with strong deviation of the CPSU membership share from what we would expect given levels of pre-communist literacy. We conjecture that while for the majority of the regions “on the regression line” (of the regression of CPSU membership on pre-communist literacy) we have to model the effect as a mediating one, for a small number of regions “off the regression line” we could possibly expect a moderating effect.

Some preliminary observations can be derived from Table 4 of the main part of the paper already. As noted earlier, the Type 1 and Type 2 regions perform as predicted in terms of correspondence between literacy levels and CPSU member saturation. We observe that regions with high literacy and high levels of party saturation have a slightly higher level of democracy than regions with low literacy and low levels of party saturation, but the difference is very small. The Type 3 and 4 regions are more interesting from the point of view of possible moderation effects. Type 3 includes regions with below the expected levels of party saturation considering their pre-communist literacy levels. This very small group of regions features the highest democracy achievers. Interestingly, on average, the literacy level in these regions is actually lower than in Type 1 regions. Nevertheless, considering the lower-than-expected levels of party saturation, the values on the democracy score are substantially higher than in regions with higher literacy and higher levels of party saturation. The Type 4 group of regions encompasses regions with higher-than-expected party membership levels considering

their imperial literacy levels. The democracy scores of these regions are slightly lower than those of regions with low pre-communist literacy and low levels of party saturation.

We test for the moderation effect explicitly. We run our baseline regression, but add an interaction term between the variables of pre-communist literacy and CPSU membership. As expected, the interaction term as such is insignificant; this is not surprising, considering that both the baseline variables are highly correlated (the correlation is an empirical confirmation of the mediation model that we chose on theoretical grounds). Thus, the first impression appears to be that there is no evidence of moderation. In the next step, however, we concentrate on the “off-the-line observations,” for which it would be interesting to ascertain the presence of a moderating effect. For this purpose we first regress the CPSU membership variable on the pre-communist literacy variable, as well as on controls from specification 1 of Table 2 of the main part of the paper and compute the absolute value of residuals. We then regress the democracy score on literacy, CPSU membership, and the interaction term between these variables, as well as on other controls, while employing only the observations for which the absolute value of residuals from the regression of CPSU membership on literacy is sufficiently large—that is, the observations are sufficiently far away from the regression line of CPSU membership and pre-communist literacy. As a threshold we employ one standard deviation of the absolute value of residuals. Note that we retain a sufficiently large number of observations for which pre-communist literacy is a good predictor of CPSU membership, but if we drop more observations, running an econometric model becomes impossible. We observe that the results in these regressions change dramatically. The interaction term is now significant and negative, suggesting that the positive effect of pre-communist literacy diminishes if party saturation levels go up.

Summing up, if we look at regions in which party saturation deviated from expected values—that is, *a-typical* regions, located at a substantial distance from the regression line, in addition to the observed appropriation and subversion mediation effect discussed above, we also find evidence of a moderating effect: CPSU saturation reduces the positive effect that pre-communist literacy otherwise appears to have on post-communist regional democratic governance. This observation should be treated as a secondary result, in addition to the paper’s main finding—in most regions pre-communist literacy had a strong effect on party saturation levels.

S10.1: Regression estimations (dependent variable is democracy; we employ the Carnegie democracy index, 2000-2004)

| | (1) | (2) |
|---|---------------------|---------------------|
| Share of CPSU members, 1970s | -1.434 (0.890) | -1.044 (0.979) |
| Literacy, 1897 | 0.771** (0.306) | 1.002** (0.391) |
| Share of CPSU members * Literacy | -0.049 (0.030) | -0.076* (0.040) |
| Education, 2002 | 0.260 (0.222) | 0.474* (0.266) |
| Income, 2000-2004 | 1.115** (0.531) | 1.246* (0.710) |
| Share of ethnic Russians, 2002 | 0.119** (0.056) | 0.176*** (0.060) |
| Dummy republic | -0.423 (2.674) | 0.623 (3.288) |
| Distance from Moscow | -0.368 (0.223) | -0.331 (0.300) |
| Log oil and gas extraction, 2000-2004 (measured in coal equivalent) | 0.187 (0.548) | -0.323 (0.811) |
| Constant | 17.397* (10.123) | 5.989 (11.563) |
| Observations | 77 | 49 |
| R-squared | 0.476 | 0.561 |
| Regions with high correlation between literacy and CPSU membership excluded | No | Yes |

Note: see Table 1

Appendix S11: Additional data on social and educational backgrounds of party recruits, 1920s-1930s

S11.1: Class Composition and Occupation of Party Membership, 1922-1932.

| Date | <i>Class composition (%)</i> | | | <i>Current occupation (%)</i> | | |
|--------|------------------------------|----------|----------------------|-------------------------------|-----------------------------------|---------------------------------|
| Jan. 1 | Workers | Peasants | White-collar workers | Workers | Individual and collective farmers | White-collar workers and others |
| 1922 | 44.4 | 26.7 | 28.9 | | | |
| 1923 | 44.9 | 25.7 | 29.4 | | | |
| 1924 | 44.0 | 28.8 | 27.2 | 18.8 | | |
| 1925 | 56.7 | 26.5 | 16.8 | 41.3 | 9.5 | 49.2 |
| 1926 | 56.8 | 25.9 | 17.3 | 42.0 | 13.4 | 44.6 |
| 1927 | 55.1 | 27.3 | 17.6 | 39.4 | 13.7 | 46.9 |
| 1928 | 56.8 | 22.9 | 20.3 | 40.8 | 12.3 | 46.9 |
| 1929 | 61.4 | 21.7 | 16.9 | 44.0 | 13.0 | 43.0 |
| 1930 | 64.3 | 20.2 | 14.5 | 46.3 | 12.0 | 41.7 |
| 1931 | | | | 44.1 | 16.3 | 39.5 |
| 1932 | 65.2 | 26.9 | 7.9 | 43.8 | 18.5 | 37.6 |

Note: This table illustrates the over-representation of white-collar workers by current occupation among party members. As discussed in the paper, class composition masks the upward mobility of workers and peasants who had already occupied white collar positions before the 1917 Revolution even though they continued to be listed as “workers” and “peasants” in Soviet records.

