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Soviet Legacies of Economic Development, Oligarchic Rule and Electoral Quality in Eastern Europe's Partial Democracies: The Case of Ukraine[1]

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Abstract

Can economic development retard democracy, defying expectations of classic modernization theorizing? If so, under what conditions? Our paper addresses the puzzle of poor democratic performance in highly urbanized and industrialized post-communist states. We assembled an original dataset with data from Ukraine's local and national elections and constructed district- (*rayon*) and region- (*oblast*) level indices of electoral quality. Regions and districts that score higher on developmental indices also score lower on electoral quality, including in Ukraine's Western regions conventionally considered more democratic than the predominantly Russian-speaking Eastern regions. We explain these outcomes with reference to the peculiarities of Soviet industrial development, which facilitated the emergence of "oligarchs" in territories housing Soviet-era mega-industries. Our research contributes to comparative debates about the links between economic development and democracy.

Introduction

Can economic development retard democracy, defying expectations of classic modernization theorizing?[2] If so, under what conditions? Several prominent studies have recently sought to nuance the development-democracy axiom.[3] Adam Przeworski et al. have for instance postulated that while the level of economic development is a poor predictor of transitions to democracy, once established, democracy is more likely to survive in wealthier countries.[4] One group of nations in particular—Europe's formerly communist countries—have contributed to the generation of ambivalence regarding the co-variance between economic development—a conventional proxy for modernization—and democracy. As David Epstein et al.'s study illustrates, many of the formerly communist "partial democracies" show comparatively high levels of industrial development, urbanization and per capita GDP.[5] Not only would classic modernization theorizing predict that these countries would democratize[6]—as they did in the 1980s-1990s—but, in line with Przeworski et al.'s reformulation of the modernization paradigm, we would expect democracy, once established, to be more likely to survive there.[7] And yet, after the initial euphoria surrounding post-communist "democratic transitions," many formerly communist states have fallen into a grey zone between democracy and authoritarianism.[8]

Our paper seeks to address the puzzle of poor democratic performance and democratic backsliding in highly urbanized and industrialized post-communist contexts. We argue that rather than being propitious for democracy, industrial legacies of a socialist planned economy could in fact have adverse effects on democratic consolidation and resilience over time. Specifically, we demonstrate that it is precisely territories that had been targeted for rapid industrial development under communism that may be more vulnerable to authoritarian tendencies in the post-communist period. In making this argument, we join influential scholarship on communist legacies.[9] We extend this research by systematically exploring the

links between Soviet-era industries and variations in electoral quality in Ukraine's sub-national regions. Our sub-national methodological strategy allows us to circumvent the issue of small-n in cross-national analyses, which plagues rigorous analysis of the drivers of anomalous outcomes in post-communist "partial democracies." Our analysis of district- and regional-level electoral data indeed demonstrates that regions, which achieved higher levels of economic development during the Soviet era, have also featured elections that are less competitive. We explain these outcomes with reference to the peculiarities of Soviet industrial development, which facilitated the emergence of "oligarchs" in territories housing Soviet-era mega-industries. Although other researchers have discussed the oligarchs' meddling in the electoral process,[10] ours is the first systematic attempt to link oligarchic influence over regional economies to sub-national electoral quality.

For our analysis, we have assembled an original dataset with electoral data from Ukraine's recent local elections and from past electoral cycles. We construct indices of sub-national electoral quality at both the region (*oblast*) and district (*rayon*) levels. We find support for conventional West-East expectations of regional patterns of sub-national political variations in Ukraine.[11] Yet, we also observe that regions and districts that score higher on developmental indices, notably urbanization, score lower on electoral quality, including in Ukraine's Western regions which usually feature in the literature as being more democratic than the predominantly Russian-speaking Eastern regions; these results hold when we control for cultural differences across regions.

Theoretical framework

Daniel Lerner proposed the "modernization" paradigm of developmental progression from "traditional" rural societies to "modern" economically developed urban industrial societies.[12]

In turn, Seymour Martin Lipset famously postulated that economic development—and the inter-connected processes of industrialization, urbanization and education—are conducive to the development and spread of democracy among nations.[13] Although many cross-national studies have since restated the modernization paradigm,[14] other scholars have problematized the assumptions animating this research. For instance, Guillermo O'Donnell postulated that in Latin America, economic development at a particular stage may lead to a "bureaucratic authoritarian," rather than a democratic, type of regime.[15] And Tatu Vanhanen has discussed how even in relatively developed economies, a high degree of concentration of non-agricultural economic sectors "in the hands of one group, whatever that group is," could impinge on democracy.[16] Recent research has also highlighted the importance of factoring in economic asset structure which may be more or less conducive to democratization;[17] the predominance of petrochemicals as a key source of national revenue;[18] and the incentives of elites controlling important economic resources to support or block democratic change.[19] These insights, while sensitive to both the elite and mass citizen preferences, shift emphasis away from the attitudinal dimension of democratic change to the structural-institutional contexts in which development occurs.

The structural insights in the modernization debate are particularly relevant in the context of mixed evidence about development-democracy links in post-communist countries. One of the most systematic attempts at highlighting the extent to which these states stand out in violating the assumptions about democratic resilience among relatively developed nations is the 2006 study by David Epstein et al. Employing a range of cross-national data, Epstein et al. argue that to the extent that these regimes defy predictions about the links between economic development and democratic resilience, they remain among the most "poorly understood"[20] type of regime and should therefore constitute the focus of analytical inquiry in democracy theorizing. Joining other analysts of "hybrid" regimes,[21] Epstein et al. highlight the disjuncture between the existence of formal institutions providing for electoral turnover, and informal

practices that undermine the meaningfulness of these mechanisms of democratic contestation in post-communist "partial democracies." They define "partial democracies" as those "which possess some, but not all, of the properties that characterize full democracies".[22] "In partial democracies," they write, "the chief executive may be elected, but then face weak constraints; and his selection may not result from open and organized competition, but rather from lobbying by a politicized military or from selection by a committee of a ruling party. Alternatively, the election itself could be uncompetitive, either because of political manipulation by the authorities or because political parties were highly factionalized". [23]

We applaud Epstein et al. for highlighting how regime types in comparatively developed post-communist contexts do not always meet the expectations of the classic modernization paradigm,[24] and indeed of recent reformulation of the modernization-democracy axiom.[25] Nevertheless, we attribute their ambivalent findings to the conceptual confusion between economic development and modernization. Epstein et al. critique the statistical analysis of Przeworski et al.,[26] specifically the computation of standard errors in evaluating the effect of modernization proxies on transition from authoritarianism to democracy and the appropriateness of a dichotomous definition of regime types (autocracy and democracy) as distinct from a trichotomous definition, which includes "partial democracies." Employing alternative statistical procedures and measures to those employed in the Przeworski et al. study, they find that high GDP per capita increases both the likelihood of transition to democracy and of subsequent democratic consolidation. They do show, however, that for "partial democracies," conventional modernization proxies fail to predict higher likelihood of transition into another regime type.

Epstein et al.'s key measure of "modernization" is per capita GDP. Among the other "standard" modernization indicators employed in their statistical analysis are "year-to-year GDP growth, the percent of the population living in cities, and log of population density".[27] The underlying assumption behind the employment of these measures is very much in line with

the broad expectations of the classic modernization paradigm. Specifically, GDP growth and urbanization are regarded as inter-connected with a bundle of developmental processes, notably the diversification of modern forms of production and of economic sectors; workforce emancipation; and broader attitudinal changes among citizens which are ultimately conducive to democracy.[28] These indicators are routinely employed in cross-country statistical tests of modernization theory; the debates in the literature are usually about whether these proxies produce different results rather than whether they have good internal validity in all settings, that is, whether they are indeed associated with modernization as theorized and as conceptualized in classic modernization scholarship.[29]

We find the assumptions about the internal validity of modernization measures like GDP and urbanization problematic in countries with a legacy of state-led socialism. Instead, we highlight the structural underpinnings of communist development that may have detrimental effects on democracy even in industrialized, urbanized and high human capital settings. Specifically, we link Soviet economic legacies to the vulnerability of the electorate to "workforce mobilization"[30] and other electoral pressures by powerful economic tycoons competing for political power at regional and national levels. Jon Elster, Claus Offe and Ulrich Preuss point to the significant distortion of communist economies in favor of "over industrialization" and away from services.[31] Bela Greskovits discusses the persistence of large vertically integrated, highly specialized and spatially concentrated industries—what he terms the "inherited sector" and the "lasting impact" of these legacies on post-socialist economic development.[32] Because Soviet planners sought to avoid "wasteful" duplication of resources originating from market competition, locking producers into a supplier arrangement with a particular consumer,[33] Soviet industry exhibited a much higher level of asset specificity than would a company in comparable sectors in a market economy.[34]

Accelerated industrial development contributed to rapid urbanization which however did not necessarily lead to the kind of diffuse, diverse and emancipated workforce that features

in classic modernization theorizing. Consider the example of the city of Novokuznetsk, one of the oldest cities in Siberia, founded in 1618. In 1926 it had a population of 4,000; by 1939 it boasted a population of 166,000 due to rapid development of the metals and mining industries. In the post-Soviet period, Novokuznetsk's workforce continued to be heavily dependent on giant industrial plants, for instance, the Novokuznetsk Aluminum Plant, which attracted notoriety as a site of "oligarchic wars" in the 1990s.[35] Soviet industrial hubs often featured high concentration of qualified specialists in engineering and science. Yet, the highly educated workforce remained dependent on employment in specific enterprises, even after communism collapsed.[36] Soviet planners celebrated loyalty to one enterprise and local "workers' dynasties".[37] Niche specialization reduced the portability of skills. Limited flexibility built into Soviet-era housing ownership and the provision of social benefits through enterprises further reduced workers' ability to emancipate themselves from their employers.[38] As Grzegorz Ekiert and Stephen Hanson wrote, the "planned heroism" of Stalinist planning "left older workers and managers with few valuable skills enabling them to compete effectively in a genuinely competitive market context".[39]

Communist states' economies of scarcity contributed to the generation of powerful informal networks of managers and planners who will be well placed to consolidate control over enterprises and their workforce after communism collapsed.[40] Joseph Berliner's account of Soviet industrial management revealed that already at the height of Stalinism, the corruption, economy of favors (*blat*) and informalities that we associate with the era of stagnation of the 1970s-1980s and with post-soviet economic development[41] were not only widespread but were in fact intrinsic to the logic of a centrally-planned economy.[42] For many a manger, the only way to meet unrealistically high targets was to develop a web of informal exchange of favors involving superiors in the various planning bodies, the party apparat and the horizontal chain of suppliers. And, to maintain workforce loyalty and enthusiasm, the manager was to provide in-kind support in the form of tourist vouchers, scarce consumer goods, and access to "elite"

sanatoria or health spas.[43] As Ken Jowitt wrote, "in Leninist regimes, the factory was (is) less a specialized institution and school of modernity than a functionally diffuse neopatriarchical provider: of houses, vacations, medical attention, food, and to some extent social activity for its workers . . . [with] each institution attempt[ing] to replicate the self-sufficiency of all the others".[44]

Henry Hale's analysis of post-communist "patronal politics" highlights the connection between these pervasive legacies of state socialist planning and electoral processes. Hale defines patronal politics as "politics in societies where individuals organize their political and economic pursuits primarily around the personalized exchange of concrete rewards and punishments through chains of actual acquaintance, and not primarily around abstract, impersonal principles such as ideological belief or categorizations like economic class that include many people one has not actually met in person." These rewards and punishments are meted out through "hierarchical networks" organized around local political machines; large "corporate conglomerates" and the state / public sector.[45] Although these insights broadly dovetail with research into "clientelism" in other contexts,[46] Hale and, in another study, Frye et. al. nuance conventional expectations of clientelism scholarship.[47] Although small rural electorates often facilitate the monitoring of electoral compliance,[48] in post-Soviet states large companies with a sizeable workforce benefit from the "economies of scale" of vote rallying, they argue.[49] In a survey of industrial workforce conducted around the time of Russia's 2011 parliamentary elections, Frye et al. find that 25 percent of employees reported pressure from employers to turn out to vote. "The workplace," they write, "is a key locus of voter mobilization for the regime".[50]

Similar processes have been observed in Ukraine, where workers in Soviet-era industries have been characterized as a "silent majority."[51] Ukraine, in fact, stands out among post-Soviet "patronal" regimes in that here a small group of tycoons known as "oligarchs"—insofar as their "networks extend[ed] far beyond business and ran deep into politics"[52]—have

tended to compete for power relying on the mechanisms of worker mobilization described above. In 2011, for example, employees of two steel giants in Mariupol in Donetsk region (MMK Ilyicha and Azovstal') reported being pressured to join the Party of the Regions—arguably one of the most effective Ukrainian political machines supporting the president Viktor Yanukovych (2010-2014)—under threat of being fired. Membership applications were distributed on the shop floor; membership fees were to be deducted from workers' salaries.[53] After the story became public, the Metinvest Group—the owner of both plants controlled by the oligarch Rinat Akhmetov—publicly prohibited this form of political agitation in the plant.[54] However, the critical role of the plant in the life of Mariupol persisted, even after the 2014 Revolution of Dignity and the start of the war in Donbass. During the 2015 local elections, the plant press and radio have been highly vocal in favor of the Opposition Bloc candidate, a movement backed by Akhmetov. Heads of factory shops were to ensure that workers show up at polling stations. The newspaper *Ukrainskaya Pravda* quoted an interview conducted at one of the polling stations, which illustrates electoral compliance. When asked for which party the respondent planned to cast a vote, he replied: "We are voting for our plants. For whom else?"[55]

Illustrative case study: The region of Dnipropetrovsk

The region and city of Dnipropetrovsk (currently Dnipro), which in our analysis (presented below) emerges as the least "democratic" of Ukrainian regions, provides an illustration of the mechanisms at work linking Soviet-era development to poor electoral quality. It illustrates the processes of the construction of oligarchic power structures at the regional level, and how these structures have the potential to negatively affect regional democratic processes.

