Market Access and Urban Growth in the Former Soviet Union*

Humoyun Abdumavlon§

April 14, 2025

Click here for latest version

Abstract

This paper quantifies the impact of changes in market access on urban growth by exploiting the sudden dissolution of the Soviet Union in 1991. Using quasi-experimental methods and population data (1970–2021) for 1235 cities, I find stark regional disparities. Post-Soviet cities near internal and external borders in Europe experienced annualized population declines of 0.35 and 0.55 percentage points, respectively, relative to interior cities. Conversely, Central Asian cities near previously restricted external borders (e.g., China, Iran) grew 1.4 percentage points faster annually, cumulatively becoming 50% larger. Nighttime lights (1992–2013) corroborate these trends, revealing slower economic activity in European border cities and initial gains in Central Asia. Robustness checks rule out alternative explanations such as the industrial composition of cities and military divestment from border regions, highlighting market access as the key mechanism. These findings add to our knowledge of how changes in access to markets, the sudden loss or gain of it, can shape regional differences in development.

JEL classification: F15, N94, R12, R23

Keywords: Market access, Urban growth, Regional Development, Night lights

*I am especially grateful to Adam Storeygard for his guidance and support. I also thank, in alphabetical order, Daniel Berkowitz, Kristian Behrens, Christa Court, Andreas Ferrara, Yannis Ioannides, Lester Lusher, Omer Ali, Enrico Spolaore, Gabriel Tourek, Randall Walsh, the NARSC Graduate Student Paper Competition Reading Committee, and participants at the 71st North American Meetings of the Regional Science Association International for their valuable discussions and suggestions.

§University of Pittsburgh, Department of Economics, 230 South Bouquet Street, Pittsburgh, PA 15260. E-mail: abdumavlon@pitt.edu.

1 Introduction

In recent years, numerous movements have established or sought to establish new sovereign states and redraw international borders. Notable examples in the 21st century include Kosovo's 2008 declaration of independence, the 2014 Scottish independence referendum, and ongoing Kurdish efforts for autonomy across Iraq, Syria, and Turkey. While such movements often gain traction due to perceived political or cultural benefits, the economic costs are frequently overlooked. One such cost is the imposition of new borders that disrupt previously integrated markets and labor flows. In this paper, I seek to quantify these costs by exploiting the collapse of the Soviet Union in 1991 as a natural experiment.

This watershed moment caught even seasoned political and economic observers by surprise (Fukuyama, 1992). In its aftermath, I leverage the abrupt division of internal Soviet borders and the dismantling of the Iron Curtain as sources of exogenous variation,[1] providing empirical evidence on the causal role of market access in shaping economic development. Figure 1 illustrates the external borders of the western former Soviet Union (FSU) and the internal boundaries among post-Soviet states in the region. These newly drawn borders separated areas that had been tightly integrated under a centralized, command-driven economic system and had belonged to a single state since 1922. [2]

Prior to 1991, internal borders within the Soviet Union functioned purely as administrative demarcations, posing no barriers to trade or migration. After the collapse, however, these borders hardened into international boundaries, significantly curtailing cross-border economic activity. At the same time, the fall of the Iron Curtain enabled former Eastern Bloc countries to break away from Soviet influence and reorient toward Western political and economic institutions. This geopolitical realignment produced an asymmetric shock: post-Soviet European border regions experienced a sharp decline in market access, while border regions in Central Asia gained access to markets in neighboring non-Soviet countries that had previously been closed off.

The primary empirical approach involves a difference-in-differences (DiD) analysis to examine intercensal population changes in post-Soviet cities within 75 km of internal and external borders separately relative to interior cities from 1970 to 2021. Over a 30-year period from 1991, post-Soviet cities in Europe near internal and external borders see their populations decrease at annualized rates of about 0.35 and 0.55 percentage points respectively, compared to interior cities. This represents a cumulative decrease

[1] In this study, the Iron Curtain refers specifically to the external borders of the Soviet Union.

[2] While the analysis includes all 15 successor states of the USSR, the map highlights the western portion—what I refer to as post-Soviet Europe—where the majority of the Soviet population lived and approximately four-fifths of the sample cities are located.

in the relative size of these border cities by approximately one-tenth and one-fifth, respectively. From 1991 over a span of 30 years, cities near Central Asia's outer borders grew faster than those in the interior, about 1.4 p.p. more per year. By the end of the period, border cities in the region had grown to be around 50% larger compared to interior cities on average. These results are especially stronger in the immediate decade following the collapse and dissipate over time. Using an event study approach to compare the difference in economic activity proxied by nighttime lights in 1992 to other years for border and non-border cities, I observe trends that lend additional support for the main findings.

The central premise of the empirical methodology is that the establishment of strict boundaries led to an abrupt discontinuation of major infrastructural and commercial connections within the post-Soviet space. As a result, post-Soviet cities close to largely sealed borders encountered a significant, disproportionate reduction in market access compared to their counterparts in the interior. This phenomenon can be attributed to the assumption that cities near the new borders experienced a loss of important nearby trading partners, with whom they previously engaged in commerce at reduced transaction costs due to proximity.

It is expected that the newly-enforced borders disrupted the more industrialized and interconnected economies of post-Soviet Europe, leading to a significant decline in intra-regional trade, while the primarily agrarian economies of Central Asia, being less integrated with the rest of USSR and having limited complementarities in trade, are expected to have experienced a comparatively milder impact (Mubinzhon and Ricardo, 2021). Concerning external borders, this reasoning also exclusively applies to cities near borders with the countries in the COMECON,[3] where there was active trade before 1991, whereas cities near external borders in post-Soviet Asia discovered access to foreign markets such as China and Iran.

Cities disproportionately affected by new border frictions experienced relative decline, while those exposed to new external trading opportunities benefited. These results are robust to a range of identification strategies. Controlling for treatment along both types of borders, dropping countries one at a time, and including various fixed effects does not alter the main estimates. To further demonstrate that the effects are driven by changes in market access following the dissolution, and not by alternative explanations, I present several additional pieces of evidence. The relative decline of border cities, particularly in post-Soviet Europe, is not explained by military capital flight. Nor can differences in pre-1991 industrial structure, migration controls, city size, or pre-existing trends account for the results. Taken together, the evidence points to changes in access to nearby markets as the central mechanism.

[3]The Council for Mutual Economic Assistance (CMEA), also known as COMECON was formed in 1949 as an economic organization comprising socialist nations.

This paper belongs to the genre of studies that focus on the role of market access in shaping regional and, by extension, comparative economic development (Krugman, 1991; Fujita et al., 2001).[4] I contribute to the strands of this literature that have focused on exogenously induced cross-border restrictions and openness (e.g., Redding and Sturm, 2008; Brülhart et al., 2012; Ahlfeldt et al., 2015; Behrens, 2024), infrastructure investments (e.g., Faber, 2014; Baum-Snow et al., 2017; Storeygard, 2016; Donaldson, 2018; Jedwab and Storeygard, 2022), and trade policies (e.g., Hanson, 2001; Topalova, 2010; Autor et al., 2013; Dix-Carneiro and Kovak, 2017).

While extensive research has examined market access in regions west of the Iron Curtain, comparatively little is known about developments in the former Soviet Union following its dissolution in 1991. The paper addresses that gap by focusing on the post-Soviet space and offering new insights into regional variation in market access and urban growth. The setting, comprising thousands of cities and numerous border pairs, provides rich variation in market access for empirical analysis. Stark regional disparities in urban population dynamics reveal lessons that complement existing literature. A further contribution is the construction of a unique decennial city-level population dataset extending back to 1970, supplemented by the Soviet 1989 industry census, records on military enterprises, and satellite-based nighttime light data.

2 Historic Background

The dissolution of the Soviet Union was influenced by political and economic reforms introduced by Mikhail Gorbachev, notably *glasnost* (openness) and *perestroika* (restructuring), which intensified demands for political autonomy among constituent republics (Kramer and Smetana, 2013). Furthermore, long-standing economic inefficiencies, a stagnant economy, and growing calls for political freedom contributed to the USSR's collapse. Historians and policymakers at the time did not anticipate the abrupt collapse—for example, the 1991 Soviet-wide referendum showed that the overwhelming majority of Soviet citizens still supported preserving the Union (Smith and Smith, 1993).

Before the Dissolution

From its inception in 1922, the USSR pursued a policy of national-territorial delimitation (NTD), *razmezhevanie*, organizing diverse ethnic groups into territorial units such as the 15 Soviet Socialist Republics and autonomous regions.[5] The Soviet republic borders were primarily administrative and did not restrict migration or trade (Denisenko and

[4]For a comprehensive review, see Redding (2022).

[5]I divide the 15 former Soviet republics into Europe (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, Russia, and Ukraine) and Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan,

Chudinovskikh, 2017). Despite the presence of the *propiska* registration system, migration within and between republics remained high, driven by economic opportunities and family ties (Tishkov et al., 2005). Regional equalization was a central goal of Soviet policy. Djankov and Freund (2002) estimate that trade flows within Soviet republics were comparable to trade between Soviet republics, reflecting the centrally planned economy's integration. The State Planning Commission (Gosplan) played a crucial role in determining production locations, output levels, pricing, and wages.

The USSR's external borders, particularly those shaped during and after World War II, reflected both geopolitical ambitions and economic strategy. Stalin's postwar annexations, including eastern Poland, parts of Finland, and Northern Romania, helped solidify the Soviet sphere of influence, with the Curzon Line formalized as Poland's eastern border (Chandler, 1998). While internal administrative borders within the USSR facilitated movement and centrally planned coordination, its external borders, including those with Eastern European satellite states, were strictly controlled to limit engagement with non-socialist markets. Nevertheless, trade relations within the Soviet bloc were strong. The USSR maintained tightly managed bilateral trade agreements with its satellite states such as Poland, Hungary, and Yugoslavia. These arrangements promoted intra-bloc exchange of goods and resources under fixed pricing mechanisms (Broadman, 2006). In contrast, trade between these satellite states and Western economies remained minimal, constrained by ideological divides, trade restrictions, and the structure of centrally planned economies.

Unlike other regions of the USSR which had close access to the COMECON, Central Asian republics of the USSR, had minimal economic exchange with neighboring countries such as Iran, China, and Afghanistan before 1991. Their trade was almost entirely directed inward, reflecting the Soviet emphasis on autarky and centralized economic planning.

After the Dissolution

The dissolution of the Soviet Union triggered significant economic changes. Newly established borders disrupted infrastructure, increased tariffs, and severed longstanding trade connections. Transaction costs rose sharply for border cities that had previously relied on accessible markets across administrative lines. Figure 2 illustrates the decline in relative export shares to former Soviet countries between 1990 and 1996, with the Baltics, Caucasus, and Russia experiencing the most significant shifts.[6] Trade

Turkmenistan, and Uzbekistan). Except for the Baltic states, which were occupied in 1940, these territories were integrated into the Russian Empire by the late 19th century.

[6] While it is theoretically possible that export volumes to former Soviet countries remained high in absolute terms despite a decline in relative share, this would require a substantial overall increase in total exports. In practice, such a scenario is highly unlikely. For the level of exports to former Soviet partners

reorientation away from former Soviet markets was especially pronounced in Eastern Europe, while previously restricted borders, such as those with Iran and China, saw increased access to nearby markets.

The collapse of COMECON further accelerated this transition. Maurel and Cheikbossian (1998) estimate that trade within the bloc was 13 times above expected levels in 1990 but dropped to 4 times by 1993, reflecting the dissolution's impact. As Eastern bloc countries like Poland and Hungary integrated with European trade systems, economic ties with post-Soviet states weakened, particularly along eastern European borders. In contrast with what is observed in post-Soviet Europe in the 1990s, there were gains in market access along previously sealed or restricted borders with China, Iran, and even Afghanistan.[7]

Migration

The collapse also led to significant migration flows. About a million ethnic Germans and Jews emigrated to Germany, while ethnic Russians and other minorities returned to ancestral homelands, driven by economic collapse, social instability, and ethnic discrimination (Becker et al., 2012; Heleniak, 2004). For example, Kazakhstan accounted for over half of the ethnic Germans who migrated to Germany, while Ukraine and Russia were the leading origins of Jewish emigrants (Dietz, 2000). However, there is no systematic evidence that these migration patterns disproportionately affected border versus interior cities, suggesting migration is unlikely to be the primary driver of economic outcomes in this analysis.

A potential concern is that the relative decline of border city populations could be attributed to migration if these areas hosted higher concentrations of ethnicities that returned to their homelands compared to interior cities. However, there is no evidence to suggest that these migration patterns were systematically aligned with the border versus interior areas, indicating that differential migration is unlikely to be the primary driver of the observed results. Migration, in general, could still play a role in contributing to regional heterogeneity in economic outcomes. The lack of publicly available data on migration flows makes it infeasible to explicitly control for migration flows.

---

to rise even as their share fell, total exports would have had to increase dramatically, an outcome for which there is little supporting evidence during the immediate post-collapse period.

[7] In the late 1950s and 1960s, ideological differences between the USSR and China began to emerge, leading to escalated border conflicts and the Sino-Soviet split, which lasted into the 1980s. Following these tensions, China stopped attending COMECON sessions as an observer in 1961 (Garver, 2015).