Source: Rigby 1968, 116.

S11.2: Class Composition of Postpurge recruits, Compared with 1929 recruits.

| | 1929 enrollment (% of all enrolments) | Enrollments Nov. 1936- March 1939 (% of all enrolments) |
|---|--|---|
| Workers | 81.2 | 41.0 |
| Peasants | 17.1 | 15.2 |
| Intelligentsia and white-collar workers | 1.7 | 43.8 |

Note: These figures refer only to those enrolled in the particular year listed in the column. They do not refer to overall share of the various categories in the party (as listed in S12.1). Rigby notes that the 1929 enrolment was when “the proletarian bias was at its height.”

Source: Rigby, 1968, 223.

S11.3: Pre-war Employment of 14,821 Leading Provincial Communists in 1921 (%)

| | Gubernia officials | Uezd officials | Reserve | Total |
|---|--------------------|----------------|---------|-------|
| 1. Agriculture | | | | |
| (a) Self-employed, farm laborers, petty functionaries | 7.6 | 19.6 | 14.4 | 16.3 |
| (b) Administrative and office staff | 1.0 | 0.6 | 0.6 | 0.7 |
| 2. Plants and factories | | | | |
| (a) Workers and petty functionaries | 19.4 | 18.6 | 20.8 | 19.0 |
| (b) Administrative and office staff | 5.3 | 3.7 | 2.7 | 3.9 |
| 3. Transport | | | | |
| (a) Workers and petty functionaries | 3.7 | 3.0 | 4.7 | 3.4 |
| (b) Administrative and office staff | 1.6 | 0.9 | 1.8 | 1.2 |
| 4. Artisans | | | | |
| (a) Owners of workshops | 1.6 | 1.7 | 1.5 | 1.6 |
| (b) Hired workers | 5.3 | 5.8 | 6.6 | 5.9 |
| 5. Trade | | | | |
| (a) Administrative and office staff | 2.5 | 2.3 | 2.6 | 2.4 |
| (b) Petty functionaries | 2.7 | 2.8 | 3.2 | 2.9 |
| 6. State, public and private institutions | | | | |
| (a) Senior staff | 20.3 | 17.5 | 14.9 | 17.7 |
| (b) Petty functionaries | 4.0 | 3.4 | 3.2 | 3.5 |
| 7. Free professions | 3.7 | 1.9 | 1.6 | 2.2 |
| 8. Others | 5.0 | 4.4 | 4.8 | 4.6 |
| 9. Dependents | 15.2 | 12.4 | 15.5 | 13.5 |
| 10. No data | 1.1 | 1.4 | 1.1 | 1.4 |

Note: This table illustrates the high representation of white collar employees and in particular of senior staff previously employed in tsarist public and private institutions among professional backgrounds of party officials. Note that at the Guberniya level there is a greater tendency for a higher representation of those who occupied higher-status professions during the imperial period as compared to the Uezd level. As discussed in the paper, many individuals engaged in white collar occupations before the Revolution (such as petty functionaries) would have featured as “peasants” (a reference to their *estate* rather than occupation) in Bolshevik records.

Source: Rigby 1990, 35.

Appendix S12: The effects of purges on continuity in the reproduction of party cadre

In Table 2, in S5 and in S9, we presented results of statistical analysis of the effects of Stalin-era repressions against particular ethnic groups on party saturation levels. In this section, we provide a discussion of how the purges may have affected the continuity in the reproduction of imperial legacies, specifically, in the recruitment of the better-educated strata with human capital advantages acquired during the tsarist period. Before we present the relevant data on the effects of repressions on the party, we ought to provide some general discussion as to recent research into repressions generally and specifically on the regional aspect of purges. The purges represent a vast topic and we do not purport to do full justice to it here. Although volumes have been written on the purges, no systematic account exists on their effects—numbers arrested and shot, numbers exiled, numbers of those released from labour camps and returning to their home regions, etc.—across the regions in Russia, though the Russian NGO Memorial is engaged in an effort to collect such regional data. Rigby (1968) provides some evidence of the implications of repressions for regional party cadre, but the regional data are for select regions only. Furthermore, his account had been written before the NKVD archives were opened in the 1990s and scholars gained access to the full horrors of Stalinism. The published accounts that do consider the latest archival revelations are however (unlike Rigby's account) concerned with national-level statistics on repressions, and, at best, on those for the republics that used to be part of the USSR (Conquest 2008; Ellman 2002; Rosefielde 1997). Thus, systematic statistics for RSFSR regions are lacking. The authors of this paper have been involved in an historical project (with other colleagues) one of the ambitions of which is to map data on repressions, but the work has not been carried out so far. Furthermore, the statistics on people who perished in the purges should not obscure the potential effects of purges on the values and behaviours of those who survived. The record of repressions is bound to have affected levels of citizen trust *across the regions* (given the known record of denunciations under Stalin's rule). Thus, the physical extinction of many people is only part of the story; the values (and human capital, if we focus on the issue of trust) of those who survived are also relevant for our historical analysis. While we do not seek to minimise the horrific impact of repressions on the social fabric of Russia's regions, two observations, based on earlier and more recent historical analyses of repressions are in order. First, social science accounts more transparent about the demographic realities of the Soviet state than accounts targeting the general reader indicate that however ghastly, "repression *mortality* (excluding famine, war and disease mortality, and repression survivors) was only a modest part of the demographic history of the USSR" (emphasis original) (Ellman 2002, 1164). This observation relates to the point made above about the suffering that all Soviet people endured in the course of Stalin's rule, even though there are likely to be variations in how some regions were affected by the repressions. The statistics on purges that we present below provide some perspective on the numbers of those repressed in proportion to the general population. Second, what became evident in particular after the NKVD archives were opened was the indiscriminatory nature of purges. Although there were several waves of purges targeting particular individuals (and party cadre of particular ranks), we now know from the archives and family records of ordinary people that pretty much everyone—including innocent school-age children—was vulnerable to arrest, exile, and execution (Conquest 2008; Figs 2007). Thus, while some regions may have been affected more than others (for instance, St. Petersburg and Moscow would have been particularly affected by the Great Purge targeting senior party cadre and Old Bolsheviks), the repressions are likely to have affected citizens in all regions. Our analysis of repressed groups presented in S4 covers the regions in which virtually the entire populations suffered, so we are able, to some extent,

to address the question of how the variations in regional intensity of repressions might affect our results.