Dnipropetrovsk, founded as Ekaterinoslav at the end of the 18th century, is a city in south-central Ukraine, located at a distance of some 391 kilometers from Kiev. By the end of the 19th century, Ekaterinoslav was already the fifth largest center of manufacturing in Russia,

boasting scores of factories and family-run artisanal enterprises.[56] The Bolsheviks further developed the city's industry. Already in the 1950s, Dnipropetrovsk became one of the USSR's most strategically important cities.[57] It housed the USSR's largest nuclear missiles plant, as well as other major military-industrial complex facilities, notably those related to ferrous metals and industrial pipes production; machine-building—it was home to the industrial giants of Yuzhmash and the Dnipropetrovsk Machine-Building Plant—; the production of metallurgical and mining equipment, hydraulic presses and train cars. Pursuant to a KGB order, Dnipropetrovsk became a closed city in 1959. It famously concentrated the cream of Ukraine's and USSR's scientific, engineering and technical cadre; this followed Stalin's decision that it would serve as a country-wide hub for the training of highly qualified rocket construction specialists. Although Dnipropetrovsk's ethnic make-up had been overwhelmingly Ukrainian, by the 1950s, over 33 percent of the city's Ukrainians considered Russian to be their native language.[58] The Soviet-era enterprises have continued to define the region and city's economic landscape and fortunes. Currently, Dnipropetrovsk *oblast* ranks third after Kharkiv and Zaporizhia in the regional economy's share of metals- and machine-building production. Already in the Soviet period, powerful networks emerged linking Dnipropetrovsk's party and managerial elite to the USSR and the Ukrainian Republic's power center in Kiev, and these links persisted in the post-Soviet period.[59] Writes Sergei Zhuk:

> It became the launching pad for the political careers of many Soviet politicians in Moscow because of its close association with the clan of Leonid Brezhnev. . . . Before perestroika, more than 53 percent of all the political leaders in Kyiv had come from Dniepropetrovsk; by 1996, some 80 percent of post-Soviet Ukrainian politicians had begun their careers in this city. The overwhelming majority of these representatives of the "Dniepropetrovsk Family" (including Leonid Kuchma, a former president of post-Soviet Ukraine, and Yulia Tymoshenko, a

heroine of the "Orange Revolution" of 2004) started their careers during the late socialist period in the factories of the closed city's military-industrial complex.[60]

Andrew Wilson writes that the origins of the powerful regional political machines could be traced to the early 1990s, when the so-called "'red director' elite. . . had taken advantage of the chaotic conditions of the early 1990s to enrich themselves, trading in subsidized exports and exploiting price controls."[61] These managers were instrumental in propelling Leonid Kuchma, who had been director of the industrial giant Dnipropetrovsk missile plant, and was by 1992 Ukraine's Prime Minister, to Ukraine's Presidency.[62] They did so by staging industrial action in Eastern Ukraine to prompt early elections and to dislodge Ukraine's first president Leonid Kravchuk.[63] Wilson writes that Kuchma "parceled out control of Ukraine's heavy industry to the rival regional 'clans'." In Dnipropetrovsk it was piping and petrochemicals, while in Donbas it was coal and steel; in Kharkiv it was engineering; and, in the Crimea it was the hospitality and tourism industry.[64] Even in the brief period following the Orange Revolution of 2004 and until 2010, when Ukraine became the only non-Baltic country to be rated by the US agency Freedom House as fully "free," that same agency, in its *Nations in Transit* report, noted that while there were significant improvements in the electoral process and media independence during that time, there had been "*no* significant improvement in levels of corruption and governance, reflecting that politics and society remained highly personalistic. . ."[65] Writes Hale: "What had changed after the Orange Revolution was *not* the level of patronalism in politics, but the *arrangement* of patronal networks, which had collectively taken on more open and competitive rather than closed configurations."[66] Regional "virtual politics"[67] involved media control and manipulation by rival oligarchic groupings; manipulation of the electorate which derived its livelihoods from the industrial giants that the oligarchs controlled; citizen mobilization to support political candidates by financing street rallies; and plain old-fashioned ballot-stuffing by loyal regional clients.[68]

These patterns were in evidence in the context of the Petro Poroshenko presidency and the 2015 local elections. Following the conflict with Poroshenko in 2015, Igor Kolomoyskiy, who had been earlier appointed as governor of Dnipropetrovsk and who possessed significant influence over the local economy—notably control over the part state-owned Ukrnafta gas processing enterprise—was forced to resign. The accusation that Poroshenko levelled against Kolomoysky was that he abused his position as governor to expand his business empire in the region and in particular to attempt to establish control over the struggling Yuzhmash industrial giant.[69] In what Kolomoyskiy described as part of a "raider attack" in March 2015, the national parliament in Kiev amended the law on shareholder companies, which resulted in Kolomoyskiy's loss of control over Ukrnafta.[70] Kolomoiskiy remained a powerful shadow figure in local politics however competing against Ukraine's other prominent oligarch Rinat Akhmetov whose interests in the region were represented by Alexandr Vilkul and his "Opposition Block." Ukrainian observers characterized the local elections of the mayors of Dnipropetrovsk and the city of Krivoy Rog which featured politicians backed by competing oligarchic interests, as "dirty politics" and "dirty elections."[71]

Thus, well into the second decade of 2000s, we observe elements of regional oligarchic rule and political machines intricately linked to Soviet-era industrial networks; these have profound implications for the dynamics of regional electoral processes.

Main hypothesis

The Dnipropetrovsk case illustrates a pattern that we expect to find in Ukraine in general. Specifically, we expect communist/soviet legacies of industrial planning to have contributed to developmental outcomes like industrialization, urbanization and high human capital

development. We expect these legacies to have a detrimental effect on democratic outcomes in post-communist states and regions. Thus, rather than "defying" conventional development predictions, the legacies of state-led socialist development are in our analysis seen as "culprits," responsible for eroding the potential for development of genuine electoral competition. Our proposed causal mechanism links the legacy of mega-industries, managerial control over workforce and workforce dependencies to the emergence of powerful economic tycoons. These industry magnates influence electoral processes because they possess control over vulnerable and dependent workforce (see Figure 1). While in some settings like Russia, the electoral "pyramids" may be controlled by one group of nationally-prominent economic actors, in others, like Ukraine, multiple oligarchs mobilize regional electorates as part of competition over national and regional political power and economic resources. The empirical analysis that follows is guided by the following baseline hypothesis:

Territories, which, due to Soviet industrial planning legacies, exhibit higher levels of urbanization and industrialization, should also exhibit lower levels of electoral quality in the post-communist period.

Figure 1 about here

Data and methodology

General approach

To test the baseline hypothesis, we begin by regressing the main *dependent variable* (a characteristic of electoral quality) on a proxy for *Soviet developmental legacies*; a proxy for

cultural-linguistic features of territories (another source of political variation across Ukrainian regions that features in the literature on Ukrainian politics); and *additional controls.* Soviet developmental legacies are measured employing *contemporary data* capturing the *general developmental characteristics* of the spatial unit of analysis. Second, we replace this proxy with a set of *historical variables* from the Soviet period, which allow us to test the "temporal depth" of contemporary development outcomes, as well as proxies for *concentration of Soviet industrial assets*, which capture the industrial aspect of the Soviet developmental project more accurately. Third, in line with our hypothesized causal mechanism, whereby Soviet developmental legacies are associated with stronger oligarchic power, we introduce a further variable quantifying *the presence of oligarchic groups* in the region, a mediating factor between Soviet developmental legacies and electoral quality.

The first step is implemented using *rayon*-level data.[72] Ukraine is administratively divided into twenty-seven regions, including twenty-four *oblasti*; two special-status cities of Kyiv and Sevastopol; and the Autonomous Republic of Crimea. These regions are in turn subdivided into roughly 500 lower-level units, the *rayony* (districts) and *rayon*-free cities. Unfortunately, Ukrainian statistical agencies do not publish other *rayon*-level data, which would be relevant for our analysis, namely Soviet-era characteristics of *rayony* and concentration of Soviet-era industrial assets. Data for these and several other indicators are available at the *oblast* level however. Similarly, the information on oligarchic groups is accessible only for the *oblast* level. The second and third steps of the analysis were therefore implemented using *oblast*-level data, in separate sections of the statistical analysis. Because of the small number of *oblast*-level observations, we limit our analysis to performing simple correlations. As an extension of our analysis, we estimate multi-level models, where *oblast*-level data are added to *rayon*-level regressions.[73]

Dependent variable

To explore regional variations in electoral quality in Ukraine, we leverage the approach that Tatu Vanhanen developed as part of his cross-national analysis of democratic variations among nations.[74] Vanhanen uses electoral data to investigate the competition and participation aspects of political systems. Because our empirical strategy is to leverage district (*rayon*)-level data, we are uncomfortable with the usage of the term "sub-national democracy." Although some studies have made a case for considering sub-national regions as mini-polities in their own right,[75] this characterization would be problematic for rural precinct- or urban-level units that constitute the core unit of analysis in this paper. Furthermore, Vanhanen admits that the label "democracy" may be problematic even as applied to national contexts, accepting that the index may cover "the variation in the degree of autocracy among non-democracies."[76] We opt instead for the term "electoral quality" (EQ) as a measure of the quality of the democratic process which is better suited to the sub-national contexts we are focusing on.[77]

Although electoral statistics are but one indicator of electoral quality,[78] they provide a straightforward measure absent more nuanced data on ballot-stuffing, vote-buying, intimidation, etc., that would be comparable across hundreds of precincts. The Vanhanen electoral index, which is composed of two sub-indictors, is meant to factor in both the competition and participation aspects of electoral processes. The participation sub-indicator is based on electoral turnout statistics. Clearly, high turnout is not in itself indicative of genuine participation and may in fact proxy for authoritarian forms of mass mobilization for sham elections practiced in communist contexts. Alone, this is meaningless as a measure of democracy. As Vanhanen notes, the Index of Democratization (ID) "gets high values only if the values of both basic indicators are high. If either of them is zero, the value of ID will also drop to zero."[79] The competition sub-indicator is computed by taking the vote share obtained by all parties during elections except the party with the largest vote share; thus, the sub-indicator is one hundred minus the vote share obtained by the winning party. The final index is obtained by multiplying these two sub-indicators and dividing the result by one hundred. Empirical

applications of the index have produced roughly similar assessments of cross-national and sub-national variations in electoral processes to those relying on more complex measures,[80] thereby providing some reassurance about the validity of this method for assessing sub-national variations in the quality of the electoral dimension of democratic representation and contestation.