Border Shifts and Spatial Equilibrium

Once new borders were enforced and the Iron Curtain removed, how might it have affected city-level outcomes? The most direct impact would be on the areas that are in the vicinity of borders. The new borders acted as barriers to trade and movement, causing cities that previously had easier access to other regions to be disproportionally impacted. We can expect the means and medians of various city-level measures to decline mechanically, especially in border areas. Redding and Sturm (2008) presents an extensive quantitative model to explain the impact of division on cities and outlines three plausible causes of the decline of cities that can generally be applied to the post-Soviet context, with the exception of external border cities in Central Asia where the logic is reversed:[8]

I. Consumers in post-Soviet cities lost access to goods and services from previously accessible parts of the Soviet Union. This loss increased the cost of living because people had to spend more on the same goods they previously obtained more cheaply. As a result, the real wages in these cities decreased, meaning that people's purchasing power was reduced, leading to a decline in overall economic well-being.

II. There was a reduction in market access for all post-Soviet firms. With fewer consumers able to purchase their goods due to the new borders, these firms experienced a drop in demand for their products. This reduction in tradable varieties led to lower nominal wages for workers, as businesses could not generate as much revenue. Consequently, the overall real wages in these cities also fell, further exacerbating the economic difficulties faced by the population.

III. The number of competing varieties available in post-Soviet cities decreased because the firms from different regions within the previously unified Soviet Union could no longer compete in the same markets. This reduced competition allowed remaining firms to increase nominal wages to attract and retain workers. However, because the benefits from trade and variety were lost, the first two effects of higher costs of living and reduced market access outweighed this third effect, resulting in an overall decline in real wages for all cities. The immediate reduction in real wages due to transport costs is more pronounced in cities close to the border compared to those farther away. This is because these border cities previously benefited from lower transport costs to other accessible parts of the Soviet Union or COMECON before the division, leading to greater gains from trade. The loss of these trade benefits causes a

[8]It should be acknowledged that unlike market-driven economies like West Germany, the Soviet Union operated under a centralized planning system that aimed to integrate the national economy across regions. Despite this system, the principle that distance influences economic interactions remained relevant, as transportation costs increased with greater distances, reducing trade between distant areas. This dynamic led to reliance on closer regions or urban centers, with administrative borders having little impact on trade due to centralized control.

larger decline in real wages, prompting individuals to migrate from border cities to interior regions in pursuit of a higher standard of living.

While the number of competing varieties from other former Soviet states declined, trade liberalization may also have introduced new varieties from outside the former Soviet space. For example, EU accession in 2004 greatly expanded market access for the Baltic states. However, such external integration occurred gradually and is unlikely to account for the sharp short-run population declines observed in the 1990s, which reflect immediate disruptions to established intra-Soviet trade networks. In fact, improved access to Western markets in the 2000s and direct access to the Baltic sea may have further disadvantaged cities near former Soviet borders, as trade, investment, and migration flows shifted westward, leaving these regions on the periphery of emerging trade networks.

3 Data and Empirical Methodology

Census

The main variable of interest is population size. The dataset includes a panel of 1235 cities in the former Soviet Union, encompassing the period from 1970 to 2021. It covers the populations of cities that had over 10,000 residents in 1970. This selection criterion ensures that the sample includes all cities whose demographic composition was unlikely to affected drammatically by the dissolution of the Soviet Union. City population data with coordinates was collected from Brinkhoff (2021),[9] while data from 1970 and later years, if missing, was gathered from Demoscope Weekly, an electronic database of the Russian Institute of Demography.[10] City population data from before 1991 come from the Soviet-wide censuses conducted in 1970, 1979, and 1989. For the post-1991 sample, data were compiled for three distinct periods, with similar intervals for each country. A breakdown of the census data by country is presented in Appendix A, Table A1.

I use the annualized growth rate of population, as it allows comparing growth rates consistently across different census periods, adjusting for length variations in those periods.[11] Then, using city name and coordinates, I match the data with various

[9] I am thankful to Adam Storeygard for sharing this data.

[10] Available at citypopulation.de and demoscope.ru, respectively.

[11] It can be computed in city c as

$$y_{ct} = \frac{ln(P_{ct}) - ln(P_{c,t-L_{ct}})}{L_{ct}}, \tag{1}$$

where P_{ct} is the population statistic at time t, and L_{ct} is the number of years between t and the prior census. It is the rate at which a population grows on average per year over a specific period, measured in log differences.

datasets. For each city, I measure the great circle distance in kilometers to internal and external borders using ArcGIS. For each city, I also ascertain to which country the closest border belongs and construct border pair labels.

Night lights

Sub-national GDP data is not available across the FSU. Instead, I use high-resolution nighttime lights data from the Defense Meteorological Satellite Program (DMSP), spanning 1992 to 2013, as an indicator of city-level economic activity. Henderson et al. (2012) provide a detailed explanation of this dataset and recommend the use of nighttime lights as a proxy for economic activity, particularly in developing countries with poor subnational income data. They show that the growth of nighttime lights closely mirrors GDP growth in low- and middle-income countries, suggesting that lights are a consistent and reliable alternative for measuring city GDP where such data is not directly available.

Several steps were undertaken to transform pixel-level lights data into city-level data following Storeygard (2016). First, 30 years of satellite-derived lights data were merged into a single binary grid, indicating whether a pixel was lit in at least one year. These ever-lit areas were then converted into polygons by aggregating contiguous lit pixels and summing their relative digital values, that range from 0 to 63, for each year. I excluded polygons that did not correspond to a known city, using census population data with latitude and longitude coordinates from Brinkhoff (2021). The discarded lights likely represent forest fires, sensor noise not flagged by the satellite algorithm, or smaller towns and large villages, accounting for 10 to 20 percent of total digital numbers in the 15-country sample. Additionally, I removed lights from gas flares, as identified by Elvidge et al. (2009). To further minimize errors, I limited the lights to the borders of the FSU countries. The night lights dataset is annual from 1992 to 2013, enabling analysis only for the period following the division.[12]

Other datasets

I have also collected various other city characteristics for the sample of post-Soviet cities in European continent. Firstly, for 1989, I have total employment, turnover, and manufacturing in the civilian industry at the city level, compiled by Kofanov and Mikhailova (2015). I also have the SIC codes of the factories that operated in the cities. I

[12]Gibson et al. (2021) highlight key issues with DMSP night lights data, such as blurring and top-coding, which can distort economic measurements. They particularly note that these errors lead to poor predictions of economic activity in low-density rural areas. However, my study focuses on whole cities with populations of at least ten thousand people in 1970, where these data provide more reliable insights. Additionally, the results are robust to dropping big cities such as Moscow, where top coding may be an issue.

also use data on the number and workforce size of Soviet defense factories and research and design establishments that stopped work between 1989 and 1991, as documented by Dexter and Rodionov (2024). Their extensive dataset includes information on the locations, names, primary defense specializations, operational periods, and size categories of military enterprises throughout the Soviet Union.

Table A2 in Appendix A provides the summary statistics for the key variables by treatment and control groups separately for Europe and Central Asia. Table A3 provides summary statistics of the treatment variables by region.

Identification Strategy

The primary concern with endogeneity arises from the fact that border drawing is often a consequence of state formation, which simultaneously shapes socioeconomic outcomes. To address this, the identification strategy leverages the plausibly exogenous enforcement of internal Soviet borders and fall of the Iron Curtain along external borders in 1991. The dissolution of the Soviet Union serves as a natural experiment because it was widely unexpected, even among political and economic elites.

Cities near borders had been deeply integrated into the Soviet economy since the borders were drawn, with centralized planning ensuring extensive trade, labor mobility, and industrial linkages across regions. The difference-in-differences (DiD) approach used here does not require borders to have been randomly assigned but assumes that, absent the exogenous dissolution, trends in outcome variables (e.g., population growth) would have been parallel between border and non-border cities (Roth et al., 2023; Meyer, 1995). This assumption is tested using pre-treatment data from 1970 to 1990, demonstrating similar economic trajectories before the Soviet collapse. By leveraging this setup, the analysis isolates the effect of the dissolution and resulting border changes on post-1991 economic outcomes, strengthening causal interpretation of the results.

Although all cities were affected by the dissolution, border cities faced disproportionate disruptions. Therefore, intensity of treatment is especially salient in border regions. Internally, cities close to new borders lost trading partners they previously interacted with at lower costs, affecting their economies. Cities farther from the borders were less impacted because they already faced higher transaction costs. Externally, areas near borders with countries that the Soviet Union had significant trade relations with before its dissolution are expected to experience similar economic disruptions, with opposite effects expected at previously sealed borderlines.

I use a generalized two-way fixed effects (TWFE) DiD specification, ensuring a consistent estimation of the average treatment effect on the treated (ATT) while addressing concerns about anticipation effects and parallel trends. To further validate the parallel trends assumption and examine dynamic effects over time, an event study specification is also employed. This approach allows for the assessment of pre-treatment differences, potential anticipation effects, and heterogeneous impacts across different post-dissolution periods. Together with the TWFE DiD model, it provides a more comprehensive understanding of how market access changes affected economic outcomes in border regions.

DiD Estimation

It is possible to implement the identification strategy by estimating the following equation:

$$y_{ct} = \alpha_c + d_t + \delta_1(IB_c \times Division_t) + \delta_2(EB_c \times Division_t) + \epsilon_{ct}, \tag{2}$$

where y_{ct} is the annualized growth rate of population in city c in census year t,[13] IB_c takes a value of one for cities within 75 km of an internal border in the treatment group and zero otherwise,[14] EB_c takes a value of one for cities within 75 km of an external border in the second treatment group and zero otherwise, $division_t$ takes a value of one in the event of the dissolution of the Soviet Union after 1991 and zero otherwise. The coefficients of interest are δ_1 and δ_2, which capture average differences in population growth between internal border and interior cities, as well as external border and interior cities, respectively, relative to such differences in the period before the Soviet dissolution. Assuming parallel trends and no time-varying confounding factors, these coefficients capture the causal effects of changes in market access following the collapse of the Soviet Union.

City fixed effects α_c absorb time-invariant observable and unobservable characteristics such as geographical location, historical infrastructure, and long-standing ethnic/cultural elements unique to each city, including any pre-division differences. Year fixed effects d_t control for time-varying shocks that are uniform across all cities, like economic shocks and secular trends in the growth rate of populations. To account for heteroscedasticity and autocorrelation, the standard errors are clustered at the city level.

Several assumptions must hold for δ to be interpreted as the causal effect. First, the enforcement of newly established Soviet borders and the dismantling of the Iron Curtain should be exogenous to relevant regional factors (i.e., no time-varying confounders should be simultaneously driving both border changes and city-level outcomes). Second, there should be no systematic difference in pre-trends across newly treated border

[13]It covers the intercensal periods 1970-1979, 1979-1989, 1989-1999, 1999-2009, and 2009-2019, with slight variations after the collapse depending on specific country census dates.

[14]The choice of 75 km is based on Redding and Sturm (2008). I also check the robustness of the results to different distance thresholds.

regions and interior areas. Third, given the heterogeneity in timing (particularly along different external frontiers), one must assume constant treatment effects over time (which is not implausible in this context) or else a simple level-shift specification may yield biased estimates (Goodman-Bacon, 2021). Because equation 2 imposes an immediate post-dissolution shift, I relax this assumption by estimating a more flexible event-study model. I also do various robustness checks and rule out various potential confounders that may have driven the results.

Dynamic Treatment Effects

Since equation 2 assumes a level shift effect, I supplement this standard difference-in-differences approach with an event-study framework. I examine how treatment effects evolve over time and to detect any potential pre-trends with the help of the following specification:

$$y_{ct} = \alpha_c + d_t + \sum_{k=T_0}^{-2} \delta_{1,k} \left[IB_c \times D_k \right] + \sum_{k=0}^{T_1} \delta_{1,k} \left[IB_c \times D_k \right] + \sum_{k=T_0}^{-2} \delta_{2,k} \left[EB_c \times D_k \right] + \sum_{k=0}^{T_1} \delta_{2,k} \left[IB_c \times D_k \right] + \epsilon_{ct} \tag{3}$$

Under this approach, the treatment effects are defined over an event-time window $k \in [T_0, T_1]$, which I fix to $[-2, +2]$. These effects are estimated relative to the excluded period immediately preceding the observed event (i.e. $k = -1$). For $k < -1$, the coefficients $\delta_{1,k}$ and $\delta_{2,k}$ capture potential pre-trend dynamics. Conversely, for $k \geq 0$, they measure the evolution of treatment impacts following the enforcement of new borders and the dismantling of the Iron Curtain, respectively.

4 Results

I begin by estimating the DiD framework specified in equation 2. Column (1) of Table 1 reports results for the full sample of post-Soviet cities. The key interaction term capturing the effect of newly formed internal borders after the Soviet collapse, represented by δ_1, indicates a drop of roughly 0.17 percentage points (pp) in the annualized growth rate of cities located near these borders, compared to interior cities. Although the result attains only marginal significance ($p = 0.11$), it suggests that transformation of administrative borders into international borders introduced some downward pressure on urban growth on the whole. In contrast, the second interaction term, δ_2, concerning the external border indicator and post-collapse period, shows a larger and statistically significant negative effect of -0.465 pp relative to interior cities at the 5% level.