We now proceed to discuss how the purges affected the party in particular, and specifically, to what extent they may have put a break on the reproduction and recruitment of individuals with human capital advantages acquired during the imperial order. The word “purge” (*chistka*) has come to refer to the full spectrum of Stalinist repression—from expulsions from the party, scrutiny of party cards, and suspension of party “candidate” status, most of which occurred in 1933-1936—to the orgy of arrests, incarceration, and executions in 1937-1938 that are referred to as the Great Purge. While some purges targeted the “class alien” elements in particular (Rigby 1968, 204), we now know that the purges affected all social strata—from peasant and worker “provocateurs” (Rigby 1968, 210) to the ostensible anti-regime plotters among the educated Old Bolsheviks (Conquest 2008). The purges, particularly the 1937-1938 Great Terror, which targeted the Old Bolsheviks, put a significant break on the continuity in the membership of senior party cadre. This is evidenced by the stark change in the corps of delegates to the March 1939 Party Congress (Conquest 2008, 438). The purges of the rank-and-file appear to have affected membership continuity to a lesser extent. Rigby provides some statistics on regional purges, though, as noted above, his account had been written before the NKVD archives were opened. Many of those purged in 1934-1936 were arguably subsequently reinstated into the party—this record of reinstatement of many formerly expelled members is actually in line with accounts of repressions that emerged after the Soviet archives were opened in the 1990s. Kirov, a “typical region,” provides an illustrative example of the effects of the 1935 purge on party membership. Out of 2,350 full members and 2,533 candidates, 107 “expulsions” were reported—approximately 2 percent of membership—when party cards were exchanged (Rigby 1968, 209). The Great Purge had the most horrific toll on the general citizenry and the party. An estimated 950,000-1.2 million (Ellman 2002) Soviet citizens—out of the USSR’s population of roughly 160 million in 1937 (Rosefielde 1997)—had been shot or perished in the labor camps in 1937-1938. The party lost some 100,000 members (Rigby 1968, 212) to expulsions, arrests, and executions in this last purge. To put these figures into perspective, note that the total number of full party members in 1937 was 1,453,828 (Fainsod 1970; Rigby 1968)).

A new—and energetic—recruitment drive commenced at the height of the Great Purge, in June 1937, with over 400,000 recruits added to the party’s ranks by the end of 1938. A record number of 1,100,000 recruits were added to the party in 1939, with regional party officials even accused of “indiscriminate chasing after numbers,” by 1940 “admit[ting] almost all who applied” (Rigby 1968, 220). And it is among these recruits, described as “The Best People” that Rigby observes “a complete break with [the] proletarian bias” that the Bolsheviks sought to maintain during the earlier waves of party recruitment (Rigby 1968, 221). In Chelyabinsk, for instance, workers constituted under 20 percent of new party recruits in 1939-1941, and peasants under 10 percent, while the intelligentsia and white collar workers—over 70 percent (Rigby 1968, 225). In the Leningrad party organization in 1937, “some 40 percent of the new candidates and 50 of those who became full members were scientists, teachers, engineers and technicians, doctors, students and office workers” (Rigby 1968, 222). Note that these statistics come from Soviet-era records and it is unlikely that these records would have inflated the numbers of “non-proletarian” cadre.

What do these statistics tell us about the reproduction of cadre with human capital advantages acquired during the imperial era or with family backgrounds that would have provided the necessary cultural capital to acquire the relevant credentials? Despite the known “young”

demographic characteristic of the above new recruits (Fainsod 1970), we may assume that “scientists” would have been born some years before the Bolshevik Revolution and would have acquired at least part of their education in the imperial period. In fact, this observation would likely apply to all of the above categories except for students, who would have been twenty years old or younger in 1937 if they had been born after 1917. A large share of entrants into higher educational institutions in the 1920s in fact came from educated family backgrounds. As Fitzpatrick notes, throughout the 1920s, the pre-Revolutionary “old” intelligentsia continued to staunchly—and successfully—fight to preserve its gatekeeping authority in admissions to prestigious educational establishments. Specifically, it resisted the Bolsheviks’ attempts to “dilute” the standards of higher education via affirmative action policies favoring those with proletarian or peasant origins. In the 1920s, it also secured preferential treatment—reserved quota of places and exemption from fees—(Fitzpatrick 1979) in university admissions for its offspring. Our discussion in the main body of the paper also illustrates how the so-called “new soviet-trained” (as distinct from “old”) intelligentsia also tended to come from strata already upwardly mobile under the old order even if they continued to be listed in early Bolshevik records according to estate origin (such as “peasants” who were actually teachers or office workers); had been trained in imperial institutions of higher learning; and had already occupied white-collar positions under the old regime. Both the “old” and “new” intelligentsia tended to colonise higher educational establishments in the 1920s and 1930s despite the Bolsheviks’ attempts to encourage farm and factory workers to pursue advanced education. As Lane writes, in 1923-1924, “the ‘working-intelligentsia’ and their children accounted for more than half of all students at university (50.5 percent),” while in 1927 “forty-five percent of all students were [still] of non-manual status” (Lane 1973, 246). Further analysis is required to more conclusively establish patterns of inter-generational reproduction of educational advantage—and likelihood of party entry—among those with better-educated ancestry, despite Stalinist purges. Nevertheless, these statistics—and of course our own systematic analysis of the link between imperial literacy and democracy; and between imperial literacy and party saturation—serve to debunk the soviet propaganda—picked up by some western scholars—about how the USSR built a new society and created a “new” (Fainsod 1970) intelligentsia virtually from scratch (including through purges of the social un-desirables from the party).