To construct the baseline sub-national EQ index, we utilize data from local elections held on 25 October 2015. In the 2015 elections, voters elected councilors to the regional assemblies (*rada*), to assemblies of districts and cities, and to lower-level settlement and village councils. The councils were elected using a proportional system.[81] Using official electoral statistics obtained from the Ukrainian Central Electoral Commission, we computed EQ indices for *oblasti* and for individual *rayony* and *rayon*-free cities within *oblasti*. To our knowledge, our paper is the first to use district-level electoral data to explore the drivers of regional variations in the quality of electoral processes in Ukraine; this provides us with a major analytical leverage over research relying on *oblast*-level data. First, because of the large number of *rayony*, we can apply multivariate regression techniques to study the effects of Soviet planned economic development *ceteris paribus* other predictors of sub-national EQ. This strategy is useful for isolating the impact of Soviet policies of state-driven economic development from that of cultural variables. Second, there exists substantial within-*oblast* variation in EQ, which ought to be taken into account in research into Ukrainian politics.[82] The Supplementary Appendix (SA) SA1 reports *oblast*-level EQ indices; it also presents the distributional plots for EQ at the *oblast* and the *rayon* levels and maps of Ukraine showing variation in EQ across the country.

Independent variables

Our main proxy for Soviet developmental legacies at the *rayon* level is the *share of urban population* in the *rayon* according to the most recent (2001) census. We regress the EQ score

computed at the *rayon* level on urbanization to test the conventional expectation of co-variance between this important indicator of development and voting patterns. Two other development proxies are employed. First, we create a dummy variable for *rayon*-free cities, which are usually relatively large urban centers and typically feature high concentrations of institutions of higher learning, services and industry.[83] Second, the Ukrainian statistical agency reports data for average salaries at the *rayon* level for the year 2015 in Hryvnia.

We also include variables measuring cultural-linguistic variation and capturing the East-West divide in Ukrainian politics. Specifically, we employ a measure of the share of those claiming Ukrainian to be their native language in the 2001 census. Language preferences and practices could reflect long-term historical processes related to nation-building and intensity of social ties to Russia. We also created two dummy variables to identify the *rayony* with a large proportion of non-Ukrainian-speakers.[84] Both interval and the dummy measures of the cultural specificity are of course collinear and thus not included in the same regression; we test whether the results change if we substitute the former for the latter.[85] Finally, we add two control variables: longitude and latitude of *rayony*, thereby accounting for geographical characteristics potentially impinging on development, while also capturing external influences associated with geographic proximity to the West. (The theoretical rationales for the inclusion of these variables are discussed in SA12).

We augment these *rayon*-level variables with a set of *oblast*-level variables. In particular, the following variables and indicators are employed: (a) data capturing urbanization and higher education variations in the Ukrainian *oblasti* available from the 1979 Soviet census, the last census before the onset of Gorbachev's far-reaching economic and political reforms, and one held at the height of the so-called Stagnation Era associated with the leadership of Leonid Brezhnev;[86] (b) the share of members of the ruling Communist Party of the Soviet Union (CPSU) in proportion to regional populations in the mid-1970s;[87] and (c) variables measuring the extent to which individual regions had been subjected to Stalin's industrialization drive in

the 1930s, specifically, industrial output and employment in large industries in 1933, that is, the period corresponding to the completion of the first five-year economic development plan.[88] Furthermore, we use *oblast*-level data to capture the extent of concentration of Soviet industrial assets. Our focus is on assets, which are likely to generate strong workforce dependencies, as indeed a form of institutional path-dependency in that old technological and production ties from the Soviet period often survived market reforms. Two major industries which were essential to the Soviet industrialization project—ferrous metals and machine-building—remain important in the Ukrainian economy. For each region, we compute the share of these two industries in total industrial output in 2015.

Electoral quality and soviet developmental legacies

We report the main results of statistical analysis in Table 1.[89] In Models 1-3, we run simple regressions of *rayon*-level EQ scores on our key variables of interest, namely urbanization; share of Ukrainian-speakers; dummy variables for large non-Ukrainian-speaking minorities (and dropping the share of Ukrainian speakers, since it measures the same phenomenon); and dummy variable for *rayon*-free cities as another proxy for development. We find that at the *rayon* level, urbanization is associated with *lower* EQ, as is the status of *rayon*-free cities. These results hold *ceteris paribus* the cultural-linguistic variables. Thus, keeping cultural-linguistic variation in Ukraine constant, the legacies of Soviet economic development appear to have a negative effect on sub-national electoral quality. Simultaneously, we find that higher share of Ukrainian speakers increases the values of the EQ index. The presence of both Russian and non-Russian minorities has the effect of a reduction in the value of the EQ score, though the negative effect of the presence of sizeable Russian minorities is larger. In Model 4, we add the longitude and latitude indicators. Our results hold, while also confirming the East-West pattern in electoral variations (longitude) and the lower level of EQ in the Southern part of Ukraine

(latitude). In the SA3, we demonstrate that using salaries as an alternative proxy for economic development likewise provides strong support for our baseline hypothesis. SA7 reports several robustness checks, confirming the main results. SA10 shows that the result holds not only in Ukraine as a whole, but also in each of the large macro-regions of the country (West, East, South and Center).

Table 1 about here

Next, we augment our *rayon*-level analysis with tests that include *oblast*-level Soviet-era developmental indicators. We also ascertain the links between concentration of Soviet-era industrial assets and EQ. In the main part of the paper, we present the correlation coefficients; the results of multi-level analysis are reported in SA4 and confirm our findings.[90] In the Table 2, we report correlation coefficients between the historical variables presented above and the *oblast* EQ index.[91] As expected, all the correlation coefficients are significant and negative. Exceptions to this pattern are the values of industrial output and employment during the Soviet period of rapid industrialization. In this case, however, the sample is extremely small—merely six regions—which makes obtaining statistically significant results impossible. We replicate our results excluding the *oblasti* which had been under Austro-Hungarian rule before World War I; or had been under Polish, Romanian and Czechoslovak rule during the interwar period.[92] Excluding these regions does not change our results.

Table 2 about here

In the remaining part of our analysis, we test whether the concentration of Soviet industrial assets has significant and detrimental effects on regional and local EQ, and test whether we observe correlation of this indicator with the *oblast*-level EQ index. This correlation

coefficient is negative (minus 0.529, significant at 1 percent level), implying that regions with a larger share of assets essential to the Soviet industrial development project, also feature lower values on the EQ index. This is in line with our baseline hypothesis. In SA8 we employ another proxy for persistence of Soviet industrial assets: the structure of international trade—and demonstrate that there is a negative (but insignificant) correlation between the persistence of post-Soviet trade ties and *oblast*-level EQ.[93]

Presence of oligarchic groups

Thus far, our analysis has demonstrated that the historical legacies of Soviet economic development have a negative effect on the quality of electoral processes in Ukrainian regions; and that this outcome is related to the prevalence of Soviet-era heavy industry. In line with our conceptual model (Figure 1), we expect this effect to be particularly strong because regions with high concentration of Soviet assets are also likely to attract oligarchic business groups, making them more powerful in the context of sub-national politics.

We anticipate two possible outcomes related to the presence of regional oligarchic strongholds. The presence of several competing oligarchic groupings in a region could well generate competition for control over the electorate. As in Russia in the 1990s and early 2000s, rival business tycoons may support competing political parties, civil society groups and the media to garner electoral support for oligarch-friendly political candidates. As the case of Russia in the 1990s demonstrates, competition among political and economic elites may well have contributed to regional and national political pluralism.[94] A second scenario is also plausible whereby any form of oligarchic capture of national, reginal and local politics—including that involving competing economic groupings—is bound to be detrimental to democracy. Perception that politics are driven by oligarchs may well generate citizen apathy and cynicism about political participation under "crony capitalism."[95] This second potential

scenario is in line with the causal mechanisms proposed in this paper. We investigate which of these effects dominates empirically.

To test whether *oblasti* with high levels of concentration of Soviet-era assets were comparatively more likely to became economic bases for powerful oligarchs, we construct an index of presence of nationally-prominent oligarchic groups in individual regions. We identify oligarchs using the Heiko Pleines dataset, one of the most comprehensive sources on oligarchic groups in post-communist Ukraine.[96] The list includes the wealthy nationally-prominent and politically-influential tycoons. We focus our attention on oligarchs listed as remaining powerful under the Poroshenko presidency. Next, we scrutinize the websites of the holding groups controlled by these different oligarchs, for instance, SKM for Akhmetov, AVEK for Feldman, etc., and create a list of *oblasti* in which these oligarchs are economically active. Finally, we create an index measuring the total number of oligarchic groups present in an *oblast*. Detailed information on the presence of individual groups in the *oblasti* is reported in SA5. While we are aware of the limitations of the index in that only the most prominent business tycoons are included, to our knowledge, it represents the most systematic attempt to capture the regional dimension of oligarchic influence in Ukraine. We compute the index for all regions except Kyiv City, because the status of the national capital encourages most business groups to have at least a representative office there. The highest value of the index is obtained for Dnipropetrovsk, where nine out of the twelve nationally-prominent business groups are present, followed by Kharkiv. The smallest index is obtained for Chernivitsi, where only one of the groups operates. Higher values of the index are concentrated in the wealthier regions.

As expected, the oligarch index is positively correlated with most of our developmental indicators: 0.777 for income per capita; 0.811 for the share of population with university degree; 0.580 for the share of college students; 0.711 for urbanization. All correlation coefficients are significant at the 1% confidence level. Importantly, the oligarch index is significantly and negatively correlated with our EQ index. The correlation coefficient is minus 0.428, significant

at the 5 percent level. These results indicate that we observe the hypothesized scenario of oligarchs having a detrimental effect on Ukraine's sub-national electoral quality and that this effect appears to override the potential contribution of competition of oligarchic groups to the vibrancy of the democratic process.

Conclusion

Our paper systematically explored the implications of spatially-uneven Soviet-era state-led development for sub-national electoral quality in Ukraine. Following other scholars who have analysed the implications of Soviet industrialization legacies for democracy in post-communist contexts[97] we have argued that the structural peculiarities of socialist state-led development provided economic actors who acquired control over key Soviet-era industrial assets in the context of post-Soviet privatization with opportunities to engage in the manipulation of the electorate. Our objective is not to challenge the premises of classic modernization theorizing suggesting a positive link between modernization and democratization. Rather, it is to highlight how conventional proxies of modernization such as industrialization, urbanization and GDP per capita in post-communist contexts may capture the legacies of socialist planned industrial development.

Our analysis of district-level data indicates that industrialization, GDP per capita and urbanization negatively correlate with electoral quality in Ukraine's regions. These indices of development also positively correlate with the presence of powerful oligarchs in regional economies. In line with theorizing into co-variance between cultural, ethno-linguistic and historical legacies of imperial tutelage and democracy in Ukraine, we find support for a broad East-West pattern of variations in electoral quality. Yet, even when we factor these variations into our analysis, we observe that communist-era development negatively correlates with regional electoral quality. This latter finding in turn supports arguments about the links between

the structural underpinnings of economic development and democracy. As our illustrative case study of Dnipropetrovsk demonstrates, oligarchic power bases tend to be in regions that the USSR targeted for industrialization. Control over regional enterprises provided oligarchs with power over workforce, a significant share of which retained employment and other links to Soviet-era mega-industries.

Our sub-national research strategy helps illuminate the "poorly understood"[98] causal mechanisms accounting for political outcomes in relatively developed "partial democracies" in large-n cross-national analyses. As such, our research contributes to the wider comparative debates about the links between economic development and democracy in a variety of geographic, historical and cultural contexts. Our work broadly dovetails with arguments that economic development may not straightforwardly predict democracy or democratic resilience.[99] Instead, we demonstrate how the structural aspects of development may interact with other political-institutional legacies peculiar to a given national and sub-national setting and generate an entirely opposite effect to that anticipated in classic modernization theorizing.

