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Timur Natkhov, William Pyle

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Abstract

Decades of investment decisions by central planners left communist societies with structures of production ill-prepared for competitive markets. Their vulnerability to liberalization, however, varied across space. Similar to the effects identified in the "China shock" literature, we hypothesize that post-market-shock outcomes will reflect pre-market-shock structures of production. Tracking voting outcomes at the district level in Russia's presidential elections, we document asymmetric reactions to the liberalization of markets in 1992. Electoral support for the pro-market incumbent declined most in areas with structural inheritances that made them most vulnerable to reforms. This finding sheds new light on an old debate about the importance of "initial conditions" (as opposed to policies) to the trajectories of post-communist societies.

JEL-Codes: N330, N530, I150, O150.

Keywords: industrial structure, transition economy, voting, Russia.

Timur Natkhov
Center for Institutional Studies
HSE University
Moscow / Russia
timur.natkhov@hse.ru

William Pyle
Department of Economics
Middlebury College
Middlebury / VT / USA
wpyle@middlebury.edu

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1 Introduction

A once lively, recently dormant, but never fully settled debate about the post-communist transition touched on the relative importance of so-called "initial conditions" to countries' post-liberalization trajectories. Did China avoid the "transformational recession" that afflicted most of the post-communist world more because the post-Mao leadership made effective policy choices or more because pre-reform structural features conferred unique advantages? Did several countries in Central Europe forge ahead of many post-Soviet nations more because they adhered to the "Washington Consensus" or more because they benefited from favorable geography and/or a briefer history under central planning? Were the fates of post-communist societies, in short, tied more to the mix of reforms they pursued or more to their inheritances – i.e., their so called "initial conditions?"

A particular challenge to answering such questions arises from the seemingly inextricable linkage between the two. At the national level, policy choices were almost certainly endogenous to "initial conditions." As a consequence, isolating the independent effect of one or the other is, at the least, a tall order. Here, we take a modest step toward addressing the independent effect of (a subset of) initial conditions by identifying a setting in which policy was plausibly invariant across space. Relatively small sub-national districts within the Russian Federation operated within policy environments shaped by officials in both Moscow and their provincial capitals. Comparing them to their within-province neighbors allows us to isolate the independent effect of initial conditions on their post-liberalization trajectories. Specifically, we connect communist-era structures of production to trends in presidential voting patterns as Russia transitioned toward a market economy in the 1990s. We find that districts with unfavorable structural inheritances abandoned the reform-oriented incumbent at a much higher rate. The independent effect of initial conditions was substantial.

In the summer of 1991, Russians went to the polls to elect a president for the first time in their nation's thousand-year history. By year's end, the winner, Boris Yeltsin, had led Russia through the dissolution of the Soviet Union to independent nationhood. In January 1992, with the stroke of a pen, he dis-empowered the planning bureaucracy that had managed the economy for over a half century. Overnight, the ruble became convertible and prices on nearly all consumer and producer goods were liberalized. Markets, both domestic and international, became the primary mechanisms for determining what would be produced and how. As enterprises scrambled to adapt, a stunning collapse ensued. Real per capita GDP and life expectancy plunged (Leon et al., 1997; Shkolnikov et al., 1998; Brainerd and Cutler, 2005), and in the nascent labor market, both the unemployment rate and the incidence of wage non-payments spiked upwards (Desai and Idson, 2001; Earle and Sabirianova, 2002). In 1996, Russians returned to the polls. In a dramatic two-round election, Yeltsin defied the early predictions and defeated a diverse field of candidates to secure a second term in office.

Although much of the initial commentary emphasized the stability of the disproportionately urban and well-educated Yeltsin electorate across the two elections (McFaul, 1996, 1997; Berezkin et al., 1999), Gehlbach (2000) observed in a short research note that at the regional level, the Yeltsin votes in 1991 and 1996 were poorly correlated. Why this might be so, to the best of our knowledge, has heretofore gone unexplored. Here, we hypothesize

that the market-oriented reforms of 1992 had differential effects across space. By virtue of their inherited structures of production, geographical units varied with respect to their preparedness for the transition away from planning. They differed, that is, with respect to their degree of *market vulnerability*.

Market vulnerability differed across space, in good part, because market vulnerability differed across sectors.[1] Some geographical units were fortunate in their sectoral inheritance, but others were not. A few had a high concentration of production in sectors well-situated to exploit price liberalization, but many did not. A large and diverse literature highlights the particular vulnerability of post-Soviet manufacturers (Hughes and Hare, 1992; Senik-Leygonie and Hughes, 1992; Ericson, 1999; Gaddy and Ickes, 1999, 2002). In both relative and absolute terms, the manufacturing sector was regarded as bloated, technologically backward, and generally ill-prepared for market competition, with large swaths described as "negative value added," "value subtracting," or "value destroying." Gaddy and Ickes' (1999) stylized model of the Russian economy takes this point to the extreme by characterizing the manufacturing sector as wholly value-subtracting and only capable of surviving the transition to competitive markets if kept afloat through subsidies channeled from a value-adding natural resource industry. In light of these descriptions, our primary measure of a geographical unit's market vulnerability is its per capita employment in manufacturing.

As highlighted by Figure 1, the province-level relationship between manufacturing employment per capita and support for Yeltsin flipped from positive to negative between the 1991 and 1996 elections. On average, manufacturing intensive provinces experienced steep drops in support for Yeltsin, whereas those with relatively little manufacturing saw little, if any, change. In conjunction with research establishing a connection between post-communist economic outcomes and voting (Colton, 1996; Fidrmuc, 2000; Tucker, 2002; Richter, 2006), this finding appears consistent with the hypothesis that market liberalization disproportionately affected voting in provinces that were most market vulnerable because of their Soviet economic legacy. Although consistent with this hypothesis, there are reasons to doubt that it reflects a causal relationship between inherited manufacturing intensity and the post-liberalization reorientation of pro-Yeltsin voting. Other developments, beyond the reforms of January 1992, could be responsible. Provincial governments, for one, had a great deal of policy autonomy in the early and mid-1990s (Stoner-Weiss, 1999; Berkowitz and DeJong, 2003; Ahrend, 2005) making it not implausible that systematic differences in their policy responses to market liberalization explain the pattern observed in Figure 1. We can rule out this possibility, however, by demonstrating that the relationship between inherited manufacturing intensity and the decline in support for Yeltsin holds for sub-provincial districts – i.e., political-geographic units which possessed relatively little policy autonomy.

Figure 1, of course, might also reflect a correlation between Soviet-era manufacturing intensity and other variables plausibly related to market vulnerability. Our baseline regres-

[1] Market vulnerability also differed across space because geographical units differed in their proximity to potential customers and suppliers. Industrial location decisions under central planning were often made for strategic (i.e., non-commercial) reasons and were always made in the absence of a price-based understanding of opportunity costs. These factors led to high levels of investment in regions, like Siberia, that were distant from domestic and global markets (Hill and Gaddy, 2003; Markevich and Mikhailova, 2013). All else equal, remote location could be a disadvantage to firms and regions when markets were liberalized.

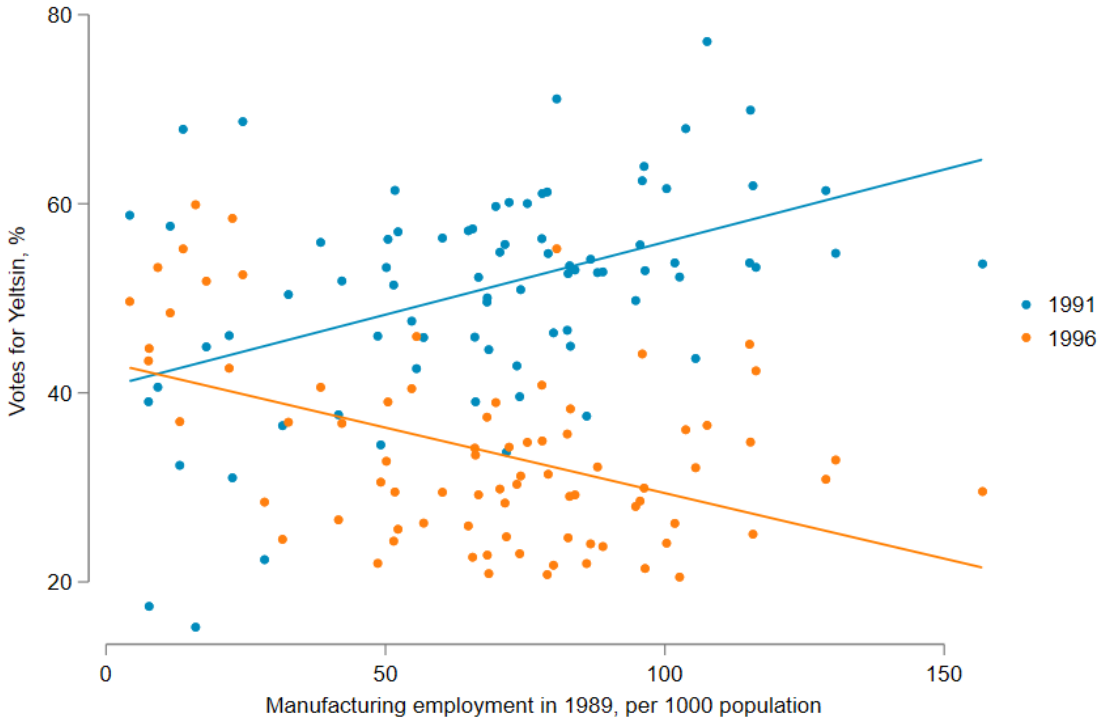

Figure 1: Manufacturing employment in 1989 and votes for Yeltsin in 1991 and 1996

Notes: The scatter plot presents correlations between employment in manufacturing in 1989 and vote shares for Boris Yeltsin in the presidential elections of 1991 (blues dots) and (the first round of) 1996 (orange dots) on the sample of 88 provinces of the Russian Federation (RSFSR in 1991).

sions, for this reason, control for geographic variables that have also been suggested as drivers of post-liberalization economic performance (Gaddy and Ickes, 2002).

Finally, we strengthen our case for a connection between districts' structural inheritance and their voting behavior by integrating two additional variables capturing within-manufacturing-sector variation. In a well-cited paper, Blanchard and Kremer (1997) tie the post-liberalization fate of economic sectors to the degree to which their enterprises were embedded in "complex" supply chains. Once plan-based coordination had been eliminated, acute market frictions – e.g., information asymmetries and costly contract enforcement – would, they theorized, be particularly problematic for firms dependent on a broader array of upstream linkages. Using a Soviet input-output table documenting the product flows across manufacturing sub-sectors, we create district-level measures of economic *complexity*. Controlling for manufacturing employment per capita, we build on Blanchard and Kremer (1997), showing that those districts with more complex profiles experienced, on average, bigger declines in support for Yeltsin. We similarly calculate one additional measure of market vulnerability by drawing on foreign trade data. Controlling for overall manufacturing employment per capita, districts specializing in sub-sectors in which the Soviet Union had a (revealed) comparative disadvantage experienced bigger drops in support for Yeltsin.