Appendix S13: Large-N evidence of legacy persistence

Bureaucracy

To explore the bureaucratic channel of persistence of legacies of party saturation in post-communist Russia, we focus on two characteristics of bureaucracies in Russia's regions in the early 2000s: their size (measured as number of civil servants per capita); and the average tenure of regional officials. Data for both of the indicators are obtained from official Russian statistical compilations, which refer to all civil servants as bureaucrats; these data do not include employees of state-owned enterprises and public sector employees like teachers or doctors, as well as military and security servicemen.

The size of the bureaucracy is relevant for regional governance because it has implications for regional executive power consolidation. For example, civil servants in regional bodies may be relied upon to perform anti-corruption checks on private companies; to organize and to supervise the process of electoral falsifications; and to ensure control over the wider citizenry. If the bureaucracy is small, the capacity of the regional governor to exercise these tasks may be limited, and hence his/ her ability to consolidate power is more modest. Bureaucratic tenure may be relevant for understanding patterns of regional governance for two reasons. First, longer tenure typically increases the extent to which regional civil servants would have been socialized in public sector institutions and would have internalized the relevant norms of bureaucratic behavior. Second, longer tenure indicates that civil servants may have commenced their service or spent a large portion of their careers in the Soviet era. Soviet bureaucracy was generally known for its compliance with political leadership directives (on Russian bureaucracies, see (Ryavec 2003). Summing up, bureaucracies with on average longer tenure may be more likely to exhibit greater levels of compliance with the demands of regional governors; in turn, larger bureaucracies may have greater capacity to execute the will of regional leaders. Both of these characteristics of regional bureaucracies may have detrimental effects on regional democracy.

We test how the legacies of pre-communist literacy and party saturation have affected the composition of regional bureaucracies in Russia in the 2000s. For this purpose, we regress the size of bureaucracy per capita of the regional population, as well as the share of bureaucrats with sufficiently long tenure (in excess of ten years) on the pre-communist literacy variable and on the party saturation variable. We also employ several control variables. Specifically, we control for education levels in the regions, which could affect the demand for public administration careers; and regional income levels; we also include a dummy variable for ethnic republics considering that this variable may have a bearing on how public offices are filled. The results are reported below. On the one hand, we observe a strong and significant effect of CPSU saturation legacy: regions with larger party saturation levels continue to maintain larger bureaucracies and tend to have a higher share of civil servants with longer tenure. On the other hand, we see that pre-Communist literacy has no impact on the composition of bureaucracy.

Next, we estimate the impact of bureaucracy on post-communist regional democratic development. For this purpose, we use specification (1) of Table 1 and control, in addition to the literacy and party saturation variables, for the tenure and size of bureaucracy variables. Tenure has, as expected, a significant and negative effect. If we drop the variables of party saturation and pre-communist literacy, this negative effect persists. For the size of bureaucracy, the effects are weaker. If we merely regress the level of democracy on the

regional share of bureaucracy variable, we find no effect. However, in contrast to the tenure variable, the distribution of the size of bureaucracy is characterized by a few outliers. Only four regions have bureaucracies exceeding 17 percent of the population: two of them (Magadan and Chukotka) are located in the Far East and have very small populations. When we drop the four outliers, we find a negative effect of the size of bureaucracy on democracy, but only if we do not control for the CPSU membership and literacy variables.

Finally, we seek to understand the role of bureaucracy in the persistence of the party saturation legacy. For this purpose, we again employ mediation analysis: we employ democracy as the outcome, CPSU membership as the predictor, and bureaucracy characteristics as mediator variables. We employ specifications from the tables below, but do not control for pre-communist literacy. The exercise we perform here is similar to that in the main part of the paper. In the main body of the paper, we decomposed the effect of pre-communist literacy on democracy into a direct effect and an indirect effect (which goes through party saturation). Now we decompose the effect of party saturation (which, as shown above, is negative), into a direct effect and an indirect effect (going through the mechanism of bureaucratic structure). In this case, we expect both the direct and indirect effects to be negative.

For tenure, one can see that the indirect effect is significant and negative; the direct effect is negative as well, but not significant. Bureaucratic tenure accounts for 39 percent of the total negative effect of the party saturation legacy on democracy. For the size of bureaucracy variable, the indirect effect is negative, but not significantly different from zero; this effect accounts only for 13 percent of the total negative influence of the CPSU legacy on democracy (if outliers are excluded).

Summing up, the composition of regional bureaucracy appears to be an important channel of persistence of the party saturation legacy. In particular, the length of tenure of regional officials appears to account for the observed effects. There are several reasons why past party membership could affect the composition of regional bureaucracies. First, at the beginning of the transition, already the low-level managerial positions in regional bureaucracies had been occupied by party members. It is possible that in regions with large numbers of CPSU members, Soviet-era officials preferred recruiting other fellow party members to new positions (because of shared values and modes of governance, for instance). Therefore, old patterns of Soviet bureaucratic behavior would have a high chance of being reproduced over time. In regions with few party members, new recruits to bureaucracy would have likely lacked a record of past CPSU affiliation, and therefore old behavioral patterns would have had a lower chance of persistence. Second, in high party-saturated regions, political leaders may find it easier to fill bureaucratic positions with individuals willing to comply with the demands of regional leaders. Again, if regional party saturation had been low, finding such compliant individuals and filling bureaucratic positions with them would have been more challenging. Third, a large share of CPSU members in the population may have increased general levels of popular acceptance for the perpetuation of Soviet-era bureaucracy in power (and the informal practices that come with it and that citizens would have been accustomed to as a way of getting things done).

