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International Trade as a Limiting Factor in Democratization: an Analysis of Subnational Regions in Post-Communist Russia

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Abstract The paper investigates the interplay of economic development and democratization in Russian regions. It introduces the new concept of a limiting factor, i.e., a particular resource with a highly localized source that is crucial for economic development. Based on both econometric analysis and detailed case studies, the paper shows that for a large subset of Russian regions, access to trade with the countries of the former Soviet Union constitutes a limiting factor, which on one hand is necessary to sustain economic growth but on the other strengthens the likelihood of a nondemocratic outcome in local regime transition. We also provide some tentative conjectures regarding other instances of a limiting factor that can be found worldwide both currently and historically.

Keywords Limiting factor · Democratization · International trade · Nested analysis · Russian regions

Introduction

The variety of outcomes of the process of democratization in Russia and other post-Communist countries belongs to the topics attracting substantial attention in both political science and economics (Frye 2012). The interplay of economic growth and democratization remains among the most important aspects of this discussion. During the 1990s, economic decline in Russia coincided with relative advancement of

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democratization; in the last decade, high growth rates and autocratic tendencies went hand in hand. The outcomes are even more complex if one takes into account the variety of democratization paths across the regions of Russia. In the 1990s, the weakness of the central government, on one hand, and the substantial variability of local conditions influencing regime transitions in the regions on the other resulted in substantial regime variation (Gel'man 1999; Lankina 2005; Lankina and Getachew 2006; Dininio and Orttung 2005). During the first years of Vladimir Putin's presidency, although the central government made a significant effort to establish a more centralized and hierarchical political system, the regional variation among political regimes survived (Gel'man and Lankina 2008; Chebankova 2005).

This paper aims to contribute to this discussion by investigating a specific type of economic development that is associated with the presence of what we *define as a "limiting factor": a particular resource with a highly localized source that is in short supply and determines the feasibility of economic growth*. Generally, this type of economic growth is observed in regions with undiversified economic structures where some inputs cannot be substituted for others at least in the short run or where companies produce goods that can be sold only on particular markets or to particular customers.[1] As a result, there is a bottleneck that political actors can control and use to accumulate power, acting as a gatekeeper for crucial economic activities in a region. Our focus is on the ability of *international trade* to function as a type of limiting factor. We propose a set of conditions under which international trade could have such an effect and we hypothesize that if these conditions are fulfilled trade a substantial impact on the path of regime transition, making autocratic consolidation more probable and undermining democratization. Specifically, we examine the trade relations *between the Russian regions and newly independent post-Soviet states*. We demonstrate that such trade constitutes a limiting factor for many Russian regions and negatively influences democratization. While the main focus of the paper is on the case of Russian regions, we also speculate about the applicability of the concept of the limiting factor beyond the post-Soviet setting, providing some tentative examples in this respect.

To establish the causal relationships regarding the ways in which the limiting factor affects economic performance and regime transition, we employ the nested analysis (NA) strategy elaborated by Lieberman (2005). There are two characteristic features of the nested approach: the sequential application of small-N and large-N analysis (SNA and LNA) and the choice of a case study for the SNA that depends upon the outcome of the LNA. However, despite an active debate on the importance of this method (Brady et al. 2006; Bennett and Elman 2006; Doorenspleet and Kopecky 2008) and on mixed methods research in general (Small 2011), the actual application of NA in an article format remains limited (especially for the model-building SNA, which is precluded *and* followed by the LNA). Thus, in a secondary manner, this paper also contributes to the testing of a new methodology in political science.

The logic of NA determines the structure of the paper, which proceeds as follows. The "Trade as a Limiting Factor and Regime Transition" section introduces the notion of the limiting factor, focusing in particular on how international trade could become one. The "Empirical Case" and "Initial large-N Analysis" sections outline the empirical

[1] The limiting factor concept was introduced in ecological economics to describe a case where productivity (e.g., a crop yield) is determined by the least available factor.

model and present the parsimonious statistical analysis. "Process Tracing: the Puzzle of the Ivanovo Region" focuses on a case study and resolves the parsimony by uncovering the causal mechanisms at work. "Synthesis: Model-Testing Large-N Analysis" is the synthesis, which, according to NA, returns us to the large-N analysis. "Possible Extensions of the Logic of the Limiting Factor" suggests how we can expand the notion of the limiting factor to a more general context. "Conclusion" section concludes.

Trade as a Limiting Factor and Regime Transition

The interplay of international trade and democratization has been subject to numerous empirical studies with generally ambiguous conclusions (Milner and Mukherjee 2010). One of the reasons may be that the label "international trade" is attributed to different types of transactions across national borders or to different trade partners.[2] We expect international trade to act as a limiting factor if the following three conditions are met:

1. *Concentration of trade*: The trade links should be focused on particular partners. In the extreme case (similar to that investigated in this paper), foreign trade flows are dominated by a handful of companies in a particular country. This level of trade concentration can emerge due to the historical reasons shaping the industrial structure and trade relations (this is the case we will investigate in this paper) or due to the institutional environment, restricting access to a certain international market (e.g., quota systems for commodities; we will provide some examples in what follows).
2. *Contribution to growth*: Existing trade links should provide a substantial contribution to the growth of a region. Generally speaking, any international trade allows for greater specialization and thus provides an impetus for economic growth. However, the *relative contribution* of trade to growth can differ: while for some regions international trade is a major factor determining growth performance, others have large domestic markets and are less dependent on trade. One could expect smaller countries or regions to be more likely to exhibit economic growth that is highly dependent on international trade. We expect trade to contribute to both region-level overall growth and profits of individual companies, which managed to gain access to it.
3. *High switching costs*: The core idea of the limiting factor is that an economy cannot easily compensate for its absence by employing other factors. Thus, we expect international trade to not merely provide a major contribution to growth but to also make growth impossible without access to these particular trade flows. Typically, we should expect this to happen if the main businesses are characterized by high asset specificity, i.e., the assets they hold can *only* produce economic gains if they are used in a particular way (Williamson 1975).[3] For example, this result can

[2] For example, Teorell (2010) looks at how democratization is affected by trade with key democratic and hegemonic nondemocratic countries and, although establishes a negative effect of the overall trade openness on democratization, does not find a significant effect of trade with particular countries.

[3] Asset specificity has already been considered in studies on political regime transition, but in a context very different from that of this paper: to describe the extent of the "international" mobility of capital and labor (Boix 2003; Boix and Stokes 2003; Acemoglu and Robinson 2006; Ansell and Samuels 2010; Freeman and Quinn 2012).

> be observed in the case of technological complementarities: the production facilities are organized such that they depend on a particular input imported from abroad or produce intermediate inputs that can be purchased only by particular buyers (because they are specifically suited for their production process). The international legal environment represents another reason for high switching costs, maintaining artificially high prices for companies allowed to access a particular market.

A preliminary causal theory can be derived from the existing literature on the politics–business nexus in transitional societies. How could the limiting factor affect regime transition? First, a substantial literature argues that as part of the transition process, incumbent politicians attempt to establish control over leading enterprises in a region or a state as a tool to enhance their power. Hellmann (1998) and Frye (2010) argue that this is the case at the national level in post-Communist countries, and McMann (2006) advances a similar argument for subnational regimes in Russia. Many subnational regimes in Russia explicitly relied on political control through business–state connections (Remington 2011): first, because the Russian political transition coincided with an economic transition, where Russian regions also varied dramatically, and this variation strongly affected the power of the governors (Orttung 2004); second, because Russian regions de jure had very limited authority and had to use control over economic assets as an important instrument of de facto control (Bahry 2005); and third, because in some cases regional business considered the governors potential protectors against the federal administration (Cai and Treisman 2004), which expanded the opportunities for using economic control as a tool of political power.

One can argue that the capture of the most lucrative enterprises in the region is made even easier when economic growth is based on a single trade channel that plays the role of the limiting factor than in cases where trade is more diversified and dispersed. On one hand, it requires lower monitoring capacities of the incumbent, and, on the other hand, foreign partners may be more interested in dealing with the government directly instead of multiple individual companies to simplify the bargaining process or to ensure higher level of security (Stoner-Weiss 2000 advances this argument for trade and foreign direct investments in Russian regions, which often flow to nondemocratic regions). Once control is established, the incumbent can effectively regulate which domestic companies receive access to the trade flows and which do not. As the switching costs are prohibitive, a lack of access to the limiting factor makes it impossible for businesses to survive in the short run. Moreover, as trade ties contribute substantially to growth and profitability, the demand from private business for access to the limiting factor should be large. Therefore, an incumbent controlling the limiting factor can ensure the loyalty of business to her regime, which, as Shleifer and Vishny (1993) show, can be used as a source of political power. As a result, the existence of the limiting factor undermines the process of democratization and results in an autocratic consolidation.