SUPPLEMENTARY APPENDIX

SA1: Electoral Quality (EQ) scores

Region		Participation	Competition	EQ score	Variation in EQ score
Cherkasy	Center	47.1	83.2	39.2	4.5
Chernihiv	Center	48.8	83.4	40.7	5.6
Chernivtsi	West	48.9	81.3	39.8	5.5
Dnipropetrovsk	East	43.0	67.6	29.1	4.1
Ivano-Frankivsk	West	52.9	78.9	41.7	5.8
Kharkiv	East	44.4	65.8	29.2	4.4
Kherson	South	37.4	78.8	29.5	5.3
Khmelnitskii	West	50.8	82.4	41.8	6.3
Kirovograd	Center	46.4	80.4	37.3	4.0
Kyiv City	Center	41.9	73.3	30.7	-
Kyiv Oblast	Center	49.8	78.3	39.0	4.3
Lviv	West	56.3	79.4	44.7	6.6
Mykolaiv	South	38.5	78.4	30.2	4.4
Odessa	South	41.9	79.2	33.2	4.9
Poltava	Center	49.0	84.6	41.5	5.0
Rivne	West	50.8	78.9	40.1	3.4
Sumy	Center	46.0	83.0	38.2	4.9
Ternopil	West	56.5	75.0	42.4	4.4
Vinnytsia	Center	50.2	72.1	36.2	4.0
Volyn	West	55.3	78.9	43.6	5.7
Zakarpattia	West	49.2	78.5	38.6	7.6
Zaporizhia	East	44.5	72.2	32.1	5.2
Zhitomyr	Center	49.1	79.5	39.0	5.4

Figure SA1.1: Map of *oblast*-level EQ scores
Red: < 30; pink 30-35; yellow 35-40; green > 40: results for Kyiv City are not reported

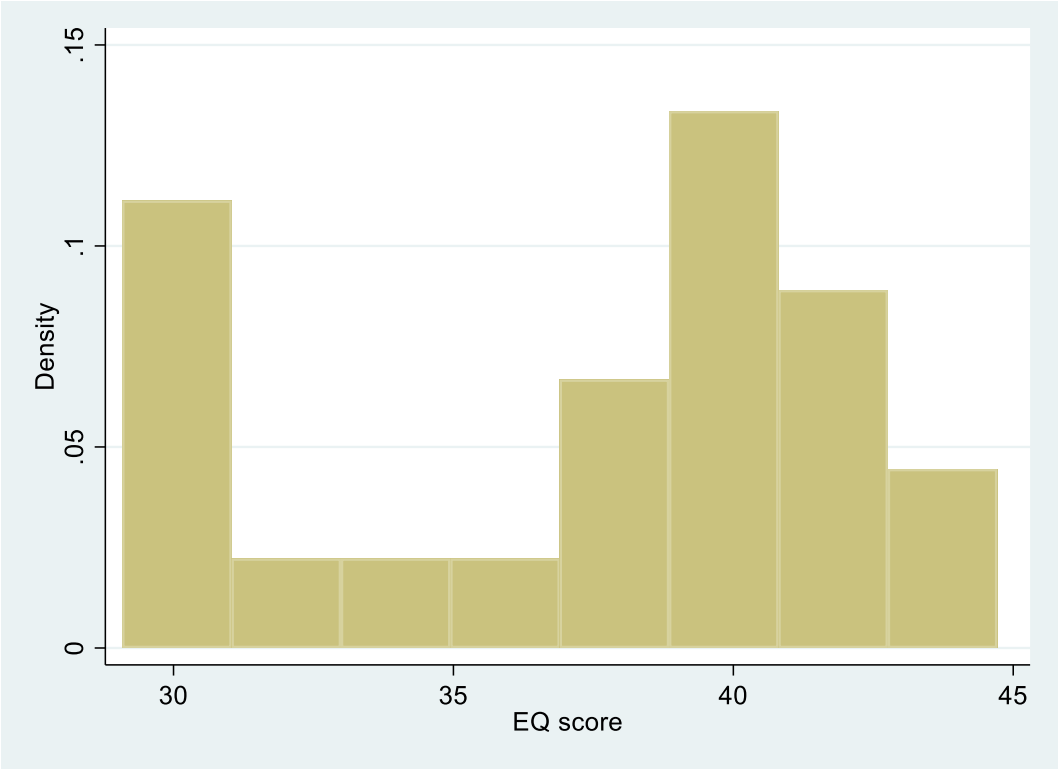

Figure SA1.2: Distribution of EQ scores across *oblasti*

Figure SA1.3: Standard deviation of EQ score within *oblasti*
Red: < 4; pink 4-5; yellow 5-6; green > 6

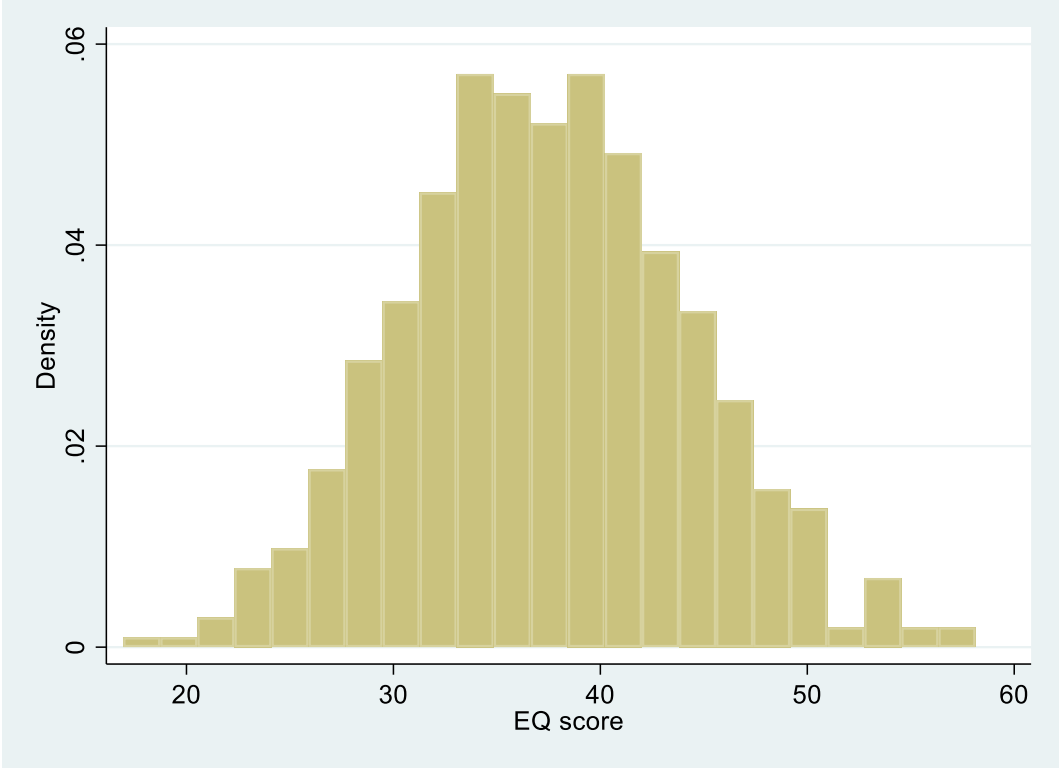

Figure SA1.4: Distribution of EQ scores across *rayony*

SA2: Elections that took place before 2015

Employing data for the 2015 elections to construct EQ indices, we may be picking up time-specific effects rather than those of persistent characteristics of regions. A number of factors, such as state reorganization after the 2013-2014 Revolution of Dignity (also known as Euromaidan), the war in the Donbass, severe economic crisis, the recent collapse of the Party of the Regions with its powerful political machine, to name just a few variables—could have potentially affected electoral behavior and thus the outcomes of our analysis. To ascertain whether the patterns uncovered for the 2015 elections are observed for previous electoral cycles as well, we compute the indicators of sub-national EQ using data for three previous electoral cycles.

Specifically, we compare the 2015 results with those for the preceding regional elections of 2010. The elections took place in all regions on October 31 except in Ternopil and Kyiv City where regional parliaments had been already elected in 2008-2009. The overall results for parties in the 2010 elections were strikingly different from those obtained by Ukraine's leading parties in the 2015 elections. The 2010 elections represented a triumph of the Party of the Regions, the power base of the then-president Viktor Yanukovych. The Party of the Regions formed the largest faction in all the regional *radas* with the exception of the four *oblasti* of Zakarpattia, Lviv, Ivano-Frankivsk and Volyn. In 2015, the Party became essentially defunct, and its indirect successor, the Opposition Bloc, represented a weak force in the new national parliament. The overall political environment in Ukraine during both the regional elections—in the aftermath of the accession of Yanukovych to the presidency and in the aftermath of the Revolution of Dignity—was also hardly comparable. Finally, the electoral systems were different across the two elections. While in 2015, the *oblast radas* were elected based on proportional representation, in 2010 a mixed system combining proportional representation and single-member districts was employed. Establishing broad similarities in political outcomes despite these variations in the political-institutional contexts in the two elections would provide confidence in the robustness of our findings.

We also explore regional outcomes of two national parliamentary elections of 2006 and 2012. The 2006 elections took place two years after the Orange Revolution; the 2012 elections took place two years after Yanukovych became president. In the 2006 elections, a proportional representation system was employed, while in the 2012 elections a mixed system was employed. In our analysis, we only analyze the results of the electoral races in which the proportional representation system was applied. In both cases electoral behavior and outcomes do not measure the characteristics of regional politics per se. They are, however, interesting for us, if one accepts three—in the Ukrainian case highly plausible— assumptions. First, regional political machines may have been deployed in national-level elections. These machines tend to be affiliated with nation-level parties either directly—like the Party of the Regions, which controlled most of the eastern and southern *oblasti* in 2012—, or indirectly through informal alliances. Second, regional political machines use similar tactics to ensure success in regional and national elections, which may result in similar electoral outcomes. Third, voters behave differently during regional and national elections.

Table SA2.1 reports the correlation coefficients between the scores for the Vanhanen indices computed for the 2006, 2010, 2012 and 2015 elections. For 2010, we compute two indicators: one looking only at the results of the proportional representation voting, and one taking single-member districts into account (in the latter case we measure competition as 100 minus the share of the leading party in the regional *rada*). *Figure SA2.1* presents the scatterplots of the Vanhanen indices for individual elections. The results indicate that spatial patterns of

participation and competition were similar across the 2010 and 2015 electoral cycles. Spatial patterns of participation and competition in parliamentary elections are also similar, although the correlation is lower, which reflects variations between national and regional politics. *Table SA2.2* computes the correlation coefficients between the Vanhanen indicators for various years. We observe persistence in spatial patterns of participation and competitiveness in Ukrainian regions.

As a final check, we also calculated an average score of EQ in Ukrainian regions, using the 2006, 2010 (without single-member districts), 2012 and 2015 data. As *Table SA2.2* shows, the results that we obtained are essentially the same as for individual indices.