Next, Columns (2)-(3) in the Table shed light on whether these results differ between small and large cities, divided at the median 1970 population. Small cities near internal borders experienced a -0.279 pp annualized growth reduction ($p < 0.11$), while those near external borders declined by -0.563 pp ($p < 0.10$). These effects reflect heightened vulnerability to severed local supply chains and limited capacity to reorient trade. Large cities, conversely, show statistically insignificant treatment effects for both internal and external border impacts. This asymmetry suggests agglomeration advantages - diversified industries and access to national/international markets - buffered larger urban centers against border shocks. The results align with urban economics frameworks where scale mitigates transport cost shocks (Redding and Sturm, 2008; Brülhart et al., 2012).

I investigate the effects in Europe and Central Asia separately in Columns (4) to (5) to uncover regional heterogeneity in the baseline pooled results. For post-Soviet cities near newly enforced borders in Europe (Column 4), the annualized population growth declined by 0.317 pp ($p < 0.01$) relative to interior cities, while cities near external borders experienced an even sharper decline of 0.518 pp ($p < 0.05$). Over the 30-year post-Soviet period (1991–2021), this translated into a cumulative population reduction of approximately one-tenth for internal border regions and one-fifth for external border regions, reflecting the severe economic dislocation caused by the dissolution.

In Column (5), post-Soviet cities near newly enforced borders in Central Asia saw a different trajectory. Internal border cities experienced a statistically insignificant increase of 0.398 pp, indicating disruption, while cities near external borders exhibited a substantial and statistically significant increase of 1.347 pp at the 5% level. Over the same period, the relative cumulative population increase for Central Asian cities along external borders is approximately 50%.

There are fundamental differences in the pre-dissolution economic integration and post-1991 geopolitical trajectories of cities in Soviet Europe and Central Asia. For external borders, Soviet countries in Europe had strong historical ties to COMECON markets, but the removal of the Iron Curtain caused these countries (e.g., Poland, Hungary) to orbit toward Central and Western Europe, weakening their economic ties with post-Soviet states. This contrasted sharply with Central Asia's post-Soviet access to previously inaccessible Asian economies such as China and Iran.

For internal borders, Europe's densely integrated industrial hubs (e.g., Russia-Eastern Europe supply chains) faced disproportionate disruptions from severed cross-border production networks, while Central Asia's agricultural economies and weaker pre-existing interdependencies, rooted in Soviet resource extraction, would serve to mitigate such shocks.

These results remain robust across a series of sensitivity checks. In Table A4, I estimate treatment effects for internal and external border shifts separately across post-Soviet Europe and Central Asia. The direction and significance of the baseline findings persist: cities near internal borders in Europe exhibit pronounced declines in population growth relative to interior cities, while external border cities in Central Asia show sustained growth. Excluding the turbulent 1989–1999 period slightly reduces precision for Central Asia, likely reflecting delayed integration with Asian markets, but strengthens estimates for Europe. To address potential biases from internal migration restrictions under the propiska system, I exclude primate cities (above 500,000 population in 1970), where such controls were most stringent. Results align closely with baseline specifications in the last two columns of Table 1, suggesting minimal confounding from migration dynamics. Additional specifications with country-year and border-pair fixed effects further reinforce the stability of the estimates, accounting for unobserved regional policies and infrastructure disparities.

Table A5 explores how treatment effects vary with proximity to borders. Consistent with prior studies, impacts are strongest near borders and diminish with distance. This pattern also holds for Central Asian cities closest to external borders, which benefit disproportionately from improved post-collapse access to non-Soviet Asian markets. In Columns (5)–(7), I progressively narrow the distance thresholds for the control group of cities relative to both types of borders. For Europe, which encompasses the vast inland regions of Russia, I implement the analysis in 500 km increments, narrowing from 2000 km to 1000 km to exclude remote areas where Soviet-era subsidies or natural resource endowments (e.g., Siberian oil) might mitigate dissolution shocks. The results grow progressively stronger as the control group cities are located closer to the borders. Since Central Asia is geographically smaller than post-Soviet Europe and has fewer cities, I apply 250 km increments and confirm that the treatment effects along external borders remain positive and statistically significant.

Figure A1a presents a leave-one-out robustness analysis for ten European post-Soviet countries, showing the estimated effects of internal and external border proximity on city population growth when excluding each country individually. The results indicate stable negative EB and IB effects, with Russia's exclusion reducing precision for EB due to its large sample share.[15] Figure A1b replicates the analysis for five Central Asian countries, revealing consistently positive and significant EB effects (except when dropping Kazakhstan, where results remain positive but marginally significant) and weaker IB effects. Both figures confirm that the core findings—divergent impacts of border types by region—are robust to country exclusions, underscoring the role of post-1991 geopolitical reorientation. The loss of Eastern Bloc ties in Europe and division of internal borders in a relatively more connected post-Soviet Europe prior to 1991, versus improved Asian market access in Central Asia.

[15] An additional robustness check, available upon request, excludes Russia's Far Eastern, Siberian, Urals, and Volga Federal okrugs (regions in the Asian continent comprising nearly three-fourths of the country), with results unchanged.

To assess heterogeneity across specific border pairs in each region, I estimate a three-way interaction model (equation 5) for each region and interpret the results in Appendix B. Figure B1 and Figure B2 provide insights on the border pairs driving the regional results.

Basic Event-Study Analysis

Before estimating the dynamic DiD specification in equation 3, Figure 3 and Figure 4 summarize the effects of border divisions and the removal of the Iron Curtain. Each figure includes panels for cities in Europe and Central Asia. Subfigures (a) and (c) show total city population trends for border and interior cities, indexed to their 1970 levels. The red dashed line marks 1991, when the Soviet Union collapsed. Subfigures (b) and (d) plot the difference between these indices, providing a simple graphical difference-in-differences estimate of the impact of border changes.

Figure 3 presents the population trajectories of post-Soviet cities near newly enforced internal borders compared to interior cities, with separate panels for Europe (Panel A) and Central Asia (Panel B). Before the Soviet collapse in 1991, population trends were similar across both groups, but after dissolution, Panel A shows a sharp and sustained decline in the population index for European border cities relative to interior cities, reflecting the disruption of integrated economic networks. The difference between the indices in subfigure (b) highlights the widening gap, which is most pronounced in the first decade following 1991 before stabilizing at a lower level. In contrast, Panel B shows that while both groups of cities in Central Asia followed common pre-trends, border cities experienced population growth relative to interior cities after 1991, with subfigure (d) displaying an increasing gap favoring border cities. This suggests that, unlike in Europe, internal border cities in Central Asia were less disrupted by the Soviet collapse, likely because they had weaker interdependencies before the collapse and lacked viable external alternatives, improving trade links with each other.

Figure 4 compares the population trajectories of post-Soviet cities near external borders to interior cities, with separate panels for Europe (Panel A) and Central Asia (Panel B). Before 1991, both groups followed similar trends, but after the Soviet collapse, Panel A shows a sharp and continuous population decline in European border cities compared to interior cities, reflecting the loss of market access as former COMECON countries shifted trade toward Central and Western Europe. Subfigure (b) highlights the growing gap over time. In contrast, Panel B shows that while both groups in Central Asia had similar pre-trends, border cities grew faster than interior cities after 1991, with subfigure (d) showing a widening advantage. This suggests that, unlike in Europe, external border cities in Central Asia benefited from newly opened trade opportunities.

Event-Study Estimates

To examine the dynamics of the effect of border shifts on urban population growth and to test for parallel pre-trends, I estimate an event-study difference-in-differences model by interacting the border treatments with event-time indicators as in equation 3, instead of a single post-collapse indicator. The omitted period is $t = -1$, which serves as the reference year for all other coefficients. Figure 5 plots the resulting coefficients, allowing for an assessment of population growth trends before and after the Soviet dissolution in $t = 0$. Black-circled and red-crossed points represent estimates for cities along internal and external borders relative to non-border cities, respectively, in Soviet Europe (Panel A) and Soviet Central Asia (Panel B).

Due to data limitations for the region, we have only one observed period of population growth before the omitted period. However, the results align with the findings from population indices. The pre-collapse coefficients remain close to zero and statistically insignificant, suggesting that border and interior cities followed similar trends before dissolution, supporting the parallel trends assumption. Following $t = 0$, the estimates for both types of European border cities show a persistent and significant decline in population growth, reinforcing the disruptive economic effects of border shifts. The effects are stronger in the two decades following the Soviet collapse and decline in strength over time.

In Central Asia, the effects for internal border cities are weak and statistically insignificant, suggesting that internal border changes had a limited impact on population dynamics within Central Asia. By contrast, external border cities experienced a relative increase in annualized population growth compared to interior cities, but this effect is only statistically significant in the immediate decade following $t = 0$, when these cities first gained access to previously restricted markets such as China and Iran. After this initial period, the effect becomes insignificant, suggesting that the initial boost from market access did not translate into sustained long-term growth.

Night Lights

In this section, I examine whether the city-level population results for Europe and Central Asia also manifest in nighttime lights data, a widely used proxy for local economic activity. Although nighttime light data is only available from 1992 onward, I exploit this limitation by treating 1992, the first full year after the Soviet dissolution, as a natural post-treatment baseline. I estimate an event-study specification comparing changes in log night lights for cities near internal and external borders to interior cities over the period 1993–2013.

$$log(lights)_{ct} = \sum_{i=1993}^{2013} \beta_i(border_c \times year_t) + \delta_k + \alpha_c + d_t + \epsilon_{ct}, \tag{4}$$

where $log(lights)_{ct}$ is the log of summed lights, $border_c$ is a dummy that is equal to one if a city is within 75 km of a border and 0 otherwise, and $year_i$ is equal to 1 for the years after 1992 and 0 otherwise. δ_k captures individual border pair fixed efffects. α_c and d_t capture individual city effects and year fixed effects, respectively. All coefficients for the years from 1993 to 2013 (β_i) represent the difference in the log of night lights for border and non-border cities relative to 1992. While this approach does not allow for direct observation of pre-1992 trends, it still reveals important information about the relative trajectories of economic activity.

Figure 6 presents results for Europe (Panel A) and Central Asia (Panel B). In Europe, both internal and external border cities show negative deviations from interior cities in the years immediately following 1992. This does not necessarily imply an absolute decline in night light intensity; rather, it suggests that economic activity near borders grew more slowly (or recovered more weakly) relative to interior areas. This pattern is consistent with disruptions to Soviet-era trade and transport networks, which previously operated without regard to internal borders. The more pronounced negative trajectory for internal border cities highlights the economic cost of new frictions introduced by national boundaries. Tighter pre-existing integration within and with social European countries appears to have amplified the economic cost of fragmentation.

After 2002, the relative trajectory shifts as both internal and external border cities in Europe begin to experience positive deviations in night light intensity relative to interior cities. This recovery may reflect broader regional stabilization, the normalization of border institutions, and increased cross-border cooperation. While only the Baltic states joined the EU during this period, other countries joined the WTO, engaged in economic liberalization, established free trade agreements, including within the Commonwealth of Independent States (CIS). 8 out of 10 countries in post-Soviet Europe joined the WTO at the turn of the century. Investments in transport corridors, customs modernization, and institutional harmonization likely contributed to the gradual reintegration of previously disrupted economic zones, enabling border cities to catch up or even outperform interior regions in relative terms.

Results for Central Asia reveal a different pattern. Both internal and external border cities show positive and increasing deviations over time in the first decade following the Soviet collapse relative to 1992. These estimates suggest that economic activity in these cities increased more (or decreased less) than in the interior relative to the baseline, likely driven by weak pre-collapse integration and expanded access to neighboring markets that had been largely inaccessible during the Soviet period. However, in the mid 2000s, the initially positive relative trajectories for border cities begin to flatten or even reverse. This shift may reflect several dynamics: first, the early post-independence gains from reopening cross-border trade with each other and non-Soviet neighbors could have plateaued as economic centralization, increasing state control, high tariffs and tighter border enforcement due to perceived terrorism threats, particularly in countries like Uzbekistan and Turkmenistan, may have served to the detriment of peripheral areas (Mubinzhon and Ricardo, 2021). Moreover, only Kyrgyzstan joined the WTO during this period, and a shift away from informal trade networks may have curbed the local economic dynamism that characterized the 1990s.