There are several remarks to be made regarding this mechanism. First, there are two perspectives on why the limiting factor can be *endogenous*. On one hand, its influence may dissipate, as other companies involved in industries that are less dependent on the limiting factors could emerge and contribute to economic growth; investments into these industries could be used by the business as at tool to gain independence from political control. However, this change requires time and is not feasible in the short run. Therefore, there is a question of incentives: it may be more attractive to accept political limitations associated with the limiting factor than risk long-term investments that should eventually make a business more independent of the government. This is especially the case if a nondemocratic regime is capable of somewhat limiting its predation and thus companies are able to retain a certain portion of the profits generated by the limiting factor.[4] Second, to reduce the degree to which economic growth depends on a limiting factor, substantial financial resources are required, which can be generated only through access to the limiting factor itself—otherwise new industries cannot emerge. Third, as Wiig and Kolstad (2012) suggest, the government, knowing that its political control depends on the limiting factor, is likely to disincentivize investments in other industries.

On the other hand, a limiting factor can be endogenous to a political regime. The economic profile of a region (or country) is often a product of politics. This seems to be particularly true for trade relations, which evolve under the strong influence of government regulation of exports and imports. From this perspective, it is necessary to acknowledge that, first, international trade ties are, as has been shown in numerous empirical papers, highly persistent: because they are associated with asset-specific investments (Baldwin 1990) and because the forces of market competition push countries towards increasing concentration in particular goods according to their comparative advantages. Thus, changing the trade structure is difficult. Second, generally speaking, many developing countries inherit their trade and industrial structures from the pre-independence period, when they were designed by the metropolitan governments and were not affected by local politics. Again, these postcolonial trade ties, while they dissipate over time (with the depreciation of asset-specific investments), have been shown to be highly persistent (Frankel 1997; Bhattacharjea 2004; Sandberg 2012). This is true also for our empirical setting: as we will show in what follows, trade between the former Soviet republics is inherited from decades of Soviet centralized planning, which, likely considering the influence of the industrial structure on the stability of the Communist regime in general, clearly did *not* take into account its implications for *subnational* regimes (which simply did not exist during the Communist period).

The second concern relates to our implicit assumption that trade partners tend to be rather indifferent towards political changes in the region with which they trade. This may not be the case for several reasons. First, large trade partners may in fact prefer dealing with smaller local companies outside of government control: while it increases negotiation costs, it also strengthens bargaining power. Second, trade partners may be concerned about the credibility of the local government should it be able to increase its power: it may then attempt to renegotiate trade agreements in its favor. Finally, foreign trading partners may have explicit preferences regarding the political regime in the region if they are committed to democracy promotion (foreign governments) or are under strict pressure from public opinion in terms of corporate social responsibility (companies). There is evidence that the trade dependence of the sort described

[4] Whether this is feasible in the long run is subject to intensive scholarly debate (e.g., Gehlbach and Keefer 2011), but in the short run, it may be feasible and may discourage investments in alternative industries.

here *can* be used to promote democracy if so desired (Cao et al. 2013). Furthermore, there may be other factors for the transmission of democratic values at play in relation to trade relations (e.g., mutual learning). We acknowledge that these factors may make the effect of the logic of the limiting factor on regime transition much weaker if they are present and will discuss their role for the case we investigate.

hird, the existence of limiting factors may be unlikely in modern, diversified economies: the empirically well-established dominance of intra-industry trade between them is likely to be incompatible with the logic presented above. However, developing countries and post-Communist states rarely have highly diversified economies: on the contrary, they are often are either driven by resource extraction and agricultural monocultures or have an uncompetitive industrial sector that depends on access to particular markets or resources. This entirely applies to most Russian regions and to post-Soviet countries in general.[5] Therefore, for these countries, the presence of limiting factor logic is likely.[6]

Empirical Case

Russian Regions and Post-Soviet Trade

The Russian case makes it relatively easy to identify how international trade can serve as a limiting factor. Specifically, it refers to *the trade with the countries of the former Soviet Union* (FSU).[7] The Soviet planned economy was based on a very high level of economic *interdependence* between territories brought together by a vast network of supply linkages. Typically, each enterprise had a monopoly position in these networks, and the machinery and equipment were adjusted in a way perfectly suited to employ materials supplied by a particular company; the outputs, in turn, could also only be used by a particular company. Moreover, the restrictions on competition and limited access to foreign markets resulted in the accumulation of specific human capital: workers and engineers were accustomed to employing particular products, knew their strengths and weaknesses, and had little experience in adjusting to alternatives. In other words, the asset specificity in the Soviet economy was very high.[8]

[5] Russian regions are relatively competitive internationally only if they possess substantial natural resources. If it is not the case, their machinery can typically be sold either to each other, due to technological complementarities, or to certain developing countries. The fact that uncompetitive manufacturing in conjunction with international trade can lead to autocratic consolidation has been explored, although from an entirely different view, by O'Donnell (1973).

[6] It is interesting to note that our argument bears some similarity to the *theory of vertical integration* in economics, which is used to explain the existence of firms and also relies on the notion of asset specificity (see, e.g., Rajan and Zingales 1998). For other papers establishing the parallels between this theory and the logic of politics, see Lake (2009) and Congleton (2010).

[7] The FSU countries are defined here as all former republics of the USSR with the exception of Latvia, Lithuania, and Estonia.

[8] Much more so than in any market economy, where companies would attempt to escape such a massive concentration on a particular buyer or supplier to avoid complete dependence—in the Soviet Union, where the entire economy worked as a single factory, the problem was not considered.

The negative consequences of the fragmentation of these economic ties after the collapse of the Soviet Union have been studied in the literature on *economic disorganization*, which shows that the disappearance of the mechanisms of coordination across enterprises present in the planned economy profoundly contributed to the economic crisis in Russia in the 1990s (Blanchard and Kremer 1997). Under these conditions, there was a significant negative effect on Russian economic actors, which had more developed economic linkages with the FSU, after the collapse of the Union given the increasing transaction costs and trade barriers that the businesses have to overcome and the disappearance of the coordination mechanisms. In many cases, the half-products of the FSU were simply incompatible with technological standards used outside of the former USSR; hence, the FSU remained the only acceptable market for them. Thus, there are reasons to expect post-Soviet trade to meet all three conditions outlined in "Trade as a Limiting Factor and Regime Transition" section: it is highly concentrated in particular countries or companies; the switching costs, due to the massive asset specificity of the Soviet economy, are very high, and, as the disorganization studies argue, it could provide an important contribution to growth (but we will investigate this issue further). However, the intensity of this factor should differ for different regions within Russia, depending on their role in the Soviet division of labor.

There is another important feature of post-Soviet trade that is relevant for our study. Trade between post-Soviet countries seems to be governed by specific mechanisms that often differ from standard way in which "free trade" is represented in economics. First, trade was often based on informal linkages established in the Soviet period between now independent companies. Therefore, the degree of open market competition in these ties remains low, and the level of persistence remains high. That the trade within the FSU is often transacted at a higher price level than in international trade corroborates this fact. Second, many FSU governments maintain a public monopoly on trade (Uzbekistan, Belarus), and in almost all countries of the region, governments significantly intervene in the trade ties; the interventions are linked to the existing interconnections between governments and businesses. Overall, trade between FSU countries is frequently a highly politicized topic (Nygren 2008). As Collins (2009) demonstrates, the ability of post-Soviet countries to cooperate in such a way as to ensure free trade among them without government intervention is very limited. Thus, political actors are likely to be able to control this limiting factor of regional economic performance.

Research Strategy

The preliminary review of the Russian regions suggests that the trade with the FSU is likely to be a limiting factor and this limiting factor *could* induce nondemocratic outcomes in regional regime transitions. However, two questions remain unaddressed. First, the argument that trade with the FSU makes a substantial contribution to economic growth requires *empirical validation*. For instance, one could imagine a situation in which the persistent post-Soviet trade ties are primarily associated with the declining sector of old Soviet companies, while the economic dynamics of the region are linked to the new sector created after the collapse of the Soviet Union, which gradually increases its share in the gross regional product and employment. Second, we need to trace the causal links between the existence of the limiting factor, its effect on the economic performance on the region, changes in behavior of politicians, and the effect of regime transitions. While the importance of politics for FSU trade is significant, it does not automatically imply that the necessary tools reside at the level of *regional politicians* (and thus are related to the variation of subnational democratization).