Table SA2.1: Correlation between the Vanhanen indices for the 2015 elections and Vanhanen indices for elections that took place in other years

Elections	Correlation coefficient
Regional elections 2010, excluding single-member districts	0.806***
Regional elections 2010, including single-member districts	0.816***
Rada elections, 2006	0.722***
Rada elections, 2012	0.654***

Note: the indicators were computed using the following data. For the Rada elections, we used the data compiled by Rivera (2014). For the 2010 regional elections, competition was measured using the Wikipedia data (Ukrainian version); participation was measured using the data published by Kommentarii.ua (http://comments.ua/politics/208209-YAvka-mestnih-viborah-stala.html), except for Khmelnytskyi oblast; for this oblast, we measure turnout data available from UNIAN, 2010, 1 November, 12:36). *** significant at the 1% level, ** 5%, * 10%

Table SA2.2: Correlates of EQ scores, other elections

	Regional elections 2010, excluding single-member districts	Regional elections 2010, including single-member districts	Rada elections, 2006	Rada elections, 2012	Aggregated index, 2006, 2010, 2012, 2015
Urbanization	-0.743***	-0.716***	-0.538***	-0.164	-0.717***
College education	-0.750***	-0.678***	-0.492**	-0.075	-0.747***
Pre-Communist literacy	-0.336	-0.461*	-0.496*	-0.211	-0.586**
CPSU membership share	-0.753***	-0-840***	-0.396*	-0.129	-0.623***
Education, Stagnation era (1979)	-0.635***	-0.574***	-0.369*	0.008	-0.743***
Urbanization, Stagnation era (1979)	-0.821***	-0.747***	-0.592***	-0.247	-0.822***
Share of Ukrainian speakers	0.770***	0.744***	0.794***	0.749***	-0.877***
Distance from Brussels	-0.846***	-0.876***	-0.623***	-0.561***	-0.791***

Note: Urbanization from the Census data of 2001 is used. *** significant at 1% level, ** 5%, * 10%

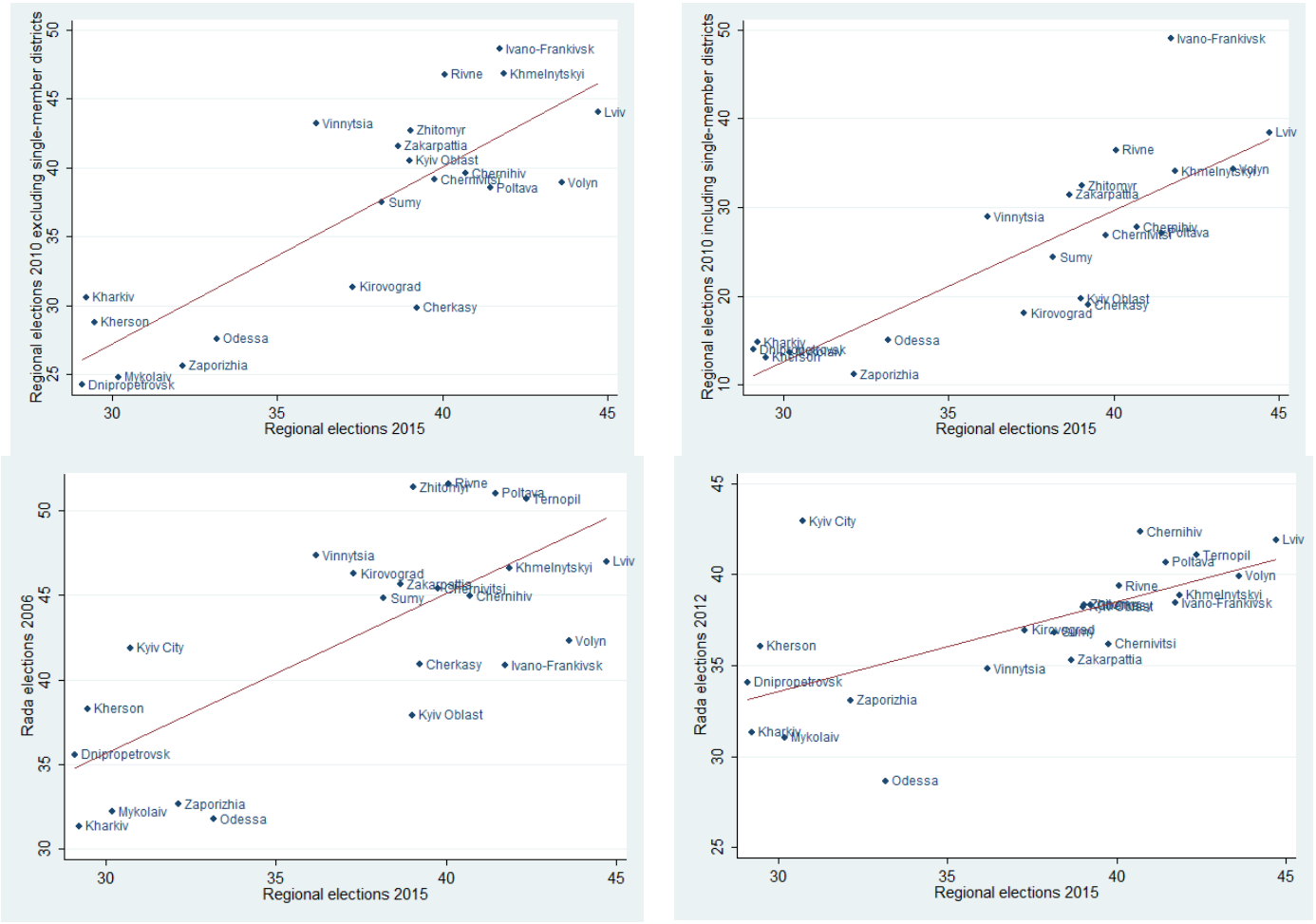

Figure SA2.1: Correlation of the 2005 EQ scores and EQ scores from previous elections

SA3: Average salaries as proxies for development

In addition to urbanization, which serves as the main proxy for development at the district level in our analysis, we also extracted data on average per capita salaries in each district. Income could be regarded as one proxy for development, but the particular measure we use has a number of disadvantages. It may not capture various forms of entrepreneurial and self-employment revenues, which may shape electoral behavior in a region. Furthermore, the quality of reporting of income is relatively low due to widespread tax evasion. We therefore use this measure as supplementary to the main urbanization proxy of development patterns in Ukraine's districts.

In the *Table SA3.1* we report our findings for this variable. In this case, the outcomes of estimations are somewhat more heterogeneous than in the case of urbanization. If we use the full sample of *rayony* and estimate OLS regressions controlling for the share of Ukrainian speaking population, the effect of salaries is insignificant. If we, however, control for *oblast*-specific fixed effects, the effect becomes significant and negative, in line with our main hypothesis. Thus, districts, where higher salaries are paid, are characterized by lower level of EQ, once one controls for *oblast*-specific factors (which could, for example, be driven by differences in performance of tax authorities monitoring whether companies pay salaries in a legal way or informally). Furthermore, the distribution of Ukrainian *rayony* according to salaries is characterized by presence of relatively few outliers with extremely high salaries (these outliers do not necessarily include *oblast*-level capitals and large cities; in many cases, these are smaller cities dominated by one particularly successful enterprise). In a further specification, we run our regressions excluding the outliers (all *rayony* with salaries exceeding 4,000 Hryvnia, see *Figure SA3.1*). In this case, again we find significant and negative effect of salaries on sub-national EQ, which corresponds to our hypothesis. Finally, if we control simultaneously for per capita salaries and urbanization, the latter keeps its significant and negative effect on EQ.

In sum, we confirm hypothesis H1 if we use salaries per capita as a proxy for income per capita (and hence, for development) and exclude the outlier *rayony* with extremely high income or control for oblast-specific factors. The results for urbanization are unaffected by inclusion of salary per capita in the set of covariates.

Table SA3.1: Determinants of EQ, *rayon* level, effect of salaries per capita

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS
Salaries per capita	-0.000	0.000	-0.003***	-0.001**	-0.001**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Share of Ukrainian speakers	0.179***	0.151***	0.182***	0.160***	0.078***
	(0.019)	(0.017)	(0.020)	(0.019)	(0.017)
Urbanization		-0.059***		-0.053***	
		(0.009)		(0.010)	
Constant	23.032***	25.963***	29.713***	29.778***	34.385***
	(2.226)	(1.999)	(2.826)	(2.628)	(2.318)
Observations	558	555	497	494	558
R-squared	0.221	0.280	0.239	0.282	0.524
Sample and estimation	Full sample	Full sample	Excluding outliers	Excluding outliers	Full sample, oblast FE

Note: *** significant at 1% level; ** 5%; * 10%. Robust standard errors in parentheses

Note that the distribution of urbanization does not suffer from the problem of outliers to the same extent as the distribution of salaries per capita. *Figure SA3.2* shows that it is bimodal: with a group of rural districts with smaller cities (average urbanization close to 30%) and a group of larger cities (100% urbanization). If we regress the EQ index on urbanization and share of Ukrainian speakers only for districts with urbanization below 60% (that is, roughly excluding the second peak of the distribution), our results are confirmed.

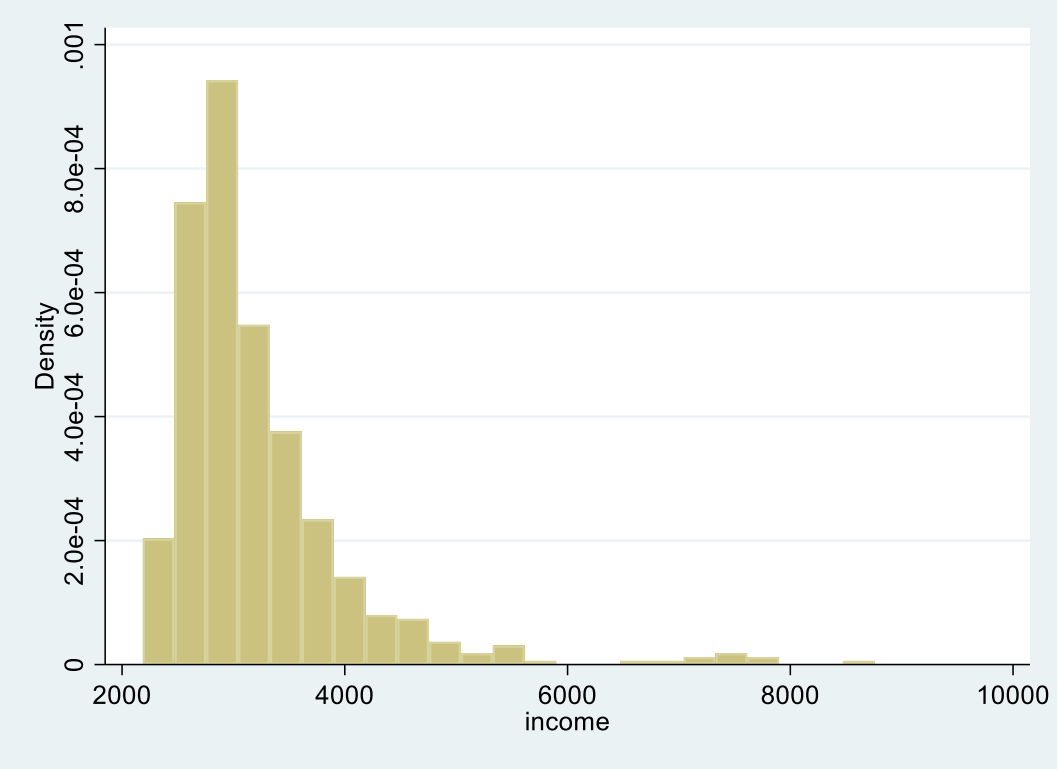

Figure SA3.1: Distribution of districts according to salaries per capita in 2015 (in hryvna)

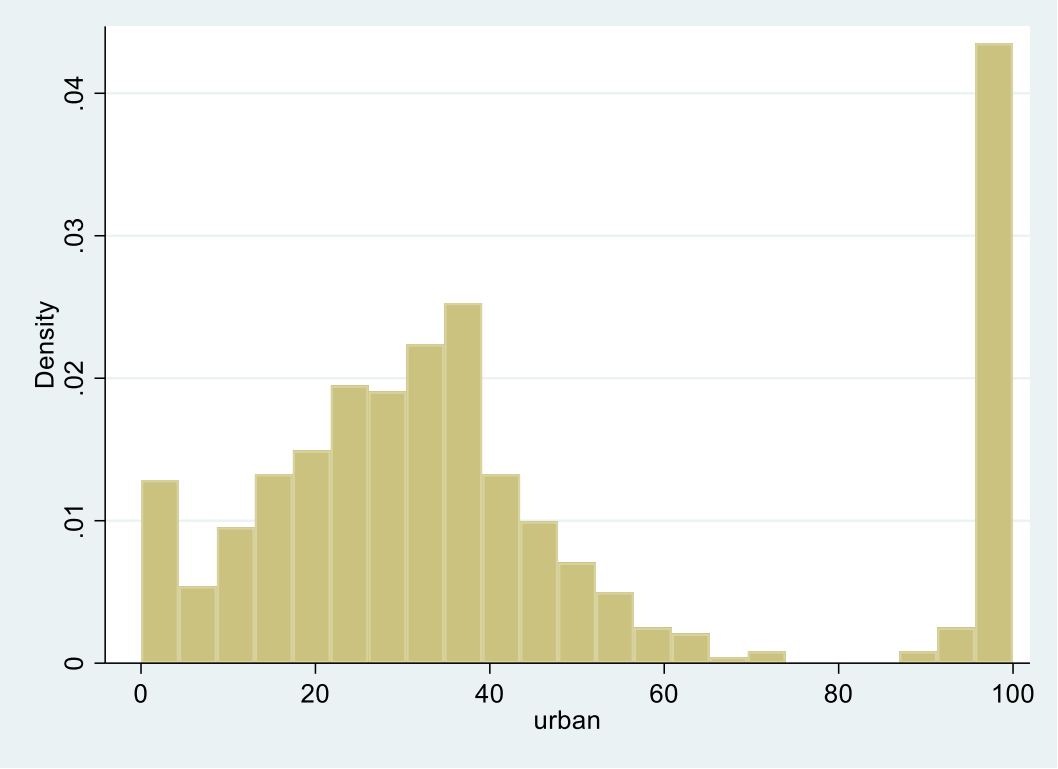

Figure SA3.2: Distribution of districts according to urbanization

SA4: Combining oblast- and district-specific variables

In this Appendix, we estimate regressions combining *oblast*- and district-level variables. For this purpose, we use the dataset of Ukrainian districts and regress district-level EQ on oblast- and district-level covariates. In *Table SA4.1*, we employ three historical oblast-level covariates: pre-Communist literacy, "stagnation era" education (using data from the 1979 census) and CPSU saturation—that is, the proportion of citizens with communist party membership. We are thereby able to assess the impact of various historical development indicators controlling for contemporary urbanization and ethnolinguistic composition of the population.