5 Discussion

The main findings reveal stark regional disparities in the impact of post-Soviet border changes. First, the division of internal borders in Europe led to a statistically significant and economically meaningful decline in urban population growth—border cities experienced annualized growth rates 0.35 percentage points lower than interior cities. This aligns with prior evidence on market access loss, driven by the disintegration of Soviet-era industrial and commercial networks, which were heavily centralized. Second, in Central Asia, internal border divisions had no discernible effect, likely due to weaker pre-existing interdependencies rooted in resource extraction and agricultural economies and a geographically constrained regional economy with fewer immediate trade reorientations. Third, the removal of the Iron Curtain has a similarly negative and statistically significant impact on cities bordering the *former* Eastern Bloc in Europe, as these markets diverged rapidly from post-Soviet ties. Fourth, the same event appears to have endowed Central Asian external border regions with enhanced access to new foreign markets (e.g., Iran and China), driving a positive relative increase in population compared to interior cities. These results are robust to varying distance thresholds, excluding primate cities, various fixed effects, and other checks. Results with night lights lend further support for these findings in terms of economic activity.

Alternative Explanations

Could it be that the observed population divergence near post-Soviet borders stems not from lost market access, but from factors other than the loss in market access such pre-existing differences in industrial structure or military divestment? To investigate this, I use a difference-in-differences approach combined with nearest neighbor matching, systematically testing whether alternative characteristics, rather than the presence of a border, might explain the patterns of post-1989 urban growth.

Each treatment city, defined as being within 75 kilometers of a post-Soviet internal or external border, is matched to at least one control city outside this radius using observable traits that may plausibly correlate with both population dynamics and exposure to broader structural changes. The matching variables include population size in 1970, 1989 industrial employment, 1989 turnover, sectoral composition given by SIC codes, and military-industrial presence before the collapse. These dimensions capture various alternative channels, including inherited economic scale, economic specialization, and dependence on Soviet-era military patronage.

Since I use propensity score matching separately on internal and external border cities, the results on the treatment effects of border divisions and external border shifts are shown in separate regressions in Panel A and B, respectively. Table 2 demonstrates that the negative treatment effects of the Soviet collapse on urban population growth of border cities in Europe holds consistently across a variety of matching strategies, reinforcing the robustness of the main results.

I start by matching on population size in 1970 in Column (1). This matching is based on the logic that small and larger cities may have demographically and economically different structures. I find that border cities still saw slower growth. Cities with large or highly concentrated industrial bases may have responded differently to economic liberalization and market fragmentation than more diversified or service-oriented cities. If, for example, industrial legacy were driving the post-collapse divergence, we would expect differences in population growth to vanish once we match border and interior cities on industrial employment, turnover, or manufacturing output right before the collapse. However, as shown in Columns (2)-(4), Table 2, across both internal and external border samples, the negative effect of proximity to a border remains remarkably stable even after matching on these variables. This suggests that neither the scale nor the sectoral structure of industry near borders can explain the decline. Column (5) takes a finer-grained approach by using 1989 industrial classification codes to capture differences in sectoral composition across cities, yielding among the strongest effects and suggesting that differences in what cities specialized in and produced do not explain the results.

Finally, the logic is similar for military-industrial enterprises, though the potential mechanism here is slightly different. During the Soviet era, cities along external borders, particularly those facing Western Europe, likely received heightened investment in defense infrastructure and associated subsidies due to geopolitical concerns. As the Iron Curtain fell and defense budgets plummeted, these same cities would have faced steep capital flight from the withdrawal of military industry. This form of state-led military divestment could plausibly explain declining fortunes in border cities. Column (6) focuses on military-industrial presence by matching on both the number and employment size of defense enterprises that ceased military activity between 1989 and 1991. Despite the smaller matched sample here, the estimates remain strongly negative, indicating that military divestment does not account for the relative decline of border cities. Across both internal and external borders, and across all specifications, the evidence points to the disruptive effect of newly imposed geopolitical divisions rather than to inherited economic characteristics.[16] Table A7 displays the descriptive statistics of the matching variables by treatment and control groups for post-Soviet Europe.

6 Concluding Remarks

This paper provides causal evidence that the enforcement of borders as well as the fall of the Iron Curtain following 1991 had profound and lasting effects on urban growth, primarily through changes in market access. Using a unique historical setting, I show that cities in post-Soviet Europe located near newly enforced internal and external borders experienced significantly slower population growth relative to interior cities. By contrast, cities along previously sealed external borders in Central Asia saw relative gains, benefiting from new access to foreign markets. These findings are consistent across difference-in-differences models, dynamic event studies, and a wide range of robustness checks. These results are corroborated by empirical evidence involving city-level economic activity measured through night lights. They also hold after controlling for industrial structure, sectoral composition, and military-industrial dependency, providing strong support for the market access explanation over alternative channels.

These results highlight the enduring importance of geography and connectivity in shaping the spatial distribution of economic activity. While much of the literature on market access has focused on infrastructure and trade policy, this study draws attention to the sharp discontinuities created by political borders. The Soviet case is particularly valuable in this context. It offers rich variation across dozens of border pairs and over a thousand cities, within a formerly unified system that collapsed abruptly and unexpectedly. The setting allows for credible identification of causal effects and provides insights with relevance well beyond the region itself.

There are, of course, limitations. While the analysis accounts for many potential confounders, the lack of systematic data on subnational trade flows or commuting patterns limits direct measurement of lost interactions. It is also difficult to measure

[16] I repeat the same analysis for Central Asian cities but the sample size is too small after each matching. The results of these regressions are available in Table A6. All the results for cities along external borders are positive relative to interior cities. They are statistically significant only when matching on 1970 population and military size and number. However, these samples include only 71 and 22 observations, respectively. Table A8 provides the descriptive statistics of the matching variables by treatment and control groups in Central Asia.

how local institutions and adaptation strategies may have shaped long-run recovery. Despite these challenges, the consistency of the results across methods, outcomes, and regions strengthens the core claim: proximity to newly enforced borders following the Soviet collapse led to stark and persistent differences in urban growth, shaped by shifts in access to markets.

Looking forward, this research opens up several avenues. First, future work could examine the re-integration processes of border regions in the 2000s and 2010s, particularly as countries entered new trade agreements or joined organizations like the WTO and EU. Second, it would be valuable to explore how these patterns of spatial divergence influence political attitudes, public goods provision, or fiscal capacity in border areas. Third, extending the framework to other post-imperial or post-conflict contexts, such as the Balkans or post-Ottoman Middle East, could test the generalizability of these dynamics and better inform ongoing debates about the costs and even benefits of border formation. As the world sees renewed interest in national sovereignty, regional autonomy, and economic decoupling, the legacy of the Soviet collapse offers enduring lessons.

Figures & Tables

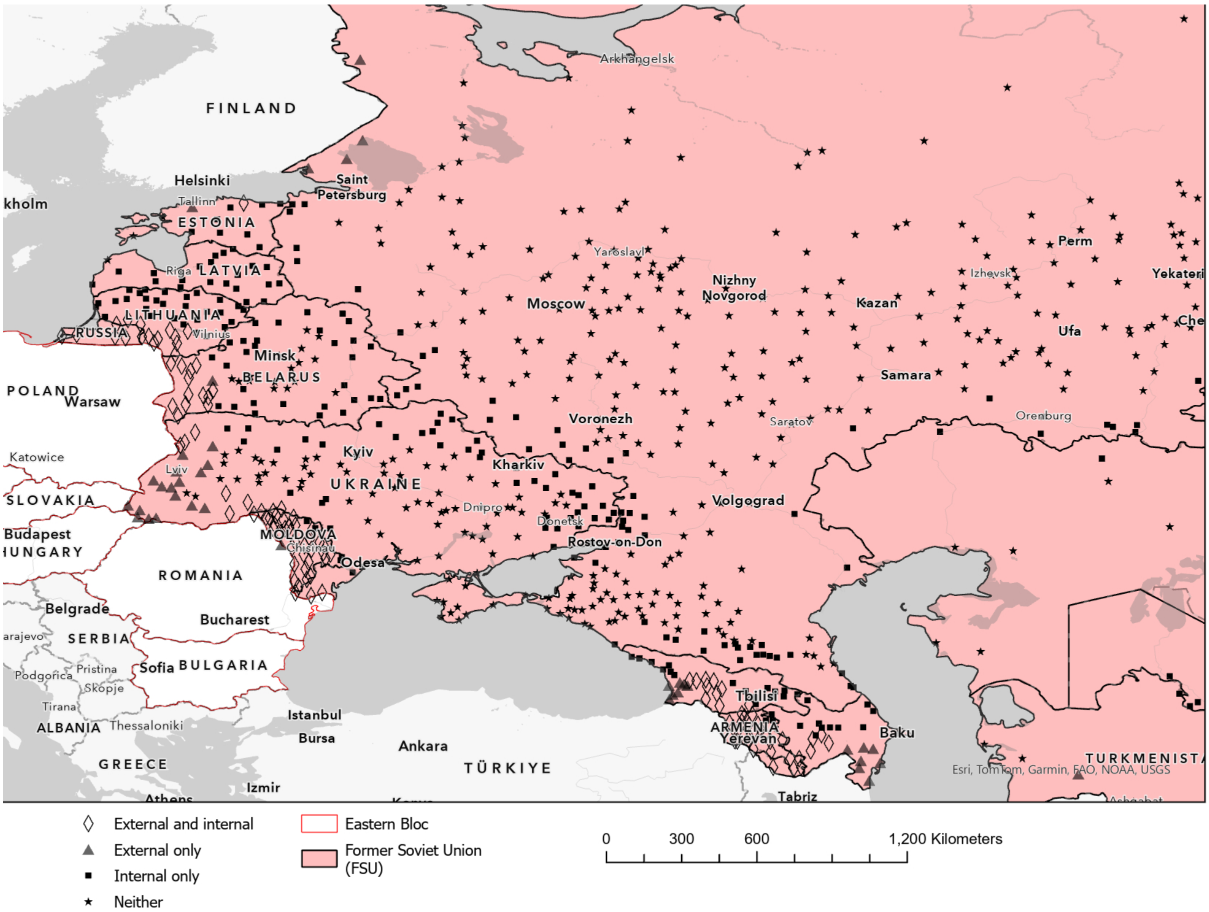


Figure 1: Cities by Type in the European Former Soviet Union

Notes: The map shows the distribution of city types. The cities that were within 75 km of both internal and external borders are denoted by rhombi, the cities that are within 75 km of only internal and only external borders are denoted by squares and triangles, respectively. Interior cities are marked by stars. A cut-off distance of 75 km is chosen following Redding and Sturm (2008).

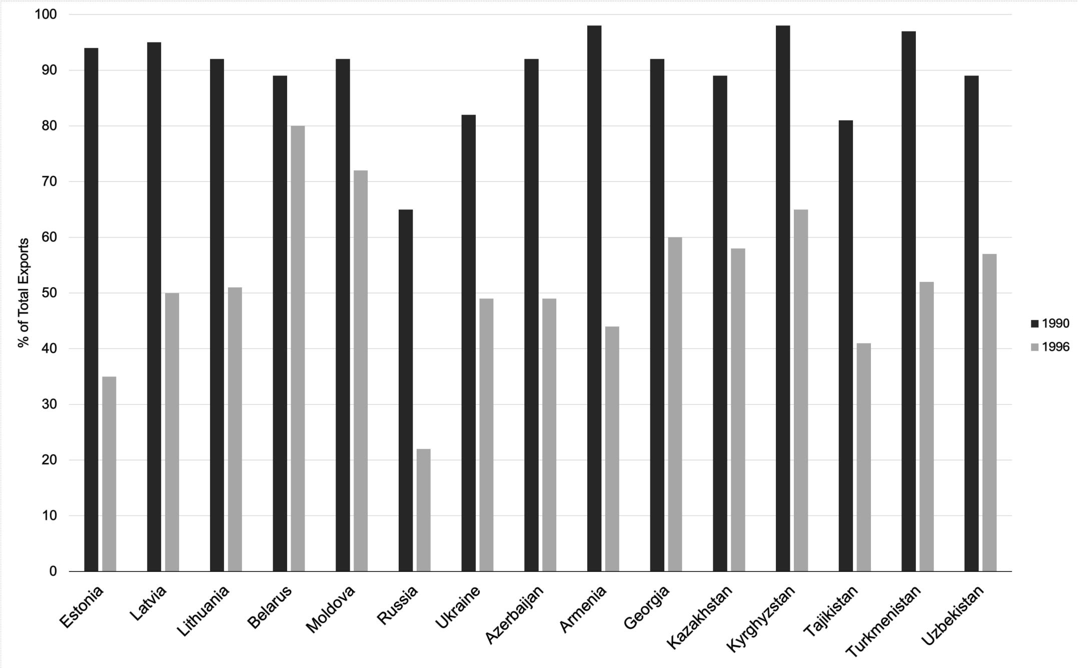


Figure 2: The share of exports to former Soviet countries relative to total exports, 1990 and 1996

Source: Reconstructed from Djankov and Freund (2002)