As rich as our district-level data are, they do not allow us to address important questions regarding, one, the timing of the shock that explains the reorientation reflected in Figure 1, or two, the mechanism whereby initial economic conditions affect post-liberalization voting. We thus supplement our district-level analysis with provincial data, which, for one, allow us to double the number of years in our voting panel. Taking the success of non-communist candidates in elections to the 1989 Congress of People's Deputies as a regional proxy for the support for Yeltsin and his platform, we show that the 1991-to-1996 change in the presidential vote did not follow from a pre-trend. Furthermore, a spring 1993 vote-of-confidence referendum reveals that the greater erosion of Yeltsin's support in the more manufacturing-intensive regions was already apparent less than a year-and-a-half after price liberalization was sprung on the country in January 1992.

Yet additional regional data suggest that changes in social welfare mediate the relationship between inherited structures of production and Yeltsin's support. After 1992, the all-cause death rate, already increasing nationally, trended upwards faster in the more manufacturing-intensive regions. Although cause-of-death data need to be treated with caution, our evidence suggests that cardiovascular-related deaths, which can be associated with stress and stress-induced behaviors, such as binge drinking, drove this finding.

Our findings here speak to at least two distinct literatures. One, by linking geographic asymmetries in Russia's economic inheritance to its post-communist trajectory, we connect to recent research on the region-specific effects of trade liberalization in large, economically diverse countries. One strand of this literature, which includes the celebrated work on the "China shock," highlights the effects of trade expansion on local labor markets (Topalova, 2010; Kovak, 2013; Autor et al., 2013; Hakobyan and McLaren, 2016; Dix-Carneiro and Kovak, 2017). Another strand highlights how regional variation in economic structure interacts with trade liberalization to realign voting (Autor et al., 2020; Choi et al., 2021; Dippel et al., 2022).

Two, we shed new light on an old debate about the post-communist transition. Though all countries in Eastern Europe and the former Soviet Union experienced a post-liberalization fall in output, the breadth and length of the "transformational recession" varied tremendously. A large literature grew up around identifying the reasons for this variety in post-communist growth experiences, with some authors emphasizing the scope and pace of policy reform and others giving more weight to pre-liberalization factors – i.e., so-called "initial conditions" (Fischer et al., 1996; Krueger and Ciolko, 1998; Berg et al., 1999; Heybey and Murrell, 1999; Popov, 2000; De Melo et al., 2001; Havrylyshyn, 2001; Campos and Coricelli, 2002; Falcetti et al., 2002). Distinguishing between the two convincingly requires overcoming several challenges, not least of which is the effective measurement of key variables. An equally, if not more, difficult challenge involves the endogeneity of policies to initial conditions. Here, in a manner new to the literature, we address that challenge by focusing on sub-national units that are situated hierarchically below the level at which policy is made. Homing in on Russian districts (*rayons*), we draw comparisons to their within-province neighbors which operate in a similar policy setting. This allows us to isolate the effects of an important legacy of planning. A district's inherited structure of production, we show, has a substantial effect on its post-liberalization trajectory.

Our paper proceeds as follows. Section 2 expands on the literature germane to our study. Section 3 reviews relevant background, including the Soviet Union's development strategy and its economic legacy for Russian politics in the 1990s. Section 4 presents the data, including our primary source evidence as well as several important constructed variables. Section 5 briefly summarizes our empirical methodology. Section 6 presents our key results, demonstrating that districts more vulnerable to market liberalization experienced bigger declines in support for the incumbent who became associated with its introduction. Section 7 uses provincial data to address timing-related questions left unaddressed by our district-level analysis. Section 8 presents evidence that mortality, particularly for men, increased faster in market-vulnerable provinces, suggesting that changes in social welfare acted as the mechanism connecting inherited industrial structure to the re-orientation of the vote for Yeltsin. Section 9 presents brief concluding points.

2 Related literature

2.1 Post-communist political economy

2.1.1 Initial conditions, policies, and economic growth

The first post-communist decade produced a large empirical literature exploring with country-level data the relative contributions of initial conditions and transition-era policies to diverging growth patterns (Havrylyshyn, 2001; Campos and Coricelli, 2002).[2,3] Conclusions were mixed. Some emphasized the importance of policies (Fischer et al., 1996; Berg et al., 1999), while others gave greater weight to initial conditions (Krueger and Ciolko, 1998; Heybey and Murrell, 1999; Popov, 2000). Yet others contended that the importance of initial conditions diminished over time (Falcetti et al., 2002). To distinguish between the two, researchers confronted several challenges, perhaps the primary one of which centered on policy's endogeneity to initial conditions. In a comprehensive review of the literature Campos and Coricelli (2002) write:

> The liberalization policies implemented in the 1990s were likely affected by initial conditions. Countries with less-favorable conditions were more constrained in the reform process and thus followed a less-radical reform path. At the same time, less-favorable initial conditions might have adversely affected output performance. As a result, one would observe a positive correlation between reforms and output performance even though the ultimate cause of both reforms and output performance was the set of initial conditions.

Though Campos and Coricelli envisioned that the "debate on the relative importance of economic policies and initial conditions is likely to continue for some time," it arguably did not, in part, we surmise, because researchers struggled to respond to this fundamental

[2]Policies, here, are understood broadly as referring to stabilization as well as economic and political liberalization.

[3]Most of the comparisons are across countries. A smaller literature addresses variation in growth across regions within a single country. See, for example, the Russia-focused studies of Berkowitz and DeJong (2003) and Ahrend (2005).

challenge of policy's endogeneity.

Our response to this challenge is to isolate the effect of initial conditions by drawing comparisons across political-geographic units for which policy is constant. That is, we compare across relatively small regions within a single country. As Stoner-Weiss (1999), Berkowitz and DeJong (2003), and Ahrend (2005) all make clear, provincial capitals were also loci of economic policy making in Russia in the 1990s. We thus make sub-provincial districts the units of analysis in our preferred specifications below.

At the sector as opposed to the macro level, the most sophisticated analysis of the post-liberalization output collapse emphasizes variation in the complexity of inherited input-output linkages (Blanchard and Kremer, 1997). As market liberalization replaces centralized coordination of enterprise relationships with decentralized bargaining, sectors that inherit a more complex web of supplier relations will face higher transaction costs and thus experience greater collapses in output. As a general rule, Blanchard and Kremer (1997) surmised, sectors further up the supply chain (e.g., natural resources) are at less of a disadvantage than those whose production involves more processing and combining of material inputs (e.g., machinery and equipment).

2.1.2 Public opinion and the exit from communism

In the early and mid-1990s, there was a great deal of speculation as to how post-communist voters would respond to the inevitable short- to medium-run dislocations that market liberalization would entail. Two general theories emerged. One, championed by the economist Leszek Balcerowicz (1994), architect of Poland's economic transformation, characterized the early reform years as a time of "extra-ordinary politics," a period in which widespread enthusiasm for the exit from communism would translate into tolerance for officials whose liberalizing reforms might bring temporary economic pain. Voters, in other words, would be forward-looking and not punish incumbents whose reforms' benefits had yet to arrive. Post-communist voting patterns could thus be expected to be only weakly connected to pre-election economic indicators. The alternative view emphasized voters as retrospective, prone to reassess support for incumbents and their reforms in light of lived experience (Przeworski, 1991). They would vote their pocketbooks and punish incumbents whose policies were understood to have produced economic pain.

Tucker (2002) reviews the relevant research on the first decade of post-communist elections. In general, the "macro-level" empirical work supports the conclusion that economic conditions do affect election results in the region's new democracies. Research on individual voting decisions, however, has been more mixed.[4] Richter (2006), however, draws on rich survey data from Russia to link electoral support for Yeltsin in 1996 to experiencing wage arrears. In so far as we are aware, no research in this area considers the economic inheritance of the pre-reform communist system.

A large and varied literature has addressed popular attitudes towards markets and market reforms during and after the exit from communism. Both Alesina and Fuchs-Schündeln

[4]Tucker speculates this is because researchers doing micro-oriented work often have access to an array of political variables that generally are unavailable to those analyzing aggregated voting data.

(2007) and Pop-Eleches and Tucker (2017), for instance, draw on comparisons to non-post-communist countries to demonstrate that the experience of living through communism socialized populations to espouse relatively anti-market attitudes. Both Shiller et al. (1991) and Duch (1993), however, point to survey evidence from within communist countries suggesting that a "nascent free-market culture" survived the communist experience. Finally, a small empirical literature emphasizes how hardships experienced during the early post-communist period produced a shift away from the more liberal values that animated the transition from communism (Gaber et al., 2019; Pyle, 2021).

2.2 Political Consequences of Liberalization-Induced Shocks

Empirical research on the political consequences of liberalization-induced shocks has grown quickly in recent years. Quite a few articles, for instance, have explored the within-country electoral effects of greater global economic integration. Margalit (2011) demonstrates with data from the 2000 and 2004 that support for the presidential incumbent, George W. Bush, declined most dramatically in counties in which job dislocation resulting from foreign competition was greatest. Choi et al. (2021) show that US counties whose industrial profiles made them most vulnerable to import competition from Mexico shifted toward the Republican Party in House elections after the passage of NAFTA. Several similar papers focus specifically on the effects of trade liberalization with China (aka, the "China shock"). Che et al. (2021) show after the extension of Permanent Normal Trade Relations to China in 2000, vote shares for Democratic candidates for the US House of representatives increased relatively more in those counties more exposed to trade with China; after the rise of the Tea Party in 2010, however, this boost for Democrats disappeared. Autor et al. (2020) demonstrate that greater import competition with China has led to increases in political polarization across US House of Representative districts. Outside the United States, Dippel et al. (2022) show that in Germany, electoral support for far right parties followed from trade shocks associated with communism's collapse and the accession of China to the World Trade Organization.

3 Historical Background

3.1 Russia's Soviet Economic Inheritance

The Soviet economic system operated on the basis of centralized plans. Owning almost all natural resources and physical capital, the state through its control over tens of thousands of enterprises accounted for the bulk of economic output. Prices in the state sector were determined bureaucratically and fulfilled both accounting and monitoring functions. Since they reflected neither use values nor opportunity costs, they often concealed gross inefficiencies, including the destruction of value by individual enterprises and entire sectors alike. By the late 1980s, the Soviet system constituted a "structure of capital and economic activity that [was] fundamentally non-viable in an environment determined by market valuation (Ericson, 1999)."

No sector more fully embodied the system's pathologies than manufacturing (Hughes

and Hare, 1992; Senik-Leygonie and Hughes, 1992; Ericson, 1999; Gaddy and Ickes, 1999, 2002). Burdened by outdated assets and redundant employees, its ill-preparedness for market competition – masked during Soviet times by a complex web of protective tariffs, distorted pricing, and hidden taxes – was a major reason for Russia's output collapse in the 1990s. Gaddy and Ickes (1999), in fact, go so far as to characterize the entire Soviet manufacturing sector as "value-destroying," its material inputs worth more in economic terms than its outputs.