Considering that these variables are available only at the *oblast* level, we employed several strategies to deal with potential downward bias of standard errors. Specifically, we ran regressions clustering standard errors at the *oblast* level; a hierarchical random-effect model with a random *oblast*-level intercept; and a hierarchical random-effect model with a random intercept and a random slope of *oblast*-level covariates.

We find that the CPSU saturation variable and the variable of education level in the Brezhnev-era "stagnation" period have the effect of dampening sub-national EQ in Ukraine. We also find that the effect of pre-Communist literacy is weaker than that of the CPSU saturation variable and appears as insignificant in several models. *Table SA4.2* looks at the share of heavy industry (as a proxy for asset specificity). The variable has a significant and negative effect throughout all specifications.

Table SA4.1: Determinants of EQ, rayon level, rayon- and oblast-level covariates, historical legacies

	(1) OLS	(2) OLS	(3) REML	(4) REML	(5) OLS	(6) OLS	(7) REML	(8) REML	(9) OLS	(10) OLS	(11) REML	(12) REML
Urbanization	-0.063***	-0.063***	-0.062***	-0.062***	-0.057***	-0.057***	-0.067***	-0.067***	-0.059***	-0.059***	-0.067***	-0.067***
	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)
Share of Ukrainian-speakers	0.039**	0.039*	0.032**	0.033**	0.101***	0.101***	0.040***	0.040***	0.098***	0.098**	0.038***	0.038***
	(0.018)	(0.020)	(0.016)	(0.016)	(0.016)	(0.024)	(0.014)	(0.014)	(0.018)	(0.043)	(0.014)	(0.014)
Stagnation era education (1979)									-1.250***	-1.250**	-1.556***	-1.763***
									(0.153)	(0.498)	(0.506)	(0.615)
CPSU membership	-3.720***	-3.720***	-3.771***	-3.684***	-2.305***	-2.305***	-2.335***	-2.335***				
	(0.401)	(0.898)	(0.969)	(0.938)	(0.257)	(0.701)	(0.626)	(0.626)				
Pre-Communist literacy	-0.096***	-0.096	-0.113**	-0.111*								
	(0.024)	(0.067)	(0.057)	(0.059)								
Constant	57.620***	57.620***	58.780***	58.209***	42.319***	42.319***	48.161***	48.162***	38.385***	38.385***	45.604***	46.659***
	(3.258)	(5.124)	(5.731)	(5.526)	(2.336)	(4.692)	(3.467)	(3.467)	(2.245)	(5.894)	(3.284)	(3.493)
Observations	394	394	394	394	555	555	555	555	555	555	555	555
R-squared	0.407	0.407			0.396	0.396			0.352	0.352		
Random-effect parameters												
SD (Constant, oblast level)			1.870	0.000			3.214	3.214			3.465	
SD (CPSU membership)				0.329				0.000				0.000
SD (Pre-Communist literacy)				0.020								
SD (Stagnation era education)												0.601
SD (Residual)			4.223	4.223			4.414	4.414			4.413	4.412
Clustered standard errors		Yes				Yes				Yes		

Note: *** significant at 1% level; ** 5%; * 10%. Standard errors in parentheses; for OLS estimators, robust standard errors are applied

Table SA4.2: Determinants of EQ, rayon level, rayon- and oblast-level covariates, heavy industries

	(1) OLS	(2) OLS	(3) REML	(4) REML
Urbanization	-0.058***	-0.058***	-0.067***	-0.067***
	(0.007)	(0.007)	(0.007)	(0.007)
Share of Ukrainian-speakers	0.116***	0.116***	0.039***	0.039***
	(0.016)	(0.027)	(0.014)	(0.014)
Share of heavy industry	-0.136***	-0.136***	-0.165***	-0.165***
	(0.017)	(0.029)	(0.060)	(0.060)
Constant	32.120***	32.120***	40.059***	40.059***
	(1.660)	(2.458)	(1.982)	(1.982)
Observations	555	555	555	555
R-squared	0.34	0.34		
Random-effect parameters				
SD (Constant, oblast level)			3.577	3.577
SD (Share of heavy industry)				0.000
SD (Residual)			4.413	4.413
Clustered standard errors		Yes		

Note: *** significant at 1% level; ** 5%; * 10%. Standard errors in parentheses; for OLS estimators, robust standard errors are applied

SA5: Presence of oligarchs in individual *oblasti*

Methodological challenges:

The definition of oligarchs that we (following Pleines 2016) adopt in this paper is restrictive in two important ways:

- First, it sets a very high threshold for being included in the set of oligarchs: only selected few businessmen with strong political influence (and not merely businessmen with large assets) are treated as belonging to this group. Since we are interested in the political influence of business tycoons, this approach seems to be reasonable. In fact, Aslund (2005) distinguishes between the political interests of the highest echelon of business tycoons with strong links to politicians and those of other wealthy businessmen who may be more interested in the establishment of transparent rules of the game and open competition.

- Second, the list excludes numerous local business groups, which fail to exercise influence at the national level, but impinge on political life in individual *oblasti* or even cities. Conceptually, our results are not solely driven by the presence of strong national oligarchic groups in an *oblast*. In fact, if we were to focus on national oligarchic groupings, we would fail to account for the negative effects of economic development indices in Western Ukraine, where few nationally-prominent oligarchic groups operate. The lesser local oligarchs play a non-negligible role in local economies and politics, also affecting sub-national elections (Stratievski 2015). Unfortunately, no systematic data on these oligarchs exist. Thus, our proxy probably captures only the cases of the most pronounced oligarchic influence of the national groups with substantial resources.

In addition, we accept that we may miss some assets not listed on those websites, as well as assets with non-transparent ownership structure. Some of the oligarchic business groups do not provide any information on the scope of their operations, in which case we rely on print media and online news sources to obtain additional information. Still, the cases of the most significant oligarchic presence are likely to be captured by our data.

Empirical results:

Oligarch	Group	Source	Oblast
Rinat Akhmetov	SCM	Group website	Dnipropetrovsk, Kharkiv, Lviv, Odessa, Zaporizhia
Volodymyr Boiko	Metinvest	Group website	Dnipropetrovsk
Oleksandr Feldman	AVEC	Group website	Kharkiv
Dimitro Firtsah	Group DF	Group website	All oblast except Kherson, Zakarpattia, Ivano-Frankivsk and Chernivitsi
Ihor Kolomoiskyi	Privat	Internet; website of Ukrnafta	Chernihiv, Dnipropetrovsk, Ivano-Frankivsk, Lviv, Odessa, Poltava, Sumy, Zaporizhia
Yuri Kosyuk	MPKh	Group website	Cherkasy, Dnipropetrovsk, Ivano-Frankivsk, Kherson, Sumy, Vinnytsia
Vadim Novinskii	Smart Holding	Group website	All oblast except Chernivitski, Sumy, Volyn and Zhitomyr
Viktor Pinchuk	Interpipe / East One	Group website	Dnipropetrovsk
Anton Prigodskii	-	Internet	Dnipropetrovsk, Kharkiv
Serhii Tigipko	TAS	Group website	Dnipropetrovsk, Poltava
Konstantin Zhevago	Finansy i Kredit	Internet	Kharkiv, Kyiv Oblast, Lviv, Odessa, Poltava, Zakarpattia, Zhitomyr

Note: Luhansk and Donetsk are not included. Vasil Khmelnitskyi is excluded, since his assets are mostly located in Kyiv.

SA6: Summary statistics

	No. obs.	Mean	St. dev.	Min	Max
Oblast-level					
CPSU membership share	23	4.91	1.42	1.36	8.73
Distance from Brussels	23	2131.35	325.86	1631.00	2630.00
Education (contemporary)	23	29.28	5.53	21.30	47.70
Education (1979)	23	5.96	3.29	3.90	19.30
Income	23	25867.19	9443.35	17789.70	65672.80
Pre-Communist literacy	15	27.02	12.55	14.70	55.38
Share of college students (per 10,000 inhabitants)	23	3.82	2.56	1.77	14.22
Share of exports to Russia	23	26.52	11.16	9.39	51.82
Share of ferrous metals and machine building in the industrial output	23	17.13	13.40	3.47	51.27
Share of Ukrainian speakers	23	82.31	16.06	46.28	98.34
Urbanization (contemporary)	23	61.10	14.65	37.15	100.00
Urbanization (1959)	23	35.57	20.19	17.00	100.00
Urbanization (1970)	23	44.48	18.86	23.00	100.00
Urbanization (1979)	23	51.35	17.12	31.00	100.00
Rayon-level					
Salary per capita	568	3223.88	834.08	2185.00	8757.00
Non-Russian minority	558	0.04	0.19	0.00	1.00
Rayon-free city	568	0.23	0.42	0.00	1.00
Russian minority	558	0.27	0.44	0.00	1.00
Share of Ukrainian speakers	558	88.03	17.53	4.80	99.80
Urbanization	555	43.25	31.25	0.00	100.00

SA7: Robustness checks for Table 1

Outliers

We check whether our results are driven by a small number of outlier observations using the following approaches, which all confirm our results:

- We exclude all districts with more than 1,000,000 population and with more than 500,000 population – these large metropolitan centers could have different political dynamics compared to the rest of the country.

- We exclude *rayon*-free cities, which either have no rural population or where de-jure rural population has de-facto a strikingly different status and composition than in the actual rural areas.

- We run robust regressions (*rreg* routine in Stata), which are less affected by outliers.

- We run median regressions with bootstrapped standard errors, including 1000 bootstraps, which again are less affected by outliers than OLS.

Oblast-level effects and clustered standard errors

We are also aware of another issue of potential correlation between politics in individual *rayony* of a single *oblast*. The governments at the *oblast*-level have administrative control over *rayon*-level administrations. Furthermore, the *rayony* of a single *oblast* are likely to share multiple common characteristics. We therefore re-estimate all the results

- using standard errors clustered at the *oblast* level, as well as

- *oblast* fixed effects.

Our main result survives both of these adjustments.

Nonparametric analysis of spatial effects

In addition to the baseline specifications reported in the paper, we also run a multivariate non-parametric regression spline model, as suggested by McMillen (2012). It has the advantage of capturing the spatial specificity of the territory more accurately. We regress the EQ scores on various splines of urbanization, share of Ukrainian-speakers and geographical coordinates determined as part of the estimation (*mvrs* routine in Stata developed by Patrick Royston). The results for urbanization are fully confirmed. For the share of Ukrainian-speakers we observe a non-linear effect, which most likely reflects the fact that the share of Ukrainian-speakers affects sub-national EQ differently in the different regions of Ukraine.

Dominant party effects

Since one of the components of EQ is turnout, one could hypothetically envision the following mechanism affecting it. In certain parts of Ukraine, particular parties have stronger roots and dominate electoral campaigns. Some of these parties have more salient political agenda and, as

a result, are able to attract higher turnout. Other parties have less salient agenda, leading to lower turnout. To check whether this mechanism could affect our results, we replicate the regressions controlling for 43 dummies for the parties winning the majority share in the *rada* in the particular district (if several parties had an equally large share, the values of the dummies for all of these parties for this district were set to one). We are aware that in this case reverse causality is possible (EQ could affect the electoral chances of particular parties), and hence use this test only as a robustness check. Our results do not change.