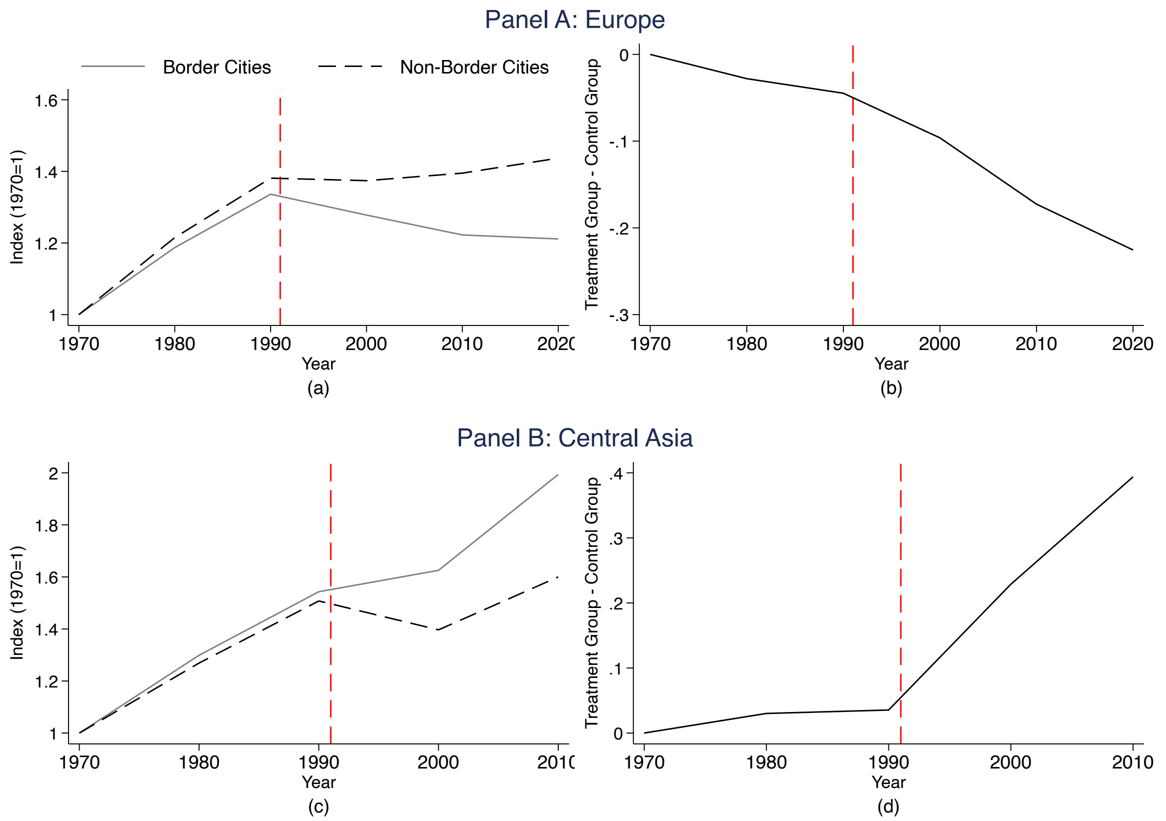


Figure 3: Indices of Internal Border and Non-Border City Population

Notes: Panel A includes all post-Soviet countries geographically situated in Greater Europe: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Russia, and Ukraine. Moldova is excluded due to an unbalanced panel. The Central Asia panel includes all five post-Soviet Central Asian countries, but only two post-collapse periods are available, as Turkmenistan and Uzbekistan conducted only two censuses after the Soviet dissolution.

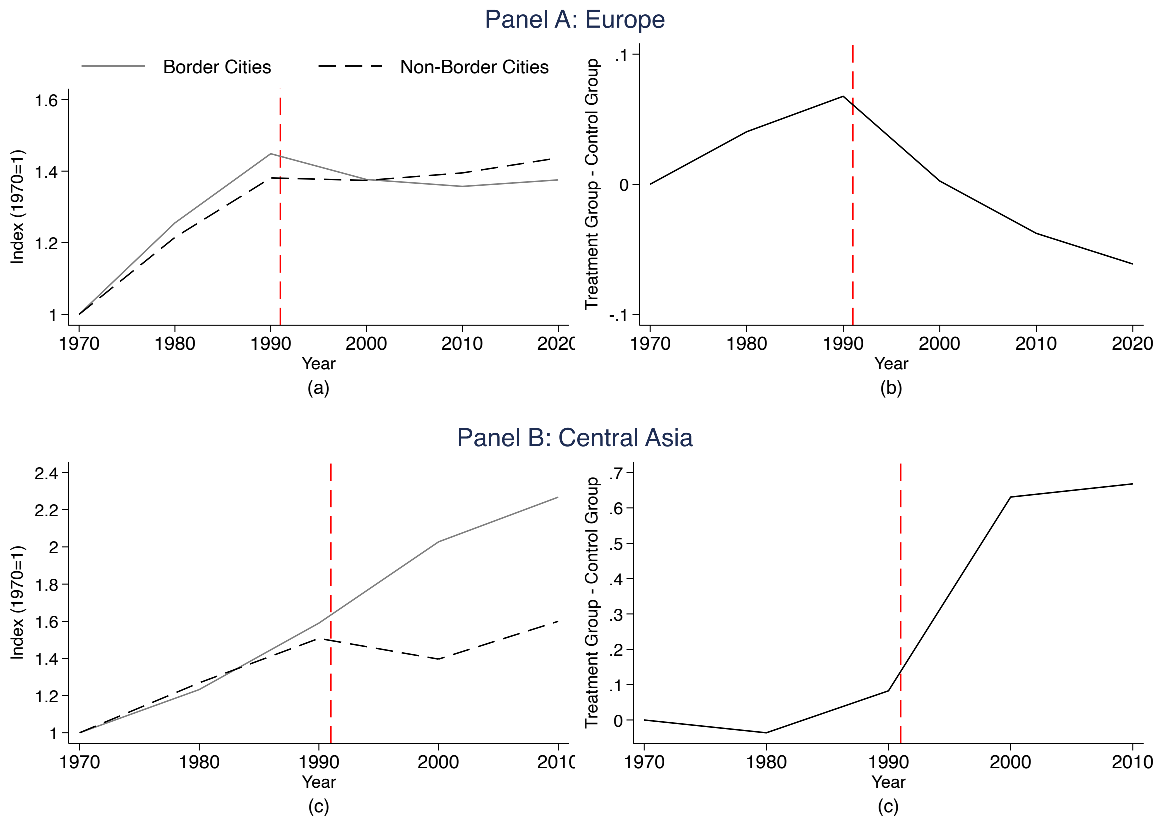


Figure 4: Indices of External Border and Non-Border City Population

Notes: Panel A includes all post-Soviet countries geographically situated in Greater Europe: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Russia, and Ukraine. Moldova is excluded due to an unbalanced panel. The Central Asia panel includes all five post-Soviet Central Asian countries, but only two post-collapse periods are available, as Turkmenistan and Uzbekistan conducted only two censuses after the Soviet dissolution.

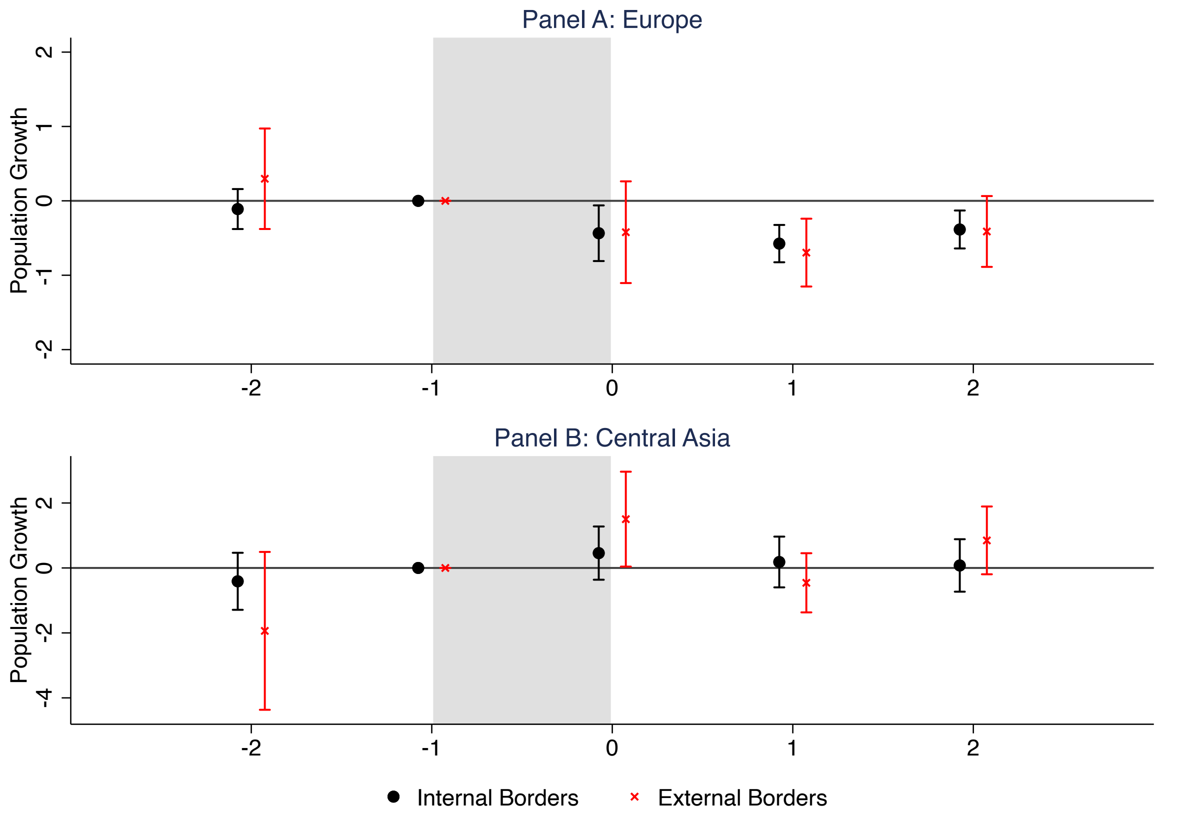


Figure 5: Urban Growth and Soviet Collapse: Event Study Plots

Notes: The figure presents coefficient plots from an event-study difference-in-differences analysis that regresses annualized population growth on year and city fixed effects, with an indicator for being near a border interacted with event-time fixed effects. Black-circled and red-crossed points represent estimates for internal and external borders, respectively, in Soviet Europe (Panel A) and Soviet Central Asia (Panel B). The event time is centered around the Soviet dissolution in 1991 ($t = 0$), with $t = -1$ as the omitted baseline period. The gray shaded area highlights the period during which the Soviet Union dissolved, between $t = -1$ and $t = 0$. The control groups include non-border cities. Standard errors are clustered at the city level, and error bars represent 95% confidence intervals.

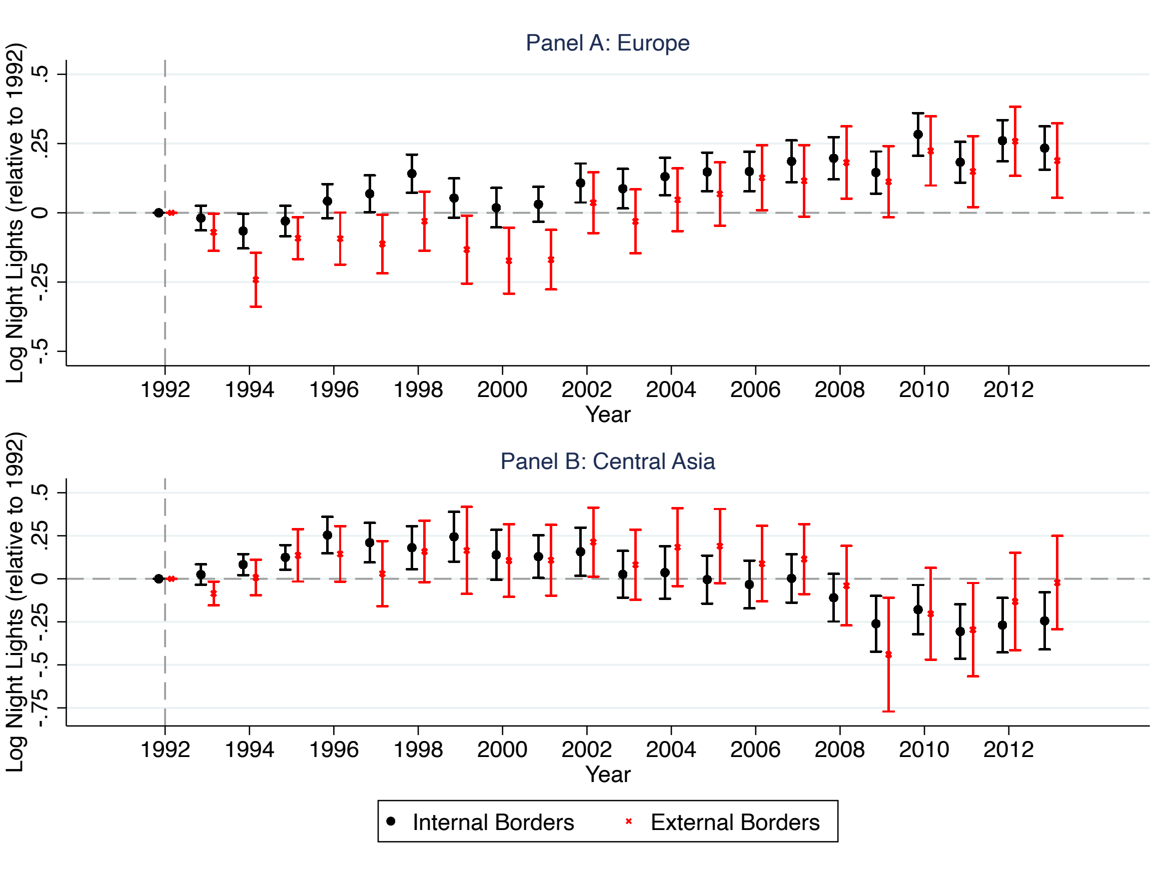


Figure 6: Event-study Estimates of Nighttime Light Intensity relative to 1992

Notes: This figure plots the coefficients from event-study regressions estimating changes in log nighttime light intensity—a proxy for economic activity—relative to the baseline year 1992. Black circles denote cities located near internal post-Soviet borders; red X's represent cities near external borders. Panel A shows that in Europe, internal border cities experienced sustained relative declines in light intensity throughout the 1990s, reflecting the disruptive effects of the Soviet collapse on previously integrated economies. External border cities in Europe also declined, but less sharply. In contrast, Panel B shows that Central Asia's internal border cities saw stable or mildly improving outcomes, while external border cities experienced rising light intensity over time—consistent with gains from opening up trade with non-Soviet neighbors such as China, Iran, and Turkey. Confidence intervals at the 95% level are shown. All regressions include city and year fixed effects and cluster standard errors at the city level.