The presence of these two challenges, as we noted in the introduction, suggests that the use of NA is appropriate. The NA begins with a preliminary LNA, which should make it possible to narrow the set of possible explanations to be considered in the SNA and assess the strength of partial explanations (Lieberman 2005, p. 439). This stage should resolve our first concern: to empirically demonstrate that FSU trade has a *significant* and *quantitatively substantial* impact on *economic growth*. If we obtain a positive answer to this question, we can then proceed to the next stage, the SNA, where we trace the causal mechanism behind the regime transition, which, as described previously, we expect to be related to the presence of a limiting factor. As a result, we should obtain an *analytical model*, which we test in the third stage, where, according to Lieberman (2005, p. 449), the LNA is implemented and now "tailored" to testing the particular interconnections.

The unit of analysis in this study is the *individual region*. For the large-N study, we have compiled an original dataset of Russian region-level data. For the SNA, we also consider the *regional level of politics in Russia*, but now study one particular region (we will discuss the logic behind the selection below). In-depth interviews were conducted with regional politicians, businessmen, academics, and journalists. The third-stage LNA once again uses a dataset of the Russian regions, consistent with the mechanisms revealed in the second stage SNA.

Initial large-N Analysis

We begin with the large-N analysis and, in the first step, consider the *impact of trade with the FSU on economic growth in Russia* at the regional level. To date, there has been a rich literature investigating the economic and political determinants of variations in growth among the Russian regions (Van Selm 1998; Popov 2001; Berkowitz and DeJong 2003; Ahrend 2005; Libman 2012). Surprisingly, however, no paper to date has examined the share of trade with the FSU as a determinant of regional economic growth. Therefore, in this section, we will first regress the growth rates on the share of FSU trade and various controls developed in previous studies. The statistical analysis is based on data collected across 79 constituent regions of Russia. This sample includes all of Russia's regions with minor exceptions. The measure of growth is defined as the average growth rate of regional GDP, corrected for inflation. The measure of the trade relations with the FSU is the share of trade with the FSU in the overall foreign trade turnover of the region. We consider the period of 2000–2006.[9] As is standard in growth econometrics, we averaged the annual growth rates and all other variables over the 7-year period of our investigation.[10] We control for the following variables: (1) the initial level of the gross regional product per capita; (2) extraction of oil and gas in the region; (3) the level of education in the region; and (4) investments in the regional economy. Furthermore, we control for trade openness (share of trade turnover to GDP) to capture the marginal change in the share of trade with the FSU ceteris paribus the overall role of the foreign trade in the regional economy.[11]

Table 1 reports the results for the economic growth regressions. In all specifications, regions with strong economic linkages with the FSU experienced significantly higher growth rates. Thus, *trade with the FSU positively affects economic growth*. The effect is not only statistically significant, but is also large relative to other covariates. Figure 1 plots standardized beta coefficients calculated for regression (1). Because the standardized regression coefficients can be compared, the length of each bar represents the "relative importance" of each factor. Trade with the FSU is among the most important variables, superseded only by investments and exceeding the impact of human capital accumulation (education). Because trade between Russia and the post-Soviet countries is strongly unbalanced in terms of the commodity structure of exports and imports, we determined the impact of the share of exports and share of imports to and from the FSU and both variables simultaneously and found a significant and strong positive effect in all cases.[12]

As we mentioned previously, reverse causality may make investigations of the role of trade as a limiting factor very difficult. Because trade with the FSU was chiefly determined by the Soviet trade structure, it is less susceptible to this problem. However, we also use a purely statistical tool to check for possible reverse causality by applying the two-stage least squares estimator (specifications (5)–(7)). The

[9] The lower cutoff is determined by data availability and because the economic decline in Russia in the 1990s rendered Ivanovo textiles, our main empirical case, incapable of generating profits, even with access to the limiting factor (see discussion of the Russian economy of the 1990s in Gaddy and Ickes 2002). The upper cutoff is determined by the political reforms implemented by Putin: before 2006, most Russian regions were still ruled by governors who were popularly elected; the elections themselves were abolished in 2004. For a discussion of the timeframe see Appendix I of the Electronic Supplementary Material. All appendices are included in the Supplementary Information, which is available online and freely accessible at the authors' website (https://sites.google.com/site/libmanalexander/Appendix.pdf?attredirects=0&d=1) and SSRN (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2195818).

[10] The annual variation in growth is generally considered to be strongly influenced by specific contemporaneous factors and is therefore not applicable for quantitative analysis. Because we are estimating the regressions for a relatively small sample, we checked the normality of the residuals using the Jarque–Bera test. The standard procedure is then to exclude observations until Jarque–Bera becomes insignificant and treat only the results robust to this procedure as being worth interpreting. In our case, our key findings passed this test in all cases.

[11] The details on the control variables employed are reported in Appendix A of the Electronic Supplementary Material.

[12] Furthermore, we implement a set of further robustness checks, reported in the Appendices C (additional controls), E (an alternative measure of FSU trade) and F (an alternative timeframe) of the Electronic Supplementary Material, which entirely confirm the main findings reported above: we estimate regressions for the period of 2000–2004 (i.e., before the elections of governors were abolished); use FSU trade per unit of GDP as an explanatory variable; exclude outliers; control for the industrial structure of trade, location, and climatic conditions of the regions, as well as degree of industrial decline in the 1990s.

Table 1 Effects of trade with the FSU on the economic growth; average GDP growth rate, inflation-corrected, 2000–2006

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) TSLS	(5) TSLS	(7) TSLS
Initial GDP per capita	−0.018 (0.015)	−0.018 (0.017)	−0.028* (0.015)	−0.017 (0.016)	−0.008 (0.016)	−0.009 (0.015)	
Oil and gas	0.003 (0.002)	0.003 (0.002)	0.004* (0.002)	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)	
Education	23.274*** (5.392)	21.030*** (5.582)	27.738*** (6.229)	24.054*** (5.941)	22.117*** (5.000)	22.443*** (5.076)	
Openness	39.933** (16.701)	44.495** (18.819)	23.290 (16.692)	36.992** (16.525)	45.046*** (17.806)	47.754*** (18.566)	
Investments	0.013*** (0.003)	0.012*** (0.003)	0.014*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	
Distance from Moscow						0.025 (0.114)	
Share of FSU trade	5.053*** (1.293)				7.541** (3.121)	7.573** (3.172)	7.100** (3.046)
Share of FSU exports		4.300*** (1.047)		2.982** (1.197)			
Share of FSU imports			3.441*** (1.188)	2.630** (1.292)			
Constant	−1.163 (1.277)	−0.424 (1.180)	−1.482 (1.380)	−1.695 (1.396)	−2.023 (1.661)	−2.085 (1.738)	5.220*** (0.663)
Observations	79	79	79	79	79	79	79
R^2	0.415	0.39	0.404	0.436			
J.–B. test	16.58***	24.15***	6.753**	14.98***			
Fist stage F-stat					10.37***	10.22***	16.88***

Note: robust standard errors in parentheses. Outliers are Dagestan in regressions (1), (2), and (3) and Dagestan and Arkhangelsk in regressions (4) and (5). After exclusion of outliers, shares of FSU trade, export, and import always remain significant and positive

*10 % level, ** 5 % level, *** 1 % level, significant

instrument we apply is a dummy for the FSU border (equal to 1 for all regions bordering the FSU and 0 otherwise). The choice of the instrument seems to be straightforward, as it

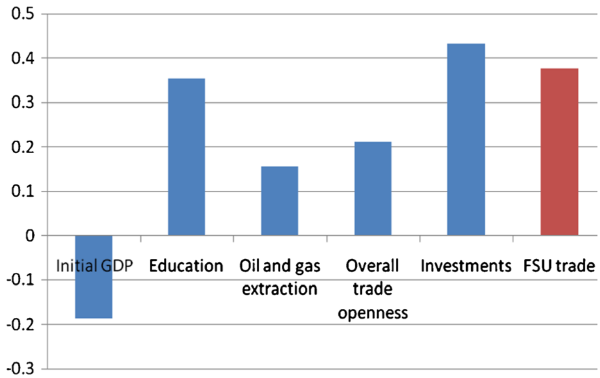

Fig. 1 Key determinants of economic growth in Russian regions: normalized beta coefficients of significant variables in the baseline regression

is closely linked with the potentially endogenous covariate but is unlikely to influence growth as such because regions bordering the FSU are highly differentiated (as are the borders of the FSU, which span from Central Russia to Altai in Eastern Siberia). The instrumental variable has excellent statistical properties: F statistics in the first stage are above 10 and the instrument is insignificant if included in the second stage regression. In the TSLS, we were once again able to confirm the positive impact of the share of trade with the FSU on growth. In specification (6), we also add the distance from Moscow to the set of covariates: regions bordering the FSU states may be farther to Moscow than other regions of Russia, which would make the instrumentation strategy questionable (if the geographic location could have affected economic growth). However, we still confirm our results, and distance from Moscow is insignificant. Finally, in specification (7), we also drop all controls due to their potential endogeneity, but the results for trade with the FSU are still sustained.