SA8: Trade with Russia

We employ an alternative indicator of importance of old industries crucial for the Soviet development project, the share of *oblast* exports to Russia. Exports to Russia could be driven by the competitiveness of Ukrainian industrial equipment on this market, which had been in turn shaped by Soviet-era technological ties. Furthermore, Lankina et al. (2016b) show that in Russia's sub-national regions, higher volumes of trade with post-Soviet states are associated with lower democracy levels. This indicator, however, is noisier than that of the share of industrial output, because it can also be affected by mere proximity to Russia. (Ukraine does not report the industrial structure of regional trade with Russia). In addition, some Soviet-era industries are currently primarily oriented towards the European market. This is true for ferrous metals, which became one of the major sources of wealth for some of the largest Ukrainian oligarchic groups. We employ data on share of exports to Russia in 2013, before the start of the war in the Donbass, which disrupted trade ties. The correlation between the EQ score and share of exports to Russia is, as expected, negative (minus 0.200), but insignificant.

SA9: Pre-communist legacies

In addition to the analysis of the impact of communist-era development indicators, we also added a measure of *pre-communist* development, namely literacy rates in Ukrainian regions in the late 19th century. Some scholars have employed pre-communist literacy statistics to link patterns of pre-Communist schooling to levels of demand for democracy and resistance to Communist indoctrination (Darden et al. 2006; Peisakhin 2015). In turn, Lankina (2012) demonstrates that Russia's regions with higher literacy levels in the 1890s also exhibited higher levels of democracy in the 1990s. The values of this indicator varied significantly among territories comprising present-day Ukraine, with literacy levels ranging from below 20 percent to over 50 percent of the population.

Combining Austria-Hungarian and Russian Imperial data on literacy in the same dataset is problematic because of variations in definitions of literacy in the respective censuses. We therefore employ data from Russia's First Imperial Census of 1897 which capture literacy variations in territories formerly under the tutelage of the Russian Empire. (The dataset does not include information for three *oblasti*: Zhytomyr, Rivne and Volyn. In a robustness check, we add data from Kessler and Markevich to capture literacy levels in these regions. This source includes only data at the level of the Russian Imperial *gubernii*. In the late 19th century these *oblasti* mostly belonged to the Volyn *guberniya*. We therefore assumed the same share of literates as for the overall Gubernya for each *oblast*. The results do not change.)

The literacy indicator is significantly and negatively correlated with EQ (correlation coefficient of minus 0.516 for the sample of 15 regions, significant at 5 percent level). Here, we may be observing the "appropriation and subversion" mechanism at work, proposed by Lankina et al. (2016a) for Russia. The CPSU may have focused its developmental drive in regions where foundations for industrialization had been already laid before the Bolsheviks came to power. The soviet state effectively co-opted the better-educated strata of the *ancien régime*; subsequent generations also benefitted from better educational and other modern infrastructure which the Bolsheviks expanded in areas where the relevant foundations had been already laid before the Revolution. In turn, these processes arguably reduced the potential of the soviet intelligentsia to serve as a constituency for democratic support after the collapse of communism.

Consistent with these causal mechanisms, we observe positive correlation between pre-communist literacy and CPSU saturation in the regions (coefficient of 0.598, significant at the 5 percent level); this is similar to the results that Lankina et al. (2016a) report for Russia's regions. Considering that we only employ data for regions of Eastern Ukraine formerly under Russian Tsarist tutelage, we discount the possible effects of the Austro-Hungarian Empire's schooling legacies. According to an influential account, these legacies arguably facilitated the germination of nationalist—and, ultimately, anti-communist—sentiment among minority ethnic groups (Darden and Grzymala-Busse 2006).

SA10: Results across Ukrainian macro-regions

Are there differences between different parts of Ukraine in terms of the link between urbanization and EQ? To test this, we follow other scholars in distinguishing between four sets of regions: those in the East, the South, Center and the West (see SA1). We then replicate our regressions adding dummy variables for Eastern, Southern and Western regions, and interact the key covariates. We also run regressions separately for each set of regions. The results are reported in the Table below. Urbanization has a negative effect on EQ throughout the country, including in Western Ukraine; there is also no evidence that in the Eastern or Southern *oblasti* the negative effects of urbanization are stronger. These results support the logic underlying our main hypothesis H1. We also find that the positive correlation between the predominance of Ukrainian language speakers and the values on the EQ index only holds for Western *oblasti*. Similarly, we find that only in the West, the presence of large non-Russian minorities appears to have a negative effect on EQ. These outcomes suggest that in our analysis of the drivers of regional EQ variations, ethno-linguistic variables could not be straightforwardly divorced from the wider regional structural and economic factors.

Table SA10.1: Determinants of EQ, *rayon*-level, variation across groups of regions, OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Urbanization	-0.060***	-0.063***	-0.064***	-0.068***	-0.045**	-0.063***	-0.082***	-0.037**	-0.048**
	(0.007)	(0.010)	(0.007)	(0.014)	(0.018)	(0.017)	(0.013)	(0.017)	(0.019)
Share of Ukrainian speakers	0.057***	0.062***	0.021	0.158***	0.033	0.031			
	(0.016)	(0.017)	(0.033)	(0.040)	(0.030)	(0.022)			
Large Russian-speaking minority							2.292	-2.717***	-3.634***
							(2.906)	(0.888)	(0.909)
Large non-Russian speaking minority							-10.986***		1.370
							(1.267)		(1.129)
Eastern Ukraine	-6.222***	-7.493***	-6.549*						
	(0.552)	(0.934)	(3.641)						
Western Ukraine	3.368***	3.703***	-9.594**						
	(0.561)	(0.909)	(4.878)						
Southern Ukraine	-5.004***	-5.242***	-6.367*						
	(0.620)	(0.989)	(3.607)						
Urbanization x Eastern Ukraine		0.027							

		(0.018)							
Urbanization x Western Ukraine		-0.009							
		(0.017)							
Urbanization x Southern Ukraine		0.008							
		(0.021)							
Share of Ukrainian speakers x Eastern Ukraine			-0.003						
			(0.041)						
Share of Ukrainian speakers x Western Ukraine			0.138***						
			(0.051)						
Share of Ukrainian speakers x Southern Ukraine			0.010						
			(0.040)						
Constant	35.914***	35.465***	39.349***	29.979***	30.720***	32.920***	46.149***	34.455***	36.396***
	(1.671)	(1.719)	(3.226)	(4.009)	(2.973)	(1.822)	(0.751)	(0.778)	(0.863)
Observations	555	555	555	160	94	78	160	94	78
R-squared	0.496	0.499	0.511	0.223	0.168	0.224	0.300	0.217	0.319
Only Western Ukraine				Yes			Yes		
Only Eastern Ukraine					Yes			Yes	
Only Southern Ukraine						Yes			Yes

Note: see Table 1.

SA11: Development indicators at the oblast level

Consistent with our *rayon*-level analysis, we employ (1) the developmental indicator of share of urban population in 2014; (2) the measure of disposable income per capita (in Hryvnia) in 2014; and (3) regional data on educational attainment, which could be regarded as one proxy for economic development, likewise not available for the *rayon* level. Because in Ukraine, secondary schooling is mandatory and universal, we also employ two sets of higher education data: the share of *oblast* population with university degree, or, alternatively, of a record of several years of university attendance available from the last Ukrainian census held in 2001; and the share of students attending higher education institutions in the regional population in 2014-2015. Furthermore, we add two proxies of cultural and geographic variation across Ukrainian regions, namely share of Ukrainian speakers and driving distance between the capital of an *oblast* and Brussels, the administrative capital of the European Union. The use of the second variable is motivated by earlier literature showing that geographic proximity to the EU may have an impact on subnational political development. Lankina and Getachew (2006), in their analysis of Russian regions, in particular, show that regions located closer to the EU as measured by proximity to Helsinki, experience stronger democratizing external influences of the European Union. Distance between the regional capital and Brussels does capture proximity to the EU (some scholars have employed another EU capital like Vienna, but using a different capital is merely a matter of recalculation of geographic distance and does not change the results).

As the table below shows, we find that higher levels of EQ are associated with lower levels of sub-national economic development. If we drop Kyiv, our results do not change. The signs of the cultural and geographic variables are also in line with the analysis reported in the main part of the paper.

Table SA12.1: Correlation between the oblast-level development indicators and the oblast-level EQ

Indicator	EQ, oblast score			Participation, oblast score	Competition, oblast score
	Full sample	Without former Austro-Hungarian regions	Without former Polish, Romanian and Czechoslovak regions		
Development indicators					
Income	-0.450** n=23	-0.400* n=18	-0.355 n=16	-0.366* n=23	-0.371* n=23
Urbanization	-0.680*** n=23	-0.695** n=18	-0.645*** n=16	-0.607*** n=23	-0.459** n=23
College education	-0.641*** n=23	-0.669*** n=18	-0.645*** n=16	-0.529*** n=23	-0.503** n=23
Share of college students	-0.390* n=23	-0.459* n=18	-0.457* n=16	-0.264 n=23	-0.414** n=23
East-West variations (culture and geography)					
Share of Ukrainian speakers	0.805*** n=23	0.807*** n=18	0.781*** n=16	0.739*** n=23	0.484** n=23
Distance from Brussels	-0.752*** n=23	-0.682*** n=18	-0.592** n=16	-0.804*** n=23	-0.248 n=23

Note: *** significant at 1% level, ** 5%, * 10%. Each cell also contains information on the number of observations used to compute the respective correlation coefficients.

SA12: Latitude and longitude

The main specifications of the statistical regressions estimated in this study control for the latitude and longitude variables for the following reasons. As Ekiert and Hanson (2003, p. 32) write, "geography can be understood as a set of underlying natural or structural factors, including climate, topography, resource endowment, population density, migration patterns, patterns of trade and spatial patterns of production, and distance from economic centers." These factors, in turn, may influence the developmental prospects of post-communist societies in greater or lower proximity to more development western economies; climate may also affect the costs of production (p. 33). Second, social space may be regarded as a "politically constructed phenomenon" rooted in historical relations of power, cultural and other networks." Finally, space could be construed as "the combination of networks that often ignore natural and constructed regional boundaries" (p. 37)—concepts that focus on diffusion, spillover effects and neighbor emulation (p. 38).

The specific measure of longitude allows us to control for proximity to the EU and, conversely, distance from Russia. In our analysis the measure also captures the historical and cultural differences between the East and the West of Ukraine: some territories have a history of Austro-Hungarian or Polish tutelage, while others have been ruled by the Russian Empire (see Peisakhin 2015). Regional variations in Ukraine are not only pronounced along the East-West axis, but also along the North-South axis, with the Southern regions (Odessa or Kherson) due to their historical path from the late 18th century developing a weaker Ukrainian national identity (Solchanyk 1994). Our latitude measure captures these variations. The inclusion of two linear terms capturing the North-South and the East-West divide is an imperfect proxy for geographic characteristics of specific territories. We therefore also estimate semi-parametric regressions. This strategy allows us to control for geographic location in a more precise way. For example, we could better capture the effects of proximity to other urban centers, or for other specific features of a rayon conditioned by geographic location, which could matter for political outcomes.

Table SA12.1: Impact of the geographical location (latitude and longitude) on the EQ, OLS, *rayon*-level

Urbanization	-0.059***
	(0.007)
Share of Ukrainian-speakers	0.074***
	(0.018)
Latitude	0.784***
	(0.294)
Longitude	-0.711***
	(0.061)
Constant	16.561
	(13.952)
Observations	555
R-squared	0.479

Note: *** significant at 1% level; ** 5%; * 10%. Robust standard errors in parentheses.