This blanket characterization, however, may miss important variation across manufacturing sub-sectors. Extrapolating from input-output tables, as well as from world and domestic prices, Hughes and Hare (1992), for instance, conclude that one-quarter of Soviet manufacturing was "negative value added," one-third was "highly competitive," and the remainder was somewhere in between. Blanchard and Kremer (1997) rank sub-sectors by the degree to which input-output relationships suggest they were embedded in costly-to-reconstitute supply chains, distinguishing the most market vulnerable (e.g. construction ceramics, and medical equipment) from the least (e.g., coking products, and cotton products). Less systematic analyses highlight the inefficiencies of the largest manufacturing sub-sector, machine-building (Grant, 1979; Treml, 1981). Using trade flows as evidence, Ofer (1987) notes that the Soviet Union is "a large net importer of machinery, with a deficit of over 20 percent...in contrast with most industrial countries, which are net exporters of machinery and equipment." Nikolay Ryzhkov, one of the last prime ministers of the Soviet Union, similarly comments, "Our industrial products were not competitive on the world market. Take machine building, for instance. It went almost exclusively to Comecon countries. The "capitalists" took barely 6 percent of all our machine-building exports! That is why we exported such large amounts of raw materials (Ryzhkov, 1995, p. 229)."

The massive defense-industrial sector also bears mentioning in any discussion of how the Soviet legacy impacted the market vulnerability of Russia's post-Soviet economy. Although its enterprises benefited from high priority access to scarce labor and material inputs, the collapse of the Soviet Union and the end to the Cold War brought about a massive reduction in demand for its goods (Gaddy, 1996). In January 1992, the budget for military procurement was slashed by 68 percent.

In addition to enterprises whose capital assets rendered them ill-equipped for market competition, the Soviet economy bequeathed post-communist Russia with industries whose geographic location alone made them market vulnerable. Hill and Gaddy (2003) describe how, particularly under Stalin, investments across Siberia were made without any concern for the opportunity cost of locating firms in regions far from customers, where they were expensive to heat, and where capital broke down at a much faster rate.

3.2 Russian Politics from Gorbachev to Yeltsin

By 1985, if not well before, the Soviet Union's stagnation had become obvious. Mikhail Gorbachev, the new General Secretary, introduced partial reforms that neither challenged the Party's leading role in the political system nor the centrality of planning and state ownership in the economy. They did, however, de-stabilize the country, ultimately putting

it on a path to dissolution at the end of 1991 (Zubok, 2021).

In the years leading up to the Soviet collapse, individual republics, including Russia, accumulated greater political autonomy. In the spring of 1991, Russians (i.e., citizens of the Russian Soviet Federative Socialist Republic) went to the polls for the first time in their nation's thousand-year history to elect a president. The campaign was relatively simple and short. Boris Yeltsin ran as an independent, but his cause was championed by Democratic Russia, a loose coalition of political parties and civic organizations. The Party's program called for the dissolution of the Soviet Union and the removal of the Communist Party from all state and public institutions. Though there were massive demonstrations in support of his candidacy, Yeltsin neither actively campaigned nor laid out specific policy priorities. Nikolai Ryzhkov, the former Prime Minister and one of five candidates that were Communist Party members, was his only serious opponent (Urban, 1992). Yeltsin ended up winning with 58.6 percent of the national vote.

In early December, in the wake of a coup that he had helped foil, Yeltsin and the leaders of Ukraine and Belarus signed an accord proclaiming that the Soviet Union ceased to exist. On Christmas day, Gorbachev resigned from his office, declaring it extinct and handing over its powers to Yeltsin. A day later, the Soviet Union was formally dissolved. A week later, Yeltsin's government rolled out a radical market liberalization reform for the newly independent Russian Federation. Overnight, international trade, as well as nearly all consumer and producer prices were liberalized. Later in the year, the Yeltsin government rolled out an ambitious plan to privatize thousands of state-owned enterprises.

In the wake of these reforms, the Russian economy contracted rapidly, shrinking each year over the next half decade. When Yeltsin launched his campaign for re-election early in 1996, he was widely predicted to lose. With the Russian economy standing in tatters, he was polling in the single digits. Most observers believed that the Communist Party candidate, Gennady Zyuganov, would win. Nevertheless, in an election characterized as "the last 'referendum' on communism–a vote between two different political and economic systems (McFaul, 1996)," Yeltsin won a 35.8 percent plurality of votes in the first round, and went on to secure the necessary majority to defeat Zyuganov in the runoff.

Although some researchers emphasize the stability of the Yeltsin electorate between 1991 and 1996 (Berezkin et al., 1999; McFaul, 1997), others correctly highlight the shift in his support. Oreshkin and Kozlov (1996), for instance, write that "the 45 million supporters of B. Yeltsin [in 1991] differ very strongly from his 40 million supporters [in 1996]." Much as we do below, Gehlbach (2000) highlights a geographic reorientation of his support; across provinces, the Yeltsin votes in the 1991 and 1996 elections are poorly correlated.

3.3 Policy in the regions

Because of its weakness, the Yeltsin government could not enforce implementation of its ambitious agenda uniformly across Russia's vast expanse (Stoner-Weiss, 1999). Through at least the mid-1990s, if not longer, provincial governments operated with some degree of discretion over small-scale privatization and price liberalization (Warner, 2001). Berkowitz and DeJong (2003), for instance, write:

> [T]he Nizhni Novgorod oblast aggressively pursued privatization during this period, but had a mediocre record in relaxing price controls; the opposite was true in the Tomsk oblast. The Tatarstan Republic moved slowly on price liberalization and privatization while the Saratov oblast moved rapidly on both of these reforms.

In his memoir, Yegor Gaidar (1999), who served as Acting Prime Minister of the Russian government in 1992, writes in a similar vein when discussing provincial variation in the pricing of bread, vodka, milk, sunflower oil, and sugar:

> In early January I signed an order delegating decision making on most of these prices to local authorities. Depending on specific local conditions, we gave local authorities the right to refuse subsidies, thereby providing an impetus for market determination of prices, which would in turn do away with shortages ... The leadership reacted differently in each region. Chelyabinsk and Nizhni Novgorod put the rights accorded them to quick use ... But there were other regions that stubbornly stuck to a policy of "regulated entry into the market," with all its attendant coupons, lines, generous subsidies, and further deterioration of the underfinanced social sphere...

In our analysis below, we account for this sort of inter-provincial variation by highlighting outcomes in districts (rayons), the political-geographic units below the level of the province.

4 Data

We draw on published and archival sources to compile two panel datasets: one of 1664 Russian districts (*rayons*), the other of 88 Russian provinces. Table 1 reports descriptive statistics and On-line Appendix Table B3 provides the data sources for all variables.

Outcome variables.—For our district-level analysis, we gather voting results for the 1991 and 1996 presidential elections from the Electoral Geography project. For 1996, we use the first rather than the second round results because the 1991 election itself was the first round of a potential two-round election. Since Yeltsin garnered a majority in the first round in 1991, there was no need for a second.[5]

For our province-level analysis, we create a four-year panel of voting outcomes: 1989, 1991, 1993, and 1996. To provincial tallies in the presidential elections, we first add a variable for the share of seats won by non-communist candidates in elections to the 1989 Congress of People's Deputies, treating it as a proxy for a province's support for Yeltsin and his anti-communist platform. We add one additional measure from 1993. Facing parliamentary

[5]Another reason we do not use the second round of the election in 1996 is that it was dogged by improprieties. Across a number of districts, Yeltsin's vote share in the second round, relative to the first, was improbably large. One explanation as to why points to public officials' incentives. Before the first round, it was unclear who would ultimately win and so officials refrained from using their political influence to alter the outcome for fear of offending the eventual winner. After the first round, however, Yeltsin had the momentum and the backing of key oligarchs, so "supporting" Yeltsin meant helping the likely winner (Myagkov and Ordeshook, 2008).

opposition to his government's economic liberalization agenda, Yeltsin put a four-question referendum to Russian voters in April, the first of which asked whether "you have confidence in the President of the Russian Federation, Boris N. Yeltsin." The provincial share of "yes" responses serves as a fourth data point capturing support for Yeltsin and his agenda. Neither the 1989 Congress of People's Deputies measure, nor the result from the 1993 referendum are available at the district level.

Our province-level panel also includes mortality rate data from the Centre for Demographic Resarch at the New Economic School. We collect deaths per 1000 population by province from all causes as well as from several specific causes. These data are also not available at the district level.

Main Explanatory Variables.—For each district and province, we assess its inherited structure of production, and thus its market vulnerability, in terms of percentages of the population employed in different sectors at the end of the Soviet era. Our main source for employment data is the *1989 Census of Soviet Industry*, which contains information on the sector, location, and employment numbers of more than 21 thousand civilian industrial enterprises across the Russian Soviet Federative Socialist Republic (RSFSR).[6] Of the 13.7 million workers at these enterprises, 11.5 million, or 83 percent, work at enterprises designated as "manufacturing" in one of twenty manufacturing sub-sectors (see Table 2). We aggregate these employment data to the district and provincial levels to generate a manufacturing employment per capita measure that serves as our primary measure of market vulnerability.

We integrate two additional variables designed to reflect dimensions of market vulnerability at the district level. Both combine employment data from the *1989 Census* with macro-level variables. One, a measure of *complexity* (Blanchard and Kremer, 1997) draws on the *1989 Input-Output Table for the Soviet Economy* from the Institute of Forecasting of the Russian Academy of Sciences.[7] The other, a measure of *revealed comparative disadvantage*, employs dollar-denominated, sector-specific estimates of Soviet and global exports for 1988 through 1990 compiled by analysts at the United Nations (1992).

To explain the post-liberalization output collapse, the widely-cited "disorganization" hypothesis of Blanchard and Kremer (1997) emphasizes variation across sectors in the "complexity" of inherited upstream linkages, with the "complexity" of sector i defined as equal to one minus the Herfindahl index of input concentration for sector i:

$$c_i \equiv 1 - \sum_j (\phi_{ij})^2 \tag{1}$$

with ϕ_{ij} being the share of inputs from sector j in the production of sector i. By construction, c_i tends to one if the sector uses inputs from many sectors in equal proportions and

[6] We thank Maxim Ananyev and Tatiana Mikhailova for kindly sharing these data, which were classified using the standard industrial classification scheme, US SIC 1987, by researchers at PlanEcon, Inc. For examples of research that have drawn on this dataset, see Ananyev and Guriev (2019), Markevich and Mikhailova (2013), and Brown et al. (1994).