S13.1: The effect of pre-communist literacy and party saturation on features of regional bureaucracy, OLS

| | (1) | (2) | (3) | (4) |
|-------------------------|--|--|--|--|
| Dep. var. | Share of bureaucrats in regional population, 2000-2004 | Share of bureaucrats with tenure exceeding 10 years, 2002 | Share of bureaucrats in regional population, 2000-2004 | Share of bureaucrats with tenure exceeding 10 years, 2002 |
| Party saturation, 1970s | 1.607** (0.617) | 2.252*** (0.522) | | |
| Literacy, 1897 | -0.094 (0.060) | -0.121 (0.086) | 0.034 (0.046) | 0.001 (0.001) |
| Education, 2002 | -0.831*** (0.288) | -0.325* (0.186) | -0.718** (0.274) | -0.002 (0.002) |
| Income, 2000-2004 | 1.142 (0.696) | -1.708*** (0.361) | 1.271* (0.744) | -0.015*** (0.004) |
| Dummy republic | 2.340* (1.197) | -1.021 (1.670) | 0.874 (1.144) | -0.031* (0.016) |
| Constant | 8.598* (5.132) | 35.646*** (4.230) | 17.363*** (3.296) | 0.479*** (0.036) |
| Observations | 77 | 77 | 77 | 77 |
| R-squared | 0.302 | 0.369 | 0.208 | 0.248 |

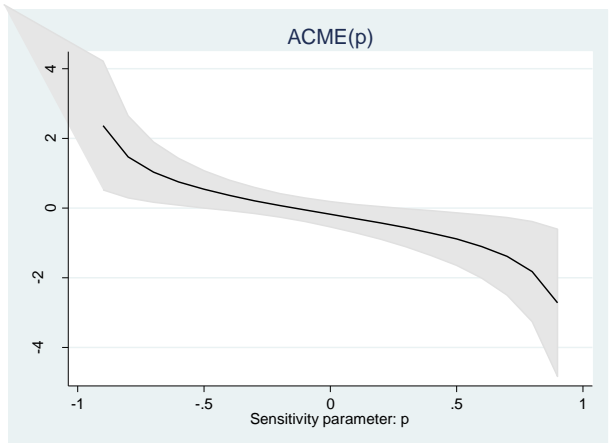
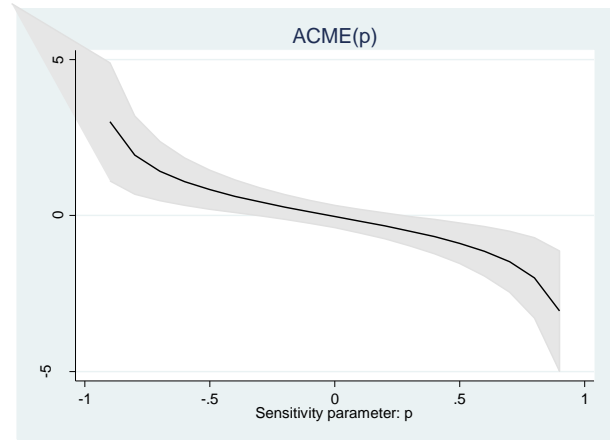
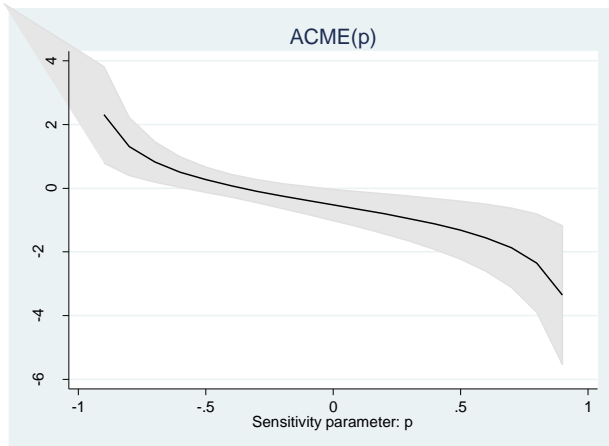
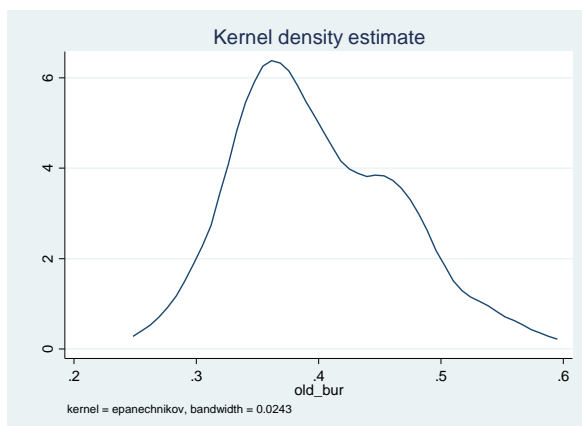
Note: see Table 1

S13.2: The effect of regional bureaucracy on democracy, 2000-2004, OLS

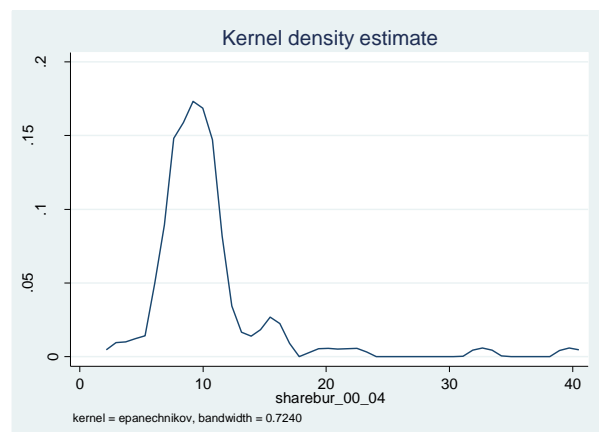
| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|----------------------|------------------------|----------------------|---------------------|----------------------|---------------------|
| Party saturation, 1970s | -2.016*** (0.662) | | -2.444*** (0.703) | | -2.440*** (0.695) | |
| Literacy, 1897 | 0.266*** (0.070) | | 0.309*** (0.071) | | 0.319*** (0.071) | |
| Share of bureaucrats in regional population, 2000-2004 | | | 0.012 (0.167) | -0.112 (0.167) | -0.254 (0.348) | -0.547* (0.305) |
| Share of bureaucrats with tenure exceeding 10 years, 2002 | -21.410* (12.618) | -38.484*** (13.703) | | | | |
| Education, 2002 | 0.054 (0.217) | 0.096 (0.243) | 0.139 (0.231) | 0.152 (0.272) | -0.019 (0.229) | 0.006 (0.290) |
| Income, 2000-2004 | 0.579 (0.415) | 0.201 (0.472) | 0.746* (0.439) | 0.547 (0.609) | 1.020** (0.499) | 0.723 (0.705) |
| Share of ethnic Russians, 2002 | 0.152** (0.064) | 0.202*** (0.063) | 0.124** (0.056) | 0.150*** (0.052) | 0.102* (0.060) | 0.142** (0.055) |
| Dummy republic | 0.355 (2.996) | 2.894 (3.054) | -0.639 (2.810) | 1.644 (2.901) | -1.471 (3.108) | 1.502 (3.223) |
| Distance from Moscow | -0.427* (0.238) | -0.561** (0.251) | -0.273 (0.240) | -0.216 (0.216) | -0.149 (0.271) | -0.016 (0.237) |
| Log oil and gas extraction, 2000-2004 (measured in coal equivalent) | 0.149 (0.533) | 0.459 (0.538) | 0.36 (0.538) | 0.904 (0.555) | 0.212 (0.563) | 0.809 (0.579) |
| Constant | 35.189*** (8.588) | 26.814*** (8.351) | 29.001*** (8.406) | 13.652* (7.573) | 34.780*** (8.842) | 19.855** (8.440) |
| Observations | 77 | 79 | 77 | 79 | 73 | 75 |
| R-squared | 0.481 | 0.414 | 0.459 | 0.337 | 0.48 | 0.352 |
| Outliers excluded | No | No | No | No | Yes | Yes |