To conclude, our major findings thus far are unequivocal: trade with the post-Soviet states has a positive impact on growth. Tracing its influence on political transitions will be a more difficult task; for this purpose, we will proceed to the next step of the nested analysis, the model-building SNA.

Process Tracing: the Puzzle of the Ivanovo Region

Methodology and Choice of the Case Study

For the case study, we consider a single region to make it possible to trace the causal mechanism at work. The region, following Lieberman, can be both "on the line" and "off the line" of the regression of the previous LNA step. For our analysis, we have decided to examine the Ivanovo region located in the central part of European Russia with a population of one million. There are several reasons for this choice. Ivanovo is not one of the few regions in Russia with significant Islamic minorities, which are argued to have a significant impact on democratization in individual Russian regions (Treisman 2007). It also does not belong to a set of ethnic republics, which have been recognized for the specifics of their regional political systems. Ivanovo is close to the average in terms of other possible factors of democratization (education and urbanization) among non-republics and does not have oil and gas reserves. These factors increase our ability to observe the specific effect of FSU trade (without it being diluted by other effects). However, Ivanovo ranks third among the Russian regions with respect to its share of trade with the FSU in its total foreign trade, and, even more attractive for our study, it has a very *clear and discernable pattern in foreign trade* (the export of cotton from Central Asia), which makes it easier to identify the main causal mechanisms in the case study analysis.

The primary methodological tools of the SNA are the process tracing based on the detailed analysis of local and regional mass media and in-depth interviews with regional politicians, bureaucrats, and businessmen and interviews with regional journalists and academics.[13] The objective of the qualitative component of this study is twofold. First, as mentioned previously, we trace the specific causal mechanism of

[13] The details on the data sources are reported in Appendix H of the Electronic Supplementary Material.

regional democratization. A secondary objective is to validate the actual importance of the trade with the FSU for regional economic growth and development and, in particular, to verify that this importance is recognized by political actors (Mahoney 2010).

Asset Specificity and Trade as a Limiting Factor

Ivanovo has the reputation of being the Russian "textile capital," which can be traced back to the Tsarist pre-Soviet period, but was enlarged and expanded through the Soviet central planning system. Textiles constitute approximately one third of the overall industrial output of Ivanovo. In the 2000s, the industry experienced a period of consolidation, with the five largest holding companies taking over the largest share of textiles in Ivanovo (therefore, textile "oligarchs" or "magnates" are often mentioned in the regional and federal media). The importance of textiles is even larger if one considers the employment structure: approximately 55 % of the total population employed in the industrial sector works in textiles and light industry; textiles account for three fourths of Ivanovo's exports (Morrison 2007). Thus, its economic structure is highly undiversified.

Importantly, Ivanovo textile companies are characterized by assets with a very high level of specificity. A particular feature of textile production in the Soviet Union was its dependence on the supply of cotton from Central Asia, particularly Uzbekistan. These trade ties can be traced back to the "cotton rush" in the newly conquered Central Asia as early as the 1880s, but, again, were strongly developed in the USSR (see Lipovsky 1995). As a result, strong technological complementarity evolved. The machinery used in the Russian textile industry was adjusted to fit the particular length of the cotton fiber typical of Central Asian cotton.[14] The selection of cotton in Central Asia resulted in a predominance of types with the particular fiber length required by Russian manufacturers (the plants have been bred to have this property). Therefore, to import cotton from other countries, Ivanovo textile companies need to change all of their equipment, which is—at least in the short run—extremely costly and *makes access to textiles from Uzbekistan the limiting factor in economic performance*. Moreover, the cotton trade in Uzbekistan is a public monopoly, where only three state-owned companies (*Uzmarkazimpex*, *Uzinterimpex*, and *Uzprommashimpex*) are officially entitled to export cotton (*Tekstil'nyi Vestnik*, 5 October 2005)—therefore, the concentration of trade partners is extremely high.[15]

Thus, although the collapse of the Soviet Union had a significant negative impact on the trade linkages between Russia and Uzbekistan, even in the late 2000s, the share of cotton from Uzbekistan accounted for approximately 40 % of the total Russian cotton supply (*CA-News*, 24 April 2010). Nearly all of the interviews we have collected clearly confirm that the cotton supply is an important factor for the region's industry and economy and is also *perceived* to be an important factor for the region. There has been no real interruption of trade between Ivanovo and Uzbekistan

[14] This information comes from an interview with Dr. Elena Kuzmina, a senior researcher at the Institute of Economics of the Russian Academy of Sciences and a recognized expert in Russia in the area of Russian Central Asian trade, conducted on 10 January 2011, Moscow. It was also verified by the mass media.

[15] Generally speaking, foreign trade in Uzbekistan is controlled by the government (Melvin 2000; Spechler 2008). However, claims have also been made that a substantial amount of cotton deliveries from Uzbekistan to Ivanovo go through offshore firms (*Tekstil'nyi Vestnik*, 14 March 2006).

since the dissolution of the USSR (or during any subsequent crises), and the pattern of interrelations has largely been preserved.[16] However, in spite of this mutual dependence, Uzbekistan still has somewhat more room to maneuver, through developing a domestic textile industry, approaching other Russian regions or focusing on other export goods (such as oil and gas) (Zabello and Sobyanin 2004).

Ivanovo's Politics and Economy in the 2000–2005 Period

To trace the impact of the limiting factor on regime transition in Ivanovo, we will investigate the 2000–2005 period, i.e., the period when the region was ruled by Governor Vladimir Tikhonov. Tikhonov, a high-ranking member of the Communist Party of the Russian Federation (CPRF), [17] was elected the governor of Ivanovo in 2000 through fairly open and competitive elections (most likely the most competitive in the history of the region) where he won against incumbent governor Vladimir Tikhomirov.[18] Thus, Tikhonov's administration came to power in a relatively democratic region, or, at least a region where the power of the governor was dispersed. However, Tikhonov's rule coincided with the period when the effects of the limiting factor became more pronounced. In the 1990s, Russia experienced economic decline, resulting in a decline of private consumption. During this period, textiles industry of Ivanovo was incapable of producing substantial profits (with cotton or without it). In early 2000s, however, Russia entered a period of economic growth, followed by a consumption boom. Now, profits from textiles became more substantial—but could be realized only for companies which gained access to the main input, i.e., cotton from Central Asia.

To understand the mechanics of Tikhonov's regime, we will study two main junctions: the “politics–economy” junction, where the administration used its control over the limiting factor to establish control over the regional economy, and the “economy–politics” junction, where the established control was used to strengthen the dominance of the governor. These two junctions create the interdependence of political and economic monopolization, which we expect to be crucial for the anti-democratic impact of the limiting factor.

Politics–Economy Junction First consider the influence of the regional governor on the economy of the region through the control over access to cotton. Here, the interviews and the analysis of the regional media reveal two main results. First, the governor has the position of a *veto player* controlling the access to the limiting factor, i.e., trade with the FSU. Second, he also actively *used this potential* throughout the period of his rule. During the Tikhonov period (and, according to our interviewees,

[16] The interviews also stated that textile enterprises that could not access trade channels with the FSU became bankrupt, were shut down, and merged with larger enterprises.

[17] Left-wing parties are not necessarily associated with nondemocratic or authoritarian rule. However, in the case of post-Soviet Russia, the Communist Party is a direct descendent of the Communist Party of the Soviet Union with approximately the same set of goals, political priorities, ideology, and governing style (see for example Hutcheson 2003). The governing style was meant to be an imitation of the hierarchical and authoritarian Soviet style.