[7] Uzyakov et al. (2006) explains the methodology for constructing the tables.

equals zero if it relies on inputs from only one sector. We use the *1989 Input-Output Table* (Uzyakov et al., 2006) to calculate complexity scores for each of its 22 manufacturing sub-sectors. We then match these 22 to the 19 manufacturing sub-sectors covered in the *1989 Census*.[8] Although the two sources draw on slightly different categorization schemes, the correspondence between them is close, with many one-to-one matches. There are two cases in which there are not one-to-one matches. If more than one of the 22 sub-sectors from the *1989 Input-Output Table* can be fit within one of the 19 sub-sectors in the *1989 Census*, we take their average to generate a match. Alternatively, if one of the 22 sub-sectors from the *1989 Input-Output Table* encompasses more than one of the 19 categories in the *1989 Census*, we match it to each of those sub-sectors that it encompasses.

Table 2 shows complexity scores for the 19 sub-sectors. Most make sense and comport with Blanchard and Kremer's (1997) ranking from a 100-sector input-output table. For example, at 0.90, the industrial machinery and equipment sub-sector scores as the second most complex, well ahead of food products, which at 0.63, could reasonably be predicted as less dependent upon a diverse array of suppliers. The stone, clay, glass, and concrete products sub-sector scores highest at 0.91. To those not familiar with the industry, this might come as a surprise. Reassuringly, however, Blanchard and Kremer (1997) find that "construction ceramics" and "glass and porcelain" rank as the most and third-most complex of 100 manufacturing sub-sectors.

We transition from sub-sector to district-level measures of complexity by summing complexity-weighted employment totals across all 19 manufacturing sub-sectors:

$$c_d = \frac{\sum_{i=1}^{19} c_i E_{id}}{\sum_{i=1}^{19} E_{id}} \tag{2}$$

with c_i being the complexity index for sub-sector i, and E_{id} being employment (as calculated from the *1989 Census*) in sub-sector i in district d. Districts specializing in more complex manufacturing sub-sectors, that is, will have a higher district-level complexity index, c_d.

We also capture market vulnerability through a district-level measure of revealed comparative disadvantage (RCD). Presuming pre-liberalization trade flows were roughly guided by principles of comparative advantage, districts specializing in sectors in which the Soviet Union had a relatively weak export profile will, we hypothesize, be more market vulnerable, *ceteris paribus*. To compile a district-level measure of RCD, we start by calculating the Balassa Index (BI) (Balassa, 1965), a widely-used measure of comparative advantage, for each of the 19 manufacturing sub-sectors represented in the *1989 Census* data:

$$BI_{USSR,i} = \frac{X_{USSR,i}}{X_{USSR}} \Big/ \frac{X_{World,i}}{X_{World}} \tag{3}$$

with $X_{USSR,i}$ and $X_{World,i}$ representing the Soviet Union's and the world's exports of goods in sub-sector i; X_{USSR} and X_{World}, in turn, represent total Soviet and global commodity

[8]The *1989 Census* actually has twenty sub-sectors, but we exclude the "miscellaneous" sector since it has no analog in the 1989 input-output table.

exports. Exports, here, are annual dollar-denominated averages for 1988-1990 as compiled by the United Nations (1992).[9] Of 237 commodity groups, we were able to match 196 to one of the 19 manufacturing sub-sectors covered by the *1989 Census*; the remaining 41 either cannot be easily matched or refer to non-manufactures (e.g., agricultural products, natural resources).[10] Table 2 reports the Soviet Union's BI for 19 manufacturing sub-sectors. We take the negative of these values to arrive at sub-sector measures for RCD.

To calculate district-level measures of RCD, we sum RCD-weighted employment totals across all 19 manufacturing sub-sectors

$$RCD_d = \frac{\sum_{i=1}^{19} RCD_i E_{id}}{\sum_{i=1}^{19} E_{id}} \tag{4}$$

with RCD_i being the negative of the Balassa Index for sub-sector i, and E_{id} being employment (as calculated from the *1989 Census*) in sub-sector i in district d. Districts specializing in manufacturing sub-sectors in which the Soviet Union operated with a revealed comparative disadvantage, that is, will have a higher district-level complexity index, c_d.[11]

Finally, in light of the Soviet Union's large defense industry, we supplement the *1989 Census*, which only covers civilian enterprises, with historical data documenting the location and dates of operation of military-industrial plants (Dexter and Rodionov, 2020). We generate a rough approximation for employment in the defense sector by calculating military-industrial plants per capita in 1989 for each district and province.

Additional Data.—Population data and the administrative status of a district – regional capital, town, or rural area – come from the 1989 population census of the USSR. Geographic controls – longitude, latitude, and distance to the regional capital – are calculated using QGIS software and the shapefile of Russian administrative divisions from NextGIS.

5 Empirical Methodology

To quantify the effect of the inherited structure of production on voting outcomes, we estimate a panel regression model with fixed effects:

$$\begin{aligned} Voting_{cdt} = \alpha\, Manuf_d \times Post1991_t + \gamma X_d \times Post1991_t + \\ \delta P_d \times Post1991_t + \psi_d + \delta_t + \epsilon_{dt} \end{aligned} \tag{5}$$

$Voting_{cdt}$ represents vote shares of candidate c in 1991 and the first round of the 1996 elections in district d. We estimate Equation (5) for three candidates: Boris Yeltsin, the leading Communist Party candidate (Nikolay Ryzhkov in 1991, and Gennady Zyuganov in

[9] Dollar-denominated export values for the Soviet Union have been estimated by UN analysts.

[10] The commodity groups in the UN data are reported at the 3-digit level of the SITC, revision 2.

[11] Our approach resembles that taken by Hakobyan and McLaren (2016) to measuring U.S. districts' vulnerability to NAFTA's passage. Their index weights a U.S. location's sectoral employment structure by the degree to which its concentrated in sectors in which Mexico had a revealed comparative advantage as measured by the Balassa Index.

1996), and Vladimir Zhirinovsky. $Manuf_d$ is the share of district d's population employed in civilian manufacturing in 1989. $Post1991_t$ is a dummy variable for the period after the shock of market reform; it takes the value "1" for the 1996 election and "0" for 1991. The interaction between $Manuf_d$ and $Post1991_t$ is our main variable of interest. Its coefficient, α, is the difference-in-differences estimator of the effect of rapid market liberalization on voting outcomes.

To account for possible correlations between a district's manufacturing intensity and other factors that might also predict its market vulnerability, we control for the interactions between the post-1991 dummy and the vector X_d, which includes in all specifications a district's longitude, latitude, and distance from the provincial capital. In some specifications, X_d also includes military plants per capita, as well as dummies for whether the district is a regional capital, and a town (as opposed to a rural area) by administrative status. Finally, P_d is a vector of provincial dummies to account for post-liberalization developments, including policy measures, that similarly affect all districts within a given province. ψ_d and δ_t are district and year fixed effects, respectively.

We build on Equation (5) by considering the effects on voting for Yeltsin of a fuller set of market vulnerability measures:

$$\begin{aligned} Voting_{dt} = \alpha\, Vulner_d \times Post1991_t + \gamma X_d \times Post1991_t + \\ \delta P_d \times Post1991_t + \psi_d + \delta_t + \epsilon_{dt} \end{aligned} \tag{6}$$

$Voting_{dt}$, here, represents vote shares for Yeltsin in district d. $Vulner_d$ is a vector of market vulnerability measures, which in alternate specifications includes district-level complexity, revealed comparative disadvantage, and manufacturing employment per capita. All other variables are as in Equation (5). We only estimate Equation (6) for districts with positive employment in the manufacturing sector.

6 Planning's legacy for post-planning politics

Table 3 presents our estimations for Equation (5). In columns (1)-(3), we regress voting for the three main candidates on manufacturing employment per capita, controlling only for district and year fixed effects as well as provincial dummies and geographic variables interacted with *Post1991*. The results show a substantial and statistically significant decrease (increase) in voting for Yeltsin (opposition candidates) in districts with a higher share of manufacturing employment.

In columns (4)-(6), we add controls for military plants per 1000 population, and dummies for the administrative status of the district. Though the coefficients of interest all drop in absolute value terms, those for Yeltsin and the Communist Party candidate remain highly statistically significant. In terms of magnitudes, an increase in manufacturing employment by 10 percentage points decreases the vote share for Yeltsin in 1996 compared to 1991 by 2.7 percentage points, and increases the vote share for the Communist Party candidate by 1.3 percentage points. These are large effects considering that Yeltsin outperformed the

Communist, Gennady Zyuganov, by just 3.25 percentage points nationwide in the fist round of the 1996 elections.

Table 4 presents our estimations for Equation (6). In column (1), we regress vote share for Yeltsin on the district complexity index. In column (2), we add additional variables, including the interactions between *Post1991* and both manufacturing employment per capita and military plants per 1000 population. The coefficient on the complexity index drops by half from -11.4 to -5.1 but remains statistically significant at the 10% level. An increase in complexity of a district's manufacturing sector from 0 to 1, in other words, decreases support for Yeltsin by about 5 percentage points. Note also that the coefficients on the interaction terms with manufacturing employment per capita and military plants per 1000 remain similar to those in the baseline estimation in Table 3.

In column (3), we regress vote share for Yeltsin on the comparative disadvantage index. In column (4), we add additional variables, including the interactions between *Post1991* and both manufacturing employment per capita and military plants per 1000 population. In both specifications, the comparative disadvantage index is negative and statistically significant, indicating that greater employment intensity in globally less-competitive sectors produced a greater decrease in support for Yeltsin after the 1992 reforms. Note, as well, that the coefficients on manufacturing employment and military plants are almost identical to the baseline results.

Finally, in column (5) of Table 4, we control for both the complexity and comparative disadvantage indices in the same regression while holding constant manufacturing employment and military plants per capita. Both indices remain negative and significant. Both, moreover, appear to be quite stable across specifications, indicating a strong effect of market vulnerability on political preferences.[12]

We conclude that local economies' initial conditions played an important role in the reversal in support for the candidate who promoted market reforms. Moreover, the significance of all three factors – manufacturing employment, industrial complexity, and comparative disadvantage – strongly suggests our measures capture different dimensions of market vulnerability.

7 Timing: provincial analysis

The advantages of tracking Yeltsin's support in district-level voting outcomes come at a cost. Notably, our panel to evaluate the effect of market liberalization has only two periods, one before and one after "treatment." We thus cannot address concerns that a pre-trend underlies the relationships in Tables 3 and 4, nor can we rule out the possible influence of major events, like the privatization of Russian industry, which came after market liberalization but before the 1996 election. To address these concerns, we add to our panel

[12]In Section A in the on-line Appendix, we estimate a version of Equation 5 for each of the 19 sub-sectors (see Figure A1 and Table A1). The results show that the more complex sub-sectors generally have a stronger effect on the decline of support for Yeltsin. The correlation between the complexity index and regression coefficients across 19 sub-sectors is -0.41.

proxies for public support of Yeltsin in 1989 and 1993. In so doing, however, data availability forces us to forego districts for provinces as units of analysis.