S13.3: Mediation analysis (democracy = outcome; CPSU membership = predictor; bureaucracy = mediator)

| Characteristics of bureaucracy | Effect | Mean | 95% confidence interval | |
|--------------------------------|---------------|--------|-------------------------|--------|
| Tenure | ACME | -0.520 | -1.127 | -0.096 |
| | Direct effect | -0.802 | -1.906 | 0.271 |
| | Total effect | -1.322 | -2.448 | -0.145 |
| Size (full sample) | ACME | -0.023 | -0.523 | 0.415 |
| | Direct effect | -1.124 | -2.419 | 0.135 |
| | Total effect | -1.147 | -2.486 | 0.150 |
| Size (outliers excluded) | ACME | -0.171 | -0.635 | 0.132 |
| | Direct effect | -1.022 | -2.332 | 0.252 |
| | Total effect | -1.193 | -2.458 | 0.110 |

S13.4: Sensitivity analysis**S13.5: Distribution of key characteristics of regional bureaucracies in Russia's regions**

Kernel density estimate, density of the share of bureaucrats with tenure exceeding 10 years



Kernel density estimate, size of bureaucracy

Electoral behavior

Another possible channel of legacy persistence could be associated with voting behavior and thus with mass attitudes rather than with elite values and conduct. To provide some suggestive evidence in this respect, we analyze the votes obtained by key parties during two electoral campaigns—the State Duma elections of 1999 and 2003 (the closest ones to the period of our investigation). For 1999, we examine the shares of votes obtained in each region by the Communist Party of the Russian Federation (CPRF); by Unity, the party supporting Vladimir Putin; and by Fatherland–All Russia, the coalition of leading Russian governors supporting the former Prime Minister Yevgeny Primakov. For 2003, we again analyze the results obtained by CPRF and United Russia, the newly formed “party of power” supporting Putin, which came into existence as a result of the merger of Unity and Fatherland–All Russia. We correlated the shares of votes for these parties with the variable of CPSU saturation in the 1970s and with the pre-Soviet literacy variable. The results reported below are unambiguous: we do not observe a significant correlation between CPSU saturation and regional voting. These results imply that the electoral channel is unlikely to explain the persistence of party saturation legacies.

Interestingly, we find significant evidence of the effect of pre-communist literacy on electoral behavior. First, in regions with higher share of literates in the late 19th century, the share of votes for CPRF is consistently lower than in the low-literacy regions. Second, for 2003, we observe a negative correlation between the share of votes obtained by the pro-Kremlin United Russia party and pre-Soviet literacy. The latter trend persists in subsequent electoral campaigns: in the 2011 Duma elections, for example, there is also evidence of a negative and significant correlation between the vote share for the United Russia party and pre-communist literacy. These results imply that the legacy of pre-Communist education counteracts both the support for the party of power (or, possibly, the extent of electoral manipulations in its favor) and the support for conservative communist forces. Both effects are consistent with higher democracy scores in regions with higher pre-communist literacy. These results provide some suggestive evidence to the effect that the electoral channel might at least partially drive the persistence of the democratic legacy effects of imperial-era literacy. For instance, we may conjecture that political attitudes and voting preferences that are more discerning and more critical of the powers-that-be and that would have characterized comparatively better-educated citizens of the imperial era *un-coopted by the party*, might be transmitted through the family; these values may be also reinforced by the higher preference for advanced education among the (particularly those *un-coopted into the party*) descendants of the imperial-era’s better-educated strata, as discussed in the main body of the paper. We acknowledge that further research is required to more conclusively ascertain the validity of this proposition.

S13.6: Correlations between electoral outcomes, CPSU saturation and literacy

| Party and election year | Correlation with party saturation | Correlation with literacy |
|---|-----------------------------------|---------------------------|
| Communist Party of the Russian Federation, 2003 | -0.146 | -0.282** |
| United Russia, 2003 | -0.131 | -0.196* |
| Communist Party of the Russian Federation, 1999 | -0.184 | -0.360*** |
| Unity, 1999 | 0.042 | -0.118 |
| Fatherland–All Russia (OVR), 1999 | -0.014 | 0.074 |

Note: *** significant at 1% level; ** 5%; * 10%

Societal channel

To test for the societal effects of party saturation that we also conjectured in the main body of the paper (in addition to the bureaucracy/ elite channels discussed in the paper and tested above), we perform tests ascertaining the links between party saturation and oppositional societal protest activism—that is, activism unrelated to Soviet-style routinized forms of participation organized by the regional regimes. As a straightforward test of the impact of CPSU legacies on compliant political behavior, we could try to ascertain whether *ceteris paribus*, public protests are less frequent in regions which had large CPSU membership in the past. The test would also help us ascertain whether in regions with higher party saturation, the compliance-fostering norms of party members would have higher chances of being accepted by the wider citizenry (horizontal norm transmission) and survive over generations (vertical norm transmission). For this test, we employ an original author-constructed dataset with protest event count data in Russia's regions covering the years 2007-2012. The dataset contains information on political, economic, social and civic protests. A detailed description of the protest dataset is provided at the end of this section. The information on how the various protests were coded into political, economic, social and civic is provided in S13.9.