Table 1: Urban Growth and Soviet Dissolution

	Dependent Variable: Population Growth				
	(1)	(2)	(3)	(4)	(5)
IB $\times$ Division	-0.171	-0.279	0.035	-0.317***	0.398
	(0.109)	(0.174)	(0.113)	(0.118)	(0.390)
EB $\times$ Division	-0.465**	-0.563*	-0.109	-0.518**	1.347**
	(0.228)	(0.326)	(0.215)	(0.237)	(0.634)
Outcome mean (%)	0.606	0.685	0.527	0.513	1.314
City sample	All	Small	Large	Europe	Central Asia
Cities	1235	617	618	1083	152
Observations	6046	3004	3042	5347	699
Adj. R^2	0.412	0.355	0.511	0.438	0.291
City FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓

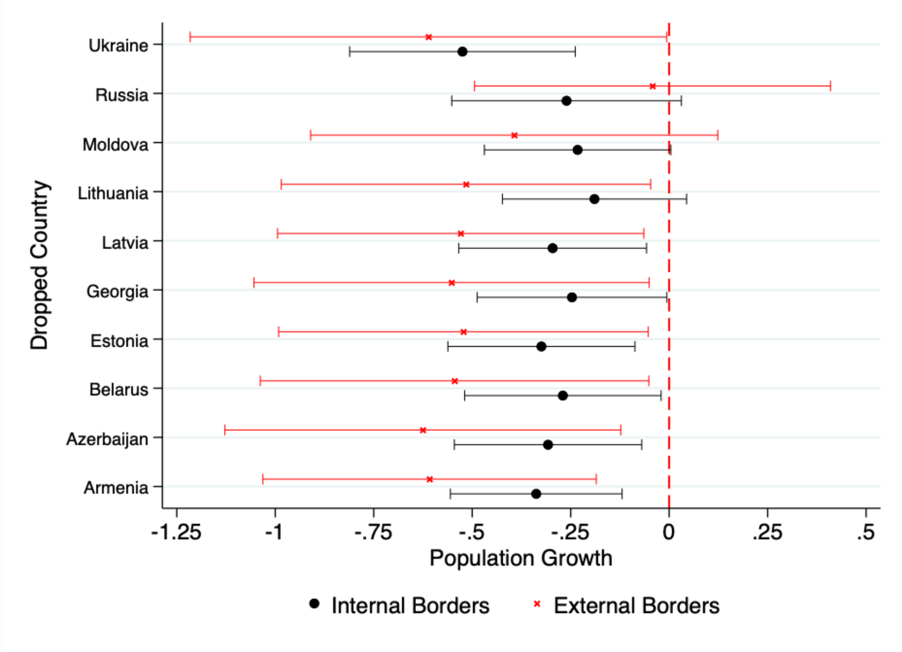
Notes: The dependent variable represents the annualized city population growth rate, expressed as a percentage. Growth rates are calculated for the periods 1970–1979, 1979–1989, 1989–1999, 1999–2009, and 2009–2019, with minor adjustments after the Soviet collapse due to variations in national census dates. The variables IB and EB are binary indicators, set to one if a city is located within 75 kilometers of an internal or external border, respectively, and zero otherwise. The division variable is also a binary indicator, taking the value of one from 1970 to 1991 during the Soviet era and zero otherwise. Columns 2 and 3 present results separately for small and large cities, where small cities have a 1970 population below the median for the former Soviet Union, while large cities are those above the median. Column 4 classifies Europe as all post-Soviet countries geographically located in greater Europe (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, Russia, Ukraine). Column 5 focuses on the five post-Soviet countries in Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan). Robust standard errors, clustered at the city level, are shown in parentheses. Significance levels are denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Robustness to Matching – Europe

	Dependent Variable: Population Growth					
	(1)	(2)	(3)	(4)	(5)	(6)
Matching On	1970 Population	1989 Industrial Employment	1989 Industrial Turnover	1989 Manufacturing	1989 SIC	Military Size & Number
Panel A: Europe – Internal Borders						
IB × Division	-0.551***	-0.318**	-0.517***	-0.436***	-0.614***	-0.432***
	(0.131)	(0.142)	(0.132)	(0.138)	(0.198)	(0.137)
Outcome mean	0.460	0.481	0.402	0.419	0.405	0.534
Observations	3,010	2,917	2,838	2,927	1,605	3,556
Cities	613	594	578	596	331	717
Adj. R^2	0.426	0.440	0.432	0.432	0.396	0.485
Panel B: Europe – External Borders						
EB × Division	-0.525*	-0.695**	-0.826***	-0.651**	-0.776*	-0.826**
	(0.275)	(0.272)	(0.263)	(0.264)	(0.408)	(0.409)
Outcome mean	0.653	0.586	0.524	0.542	0.596	0.745
Observations	1,272	1,164	1,263	1,233	665	490
Cities	260	238	258	252	138	100
Adj. R^2	0.356	0.333	0.364	0.373	0.278	0.307

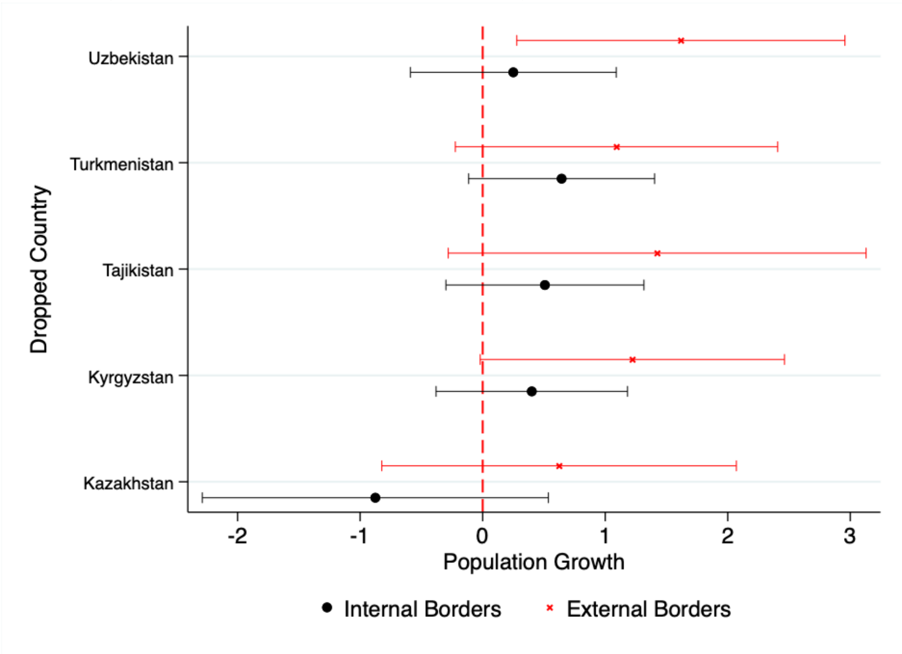
Notes: This table tests robustness to alternative matching strategies. The dependent variable is the annualized population growth rate. IB/EB refer to cities near internal/external post-Soviet borders. "Division" indicates post-1989 years. Standard errors clustered at the city level. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix A - Figures & Tables



(a) Europe

Notes: This figure replicates the leave-one-out robustness check for ten European post-Soviet countries. Circles and X markers denote IB and EB effects, respectively. Both IB and EB effects remain negative and significant, the EB effect when excluding Russian cities, which make up most of the sample, is less precise.



(b) Central Asia

Notes: This figure replicates the analysis for five Central Asian countries. EB effects remain consistently positive and significant, while IB effects are smaller and less precise.

Figure A1: Dropping One Country at a Time

Table A1: Summary of Census Data

Country	Cities	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Armenia	21	1970	1979	1989	2001	2011	2016
Azerbaijan	36	1970	1979	1989	2002	2011	2015
Belarus	45	1970	1979	1989	1999	2009	2019
Estonia	13	1970	1979	1989	2000	2011	2017
Georgia	31	1970	1979	1989	2002	2014	2020
Kazakhstan	73	1970	1979	1989	1999	2009	2021
Kyrgyzstan	21	1970	1979	1989	1999	2009	2021
Latvia	13	1970	1979	1989	2000	2011	2020
Lithuania	22	1970	1979	1989	2001	2011	2021
Moldova	24	1970	1979	1989	2004	2014	
Russia	677	1970	1979	1989	2002	2010	2021
Tajikistan	20	1970	1979	1989	2000	2010	2021
Turkmenistan	9	1970	1979	1989	1995	1999	
Ukraine	201	1970	1979	1989	2001	2014	2021
Uzbekistan	29	1970	1979	1989	2005	2020	
Total	1235						

Notes: Census years are recorded for each country from 1970 to the most recent available year.

Table A2: Descriptive Statistics by Region

Variable	Group	Mean	S.D.	Min	Max	Obs.
			Europe			
Population Growth	IB=1	0.40	1.96	-13.61	14.81	1,298
	IB=0	0.55	1.75	-8.11	27.25	4,049
Population	IB=1	96,554	186,841	3,740	1,609,959	1,598
	IB=0	122,972	430,398	5,433	12,500,000	4,876
IB Distance (km)	IB=1	40.08	19.87	0.26	74.52	1,620
	IB=0	468.47	662.45	75.54	4,594.41	4,878
EB Distance (km)	IB=1	357.40	339.50	3.07	1,658.53	1,620
	IB=0	706.84	491.53	0.07	2,028.30	4,878
Large (=1)	IB=1	0.422	0.494	0	1	1,620
	IB=0	0.535	0.499	0	1	4,878
Log(Lights)	IB=1	7.57	1.64	0.92	11.95	6,030
	IB=0	8.67	1.41	0.92	14.50	13,290
Population Growth	EB=1	0.63	2.38	-13.61	27.25	528
	EB=0	0.50	1.73	-11.64	23.03	4,819
Population	EB=1	81,995	154,610	3,740	1,201,539	649
	EB=0	120,290	402,452	4,702	12,500,000	5,825
IB Distance (km)	EB=1	424.22	914.38	1.39	3,334.45	666
	EB=0	354.52	556.40	0.26	4,594.41	5,832
EB Distance (km)	EB=1	36.92	21.91	0.07	74.65	666
	EB=0	686.28	465.04	75.73	2,028.30	5,832
Large (=1)	EB=1	0.324	0.468	0	1	666
	EB=0	0.528	0.499	0	1	5,832
Log(Lights)	EB=1	7.20	1.55	1.10	11.13	2,654
	EB=0	8.50	1.50	0.92	14.50	16,666
			Central Asia			
Population Growth	IB=1	1.38	2.10	-8.71	16.36	397
	IB=0	1.23	2.37	-7.23	12.84	302
Population	IB=1	127,625	272,445	8,169	2,571,668	485
	IB=0	87,180	118,089	6,920	1,184,469	366
IB Distance (km)	IB=1	26.06	19.34	1.59	70.68	528
	IB=0	210.89	110.27	78.52	502.41	384
EB Distance (km)	IB=1	322.65	298.65	6.29	1,539.92	528
	IB=0	565.99	399.06	2.82	1,464.23	384
Large (=1)	IB=1	0.409	0.492	0	1	528
	IB=0	0.516	0.500	0	1	384
Log(Lights)	IB=1	8.11	1.74	3.53	12.05	1,495
	IB=0	8.13	1.62	3.18	11.54	1,166
Population Growth	EB=1	2.05	1.94	-6.68	5.39	37
	EB=0	1.27	2.23	-8.71	16.36	662
Population	EB=1	83,178	131,667	6,920	604,700	46
	EB=0	111,776	224,553	8,169	2,571,668	805
IB Distance (km)	EB=1	171.61	111.79	42.27	382.07	54
	EB=0	99.62	115.96	1.59	502.41	858
EB Distance (km)	EB=1	26.12	18.80	2.82	56.86	54
	EB=0	450.22	361.52	80.53	1,539.92	858
Large (=1)	EB=1	0.444	0.502	0	1	54
	EB=0	0.455	0.498	0	1	858
Log(Lights)	EB=1	6.94	1.72	3.18	11.50	308
	EB=0	8.27	1.62	3.53	12.05	2,353

Notes: "Population Growth" is the annualized average over the whole period, and "Population" is in levels. "IB Distance" and "EB Distance" measure straight-line kilometers from each city to the closest internal and external post-Soviet border, respectively. "Large (=1)" is a binary indicator for cities above the sample median in 1970 population. "Log(Lights)" denotes average annual log-transformed nightlight intensity.