In March of 1989, Soviet citizens cast ballots for representatives to the Congress of People's Deputies (CPD) in what was the country's first contested election for a national legislative body since 1918. Boris Yeltsin was only on the ballot in one Moscow district, but his anti-establishment spirit loomed large over an election considered by many to be a referendum on the Communist Party.[13] Party members, advantaged by Party-written election rules, did take home 86 percent of the 1044 seats available to Russian Federation candidates.[14] Nevertheless, Russian voters, much like Yeltsin himself, were widely seen has having offered a rebuke of the Party, with independent candidates prevailing over powerful Party members in many districts (Brovkin, 1990). In light of the above, we feel it not unreasonable to use the percentage of seats won by independent, non-Party candidates to the CPD as a province-level proxy for Yeltsin's support in 1989.

In the year after he launched his reform program in January 1992, Yeltsin met with increasingly intense criticism from the Russian Parliament. Seeking the leverage of a popular mandate, Yeltsin put a four-question referendum to voters in April 1993. The first asked whether "[Y]ou have confidence in the President of the Russian Federation, Boris N. Yeltsin."[15] Of those that voted, 59.9 percent responded in the affirmative. Prior research explains variation in support across provinces as a function of urbanization rates, educational attainment, and the percentage of the workforce in white-collar jobs (Clem and Craumer, 1993; Corning, 1993).

Having identified province-level proxies for Yeltsin's electoral support in both 1989 and 1993, we double the number of periods available for analysis, gaining leverage in addressing two important questions left outstanding above. A second year prior to the 1992 reforms enables us to comment on pre-trends. A second year after those same reforms, but prior to 1996, allows us to home in on the timing of any effects from market liberalization.

To this end, we once again estimate a panel regression model with fixed effects:

[13]The so-called "Yeltsin affair" was one of the defining issues of the election. Initially a supporter of Gorbachev, Yeltsin had been relieved of his duties as a candidate member of the Politburo in early 1988 in the wake of criticisms he had leveled against the Soviet leader and the Communist Party. The CPD election offered him a chance at rehabilitation. One week prior to election day, however, the Party's Central Committee announced plans to investigate his campaign, an action widely seen as a precursor to his removal from the Central Committee and the stripping of his Party membership. Large crowds rallied in his support in Moscow, Sverdlovsk, Perm, and several other Russian cities, and many "progressive" CPD candidates signed a public letter of protest (Kiernan and Aistrup, 1991).

[14]There were two large blocs in the CPD: one-third were delegated by political and social organizations; the remainder were elected in territorial and nationality-territorial districts. Generally, Party candidates supported the Party and Gorbachev's limited reforms and made promises to improve the food supply and various public services. Non-Party candidates included those whose platforms were just "a step ahead" of official Party policy as well as those who were much more critical of the existing social order. Even though reformist candidates' platforms varied in specifics, they all reflected "a general striving for more democracy, private initiative, private enterprise, human rights, and less government interference (Brovkin, 1990)."

[15]Additional questions asked about support for Yeltsin's economic and social policy as well as about the timing of subsequent elections for the Presidency and the Parliament.

$$Voting_{pt} = \alpha\, Manuf_p \times Post1991_t + \gamma X_p \times Post1991_t + \psi_p + \delta_t + \epsilon_{pt} \quad (7)$$

$Voting_{pt}$, here, represents vote shares for Yeltsin in province p. $Manuf_p$, as in Equation (5), captures manufacturing employment per capita.

Table 5 presents our estimates for Equation (7), with columns (1)-(5) each including a different combination of years, allowing us to home in on the timing of any market liberalization effect. Column (1) displays results for the entire four-period panel. As did the baseline estimates on district level data (presented in Table 3), we observe a strong correlation between manufacturing intensity and a post-1992 change in support for Yeltsin. On average, an increase in manufacturing employment by 10 percentage points increases the decline in Yeltsin's vote share by 1.6 percentage points. The magnitude of this effect, as can be observed in column (2), is smaller when the analysis excludes 1996. However, it remains statistically significant. The effect, that is, was apparent as early as March of 1993, just a bit more than a year after price liberalization. This suggests that the earlier district-level results could not have resulted primarily from the privatization of Russian industry and/or other developments after the spring of 1993.

In column (3), we present an exercise designed to identify whether or not the difference-in-difference results in columns (1) and (2), and by implication, in the baseline regressions in Table 3, reflect a pre-trend. Analyzing just the panel from the 1989 and 1991 elections, treating the two years, respectively, as pre- and post-"treatment," we observe that provincial support for Yeltsin and his anti-communist platform *increases* more in manufacturing-intensive regions. In other words, our main finding that Yeltsin's support declines more after 1991 in more manufacturing intensive areas does not reflect a pre-trend. That the pre-trend points in the opposite direction as the main result conceivably suggests that our estimate of the effect of liberalization (in columns (1) and (2), and by implication in Table 3) represents a lower bound.

Columns (4) and (5) both exclude the 1989 CPD elections from the analysis. The former shows that support for Yeltsin decreased the most in the most manufacturing intensive provinces in 1993 and 1996 relative to 1991. As with the comparison between columns (1) and (2), the latter demonstrates that this change is largely driven by what happens before, as opposed to what happens after, the national referendum in the spring of 1993. Given this timing, we feel it not unreasonable to rule out the privatization of Russian industry, as opposed to the liberalization of markets, as the source of the geographic variation we observe. By the end of 1992, just four months before the referendum to Russian voters, only eighteen mid-sized and large companies had been privatized nationally (Blasi et al., 2018).[16]

8 Mechanism: a shock to well-being

With respect to mechanisms underlying the relationships above, a connection might be presumed between voters' post-1991 well-being and the inherited structure of production in

[16]We repeat the same exercise with an alternative measure of manufacturing employment from Goskomstat yearbook. The results are similar. See (see Table A2 in the online Appendix).

the district in which they reside – i.e., a causal chain connecting a locale's market vulnerability to changes in its voting through changes in the quality of life of its residents. Finding data that reliably captures changes in well-being in the early 1990's, however, poses a challenge. Price-based proxies for welfare – e.g., gross provincial product per capita – require a consistent set of prices. But of course market-based prices did not exist prior to 1992, and imputing them can be no more than an exercise in educated guesswork. We thus turn to provincial annual mortality data between 1988 and 1996 as a non-price-based measure of changes in well-being between the periods before and after market liberalization in January 1992.

Mortality rates, particularly for working-age Russian males, spiked upwards in the early 1990s, due in largest part to increases in cardiovascular disease (Leon et al., 1997; Shkolnikov et al., 1998; Brainerd and Cutler, 2005). Many researchers point to economic factors, demonstrating, for instance, negative correlations between sub-national increases in labor turnover and de-industrialization, on the one hand, and decreases in life expectancy, on the other (Walberg et al., 1998; Scheiring et al., 2021). Longitudinal data, moreover, have turned up strong evidence that individual labor market shocks experienced between 1991 and 1995 both adversely affected health and increased high risk behaviors (Lazareva, 2020).

To the extent that there were economic roots for the mortality crisis, we would expect that provinces most vulnerable to the shock of market liberalization would experience the biggest increases in mortality and that the specific causes in death driving the variation would be those most plausibly associated with economic dislocation. To this end, we once again estimate a panel regression model with fixed effects:

$$Mortality_{pt} = \alpha\, Manuf_p \times Post1991_t + \gamma X_p \times Post1991_t + \psi_p + \delta_t + \epsilon_{pt} \tag{8}$$

$Mortality_{pt}$, here, represents deaths per 1000 population in province p and year t. $Manuf_p$, as in Equation (5), captures manufacturing employment per capita. X_p is as in prior specifications with one additional variable. Bhattacharya et al. (2013) show that variation across provinces in the rate of increase in mortality rates can be largely explained by the discontinuation of an anti-alcohol campaign pursued, with varying intensity across provinces, under Gorbachev. In essence, the lives saved by the campaign in the 1980s became lives lost after the campaign came to an end. To account for this, X_p includes Bhattacharya et al.'s (2013) province-level measure of the campaign's intensity – i.e., annual alcohol consumption prior to the campaign's introduction.[17]

Table 6 presents the results. Columns (1) and (2) show that for both men and women all-cause mortality increased more after price liberalization in provinces with a higher share of manufacturing employment, with the effect on male mortality significant at the 5% level.[18]

[17] This strategy follows one often used in the literature to evaluate campaigns to eliminate certain diseases. Areas with greater pre-campaign exposure to that disease benefit more from a population-wide campaign against that disease.

[18] The result is consistent with Scheiring et al. (2021) who identify a correlation between changes in industrial employment and mortality rates across 500-plus towns in Russia between 1991 and 1999.

Nearly all of that disproportionate increase can be explained by an increase in cardiovascular-related deaths – e.g., ischaemic heart disease and circulatory diseases; the coefficients in columns (1) and (2) are nearly identical to those in columns (3) and (4). Brainerd and Cutler (2005) report that in countries like Russia, undergoing a transition to a market economy, "A high level of stress seems related to the development of cardiovascular disease, although the physiological mechanisms by which this occurs is not yet clear." In columns (5)-(8), we run placebo-like regressions with causes of death less likely to be related to the stresses of economic dislocation. We find no evidence that either deaths from cancer or respiratory diseases increased more quickly in manufacturing-intensive provinces after price liberalization.

To better understand the dynamics underlying our results above, we trace out the time path of mortality in more manufacturing-intensive regions by estimating the following equation for provinces p and years t:

$$Mortality_{pt} = \sum_n \alpha_n \left[(Manuf)_p \times (year)_{tn}\right] + \sum_n \gamma_n \left[(X)_p \times (year)_{tn}\right] + \psi_p + \delta_t + \epsilon_{pt} \quad (9)$$

Figures 5a-6b present estimates for α, with 95-percent confidence intervals, across time. As can be observed in Figure 5a, all-cause mortality increases disproportionately faster after 1994 for men and, to a lesser extent, women. A similar pattern can be observed in Figure 5b for cardiovascular-related deaths suffered by men. The placebo-like regressions for cancer and respiratory-related deaths (Figures 6a and 6b), however, show no such temporal pattern.

Overall, these results appear consistent with an interpretation that a post-liberalization shock to their material and/or emotional well-being, likely mediated the effect of the inherited structure of production on the drop in voters' support for the pro-market incumbent.

9 Conclusion

Research on China's entry into the World Trade Organization confirms that when an already established market economy opens itself up quickly to imports from a low-wage country, the cross-regional differences in net benefits can be large and persistent. As some regions gain, and other regions suffer, the country's trajectory is forever altered.

If consequential asymmetries result from a quick expansion of trade relations with just a single country, albeit a large one, then certainly they must also result from the quick expansion of trade relations *with the entire world*. And even more, for non-market economies, they must result from the simultaneous liberalization of nearly all internal and external markets in one dramatic break with the past.

Considering the magnitude of the shock, as well as the country's size and geographic diversity, is it any surprise that Russia's voters' response to the January 1992 reforms was so asymmetric across the country's regions? In fact, it is not. Far from being a "time of extraordinary politics," Russia's exit from communism turns out to have been a time of quite

ordinary politics. Electoral support for the pro-market incumbent, that is, declined precisely where we might have expected it to, in those regions most vulnerable to the all-encompassing liberalizing reforms.