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Notes

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46 Susan Stokes, "Perverse Accountability: A Formal Model of Machine Politics with Evidence from Argentina," *American Political Science Review* 99 (August 2005), 315-25; Herbert Kitschelt and Steven I. Wilkinson, *Correlates of Clientelism: Political Economy, Politicized Ethnicity and Post-Communist Transition* (New York: Cambridge University Press, 2007); Edward L. Gibson, "Boundary Control: Subnational Authoritarianism in Democratic Countries," *World Politics* 58 (October 2005), 101-32; Beatriz Magaloni, Alberto Diaz-Cayeros, and Federico Estévez, "Clientelism and Portfolio Diversification: A Model of Electoral Investment with Applications to Mexico," in Herbert Kitschelt and Steven I. Wilkinson, eds., *Patrons, Clients and Policies: Patterns of Democratic Accountability and Political Competition* (New York: Cambridge University Press, 2007), 182-205. Susan Stokes defines clientelism as "the proffering of material goods in return for electoral support, where the criterion of distribution . . . is simply: did you (will you) support me?" (Susan Stokes,

"Political Clientelism," in Carles Boix and Susan Stokes, eds., *The Oxford Handbook of Comparative Politics* (Oxford: Oxford University Press, 2007), 604-27, p. 605.
47 Hale, 2015; Frye et al., 2014.
48 Stokes, 2007; Magaloni et al. 2007; Herbert Kitschelt and Steven I. Wilkinson, "Citizen-Political Linkages: An Introduction," in Herbert Kitschelt and Steven I. Wilkinson, eds., *Patrons, Clients and Policies: Patterns of Democratic Accountability and Political Competition* (New York: Cambridge University Press, 2007), 1-49; Fabrice Edouard Lehoucq and Iván Molina Jiménez, *Stuffing the Ballot Box: Fraud, Electoral Reform, and Democratization in Costa Rica* (Cambridge: Cambridge University Press, 2002).
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51 Stephen Crowley, "Between Class and Nation: Worker Politics in the New Ukraine," *Communist and Post-Communist Studies* 28 (1995), 43-69.
52 Hale, 2015, p. 99; see also Sarah Birch, "Nomenklatura Democratization: Electoral Clientelism in Post-Soviet Ukraine," *Democratization* 4 (1997), 40-62.
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54 *Donetsk.Kommentarii*, Nov. 5, 2011.
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65 Hale 2015, p. 325, emphasis original.
66 Ibid.
67 Andrew Wilson, *Virtual Politics: Faking Democracy in the Post-Soviet World* (New Haven: Yale University Press, 2014).
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70 "Spor Kolomoyskogo i Nayoma o reyderskom zakhvate Ukrnafty," *Ria Novosti Ukraina*, 23 March 2015. http://rian.com.ua/video/20150323/365157249.html (accessed 30 August 2017).

71 Elena Solomina, "Dnepropetrovsk: Nevidimoye prisutstviye Kolomoyskogo," *Ria Novosti Ukraina*, 5 January 2016 http://rian.com.ua/analytics/20160105/1003118883.html (accessed 30 August 2017).
72 We drop Kyiv, which has the status of national capital and which we excluded from *rayon*-level analysis due to administrative incompatibility of within-city *rayony* with municipalities elsewhere in Ukraine.
73 Employing *oblast*-level data, we can also perform tests addressing the potential concern that the 2015 elections may not be fully representative of electoral patterns over time. Employing *oblast*-level data for several electoral cycles, we can confirm that the territorial distribution of voting patterns remains relatively stable over time (see SA2).
74 Vanhanen, 1997: Tatu Vanhanen, "A New Dataset for Measuring Democracy, 1810-1998," *Journal of Peace Research* 37 (March 2000), 251-65.
75 Tomila Lankina and Lullit Getachew, "A Geographic Incremental Theory of Democratization: Territory, Aid and Democracy in Postcommunist Regions," *World Politics* 58 (July 2006), 536-82.
76 Vanhanen 1997, p. 37.
77 We prefer this measure over measures capturing vote for a particular party. Party preferences are not the best guide for ascertaining regional quality of the electoral processes, not least because in Ukrainian politics, contending candidates may be associated with rival oligarchic groups. See also: Clem and Craumer; John O'Loughlin, "The Regional Factor in Contemporary Ukrainian Politics: Scale, Place, Space, or Bogus Effect?," *Post-Soviet Geography and Economics* 42 (2001), 1-33; Ivan Katchanovski, "Regional Political Divisions in Ukraine in 1991–2006," *Nationalities Papers* 34 (November 2006), 507-32; Paul Kubicek, "Regional Polarisation in Ukraine: Public Opinion, Voting and Legislative Behaviour," *Europe-Asia Studies* 52 (2000), 273-94.
78 Fabrice Edouard Lehoucq, "Electoral fraud: Causes, types, and consequences," *Annual Review of Political Science* 6 (2003), 233-56; Rodion Skovoroda and Tomila Lankina, "Fabricating Votes for Putin: New Tests of Fraud and Electoral Manipulations from Russia," *Post-Soviet Affairs* 33 (2017), 100-23; Pippa Norris, *Why Electoral Integrity Matters* (Cambridge: Cambridge University Press, 2014); Andreas Schedler, "The Menu of Manipulation," *Journal of Democracy* 13 (April 2002), 47-59.
79 Vanhanen, 1997, p. 35. In the same study, Vanhanen discusses measures capturing peculiarities of socialist economies that may impinge on democratic development, namely "the relative concentration and distribution of the means of production in non-agricultural sectors of the economy" (1997, p. 51). He defines concentration as "important economic resources [are] owned or controlled by the few, usually a more or less coherent social or political group. The controlling group may be a group of individuals, a group of big corporations (domestic or foreign-owned), a group of public enterprises, or a party controlling the state and through it the means of production owned by the state" (p. 52). In discussing this measure, Vanhanen had been however concerned with its failure to account for democratization in Eastern Europe in the early 1990s, rather than to explain how the structural legacies of industrial concentration may account for democratic backsliding in the period that followed the publication of his book in 1997.
80 Tomila Lankina and Lullit Getachew, "Mission or Empire, Word or Sword? The Human Capital Legacy in Post-Colonial Democratic Development," *American Journal of Political Science* 56 (April 2012), 465-83; Caroline Beer and Neil J. Mitchell, "Comparing Nations and States: Human Rights and Democracy in India," *Comparative Political Studies* 39 (October 2006), 996-1018; Michael Coppedge, Angel Alvarez, and Claudia Maldonado, "Two Persistent Dimensions of Democracy: Contestation and Inclusiveness," *The Journal of Politics* 70 (July 2008), 632-47.

81 In the Donetsk and Luhansk *oblasti,* elections did not take place in the separatists-controlled territories, which include the capital cities of both regions, and in the conflict zones; elections also did not take place in Crimea and Sevastopol. We exclude these territories from our analysis due to missing data. Our "competition" sub-indicator is based on the precise share of votes obtained by parties, rather than on the allocation of seats in the *rada*. This is because in some cases several parties with slightly different vote shares obtained the same number of seats. The party's exact vote share therefore represents a more straightforward measure for calculating the EQ sub-indicator.

82 The Odessa *oblast* represents one of the most striking cases. The *oblast*-level Vanhanen score is 33.16, while in the city of Izmail, the score is twice as low and has the value of 16.49 Izmail is located in the Western part of the *oblast* and is among the relatively few Ukrainian districts where the majority of the population is ethnically Russian. Izmail's Soviet-era industries have been in decline.

83 The dummy captures the potentially non-linear effect of development in that while small changes in the size of urban population in the mostly rural *rayony* may have little or no effect on regional EQ, we may observe significant voting differences among the metropolitan centers (*rayon*-free cities) and the rest of the country.

84 The first dummy variable takes the value of one if 10 percent or more of the *rayon* population claims Russian as native language. The second dummy variable takes the value of one if 10 percent or more of the *rayon* population speaks a different, non-Russian and non-Ukrainian, native language. These *rayony* are concentrated in three *oblasti*: Transcarpatia, which has a large Hungarian minority; the Western part of the Odessa *oblast*, which counts Bulgarians and Moldovans among its ethnic minority groups; and Chernivitsy, which has sizeable Moldovan and Romanian populations.

85 The reason why we need the dummy measure is because the culturally-driven effects in politics could emerge only if the linguistic minority group is sufficiently large: small changes in the linguistic composition would have no effect, but major variation between regions with a small and with a large minority share would matter. Nevertheless, it is also possible that even small changes matter. Employing two regression specifications therefore would help establish the robustness of our results.

86 For robustness checks, we also employ urbanization data for two additional time periods in Ukraine's post-World War II Soviet history: 1959, corresponding to the early Khrushchev period, and 1970 corresponding to the early Brezhnev era.

87 We regard this measure as a proxy for the extent to which the national leadership prioritized specific geographic areas as part of its developmental drive. Again, data for this variable correspond to the so-called Stagnation Era by which time we observe significantly higher levels of bureaucratic continuity and stability as compared to the earlier periods in Soviet history. In Ukraine, the share of CPSU members in individual *oblasti* varied substantially, from more than 8 percent of the total population in Kyiv, to a mere 1 percent in Ivano-Frankivsk. On the CPSU legacies see Lankina, Libman and Obydenkova; Alexander Libman and Anastassia Obydenkova, "CPSU Legacies and Regional Development in Contemporary Russia," *Political Studies* 63 (2015), 173-90.

88 The last dataset excludes Western Ukraine, which had been at that time under Polish and Romanian rule. In the East, there were substantially fewer *oblasti* than there are today. Ukraine consisted of seven *oblasti* (including Donetsk) and the Moldovan Autonomous Republic (currently part of Moldova). We therefore employ the following approach. We computed an average EQ score for all of the present-day *oblasti* which belonged to a single *oblast* in 1933 and correlated this variable with the 1933 industrial output data. Cherkasy and Kherson *oblasti* were not considered since they were formed from *rayony* originally belonging to different *oblasti*.

89 In the *rayon*-level analysis, we exclude Kyiv, where administrative sub-divisions are based on a different principle than in entities with the status of *oblast*.
90 Furthermore, in SA11 we replicate our analysis of the effect of the conventional economic development indicators and of the East-West divide on electoral quality using *oblast* level data instead of *rayony*. We also experiment with employing four economic development proxies for which *rayon*-level data are not available. Our developmental indicators are robustly and negatively correlated with EQ.
91 We also employ the correlation coefficient with two components of the Vanhanen index, participation and competition, but obtain results similar to those obtained when employing the composite index.
92 We consider Odessa *oblast* to be part of Eastern Ukraine, although it includes the territories of Budzhak, which had been under Romanian rule in the interwar period. Budzhak accounts for roughly 25 percent of the *oblast* population (2001 Census).
93 The role of post-Soviet trade in the context of the regime transition is discussed in: Tomila Lankina, Alexander Libman and Anastassia Obydenkova, "Authoritarian and Democratic Diffusion in Postcommunist Regions," *Comparative Political Studies* 49 (2016), 1599-629.
94 Graeme B. Robertson, "Strikes and Labor Organization in Hybrid Regimes," *American Political Science Review* 101 (November 2007), 781-98; Michael McFaul, Nikolai Petrov, and Andrei Riabov, *Between Dictatorship and Democracy: Russian Post-Communist Political Reform* (Washington: Carnegie Endowment for International Peace, 2004); Vladimir Gel'man and Grigorii V. Golosov, "Regional Party System Formation in Russia: The Deviant Case of Sverdlovsk Oblast," *Journal of Communist Studies and Transition Politics* 14 (1998), 31-53; Tomila Lankina, "President Putin's Local Government Reforms," in Peter Reddaway and Robert W. Orttung, *The Dynamics of Russian Politics: Putin's Reform of Federal-Regional Relations* (Lanham: Rowman and Littlefield, 2005); William M. Reisinger and Bryon J. Moraski, *The Regional Roots of Russia's Political Regime* (Ann Arbor: University of Michigan Press, 2017).
95 Gulnaz Sharafutdinova, *Political Consequences of Crony Capitalism Inside Russia* (Notre Dame: University of Notre Dame Press, 2011).
96 Heiko Pleines, "Dataset on Ukrainian Oligarchs 2000-2015," 2016, https://www.forschungsstelle.uni-bremen.de/UserFiles/file/table-oligarchs-overview.xls (accessed 20 June 2018); Heiko Pleines, "Oligarchs and Politics in Ukraine", *Demokratizatsiya* 24 (Winter 2016), 105-27.
97 Frye et al.
98 Epstein et al.
99 Przeworski et al., 2001; Doh Chull Shin and Hannah June Kim, "Liberal Democracy as the End of History: Western Theories versus Eastern Asian Realities," *Asian Journal of Comparative Politics* 2 (2017), 133-53; Bruce Bueno de Mesquita and George W. Downs, "Development and Democracy," *Foreign Affairs* 84 (September – October 2005), 77-86.