Table A3: Treatment Descriptive Statistics by Region

Variable	Mean	S.D.	Min	Max	Obs.
		Europe			
Division	0.500	0.500	0	1	6,498
IB	0.249	0.433	0	1	6,498
EB	0.102	0.303	0	1	6,498
IB × Division	0.125	0.330	0	1	6,498
EB × Division	0.051	0.221	0	1	6,498
IB (0-25 km)	0.066	0.248	0	1	6,498
EB (0-25 km)	0.034	0.182	0	1	6,498
IB (0-25 km) × Division	0.033	0.178	0	1	6,498
EB (0-25 km) × Division	0.017	0.130	0	1	6,498
IB (0-50 km)	0.171	0.376	0	1	6,498
EB (0-50 km)	0.069	0.254	0	1	6,498
IB (0-50 km) × Division	0.085	0.280	0	1	6,498
EB (0-50 km) × Division	0.035	0.183	0	1	6,498
IB (0-100 km)	0.323	0.468	0	1	6,498
EB (0-100 km)	0.131	0.338	0	1	6,498
IB (0-100 km) × Division	0.162	0.368	0	1	6,498
EB (0-100 km) × Division	0.066	0.248	0	1	6,498
IB (0-125 km)	0.393	0.489	0	1	6,498
EB (0-125 km)	0.162	0.368	0	1	6,498
IB (0-125 km) × Division	0.197	0.398	0	1	6,498
EB (0-125 km) × Division	0.081	0.273	0	1	6,498
IB × Year 2-6 (same)	0.042	0.200	0	1	6,498
EB × Year 2-6 (same)	0.017	0.130	0	1	6,498
		Central Asia			
Division	0.500	0.500	0	1	912
IB	0.579	0.494	0	1	912
EB	0.059	0.236	0	1	912
IB × Division	0.289	0.454	0	1	912
EB × Division	0.030	0.170	0	1	912
IB (0-25 km)	0.316	0.465	0	1	912
EB (0-25 km)	0.033	0.178	0	1	912
IB (0-25 km) × Division	0.158	0.365	0	1	912
EB (0-25 km) × Division	0.016	0.127	0	1	912
IB (0-50 km)	0.487	0.500	0	1	912
EB (0-50 km)	0.046	0.210	0	1	912
IB (0-50 km) × Division	0.243	0.429	0	1	912
EB (0-50 km) × Division	0.023	0.150	0	1	912
IB (0-100 km)	0.632	0.483	0	1	912
EB (0-100 km)	0.086	0.280	0	1	912
IB (0-100 km) × Division	0.316	0.465	0	1	912
EB (0-100 km) × Division	0.043	0.202	0	1	912
IB (0-125 km)	0.678	0.468	0	1	912
EB (0-125 km)	0.125	0.331	0	1	912
IB (0-125 km) × Division	0.339	0.474	0	1	912
EB (0-125 km) × Division	0.063	0.242	0	1	912
IB × Year 2-6 (same)	0.096	0.295	0	1	912
EB × Year 2-6 (same)	0.010	0.099	0	1	912

Notes: This table reports summary statistics for treatment-related variables across Europe and Central Asia. "Division" marks post-collapse years. "IB" and "EB" indicate whether a city lies within 75 km of internal or external borders, with their interaction terms capturing treated units in a difference-in-differences setup. Distance-band variables (e.g., "IB (0–25 km)") indicate proximity to borders at varying thresholds. Interactions with "Division" capture heterogeneous treatment timing. "IB × Year 2–6 (same)" and "EB × Year 2–6 (same)" reflect treatment years separately from year 2 to 6 (1970-1979, 1979-1989, and so on). Treatment indicators are not mutually exclusive.

Table A4: Urban Growth and Soviet Dissolution: Robustness Checks

	Dependent Variable: Population Growth					
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Europe			
IB × Division	-0.415***		-0.284**	-0.314***	-0.346***	-0.320***
	(0.121)		(0.117)	(0.121)	(0.074)	(0.071)
EB × Division		-0.668***	-0.578***	-0.509**		-0.255**
		(0.239)	(0.224)	(0.242)		(0.109)
Outcome mean (%)	0.502	0.548	0.708	0.510	0.513	0.513
Cities	1,026	867	1,083	1,053	1,083	1,083
Observations	5,072	4,302	4,264	5,199	5,347	5,347
Adj. R^2	0.448	0.429	0.469	0.435	0.334	0.352
			Panel B: Central Asia			
IB × Division	0.470		0.358	0.388	0.336	0.374
	(0.400)		(0.393)	(0.397)	(0.241)	(0.252)
EB × Division		1.507**	0.508	1.347**	1.168***	1.127***
		(0.668)	(0.541)	(0.635)	(0.259)	(0.313)
Outcome mean (%)	1.290	1.266	1.736	1.319	1.314	1.314
Cities	145	66	152	149	152	152
Observations	670	310	547	685	699	699
Adj. R^2	0.311	0.285	0.188	0.287	0.252	0.260
City sample	IB Only	EB Only	Excl. 89-99	Pop<500k	Main	Main
City FE	✓	✓	✓	✓		
Year FE	✓	✓	✓	✓	✓	✓
Country FE					✓	✓
Border Pair FE						✓

Notes: The dependent variable represents annualized city population growth rates (%). IB/EB indicate cities within 75km of internal/external borders. Division=1 for 1989 on. Panel A analyzes European post-Soviet states; Panel B focuses on Central Asia. Column 3 excludes the period between 1989-1999 as it partially falls in the period of collapse. Column 4 excludes major cities with a population above 500 thousand in 1970. Columns 5-6 in Panel B include country and border-pair fixed effects. Robust standard errors clustered at city level in parentheses. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Urban Growth and Soviet Dissolution: Distance-Based Robustness Checks

	Dependent Variable: Population Growth						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Europe							
IB×Division	-0.310	-0.304**	-0.208*	-0.145	-0.398***	-0.400***	-0.492***
	(0.206)	(0.137)	(0.108)	(0.103)	(0.113)	(0.115)	(0.117)
EB×Division	-1.046**	-0.745**	-0.671***	-0.793***	-0.389*	-0.368*	-0.414*
	(0.423)	(0.316)	(0.198)	(0.173)	(0.210)	(0.210)	(0.212)
Outcome mean (%)	0.513	0.513	0.513	0.513	0.511	0.522	0.545
Distance sample (IB&EB)	All	All	All	All	<2000 km	<1500 km	<1000 km
Cities	1083	1083	1083	1083	1046	963	819
Observations	5347	5347	5347	5347	5162	4747	4027
Adj. R^2	0.437	0.438	0.439	0.442	0.450	0.447	0.447
Panel B: Central Asia							
IB×Division	0.376	0.422	0.373	0.378	0.452	0.277	0.396
	(0.312)	(0.359)	(0.433)	(0.464)	(0.407)	(0.401)	(0.469)
EB×Division	1.818**	1.284*	1.194*	0.660	1.319**	1.170*	1.250*
	(0.883)	(0.738)	(0.607)	(0.489)	(0.644)	(0.630)	(0.667)
Outcome mean (%)	1.314	1.314	1.314	1.314	1.322	1.358	1.392
Distance sample (IB&EB)	All	All	All	All	<1250 km	<1000 km	<750 km
Cities	152	152	152	152	144	138	124
Observations	699	699	699	699	659	629	559
Adj. R^2	0.291	0.290	0.291	0.288	0.280	0.283	0.269
Treatment Cut-off	25km	50km	100km	125km	75km	75km	75km
City FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports robustness checks on population growth using varying proximity thresholds to internal (IB) and external (EB) Soviet borders. Division = 1 for years from 1989 onward. Cutoffs are indicated in the "Treatment Cut-off" row. All models include city and year fixed effects. Standard errors are clustered at the city level and shown in parentheses. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Robustness to Matching – Central Asia

	Dependent Variable: Population Growth					
	(1)	(2)	(3)	(4)	(5)	(6)
Matching On	1970 Population	1989 Industrial Employment	1989 Industrial Turnover	1989 Manufacturing	1989 SIC	Military Size & Number
Panel A: Central Asia – Internal Borders						
IB × Division	0.479	0.565	0.621	0.546	0.337	0.379
	(0.431)	(0.495)	(0.522)	(0.429)	(0.623)	(0.630)
Outcome mean	1.315	1.333	1.345	1.375	1.382	1.562
Observations	628	574	561	547	491	317
Cities	136	125	122	119	107	69
Adj. R^2	0.297	0.320	0.321	0.360	0.332	0.407
Panel B: Central Asia – External Borders						
EB × Division	3.344*	0.857	1.309	1.218	0.158	3.819*
	(1.764)	(1.246)	(1.387)	(2.263)	(1.256)	(1.450)
Outcome mean	1.463	1.538	1.378	1.538	1.755	2.294
Observations	71	56	80	58	53	22
Cities	16	13	18	13	12	5
Adj. R^2	0.184	0.142	0.0464	-0.0505	0.442	0.401

Notes: This table tests robustness to alternative matching strategies in Central Asia. The dependent variable is the annualized city population growth rate. IB/EB refer to cities near internal/external post-Soviet borders. "Division" indicates post-1989 years. Standard errors clustered at the city level. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Descriptive Statistics for Matched Samples in Europe

Matching Variable	Group	Mean	S.D.	Min	Max	Obs.
		Europe: IB vs. Interior				
Population 1970	IB=1	77,885	152,370	10,065	1,222,852	1,620
	IB=0	78,665	146,841	10,037	1,170,133	2,208
Industrial Employment	IB=1	17,575	33,508	195	250,404	1,524
	IB=0	16,724	31,096	190	274,489	2,226
Industrial Turnover	IB=1	382,745	675,022	70	4,758,280	1,530
	IB=0	407,721	724,176	64	4,796,282	2,046
SIC	IB=1	13,162	6,555	2,730	32,720	1,518
	IB=0	16,452	6,924	2,730	32,720	528
Manufacturing Turnover	IB=1	245,184	488,580	70	3,781,983	1,518
	IB=0	274,817	526,857	64	3,728,328	2,154
Military Count	IB=1	8.08	17.72	1	160	1,074
	IB=0	10.62	47.67	1	796	3,432
Military Size	IB=1	17.59	37.89	2	339	1,074
	IB=0	23.54	107.23	2	1,784	3,432
		Europe: EB vs. Interior				
Population 1970	EB=1	60,889	114,896	10,149	766,705	666
	EB=0	63,760	117,322	10,136	770,905	1,176
Industrial Employment	EB=1	13,315	25,414	97	161,117	624
	EB=0	14,084	26,340	37	158,143	1,098
Industrial Turnover	EB=1	281,721	521,377	70	3,176,533	636
	EB=0	278,702	523,180	64	3,107,729	1,128
SIC	EB=1	13,092	6,258	2,730	27,520	630
	EB=0	14,841	6,225	2,730	27,520	360
Manufacturing Turnover	EB=1	175,682	339,865	70	2,117,026	630
	EB=0	186,157	353,817	64	2,161,119	1,062
Military Count	EB=1	7.76	15.26	1	105	396
	EB=0	14.65	27.87	1	166	294
Military Size	EB=1	16.53	32.27	2	218	396
	EB=0	31.65	59.62	2	360	294

Notes: "IB" and "EB" denote internal and external border proximity (within 75km). Industrial and manufacturing turnover are in local currency; population is city-level. Military Count refers to the number of unique Soviet military-industrial establishments (e.g., factories, design bureaus, and research institutes) located in each city, as identified in the Dexter–Rodionov database.Military Size is the sum of the size classifications of these establishments, where size is coded from 1 (fewer than 100 workers) to 3 (more than 1,000 workers).