That twentieth century communism was not a monolith is a truism but, perhaps, one too easily disregarded. Ascribing the divergent trajectories of post-communist societies, in whole or even in good part, to post-communist policies risks disregarding the potentially consequential ways communist societies differed across space on liberalization's eve. Culture, geography, and inherited human capital, perhaps all played independent roles in determining whose post-communist trajectories were relatively successful and whose were not.

Here, we have taken a modest step, shedding light on the effects of only one such "initial condition," the inherited structure of production. By focusing on differences along this dimension across relatively small political-geographic units, we draw comparisons across units for whom post-communist policy environments are plausibly similar. We thus isolate what turns out to be a substantively large, independent effect of the inherited structure of production on Russia's political trajectory in the 1990s. In light of this finding, we believe it prudent for policy makers contemplating liberalizing reforms in the future to pay heed to *ex ante* inter-regional asymmetries so that they are better positioned to ease the burden on the most vulnerable after reforms' passage.

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10 Tables

Table 1: Summary statistics

Variable	Mean	SD	Min	Max	N
Panel A: *District (rayon) level data*					
Votes for Yeltsin in 1991, %	43.5	16.8	7.1	90.5	1664
Votes for Yeltsin in 1996 (first round), %	27.3	10.5	9.3	70.2	1664
Votes for communist candidate in 1991 (Ryzhkov), %	40.6	13.3	5.1	84.9	1664
Votes for communist candidate in 1996 (Zyuganov), %	41.3	14.7	5.4	82.5	1664
Votes for Zhirinovsky in 1991, %	10.1	4.7	0	29.4	1664
Votes for Zhirinovsky in 1996, %	7.3	3.2	1.0	25.5	1664
Manufacturing employment, %	4.9	5.4	0	30.6	1664
Military plants, per 1000	0.05	0.14	0	2.61	1664
Complexity index	0.74	0.11	0	0.91	1569
Balassa index	0.73	0.86	0	5.22	1569
Regional capital	0.04	0.18	0	1	1664
Town status	0.19	0.39	0	1	1664
Distance to regional capital, km	132	112	0	1435	1664
Latitude, N	53.9	4.1	42.8	75.1	1664
Longitude, E	55.8	25.6	19.9	142.0	1664
Panel B: *Region level data*					
Votes for Yeltsin in 1991, %	52.3	12.5	15.3	84.8	88
Votes for Yeltsin in 1996 (first round), %	34.7	11.1	19.3	65.11	88
Winning independent candidates in 1989, %	10.7	12.8	0	66.7	88
Support for Yeltsin in 1993 referendum, %	56.8	13.9	2.4	84.4	88
Manufacturing employment, %	6.8	3.2	0.4	15.7	88
Military plants, per 100,000	9.2	10.5	0	67.6	88
Death rate in 1991, per 1000	11.1	2.3	5.4	15.4	88
Death rate in 1996, per 1000	13.5	2.8	6.1	19.5	88
Alcohol consumption, average for 1980-1985, litres	14.2	2.0	8.3	20.3.5	88
Latitude, N	55.2	6.2	43.0	69.2	88
Longitude, E	64.5	34.9	21.5	162.9	88

Notes: Summary statistics for two panel data sets. District data comprise 1664 districts (*rayons*) that cover 85% of the population of Russia in 1989. Regional data comprise 88 regions. For data sources see Table B3 in the online Appendix.

Table 2: Manufacturing sub-sectors, complexity index, and revealed comparative advantage index

SIC code	Manufacturing sub-sectors	(1) Employees, thousands	(2) Number of enterprises	(3) Complexity index	(4) Balassa index
35	Industrial machinery and equipment	1863.1	1138	0.90	0.32
20	Food products	1318.4	5865	0.63	0.16
32	Stone, clay, glass, concrete products	1027.1	2008	0.91	0.18
37	Transportation equipment	995.0	351	0.89	0.39
24	Lumber and wood products	928.0	1858	0.86	2.92
33	Primary metals	840.0	227	0.77	1.57
22	Textile products	851.3	601	0.53	0.57
28	Chemicals and allied products	673.0	454	0.85	0.69
23	Apparel, finished fabric products	517.6	814	0.53	0.00
36	Electronics, electrical equipment	443.4	270	0.86	0.15
34	Fabricated metal products	381.9	565	0.85	0.13
38	Measuring, photographic, medical goods	275.9	290	0.86	0.17
30	Rubber and plastic products	272.9	176	0.79	0.26
31	Leather and leather products	231.8	261	0.53	0.07
25	Furniture and fixtures	231.4	390	0.89	0.17
26	Paper products	195.9	157	0.84	0.28
29	Petroleum refining	136.3	82	0.69	5.22
27	Printing, publishing	142.0	1424	0.84	
21	Tobacco products	14.1	28	0.63	0.00

Notes: Sub-sectors are sorted by the number of employees. Data on employees and number of enterprises are from 1989 Census of Soviet Industry. The Complexity Index has been calculate on the basis of Soviet input-output tables for 1989 (see Section 4 for calculation method). The Balassa Index has been calculated on the basis of United Nations international trade statistics for years 1988-1990. See Table B3 for data sources.

Table 3: Manufacturing employment and change in 1996 voting relative to 1991 (district level panel regressions)

	(1)	(2)	(3)	(4)	(5)	(6)
	Vote shares (%) for					
	Yeltsin	Communist candidate	Zhirinovskiy	Yeltsin	Communist candidate	Zhirinovskiy
Manufacturing employment × post 1991	-0.76***	0.28***	0.14***	-0.27***	0.13***	0.02
	(0.05)	(0.04)	(0.02)	(0.05)	(0.05)	(0.02)
Military plants × post 1991				-3.16**	1.75*	0.41
				(1.43)	(0.97)	(0.39)
Regional capital × post 1991				12.77***	-7.38***	-3.11***
				(1.60)	(1.25)	(0.54)
Town × post 1991				-14.50***	4.74***	3.35***
				(0.74)	(0.63)	(0.26)
District and year fixed effects	✓	✓	✓	✓	✓	✓
Region interactions	✓	✓	✓	✓	✓	✓
Geography interactions	✓	✓	✓	✓	✓	✓
R-squared	0.80	0.64	0.73	0.84	0.65	0.76
Number of districts	1,664	1,664	1,664	1,664	1,664	1,664
Observations	3,328	3,328	3,328	3,328	3,328	3,328

Notes: Dependent variables are vote shares of respective candidates in 1991 and 1996 presidential elections. Communist candidates are Ryzhkov in 1991 and Zyuganov in 1996. All regressions are run at the district (*rayon*) level with district and year fixed effects. Region interactions are region fixed effects interacted with $Post1991dummy$. Geography interactions are latitude, longitude, and distance to regional capital interacted with $Post1991dummy$. Standard errors are clustered within observational units (districts) over time and reported in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table 4: Industrial complexity, comparative disadvantage and voting (district level panel regressions)

	(1)	(2)	(3)	(4)	(5)
	Vote shares for Yeltsin, %				
Complexity index × post 1991	-11.41***	-5.13*			-7.70***
	(2.82)	(2.71)			(3.00)
Comparative disadvantage index × post 1991			-1.00***	-0.62*	-0.98***
			(0.38)	(0.35)	(0.38)
Manufacturing employment × post 1991		-0.23***		-0.29***	-0.25***
		(0.06)		(0.06)	(0.06)
Military plants × post 1991		-3.73**		-3.94**	-3.84**
		(1.61)		(1.68)	(1.62)
Regional capital and town interactions		✓		✓	✓
District and year fixed effects	✓	✓	✓	✓	✓
Region interactions	✓	✓	✓	✓	✓
Geography interactions	✓	✓	✓	✓	✓
R-squared	0.78	0.85	0.78	0.85	0.85
Number of districts	1,569	1,569	1,569	1,569	1,569
Observations	3,138	3,138	3,138	3,138	3,138

Notes: The sample is restricted to districts with non-zero manufacturing employment. Dependent variable is vote share for Boris Yeltsin in 1991 and 1996 (first round) presidential elections. All regressions are run at a district (*rayon*) level with district and year fixed effects. Regional capital interaction is dummy for a regional capital interacted with post 1991 dummy. Town interaction is dummy for administrative status of a town interacted with post 1991 dummy. Region interactions are region fixed effects interacted with post 1991 dummy. Geography interactions are latitude, longitude and distance to regional capital interacted with post 1991 dummy. Standard errors are clustered within observational units (districts) over time and reported in parentheses.

* p<0.10, ** p<0.05, *** p<0.01.

Table 5: Manufacturing employment and voting in 1989-1996
(regional level panel regressions)

	(1)	(2)	(3)	(4)	(5)
	Vote shares for Yeltsin, %				
	1989–1996	1989–1993	1989, 1991	1991–1996	1991–1993
Manufacturing employment × post 1991	-0.16***	-0.10**		-0.23***	-0.17***
	(0.05)	(0.05)		(0.06)	(0.05)
Manufacturing employment × post 1989			0.14**		
			(0.07)		
Region and year fixed effects	✓	✓	✓	✓	✓
Geography interactions	✓	✓	✓	✓	✓
Military plants interactions	✓	✓	✓	✓	✓
R-squared	0.844	0.873	0.875	0.783	0.528
Number of regions	82	82	82	82	82
Observations	328	246	164	246	164

Notes: The dependent variable is the vote shares for Yeltsin in the 1991 and 1996 presidential elections, and 1993 referendum. For 1989, the dependent variable is the share of non-Communist (independent) winners for a province's seats in the Congress of People's Deputies in 1989. All regressions are run at the regional level with region and year fixed effects. Geography interactions are latitude and longitude interacted with *post*1991. Standard errors are clustered within observational units (provinces) over time and reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 6: Manufacturing employment and mortality in 1988-1996 (regional level panel regressions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mortality per 1000 population							
	all causes		cardiovascular		cancer		respiratory	
	men	women	men	women	men	women	men	women
Manufacturing employment × post 1991	0.07**	0.03	0.06*	0.03	0.00	-0.00	0.00	-0.00
	(0.04)	(0.02)	(0.03)	(0.04)	(0.01)	(0.00)	(0.01)	(0.00)
Region and year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Geography interactions	✓	✓	✓	✓	✓	✓	✓	✓
Military plants interactions	✓	✓	✓	✓	✓	✓	✓	✓
Alcohol consumption interactions	✓	✓	✓	✓	✓	✓	✓	✓
R-squared	0.95	0.92	0.88	0.64	0.59	0.20	0.82	0.32
Number of regions	71	71	71	71	71	71	71	71
Observations	630	630	605	598	563	556	549	542

Notes: The dependent variables are mortality per 1000 population (crude death rate). All regressions are run at the regional level with region and year fixed effects. Geography interactions are latitude and longitude interacted with *post*1991. Military plants interactions are number of military plants per 1000 population interacted with *post*1991. Standard errors are clustered within observational units (provinces) over time and reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