We regress the aggregate number of protests for all years on the variable of share of CPSU members in Russia's regions in the 1970s, as well as on three other relevant covariates. Specifically, we control for urbanization (averaged for 2007-2012) because urban populations may be more likely to get involved in protests due to stronger preferences for political freedoms, economic well-being etc., and may possess a greater volume of mobilizational resources and capacity; ethnic republic status employing a dummy variable (because of the known low levels of protest in the ethnic republics); we also employ a proxy for citizen perception of economic well-being. Data for the latter variable is obtained from Georating, a large-scale public opinion survey regularly carried out by FOM (Public Opinion Foundation, a reputable Russian polling agency), which has a major advantage of being based on representative population samples in each region. The FOM well-being perception index is based on weighted responses to three questions as part of a survey administered in 2007: (a) how happy people are with the overall situation in the region and whether they think that the situation is improving or deteriorating; (b) how happy citizens are with their material well-being and whether they perceive it as improving or deteriorating; and (c) whether people are generally satisfied with their lives. The index takes the values of between 0 and 100, with 100 signifying the most positive responses. We employ this index because human behavior is more likely to be driven by subjective perceptions rather than objective income proxies (for instance, because income distribution; expectations regarding possible income levels; and non-pecuniary and even non-material benefits may matter as well). Regressions are estimated using OLS. We exclude the cities of Moscow City and St. Petersburg from the sample: these regions recorded very large numbers of protests (only slightly fewer than the number of protests in all the other regions taken together), and these protests are often unrelated to regional issues, but are driven by national-level concerns (in addition, participants in these protests are more likely to come from other regions to take part in national protests).

The results of the analysis are presented below in S13.7. The results demonstrate that in regions with high levels of party saturation in the 1970s the number of political protests is significantly lower. The number of economic protests is also significantly lower. For other types of protests we find no significant effects. If we control for pre-communist literacy, the effect for economic protests remains robust, while the effect for political protests retains its sign, but is not significant (in this specification there is a significant and negative effect of the

CPSU legacy on the number of civic protests). Imperial-era literacy has no significant effect on protest activity. This result suggests that higher levels of education in the imperial period may not necessarily result in higher levels of citizen civic and protest activism after seventy years of communism. The result for the imperial literacy variable suggests that future research going beyond the scope of this paper should consider alternative channels of transmission of the imperial literacy effects on democracy. The analysis of regional electoral preferences presented above suggests that the electoral channel might go some way towards illuminating why imperial literacy is associated with post-communist democratic outcomes in Russia's regions.

S13.7: Effects of legacies on the number of protests

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-------------------------|--------------------|---------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| Dep. var. | Political protests | Economic protests | Social protests | Civic protests | Political protests | Economic protests | Social protests | Civic protests |
| Party saturation, 1976 | -1.770* (1.007) | -1.051* (0.605) | -0.277 (1.106) | -0.542 (1.188) | -1.859 (1.305) | -1.373* (0.755) | -1.346 (0.892) | -2.037* (1.195) |
| Literacy, 1987 | | | | | -0.095 (0.223) | 0.026 (0.098) | 0.093 (0.283) | 0.274 (0.407) |
| Subjective well-being | -0.09 (0.087) | -0.146* (0.074) | -0.044 (0.067) | -0.013 (0.067) | -0.095 (0.089) | -0.149* (0.076) | -0.043 (0.069) | -0.011 (0.067) |
| Dummy republic | 8.437** (3.777) | 6.237*** (1.979) | -4.378* (2.570) | -5.934* (3.168) | 8.420** (3.802) | 6.325*** (1.981) | 5.155** (2.475) | 6.875** (3.228) |
| Urbanization, 2007-2012 | 0.241 (0.156) | 0.194** (0.083) | 0.211 (0.131) | 0.152 (0.161) | 0.248 (0.155) | 0.183** (0.083) | 0.18 (0.128) | 0.092 (0.163) |
| Constant | 18.153 (12.943) | 10.663 (7.157) | -0.82 (13.050) | 4.891 (16.730) | 20.326 (13.452) | 13.658* (7.473) | 8.215 (9.955) | 15.957 (14.676) |
| Observations | 77 | 77 | 77 | 77 | 75 | 75 | 75 | 75 |
| R-squared | 0.113 | 0.22 | 0.087 | 0.08 | 0.112 | 0.22 | 0.086 | 0.094 |

Note: robust standard errors in parentheses. Estimation using OLS

Considering that our dependent variable is the number of protests in a given region, estimating the regressions employing OLS may be problematic. We therefore perform two additional tests. First, we run Tobit regressions to account for the fact that in some regions no protests occurred. Our results are confirmed (S13.8).

Second, to take into account both the lack of protests in some regions and the fact that our dependent variable is a count variable, we run zero-inflated negative binomial regressions. For three of our four protest types (political, economic and civic) the Vuong test is significant, confirming that the zero-inflated negative binomial estimator is preferable over the negative binomial estimator (the values of the test statistic are 1.81; 1.38; and 1.38 respectively); and the LR test aimed at ascertaining the suitability of the zero-inflated negative binomial over the zero-inflated Poisson model is significant (implying that the zero-inflated negative binomial estimator is more appropriate; the test statistics are 473.14; 183.28; and 449.37 respectively). For social protests the zero-inflated negative binomial estimator does not converge, and we therefore employ the zero-inflated Poisson model as the second-best option; the significance of the Vuong test (2.62) again confirms that the zero-inflated model should be employed instead of the simple Poisson model.

Both the zero-inflated negative binomial and the zero-inflated Poisson models imply that two equations ought to be estimated. The first equation (we use Probit) estimates the impact of the covariates on the likelihood that *no protests* took place in a given region (*inflation stage*). Thus, if a covariate has a *positive sign* at this stage, it means that this variable makes the absence of protests in the region more likely. The second equation estimates how many protests in the region should happen given that some protests in the region happen at all. Here, if a covariate has a *negative sign*, it means that if this variable goes up, the number of protests (conditional on protests happening at all) goes down. We include CPSU membership in both the equations, which allows us to estimate these effects.