[18] For details on the development of Ivanovo in the 1990s, see Appendix I of the Electronic Supplementary Material.

before and after), almost no large trade deals with the FSU were made without the involvement of the regional administration. An anonymous head of one of the textile companies stated that, while there are no official restrictions on trade, unofficially, "when businessmen from Ivanovo go to Central Asia, they are always accompanied by the regional bureaucrats, or the negotiations shall fail."[19] At the same time, if Ivanovo's entrepreneurs were willing to engage in any large project with the FSU, it was recommended that they "seek advice" from the regional administration to "speed up" the decision making on both sides of the border. One of the interviewees claimed that there was only one company in Ivanovo that addresses the FSU without the direct intervention of the governor.[20] While other interviewees acknowledged the ability of private business to make deals with the FSU without direct public intervention, they still recalled a large number of private undertakings that were shut down.[21]

According to almost all of the interviewees, the governor paid significant attention to the textile industries, being an insider himself. Before becoming governor, Tikhonov was the president of one of the textile companies in Ivanovo, *Shuiskie Sitsy*. After Tikhonov was elected governor, several high-ranking managers of the company followed him into the regional administration.[22] The support for textiles is both visible in the policy actions of the governor and openly declared in public discussion.[23] While Tikhonov did not personally visit the FSU countries often, he regularly dispatched his representatives to the post-Soviet states and also received numerous delegations from the FSU states. The function of "supervising" trade with FSU partners has been delegated to the First Deputy Governor, Aleksandr Kanaev, who is the highest-ranking official in the Ivanovo administration after the governor himself. Furthermore, Tikhonov openly lobbied the central government to reduce the import duties for cotton exports (*LegkPromBisnes*, 24 January 2001).

Most likely the most evident example of Tikhonov's attempts to seize control over the regional economy was a formal organization: a Council on Foreign Trade, established by the governor as part of his administration. According to the interviews, the Council became a powerful institution for exercising control over regional businesses. We have received somewhat ambiguous responses regarding the actual functions of the Council: some respondents indicate that the Council was de jure created merely "to facilitate trade" and "to support the companies by solving legal

[19] The interview was recorded via telephone on 23 July 2010 (Moscow–Ivanovo). The failure of negotiations was explained though the traditional cultural lens of the interviewee: the absence of an important political leader in a delegation from Ivanovo to Uzbekistan was perceived by the accepting side as a lack of respect and a lack of a serious attitude.

[20] Presumably, the interviewee meant the company was previously owned by the governor, *Shuiskie Sitsy*. However, we should be cautious because this statement represents an opinion rather than an unambiguous fact.

[21] This outcome is not particularly surprising. Because Uzbekistan remains a country where both the economy and society are under strict governmental control, the presence of public officials at trade negotiations is to be expected. Furthermore, because Ivanovo had a somewhat weaker position in the network of mutual dependence (as described above), this region had to adjust. The reviews of the media and the interviews confirm that the regional government was fully aware of this task and was actively engaged in negotiations.

[22] Interview held on 17 July 2009

[23] See, for example, Tikhonov's interview in the Communist newspaper *Pravda*, 27 July 2003: most of the text is devoted to textiles. Tikhonov even supervised individual exhibitions and fairs in the textile industry (see *Shveinaya Promyshlennost* 2003, p. 1).

and administrative problems to negotiate and trade with foreign partners" (interview). However, many respondents indicated that de facto the "help" of the Council became a necessary precondition for opening any business negotiations with trading partners. Legally, the governor of a Russian region has no authority with respect to international trade; however, de facto forcing the companies to "accept" the help of a Council created by the regional administration could be as effective as direct control (also because the federal government paid little attention to cotton trade).

There is also some indirect evidence that the governor paid a great deal of attention to the informal side of the cotton trade. It is claimed that Tikhonov maintains close ties with some of the textile oligarchs, exchanging governmental protection for political support, including Arkadiy Zlatkin (*TDL*), Vasiliy Gushchin (*MEGA*), and Dmitriy Siganov (*ROSKO*), who were able to expand their corporate empires with his help. Furthermore, of course, Shuiskie Sitsy remained a privileged company (*Ivanovo-Voznesensk*, 15 March 2005). Therefore, we can conclude that Tikhonov used his office to increase control over international trade and restrict access to the limiting factor.

Economy–Politics Junction Tikhonov used the political power he obtained from controlling textiles to establish control over two major possible sources of opposition—the regional media and the regional parliament. The interviewees confirmed that critical newspapers in the region (*such as Ivanovo Press*) existed under the persistent threat of lawsuits from Tikhonov and attacks from the state-owned radio station. The interviews also reveal numerous interventions by the executive into the legal process during these lawsuits. At the same time, opposition media received no financial support from textile companies. Regarding the parliament, immediately following the elections, Tikhonov was supported by communists and the industrial group (primarily associated with textiles). However, he did not have complete control over the parliament, and, according to the media, failed to establish good connections with the chairman of the regional assembly, Vladimir Grishin. In 2002, Tikhonov established a new parliamentary group, the "Industrial–Economic Group," headed by Pavel Kon'kov, president of the *Kolobovskaya Tkatskaya Fabrika* (one of the textile companies in the region). Furthermore, Tikhonov invited two members of *Edinstvo*, the pro-Kremlin group, to be his economic advisors. Ultimately, the new group recalled the deputy chairman of the parliament and forced Grishin to resign in February 2003 (*Nezavisimaya Gazeta*, 10 February 2003).[24]

In 2004, Tikhonov was already strong enough to stage a revolt against the leadership of his own party, the CPRF. In July, Tikhonov supporters organized an alternative Central Committee meeting, which deposed the current head of the party, Gennady Zyuganov, and elected Tikhonov as the head of the party. However, the Zyuganov faction organized its own meeting (*Vedomosti*, 5 July 2004). As a result, the CPRF entered in a period of legal dispute, which was finally resolved in favor of Zyuganov.[25]

[24] In a press interview after his resignation, Grishin openly stated that he believes Tikhonov to be supported by the powerful textile tycoons (literally, "people with big money"). Specifically, he mentioned Dmitriy Siganov and Arkadiy Zlatkin, as well as Yuriy Yablokov (*Yakovlevskiy Textiles Plant*). He also claimed that he expects that this alliance will not last long (*Chastnki.ru*, 2 February 2003). However, Grishin's prediction was not fulfilled; the textile industry seems to have continued to provide support to Tikhonov (*Ivanovo-Voznesensk*, 18 May 2004).

[25] http://lenta.ru/articles/2004/08/03/kprf/, accessed 5 March 2011.

Tikhonov, in response, created his own “alternative” Communist party—the “All-Russian Communist Party of the Future” (see *Gazeta.ru*, 11 September 2004).

The strength of Tikhonov becomes particularly obvious if one considers that he was among the very few Russian governors openly criticizing Vladimir Putin's decision to abolish the direct election of regional governors in 2004 (*Politicheskiy Zhurnal*, 29 August 2005). Here, however, an important remark should be made. Generally speaking, criticisms of the (nondemocratic) government of Vladimir Putin by the regional governors should *not* be interpreted as a sign of their own democratic attitude. One of the key elements behind Putin strengthening his control over country (the so-called vertical of power) was associated with his confrontations with regional political machines, which were either dismantled or integrated into Putin's own political machine. Thus, the *less* democratic regional leaders were those who often criticized Putin's decision to abolish gubernatorial elections—because for governors with effective political machines, regional elections presented an excellent opportunity to perpetuate their power without interventions from the federal center (see Stoner-Weiss 2006). In the same way, Putin paid greater attention to restricting the power of influential regional autocrats than dealing with more democratic regions, as the latter (given the absence of powerful incumbents with strong political machines) are hardly able to challenge his dominance. Tikhonov fits this pattern.

The End of the Regime From the second half of the 2000s on, the Russian central government gradually attempted to dismantle the regional political machines created by the governors, and Tikhonov was among the first pressured by the federal center. Primarily, the attack seems to have been directed against Tikhonov's control over the regional parliament. In this case, the federal government could have used its influence on the regional faction *Edinaya Rossiya*, the successor of *Edinstvo* (*Nezavisimaya Gazeta*, 23 March 2003). For instance, Grishin was reinstated as the chairman of the regional assembly, representing Edinaya Rossiya. However, even under these conditions, removing Tikhonov from office seems to have been a challenging task. The story of Tikhonov's resignation resembles a crime novel: Tikhonov's office and home were searched by the Federal Security Service (although the government did not confirm this) due to accusations of corruption. After the search, Tikhonov was admitted to the regional hospital (neurological division), where his signed his resignation (*Kommersant*, 18 July 2005). In Russia, any measures of this sort implemented by the security service against a governor have to be sanctioned by the highest level of the national political leadership. The intensity of this pressure is unusual for Russia, where most governors' resignations are secured through hidden bargaining—with the exception of the entrenched and powerful governors. Therefore, Tikhonov's regional autocratic regime was obviously too strong to remove him through ordinary channels; the explicit intervention of the security agencies was required.