11 Figures

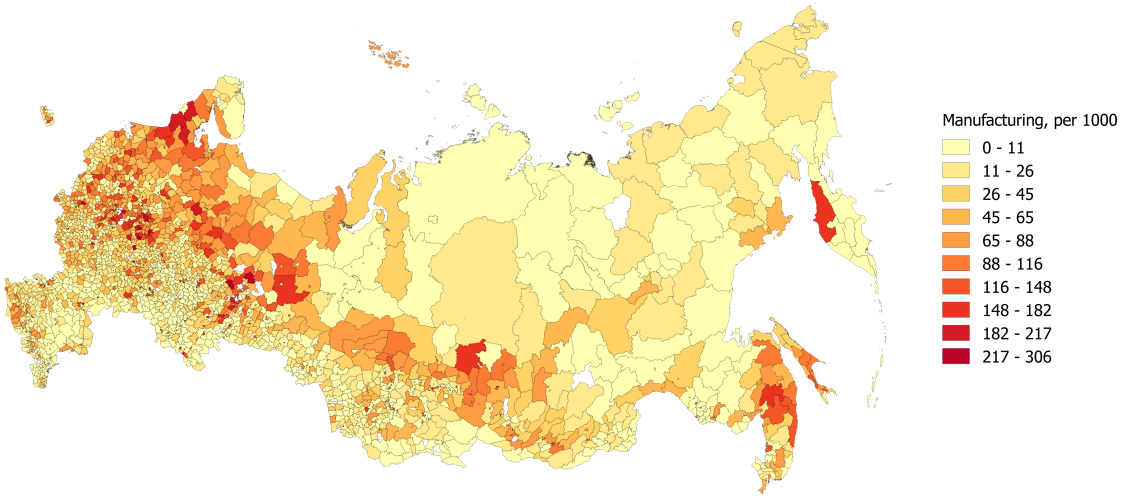


Figure 2: Share of manufacturing employment in 1989

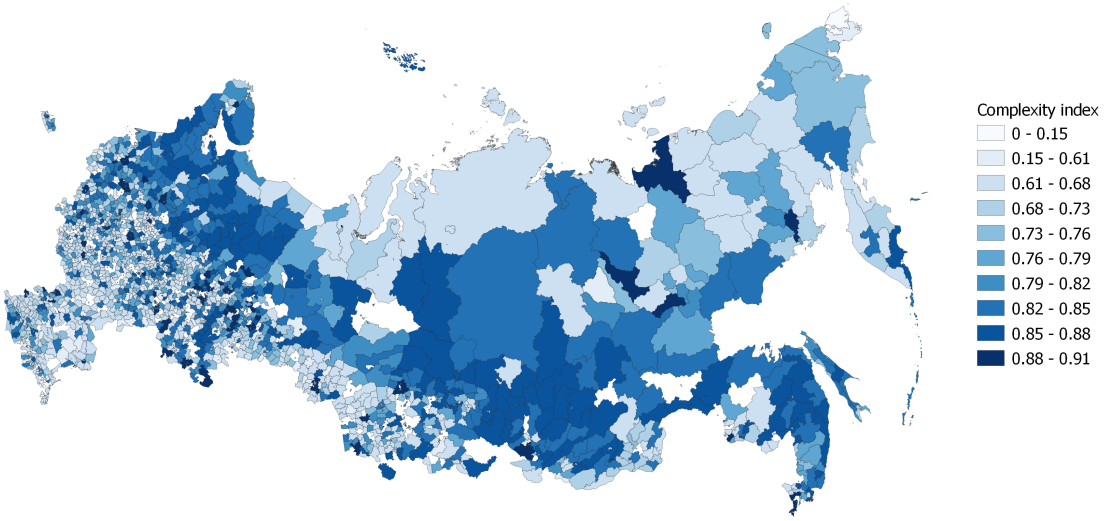


Figure 3: Complexity index

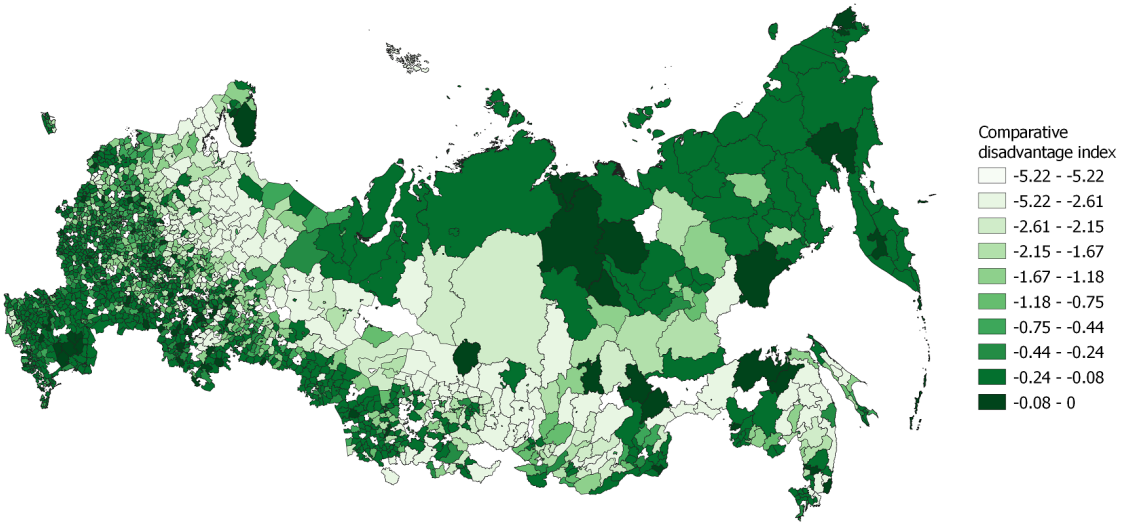
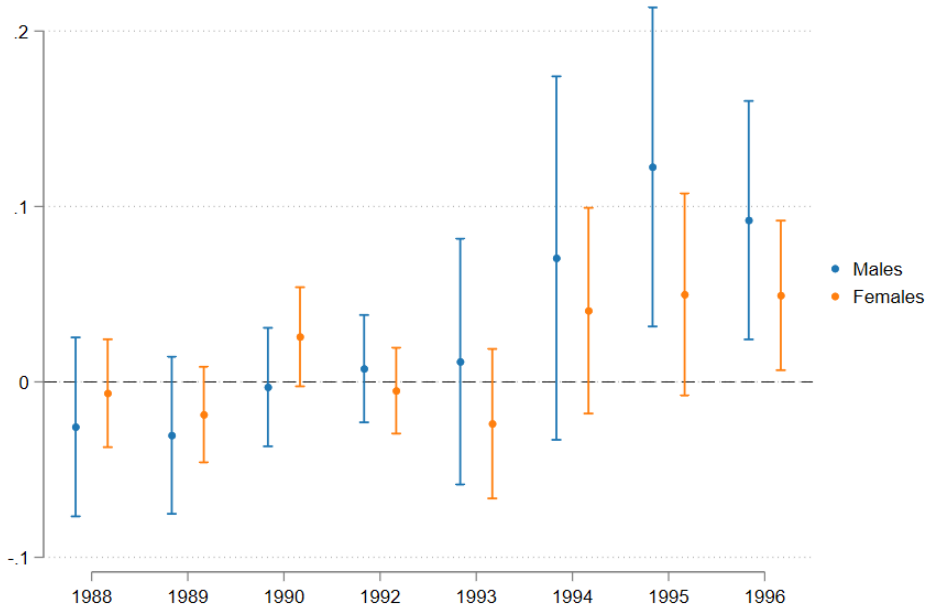
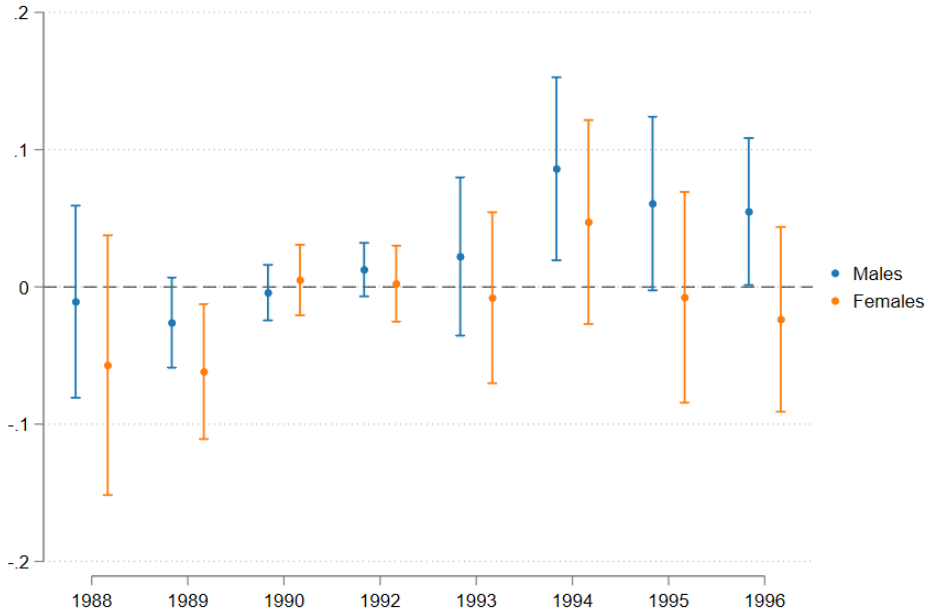


Figure 4: Comparative disadvantage index (negative Balassa index)

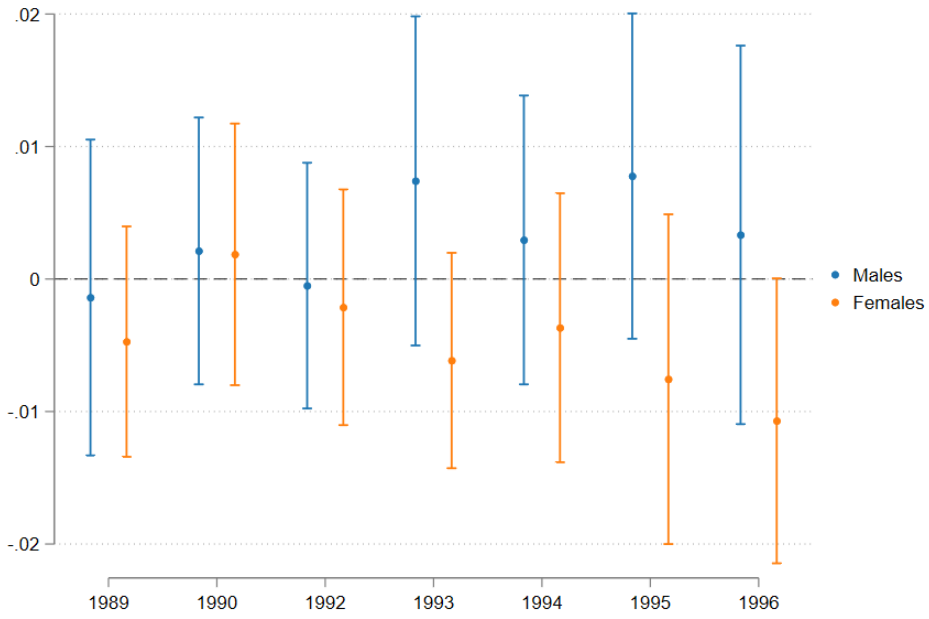


(a) All cause mortality coefficients



(b) Cardiovascular diseases mortality coefficients

Figure 5: Coefficients for the year and manufacturing employment interactions.