The results (S13.8) indicate an even stronger impact of the party saturation variable than those obtained earlier. We find that for all types of protests, higher levels of CPSU saturation increase the likelihood of protests not happening at all. In the regions where protests do happen, the number of recorded protest acts does not depend on CPSU membership. These results provide some suggestive evidence to the effect that high levels of regional party saturation might discourage all regional protest activity; they do not however indicate that the intensity of protest activity (as measured by number of protests events) is affected in regions where protests do take place.

S13.8: Effects of legacies on the number of protests (alternative estimators)

| Dep. var. | Effect of party saturation (Tobit) | Effect of party saturation (zero-inflated negative binomial / Poisson, inflation stage) | Effect of party saturation (zero-inflated negative binomial / Poisson, negative binomial / Poisson stage) |
|--------------------|------------------------------------|---|---|
| Political protests | -2.230** (1.114) | 174.532*** (3.344) | -0.090 (0.082) |
| Economic protests | -1.223* (0.642) | 6.517*** (0.119) | -0.091 (0.063) |
| Social protests | -0.890 (1.262) | 0.340** (0.154) | 0.057 (0.101) |
| Civic protests | -0.775 (1.280) | 6.618*** (0.115) | -0.014 (0.113) |

Note: The other covariates are the same as those in specifications employed to obtain the OLS estimates (we do not control for literacy). In the zero-inflated negative binomial and zero inflated Poisson regressions, the covariates of the inflation stage and of the negative binomial / Poisson stages are the same. Robust standard errors are applied.

Description of protest data

Our dataset, assembled from the liberal *namarsh.ru* website sponsored by the opposition politician Garry Kasparov, covers protests ranging from small-scale acts and large-scale demonstrations featuring tens of thousands of protesters. It ranges from localised political protests, such as demands to remove corrupt local officials, to protests converging on national capitals and targeting national authorities. A wide range of protest issues feature in the dataset. For instance, in addition to political protests, many protests are motivated by socio-economic grievances like frustration over wage arrears. A large number of regional protests are concerned with cultural issues, as would be the case when rallies challenge the demolition of historic buildings. Note that we exclude rallies that are organized by the regime or its

supporters, as would be the case with rallies organized by the United Russia (UR) party or pro-government youth movements, such as the notorious pro-Kremlin group *Nashi*.

We acknowledge that the *namarsh.ru*, as a liberal-leaning website, may over-report certain types of protests—for instance, those organized by liberal-leaning groups at the expense of protests organized by the Communist party or other left-leaning parties and groups. Indeed, Robertson and Reuter, who compiled Russian regional protest data based on protest reporting by the Communist Party of the Russian Federation (CPRF), suggest that the data only partially correlate with protests reported by the more liberal political sources (Robertson and Reuter 2013). While we acknowledge the limitations of the data, we also note that our data dovetail with public opinion polls about citizens' intentions to participate in protest rallies and also overall levels of citizen activism in the various regions (Petrov 2005). As a further check on the reliability of our data, we cross-validated our *namarsh.ru* data with Graeme Robertson's regional protest data, which are based on reports from the left-leaning source Institute of Collective Action (IKD) for the period January 2007-March 2012. The number of protests reported in Robertson's dataset is roughly similar to ours, comprising 5540 protest events across 74 regions. Regional (log) protest counts across the two datasets over the period March 2007-March 2012 are correlated with a correlation coefficient of 77 percent. The table below outlines the criteria for coding our protests into the categories of political, civic, social, and economic. In the dataset that we employ, the number of protests in individual regions varies between zero and seventy-four (political protests); zero and forty-five (economic protests); and zero and sixty-nine (both social and civic protests).

S13.9: Criteria for coding of protests

| Category of protest | Criteria for coding |
|----------------------------|---|
| <i>Political</i> | <p>Anti-government protests. Protests may include other issues, but criticism of regime/ government policy/ politics or demands for the protection of political rights form the crux of the event. These protests are often organised by the political opposition, though they are not exclusive to one particular party or civic movement; include events like the March of the Millions, a mass civic march organised by the political opposition, and Strategiya-31 civic meetings organised in support of the right to peaceful assembly. Anti-government protests organized by nationalist activists (excluding those sponsored by the government) were also coded as political protests; protests challenging electoral fraud, notably protests that occurred between December 2011 and May 2012, as well as protests against local and regional instances of electoral fraud; protests featuring calls for resignation of elected or appointed officials at all levels of government (regional and local politicians and other public officials); protests against political repression, such as rallies calling for the release of political prisoners; and protests organized by the group Memorial commemorating past victims of political repression; protests in support of political activists; against police abuse and repression of political activists; protests against aspects of Russia's foreign policy (excluding those organised by pro-regime groups), such as those against Russia's cooperation with Japan over the Kuril Islands, or rallies showing solidarity with political events abroad, for instance support for anti-regime protesters elsewhere.</p> |
| <i>Civic</i> | <p>Within this category, we distinguish between <i>legal</i>, <i>environmental</i>, and <i>cultural</i> protests:</p> <p><i>Legal</i>—protests against lawlessness and unpopular legislation, its implementation (labor, criminal and administrative codes); protests against acts perceived to be illegal and involving state bodies or private companies (forced eviction, illegal construction);</p> <p><i>Environmental</i>—protests against waste dumping, destruction of forests, parks and protected woodlands; protests calling for the protection of nature reserves and parks;</p> <p><i>Cultural</i>—protests challenging the destruction of monuments and of historically significant buildings; against change in city or area names.</p> |
| <i>Social</i> | <p>Social—protests by socially vulnerable groups like pensioners, victims of the Chernobyl' nuclear reactor accident, students, disabled people, people on state welfare.</p> |
| <i>Economic</i> | <p>Economic—protests challenging government economic policies; rallies challenging wage arrears; wage- and worker rights-related labor strikes.</p> |

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