The situation sharply contrasts with the story of the previous two governors of Ivanovo, who lost their positions without significant resistance. While the governors of the period of the transition recession, when access to the limiting factor played a limited role, failed to consolidate their regimes, Tikhonov, who became governor during a period of overall economic growth in Russia, seems to have been much more entrenched and presented a greater challenge to the federal government—although under Putin, the latter became substantially stronger than the Yeltsin administration of 1996.

Summary of the Ivanovo Model

It remains to summarize the underlying logic of the Ivanovo model of regime consolidation. In the 2000s, as the Russian economy entered a period of economic growth, access to the limiting factor in the region became more important. At the same time, Tikhonov became governor of Ivanovo through competitive elections. His success, clearly, was also linked to the predominance of textiles in the region. This link to the industry combined with the policy of the primary cotton supplier (Uzbekistan) made it relatively easy for the governor to use his office to establish control over the limiting factor and thus over the textile industry through a vast network of formal (Council for Foreign Trade) and informal connections. This control was employed by Tikhonov to monopolize political power; his dominance over parliament was ultimately achieved through the strong backing of textile magnates (acknowledged even by his political adversaries). This political monopoly, in turn, reinforced the economic monopoly (as it made the governor's control over textiles even stronger); the economic monopoly reinforced the political monopoly (as it reduced incentives for the businesses to oppose the governor). Although the Tikhonov regime did not ultimately survive the process of centralization in Russia (as was ultimately the case for all of Russia's regional regimes, including the strongest ones), his advancement in the early 2000s was astonishing. Figure 2 represents the political development in Ivanovo under the Tikhonov administration.

Alternative Trajectories

The example of Ivanovo demonstrates how post-Soviet trade can support nondemocratic outcomes during a regime transition. It is helpful to briefly examine the opposite scenario in terms of growth and regime transition in regions that not have developed trade ties with the FSU. There are two cases we intend to briefly discuss: Karelia and Perm—where the logic of the limiting factor as described above did not affect the path of democratization. Both regions exhibit a very low degree of dependence on trade with the FSU, which is driven by both their geographical locations (at the Finnish border for Karelia and in the Ural Mountains for Perm) and their industrial structures. Unlike Ivanovo, Perm has a diversified economy, ranging from natural resources (it has some oil extraction, although accounting for a very small fraction of Russian output) to a highly developed defense industry. It is also important to note that both the defense industry and oil extraction fall within the scope of the national government's authority and thus cannot be captured by subnational entrepreneurs or subnational governments. Karelia is a single-industry economy dominated by the forestry and pulp and paper industry.

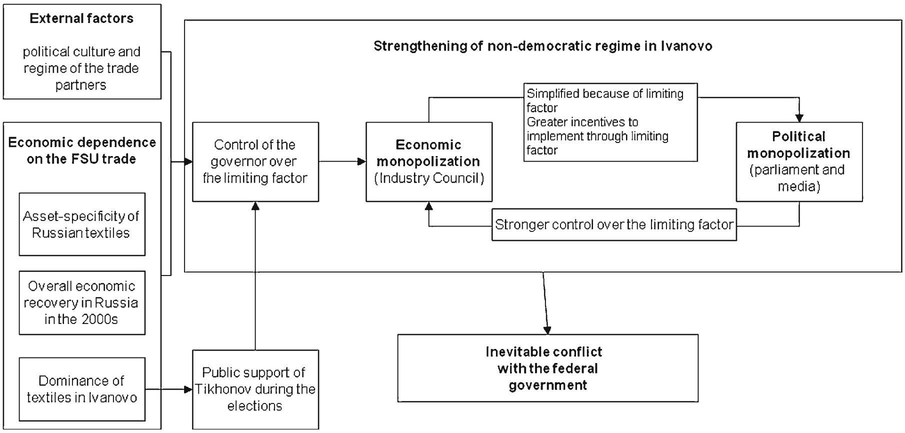

Fig. 2 Limiting factor and regime transition in Ivanovo

Both regions were among the most democratic in Russia in the first half of the 2000s.[26] Karelia has been acknowledged in the literature for having a vivid civil society, relatively strong municipal government, and free media (Lankina and Getachew 2006). Perm was one of the Russian regions with a very strong and independent parliament, effectively restricting the power of the governor (Gel'man and Senatova 1995). While in Perm business elite was also highly influential, unlike Ivanovo, there was a multiplicity of business groups and interests interacting with the government (Orttung 2004; Kryshtanovskaya and White 2005); the political system of the region was characterized by “pluralism in which rival interests compete openly for publicly elected offices and in which the electorate will have a real choice at the ballot box” (Moses 2002, p. 927). Moreover, while economic decline in the 1990s was less severe in these regions than in Ivanovo (because they did not suffer from disorganization to as great an extent), they underperformed Ivanovo in terms of economic growth in the 2000–2004 period.

The case of Karelia allows us to discuss another factor that we have yet to analyze in great detail thus far: the role of non-FSU trade and, specifically, that with the European Union. In this case, although the trade flows can be substantial, it is more difficult to argue that they fit the definition of a limiting factor detailed above. First, unlike the trade with post-Soviet countries, trade with the EU primarily emerged after the fall of the USSR.[27] Thus, the switching costs are typically lower: there are no inherent technological complementarities present in this case. Second, trade with European countries is frequently more diversified: there are multiple companies (often relatively small) from multiple European countries involved in these trade relations.

[26] The Carnegie rating, which we will discuss below, places both of them among the top five Russian regions with respect to democracy.

[27] With some exceptions regarding commodity exports and trade ties to Central and Eastern Europe, which, however, turned out to be much less persistent than trade with the FSU.

Finally, trade with the EU is more actively regulated by the central government, leaving fewer opportunities for regional incumbents to capture it. However, for some regions, the EU trade does provide a major contribution to economic growth, so it fits one of three criteria of the limiting factor.

Hypothetically, if trade with the EU becomes a limiting factor, yet another issue should be mentioned: in the EU, there is a strong commitment to democracy promotion at the governmental level. As we have mentioned previously, this factor could outweigh the negative effects of the limiting factor, effectively restricting the ability of incumbents to transform control over the limiting factor into political dominance. This is precisely what we observe in Karelia. A substantial share of Karelia's exports is directed towards the EU (forestry); again, forestry is the main source of growth, and switching costs are prohibitive. However, the literature documents the very strong and persistent involvement of the EU in the regime transition process in Karelia in the form of hundreds of aid projects and initiatives (Lankina and Getachew 2006; Obydenkova 2008, 2012), leading to much more successful democratization.

The Perm region is much less connected to the EU but has a diversified trade structure. The largest industry in terms of exports is the chemical industry; the largest export partners are India and China,[28] and the imports are also diversified across multiple countries. This diversified trade is one of the reasons for the pluralism regarding interest groups and business groups in Perm. Perm demonstrates that in this economic environment, even in the absence of a strong push towards democracy from the EU, democratic outcomes are more likely to be achieved. In addition, Perm is interesting for another reason. One could claim that the nondemocratic trajectory of the regime transition in Ivanovo occurred because of Soviet nostalgia: the textile industry suffered severely after the collapse of the USSR, thus it may make people more perceptive to call of the Soviet past. In Perm, however, a major segment of the population is former and current employees of the defense industry, which suffered from the Soviet collapse to an even greater extent—nonetheless, the region remained highly democratic.

Synthesis: Model-Testing Large-N Analysis

Following the logic of nested analysis, at this stage, we move from the model-building SNA to the model-testing LNA. The previous step has demonstrated that economic growth driven by a limiting factor controlled by the incumbent provides favorable conditions for economic and political manipulation by a political leader (in this case, a regional governor). For many regions in post-Soviet Russia, this limiting factor is likely to be trade with FSU countries. The case study demonstrates how the

[28] The role of trade with China, which is substantial for some Russian regions, also deserves attention. Similar to trade with the EU, it is not based on persistent technological complementarities and emerged only recently. In addition, a large portion of trade with China is informal cross-border transactions, which are difficult to monitor and control. In the case of Perm, this is unlikely to be the case: Chinese imports from Perm mostly consist of the products of the manufacturing and chemical industries. Nonetheless, the role played by China is by far less dominant for Perm than the role Uzbekistan plays for Ivanovo, and thus, no limiting factor effects are present.

monopolization of economic power in the regions is translated into monopolization of political power. Thus, it allows us to disentangle the sequence and causality of economic and political components of development. In the next step, we attempt to generalize our conclusions for the entire set of Russian regions and find some evidence for the mechanisms observed using the quantitative methods.