(a) Cancer mortality coefficients

(b) Respiratory diseases mortality coefficients

Figure 6: Coefficients for the year and manufacturing employment interactions (placebo diseases.

Online Appendix

A Exploring variation within the manufacturing sector

Drawing on literature that is suggestive of machinery and equipment manufacturers' market vulnerability (Grant, 1979; Treml, 1981; Cooper, 1986; Ofer, 1987), specifically, or, more generally, that of enterprises in more complex (Blanchard and Kremer, 1997) or internationally un-competitive sub-sectors, in a second model, we split the manufacturing sector into twenty sub-sectors and estimate a version of Equation (5) separately for each:

$$Voting_{cdt} = \alpha\, Manuf_{id} \times Post1991_t + \beta(\sum_{j=1,j\neq i}^{19} Manuf_{jd}) \times Post1991_t + \gamma X_d \times Post1991_t + \delta R_d \times Post1991_t + \psi_d + \delta_t + \varepsilon_{rt} \tag{10}$$

where $Manuf_{id}$ is the population share employed in manufacturing sub-sector i in district d, and $\sum_{j=1,j\neq i}^{19} Manuf_{jd}$ is the population share employed in the rest of the manufacturing sector in the same district. The outcome and control variables are as in Equation (5). Again, the coefficient of interest is α. It captures the percentage point change in the voting share of a presidential candidate in district d as a function of the district's per capita employment in one of manufacturing's nineteen sub-sectors.

Next, we estimate Equation 10 by splitting the manufacturing sector into twenty sub-sectors. Figure A1 presents the coefficients for each sub-sector ordered by t-statistics (see also Table A1 in online Appendix). Only five sub-sectors out of twenty yield statistically significant coefficients. Fabricated metal products, and industrial machinery and equipment are both significant at the 1% level. Transportation equipment, and stone, clay, glass and concrete products are significant at the 5% level. Electronics and electrical equipment is significant at the 10% level. The magnitudes of the five significant coefficients – which range from -0.4 for transportation equipment to -1.03 for fabricated metal products – imply that employment in these sub-sectors has a larger effect on the fall in support for Yeltsin than the manufacturing sector overall.[19] In the next section we further explore this variation across sub-sectors and empirically test two additional measures of regional market vulnerability.

[19]Note that the coefficients for the rest of the manufacturing sector in Table A1 are very stable and similar in magnitude to the coefficient in the baseline estimation in Table 3, about -0.27.

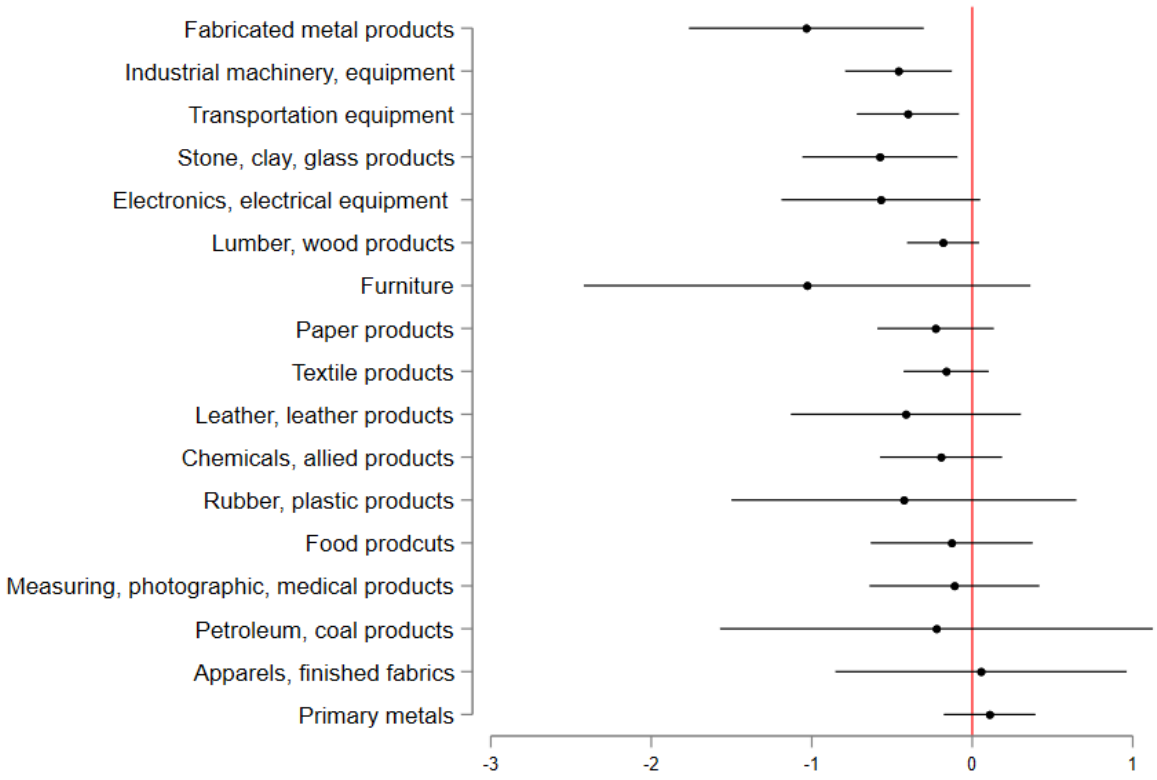


Figure A1: Regressions coefficients for manufacturing sub-sectors from Equation (10). See Table A1 below in online Appendix for the estimation results.

Table A1: Manufacturing sub-sectors and voting for Yeltsin, 1996-1991 (district level panel regressions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Vote shares for Yeltsin, %																		
Food and kindred products	-0.13																		
	(0.26)																		
Tobacco products		-0.34																	
		(5.17)																	
Textile mill products			-0.16																
			(0.14)																
Apparel, finished products from fabrics				0.05															
				(0.46)															
Lumber and wood products					-0.18														
					(0.11)														
Furniture and fixtures						-1.02													
						(0.71)													
Paper and allied products							-0.23												
							(0.18)												
Printing, publishing, and allied industries								-1.49											
								(1.57)											
Chemicals and allied products									-0.19										
									(0.19)										
Petroleum refining and related industries										-0.22									
										(0.69)									
Rubber and miscellaneous plastics											-0.43								
											(0.55)								
Leather and leather products												-0.41							
												(0.37)							
Stone, clay, glass, concrete products													-0.58**						
													(0.25)						
Primary metals industry														0.11					
														(0.15)					
Fabricated metal products															-1.03***				
															(0.37)				
Industrial and commercial machinery, equipment																-0.46***			
																(0.17)			
Electronics and electrical equipment																	-0.57*		
																	(0.32)		
Transportation equipment																		-0.40**	
																		(0.16)	
Measuring, photographic, medical and optical goods																			-0.11
																			(0.27)
Manufacturing (sum of other sub-sectors)	-0.27***	-0.27***	-0.29***	-0.27***	-0.29***	-0.25***	-0.26***	-0.26***	-0.27***	-0.27***	-0.26***	-0.26***	-0.24***	-0.30***	-0.23***	-0.24***	-0.25***	-0.25***	-0.27***
	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
District and year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
All controls from Table 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R-squared	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84

Notes: The dependent variable is the vote share for Boris Yeltsin in 1991 and 1996 (first round) presidential elections. All regressions are run at the district (*rayon*) level with district and year fixed effects. The number of districts is 1664, and the number of observations is 3328 as in Table 3. All controls from Table 3 are included but not reported for the sake of brevity. Standard errors are clustered within observational units (districts) over time and reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table A2: Manufacturing employment and voting in 1989-1996
(regional level panel regressions with Goskomstat employment data)

	(1)	(2)	(3)	(4)	(5)
	Vote shares for Yeltsin, %				
	1989–1996	1989–1993	1989, 1991	1991–1996	1991–1993
Manufacturing employment × post 1991	-0.09*	-0.02		-0.19***	-0.12**
	(0.06)	(0.05)		(0.06)	(0.06)
Manufacturing employment × post 1989			0.19***		
			(0.06)		
Region and year fixed effects	✓	✓	✓	✓	✓
Geography interactions	✓	✓	✓	✓	✓
Military plants interactions	✓	✓	✓	✓	✓
R-squared	0.849	0.877	0.901	0.803	0.372
Number of regions	66	66	66	66	66
Observations	264	198	132	198	132

Notes: Dependent variables are vote shares for Yeltsin in 1991 and 1996 presidential elections, and 1993 referendum. For 1989 the dependent variable is vote share of non-Communist (independent) winners for the Congress of People's Deputies in 1989. All regressions are run at a regional level with region and year fixed effects. Geography interactions are latitude and longitude interacted with post 1991 dummy. Standard errors are clustered within observational units (regions) over time and reported in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

B Data sources

Table B3: Data sources

Variable	Source
Panel A: *District (rayon) level data*	
Votes for Yeltsin in 1991, %	Electoral Geography. Russia, 1991 elections
Votes for Yeltsin in 1996, %	Electoral Geography. Russia, 1996 elections
Votes for Ryzhkov in 1991, %	Electoral Geography. Russia, 1991 elections
Votes for Zyuganov in 1996, %	Electoral Geography. Russia, 1996 elections
Votes for Zhirinovsky in 1991, %	Electoral Geography. Russia, 1991 elections
Votes for Zhirinovsky in 1996, %	Electoral Geography. Russia, 1996 elections
Manufacturing employment, %	1989 USSR manufacturing census
Military plants, per 1000	Dexter and Rodionov (2020)
District (*rayon*) level population	1989 population census of USSR, Table 3
Town population in 1989	1989 population census of USSR, Table 3
Distance to regional capital, km	Authors' calculations using QGIS software
Latitude, N	Authors' calculations using QGIS software
Longitude, E	Authors' calculations using QGIS software
Panel B: *Region level data*	
Manufacturing employment, %	1989 USSR manufacturing census
Employment in other sectors	Rosstat. Labor and Employment, 2003. Tables 9.2-9.95
Death rate in 1989-1996, per 1000	The Centre for Demographic Research at the NES
Death causes in 1989-1996, per 1000	The Centre for Demographic Research at the NES
Alcohol consumption in 1980-1985, litres	Bhattacharya, Gathmann and Miller (2013)
Panel C: *Indices*	
Complexity index	Authors' calculations on the basis of input-output tables from Institute of Forecasting and Uzyakov et al. (2006)
Balassa index	Authors' calculations on the basis of United Nations (1992) for years 1988-1990