We have to begin by acknowledging that the substantial volume of trade with the FSU does not necessarily imply that it is a limiting factor. The Ivanovo case was special in the sense that the dominance of a single industry made it easy to trace the nature of technological complementarities and asset specificity. In other industries, the complementarities may be larger (or smaller), and it is difficult to explicitly consider this factor for each region. In the growth regressions, we simply measure the equilibrium outcome of the trade policy decisions of economic and political actors. However, we are unable to empirically investigate the outside options they had, i.e., opportunities to trade with other parties. It is possible to hypothesize that the *dependence of economic growth on trade with the FSU* is reflected not only by the *size of the trade flows*, but also by the *volatility* of trade between the region and the FSU over time. Low volatility combined with a significant trade volume indicates that trade with the FSU is a limiting factor and that the region most likely cannot survive without it. If the volatility is high, outside options are present and have been explored in individual years.

The mechanism of a limiting factor-driven transition to a nondemocratic regime is more likely to be present in cases of *low volatility* and *high trade volume*; hence, the economic monopolization is pronounced and most likely perceived by all economic actors as being inevitable, and this can be used by the governors. *High volatility* and high trade volume indicate that governors face greater difficulties in using trade with the FSU as a source of power; economic actors, although currently dependent upon FSU trade ties, experiment with alternative solutions. The *low trade cases*, regardless of volatility, are likely typical for regions where FSU trade is less important. Thus, if the causal mechanism described above is correct, we should observe autocratic consolidation *particularly* in regions with *large FSU trade* and *low volatility of this trade*.

To test this hypothesis, we first calculate the *coefficient of variation* in the annual share of FSU trade for all Russian regions using data for 2000–2006. The use of a coefficient of variation should account for the differences in mean trade, which, as discussed above, are occasionally substantial. Then, we estimated two regressions to explain the economic growth and democracy in the Russian regions, including the coefficient of variation and the interaction term of this coefficient and of the share of FSU trade in addition to the standard covariates. To measure the level of democracy in the Russian regions, we use the Moscow Carnegie Center's democracy index.[29]

[29] The Carnegie index includes ten components measuring political pluralism, the competitiveness of elections, freedom of the media, regional political organization, independence of municipalities, openness of regional political life, composition of regional elites, advancement of civil society, corruption, and economic liberalization. Seven components seem to fit any generally acceptable definition of democracy; the independence of municipalities is important for subnational democratization; finally, corruption and economic liberalization can be argued to be related rather to economic than to political reforms; however, after we drop these two components, our results remain the same. For details see Appendix B of the Electronic Supplementary Material.

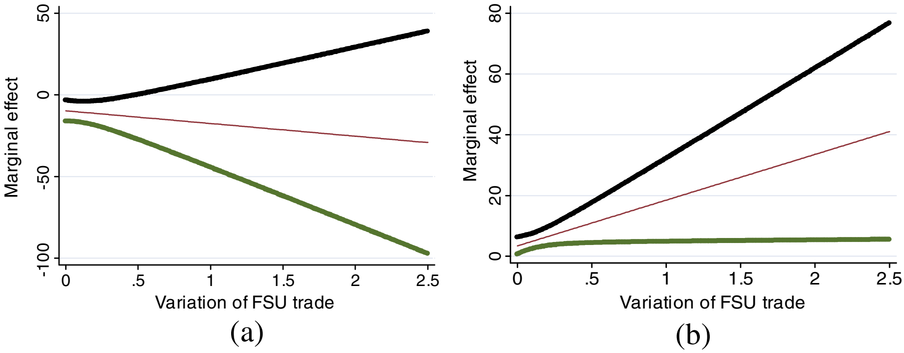

Fig. 3 Marginal effects of trade with the FSU countries on the level of democracy (**a**) and economic growth (**b**), conditional on the coefficient of variation of the FSU trade, 10 % confidence interval

The coefficient of variation as such is never significant; to determine the marginal effects of FSU trade on growth and democracy, we plotted both the size of the effect and the confidence intervals (at the 10 % level) for all feasible levels of the coefficient of variation. The results are reported in Fig. 3. One can see that the marginal effect of the trade on growth is *always* positive and significant (zero is never within the confidence interval). The marginal effect of FSU trade on democracy is negative but is only significant for regions with very small coefficients of variation (Ivanovo is in this subgroup). This indicates that the set of regions where trade with the FSU generates both economic growth and nondemocratic trajectories of regime change is restricted to those with low levels of variation in trade with the FSU, i.e., those where the latter is more likely to serve as a limiting factor.[30]

Possible Extensions of the Logic of the Limiting Factor

Limiting Factor on the National Level

Our analysis thus far provides evidence on how post-Soviet trade can operate as a limiting factor, effectively leading to nondemocratic regime change trajectories. We have demonstrated that post-Soviet trade provides a substantial contribution to the economic growth of the Russian regions, that it is quite often trade with a very small set of trade partners, and that the switching costs, given very high technological complementarities, can be prohibitive. As a result, subnational governments can use their informal control over trade with post-Soviet countries to consolidate their power over parliaments and the press using the support of the business community in the region. Thus, the limiting factor leads to high growth rates (in Ivanovo, the *only* reason why economy of the region is capable of functioning is cotton from

[30] Appendix G of the Electronic Supplementary Material investigates the same problem using a different approach and comes to identical conclusions. As a further piece of evidence, we estimate a set of simultaneous equations explaining both economic growth and regime transitions in the Russian regions. The results are reported in Appendix D of the Electronic Supplementary Material and indicate that in Russia trade with the FSU *simultaneously increases economic growth and reduces the level of democracy* within individual regions, in line with our expectations. See also Obydenkova and Libman (2012).

Uzbekistan); but the incumbent, acting as a gatekeeper, uses this situation as a tool of autocratic consolidation.

While we have focused our discussion on a particular empirical case (Russian regions) and a particular limiting factor (post-Soviet trade), there are broader implications possible in this context, which, however, require further investigation. To start with, one could speculate that international trade could play the role of a limiting factor outside the subnational democratization and the post-Soviet space. We recognize that the analysis of subnational units cannot be automatically extended to nation-states (Gervasoni 2010); in fact, we believe that the effects investigated in this paper are quite likely even more pronounced at the subnational level because of lower diversification of the regional economies and larger role of control over business for consolidation of regional political regimes (McMann 2006 refers to it as control over economic autonomy).[31] However, to stimulate further discussion, let us provide three possible examples of how trade can become a limiting factor leading to non-democracy on the national level. It is important to point out that the examples below should be perceived as mere conjectures and not as solid empirical evidence; whether the logic of the limiting factor affects these cases requires further investigation.

The first case (again, from the post-Soviet space) is Belarus. This country is dominated by manufacturing inherited from the Soviet period and is highly inefficient in terms of energy utilization (as well as being uncompetitive on international markets). The only source of energy for Belarus is the cheap supply of Russian oil and gas; the only market where Belarus is capable of selling its goods is, again, Russia, but in many cases only through intergovernmental agreements (where low-quality manufacturing goods from Belarus are purchased directly by Russian governments or state-owned companies). The supply of oil and gas and the existence of these agreements have been politically motivated over the last two decades. This dependency has been used by incumbent president Alexander Lukashenka, who first positioned himself as the only pro-Russian player in the country (and thus obtained control over the supply of the resources) and then actively played this card in domestic politics (Silitski 2005; Egorov et al. 2009). Thus, all three conditions we discussed are present: trade is highly concentrated (a small group of Russian energy companies, often state-owned or with close ties to the government), makes the major contribution to economic performance (which has been much more robust in Belarus than in many other post-Soviet countries), and switching costs are prohibitive (they would require either a substantial increase in energy efficiency or new sources of oil and gas—both are extremely costly if feasible at all). The result is a robust nondemocratic regime.

The second example is Fiji. This country specializes in sugar exports, and the specialization is inherited from the colonial period. After Fiji became independent in 1970, it continued exporting sugar, mostly to Europe as part of the European Union Sugar Protocol (abolished in 2009). The Sugar Protocol created a system of preferential access to the European market for some states, allowing them access to a sugar price several times higher than that of global markets. Therefore, Fiji's trade in sugar with Europe exhibits all three features of the limiting factor: it is organized within a market with high barriers to entry (protected by the Protocol); it is the main source of

[31] Control over limiting factors can serve as yet another strategy for territorial control (Gibson 2005).

growth for the Fiji's economy; and the switching costs are prohibitive (given the colonial heritage). As a result, Fiji, which after achieving independence and initially establishing a democratic political system subsequently shifted towards autocracy, which is claimed to be strongly promoted by local elites holding major stakes in sugar production and trade (Barbalich 2009).

The third example is Rwanda. Similar to Fiji, the colonial past has determined Rwanda's economic structure: this country's main export commodity is coffee. Until the mid-1980s, coffee was exported through a system of quotas assigned by the International Coffee Organization, which de facto functioned as a cartel that ensured relatively high market prices for coffee. As a result, during this period, Rwanda received substantial rents from coffee exports. Again, we have a similar setup of a limiting factor, exploited by the dictatorial regime of Habyarimana, which existed in Rwanda during this period. The regime established tight controls over coffee exports while paying a high price to farmers. The Rwandan case also demonstrates what could happen to an economy if at least one of the aspects of the definition of a limiting factor disappears: after the coffee quotas were abolished, the prices dropped. As a result, while Rwanda was still dependent on coffee exports and the switching costs remained high, coffee's contribution to growth became much lower. The regime switched from buying loyalty to severe repression (Verwimp 2003).[32]

Other Possible Limiting Factors

Furthermore, one could conjecture that foreign trade is not the only source of limiting factors that could be present in the economy (again, we should stress that this section should be interpreted with caution as mere suggestions, which require further investigation). If there are other clearly localized elements of infrastructure or commodities, which contribute substantially to economic growth and are associated with large sunk costs, they could possibly also serve as limiting factors if—similar to the case described above—the government is capable of establishing control over access to these resources. Interestingly, the concept of a limiting factor exhibits obvious similarities to the notion of a political resource curse (Ross 2001; Haber and Melando 2011). However, the resource curse argument and the approach we discuss in this paper are overlapping but not identical. In contrast to the resource-curse literature, the case studies discussed in this paper (e.g., Ivanovo and Belarus) demonstrate that the political regimes of even *resource-poor* countries and regions can be influenced by a limiting factor.

Effects similar to those we observe could also possibly occur if the country's economic performance crucially depends on a *centralized infrastructure* (which can be managed and organized only by the central government and not by subgroups of citizens). A possible example here is the hydraulic civilizations of the Ancient East: in this case, control was established through the crucial dependence of economic

[32] Thus, the dynamics of these regimes are influenced by (a) the ability of the political leaders to control the limiting factor and (b) the potential for economic growth driven by the limiting factor. In Belarus, in the same way, worsening political relations with Russia in the late 2000s contributed to a more cautious position on the part of Russia in terms of providing cheap energy (Moshes 2010) and the economic difficulties the country experienced in 2011, which could become a challenge for Lukashenka regime.

performance in these systems on the functioning of irrigation systems, which have been maintained by central governments that in turn became extremely despotic but economically highly stable and prosperous (Wittfogel 1957). Another infrastructure example of a limiting factor is shipping infrastructure and harbors; by controlling these facilities, the government can effectively restrict access to international trade and thus establish control over the whole country. External economic aid could also become a limiting factor if the country critically depends on it and it is linked to a particular political leader. Fish (2001) demonstrates the presence of these effects in the post-Communist world, where incumbents in aid-dependent countries were able to consolidate autocratic regimes, and Morrison (2012) highlights the existence of direct parallels between foreign aid and resource-curse effects. However, more work is required to trace how these alternative limiting factors affect the path of democratization.

Finally, the logic of the limiting factor suggests a further interesting observation (which we have found to be true in the Russian case). On one hand, access to the limiting factor stimulates economic growth. On the other hand, it also affects regime transitions, making autocratic consolidation more likely (with the caveats discussed above). Thus, our analysis contributes to a more general set of questions associated with the uneasy relationship between democratization and economic growth. While a number of excellent studies have investigated different directions of causality between these two variables, it still presents an academic puzzle with an array unexpected outcomes worldwide.[33] A particularly puzzling topic seems to be the existence of the autocracies in some developing countries, exhibiting a high degree of stability during periods of rapid economic growth (e.g., Dimitrov 2009). One could conjecture that the logic of the limiting factor could shed some light on this issue. If a country's economy is crucially dependent on a single factor, which the government can control, increasing access to this factor (or a change in the external environment that makes the payoff from this factor larger—such as the growth in Russia in 2000s that created demand for textiles) should, on one hand, intensify economic growth (also reducing the willingness of companies to invest in alternative industries not dependent on the limiting factor) but, on the other hand, make the government's controlling position as a gatekeeper even stronger (because the payoffs for business from accessing the limiting factor are higher, and hence, they would be more interested to provide political support to the incumbent in exchange for the limiting factor). Thus, high economic growth and non-democracy become mutually sustainable at least in the short run. One could speculate on the persistence of this equilibrium in the long run (for example, if companies accumulate sufficient resources to pursue investments in other sectors free from governmental control through control of the limiting factor). However, in the short and medium run, this type of effect could play an important role.

[33] Numerous studies have examined the causal link from democracy to economic growth (Sirowy and Inkeles 1990; Przeworski and Limongi 1993; Helliwell 1994; Feng 1997; Tavares and Wacziarg 2001; Doucouliagos and Ulubasoglu 2008; Sloan and Tedin 1987; Barro 1996; Persson and Tabellini 2006); from economic growth to democracy (Lipset 1959; Boix 2003; Inglehart and Welzel 2005; Acemoglu and Robinson 2006); from political transition to growth (Rodrik 2000; Fidrmuc 2003; Rodrik and Wacziarg 2005; Papaioannou and Siourouins 2008; Persson and Tabellini 2008; Giavazzi and Tabellini 2005); from growth to political transition (Przeworski et al. 2000; Boix and Stokes 2003; Epstein et al. 2006); and from growth to a public demand for democracy (Evans and Whitefield 1995; Duch 1995; Minier 2006).

Again, we should stress that further research is required to validate this conjecture: this paper should be viewed as merely the first step in this direction.

Conclusion

The aim of the paper was uncover and explore a previously unknown characteristic of the nexus of economic growth and democratization in the Russian regions, which we call a limiting factor. We intended to introduce this new concept and analyze the nature and operation of the phenomenon. We investigated regime transition in a setting where economic growth depends on a single resource that is in short supply and cannot be substituted for any other resource, at least in the short run. Our focus was, specifically, on how international trade can become such a limiting factor. We argued that this is the case if trade is heavily concentrated on particular partners, makes a major contribution to economic growth, and if the switching costs to other trade partners are prohibitive: we show that trade between the former Soviet Union republics and the Russian regions with their skewed industrial structure and persistence of economic ties from the Soviet past satisfies these criteria. Under these conditions, if the *existing government understands the importance of this factor and holds the position of a veto player in terms of exploiting its potential* (in the case of trade it can be driven by the set of formal and, more importantly, informal institutions governing international transactions), it can use this control to consolidate its power, eventually leading to autocratic consolidation. This is precisely what we find in Russian regions.

While our main focus was on a particular case of international trade, we cautiously argue that the notion of a limiting factor can be applied to a broader set of resources that similarly make a major contribution to economic development and are associated with massive asset-specific investments: natural resources or infrastructure. As such, the notion of the limiting factor could be helpful to understand the unusual situation when economic growth is accompanied by the strengthening of a nondemocratic regime. While the limited unobserved heterogeneity and ability to trace the specific mechanism made the Russian regions and their trade with the FSU an appropriate laboratory for our analysis (in line with a broad literature using subnational data for the study of democratization, see Snyder 2001), effects similar to those described in the paper could have been observed in other parts of the world and at the level of individual countries: the examples of Belarus, Rwanda, and Fiji could serve as similar cases. We should stress, however, that broader implications of the concept of the limiting factor require further investigation; the extension of the logic of our paper to other parts of the world and other limiting factors should be interpreted as a mere conjecture.

Finally, testing the methodology of a nested approach demonstrates that it is very useful in understanding the triangle of connections and provides better insights into untangling the causal mechanisms. While the strategy of NA elaborated by Lieberman has been acknowledged as one of the most successful and novel methods, this approach had yet to be tested in an article format analysis. As this study demonstrated, NA makes it possible to reveal both trends and causal mechanisms, which are indispensible in the elaboration of a new concept. Specifically, this paper shows not only how to move from LNA to SNA but also that, after the mechanism was traced in the SNA, a return to better designed and specifically focused LNA can be an important part of a research strategy. Thus, testing the NA approach in an article format analysis argues in favor of the further use of this method.

It is important to highlight that this paper takes merely the first steps in conceptualizing the limiting factor. The implications of our analysis suggest a possibility for further investigation of the limiting factor at not only the subnational, but also the national level and not merely in the post-Communist world but worldwide. Including the limiting factor concept in further analytical discussions of economic growth–democratization nexus could possibly shed more ample light on modern instances where democratization has failed and autocracies have been consolidated. We should again stress, however, that these conjectures require further investigation, going beyond the framework of this paper.

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