Table A8: Descriptive Statistics for Matched Samples in Central Asia

Matching Variable	Group	Mean	S.D.	Min	Max	Obs.
		Central Asia: IB vs. Interior				
Population 1970	IB=1	60,740	78,990	10,238	430,618	510
	IB=0	62,233	83,617	10,184	523,271	336
Industrial Employment	IB=1	12,049	16,199	147	87,890	492
	IB=0	11,718	19,873	118	117,556	294
Industrial Turnover	IB=1	330,075	453,680	1,330	2,403,345	498
	IB=0	486,119	678,238	954	2,731,450	270
SIC	IB=1	12,125	7,294	2,730	49,111	498
	IB=0	14,664	8,230	2,730	35,330	150
Manufacturing Turnover	IB=1	219,543	354,893	690	1,825,853	474
	IB=0	208,579	328,201	579	1,414,383	264
Military Count	IB=1	5.28	11.54	1	72	276
	IB=0	2.92	2.65	1	11	150
Military Size	IB=1	11.70	25.18	2	158	276
	IB=0	6.32	5.80	2	23	150
		Central Asia: EB vs. Interior				
Population 1970	EB=1	49,292	73,462	11,375	253,118	54
	EB=0	54,297	80,648	11,208	266,815	90
Industrial Employment	EB=1	4,441	6,531	163	21,598	54
	EB=0	5,018	6,827	147	22,022	96
Industrial Turnover	EB=1	116,812	131,846	2,523	382,986	54
	EB=0	126,923	134,793	2,080	386,449	96
SIC	EB=1	10,460	5,636	7,239	20,130	48
	EB=0	11,530	6,153	7,239	20,110	36
Manufacturing Turnover	EB=1	77,858	94,535	1,642	281,351	42
	EB=0	79,070	95,258	1,362	302,282	84
Military Count	EB=1	1.33	0.49	1	2	18
	EB=0	1.50	0.51	1	2	24
Military Size	EB=1	2.67	0.97	2	4	18
	EB=0	3.00	1.02	2	4	24

Notes: "IB" and "EB" denote internal and external border proximity (within 75km). Variables reflect pre-collapse values for city population, employment, turnover, and military presence. Military Count refers to the number of unique Soviet military-industrial establishments (e.g., factories, design bureaus, and research institutes) located in each city, as identified in the Dexter–Rodionov database. Military Size is the sum of the size classifications of these establishments, where size is originally coded from 1 (fewer than 100 workers) to 3 (more than 1,000 workers).

Appendix B - Effects by Individual Border Pair

To further probe how the effect differs for each border pair, I also estimate the following three-way interaction model separately for internal and external borders:

$$y_{ct} = \sum_{i=1}^{k} \beta_i (border_c \times division_t \times borderpair_{ck}) + \delta_k + \alpha_c + d_t + \epsilon_{ct}, \tag{5}$$

where $border_c$ indicates proximity to internal or external borders, $borderpair_{ck}$ denotes the specific border pair nearest to city c, and δ_k captures fixed effects for each border pair. This model allows isolation of how the Soviet Union's dissolution uniquely influenced population growth around distinct borders.

Figure B1 illustrates these effects for internal border pairs. Cities in Eastern Europe generally experienced negative growth, reflecting economic disruptions and decreased trade connectivity after 1991. Particularly pronounced declines occurred near borders involving Russia, Ukraine, Belarus, and the Baltic states, where Soviet-era industrial and agricultural supply chains were abruptly severed. The Baltics faced prolonged adjustment costs due to delayed integration with Western Europe, while Moldova-Ukraine and Belarus-Ukraine borders became emblematic of fragmented regional economies. In the Caucasus, effects varied: militarized borders like Armenia-Azerbaijan saw near-total economic isolation due to conflict, whereas Georgia's borders with Russia mirrored post-2008 geopolitical tensions. Central Asian border cities, in contrast, show positive urban growth near intra-regional borders, likely buoyed by preserved rail connectivity and reoriented trade networks, though smaller samples limit precision for some pairs.

Figure B2 shows results for external border pairs. Most Slavic and Baltic countries faced negative growth due to severed economic connections with Eastern Bloc countries after the dissolution of COMECON. However, Kaliningrad emerged as an outlier, leveraging its exclave status through cross-border cooperation with the EU and targeted economic policies. In the Caucasus, while the observation count for Turkiye-Armenia is notable, the closed and militarized status of this border—due to the unresolved Nagorno-Karabakh conflict and lack of diplomatic relations—likely stifled formal economic integration. Post-Soviet economic chaos and Georgia's conflicts likely drove urban decline along the Türkiye-Georgia border, eclipsing its strategic geographic advantages. Central Asian cities along exterior borders show positive growth, particularly where Soviet-era isolation gave way to reopened trade corridors with Iran, Afghanistan, and China. These regions transformed into gateways for informal markets and infrastructure projects, offsetting the loss of centralized Soviet trade frameworks.

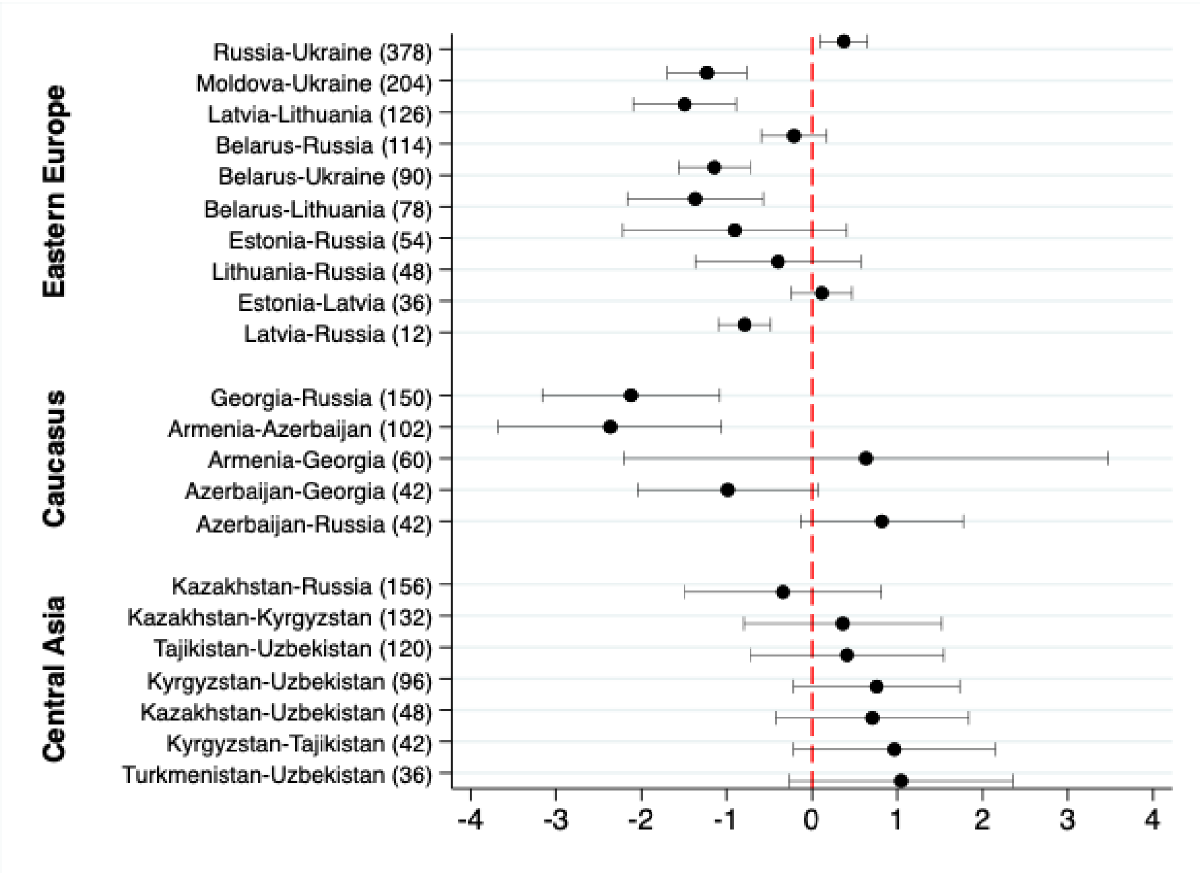


Figure B1: Coefficient plot for internal border pairs by region

Notes: This figure presents the coefficient estimates from separate regressions of population growth on internal border treatment interactions, conducted independently for Eastern Europe, Caucasus, and Central Asia. Each region's regression uses internal cities within that region as the control group. Confidence intervals represent the 95% level, with horizontal tails indicating precision. The numbers in parentheses following border pair labels indicate the number observations in the corresponding treatment border pair group. Standard errors are clustered at the unique city identifier. The vertical dashed red line represents a coefficient of zero.

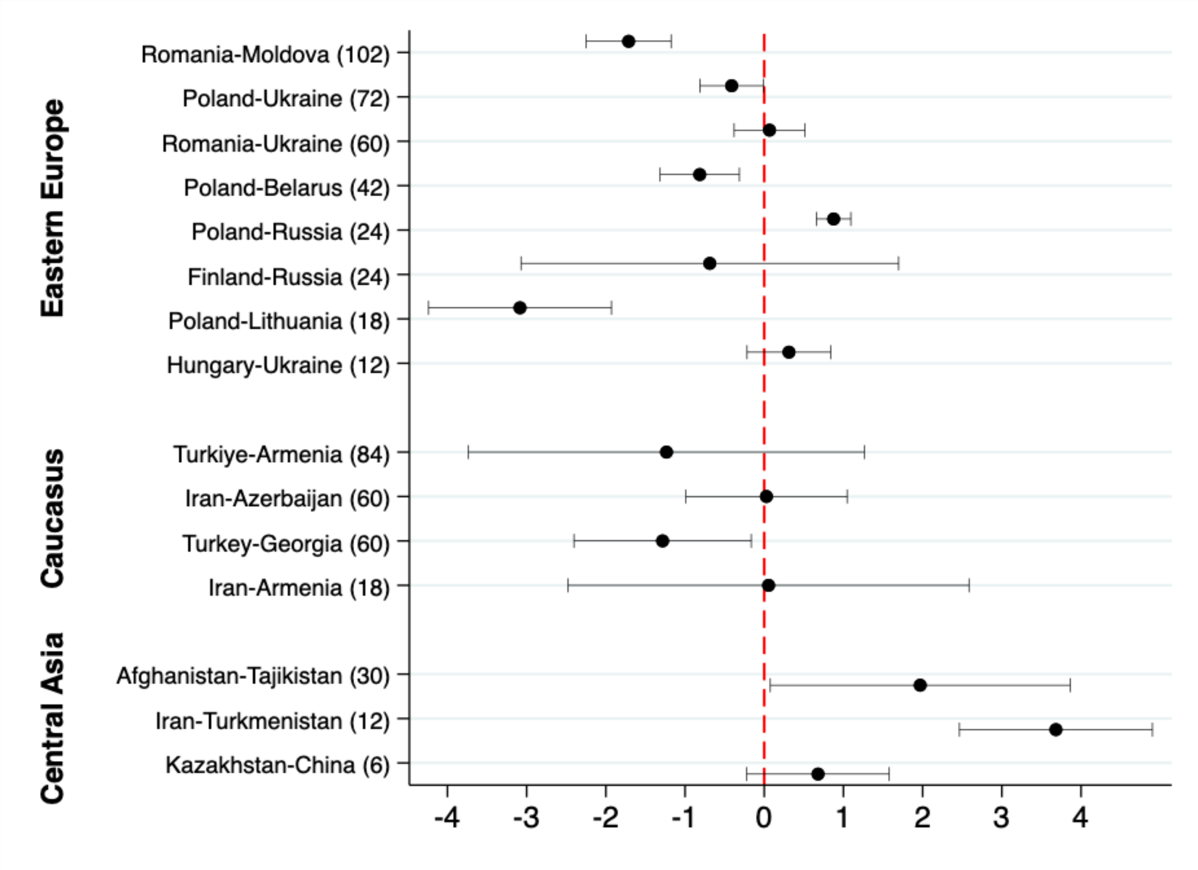


Figure B2: Coefficient plot for external border pairs by region

Notes: This figure illustrates coefficient estimates derived from separate regressions of population growth on external border treatment interactions, conducted individually for Eastern Europe, Caucasus, and Central Asia. Each regression employs interior cities within the respective region as controls. The regressions exclude certain external border pairs as indicated in the detailed regression specifications. The numbers in parentheses following border pair labels indicate the number observations in the corresponding treatment border pair group. Confidence intervals at the 95% level include horizontal tails for precision, and standard errors are clustered by city. The vertical dashed red line indicates a zero coefficient.

References

Ahlfeldt, G. M., Redding, S. J., Sturm, D. M., and Wolf, N. (2015). The economics of density: Evidence from the berlin wall. *Econometrica*, 83(6):2127–2189.

Autor, D. H., Dorn, D., and Hanson, G. H. (2013). The china syndrome: Local labor market effects of import competition in the united states. *American economic review*, 103(6):2121–2168.

Baum-Snow, N., Brandt, L., Henderson, J. V., Turner, M. A., and Zhang, Q. (2017). Roads, railroads, and decentralization of chinese cities. *Review of Economics and Statistics*, 99(3):435–448.

Becker, C., Mendelsohn, S. J., and Benderskaya, K. (2012). *Russian urbanization in the Soviet and post-Soviet eras*. Human Settlements Group, International Institute for Environment and ....

Behrens, K. (2024). Casualties of border changes: Evidence from nighttime lights and plant exit. *Economic Policy*, page eiae020.

Brinkhoff, T. (2021). City population. *The Review of economic studies*.

Broadman, H. G. (2006). *From disintegration to reintegration: Eastern Europe and the former Soviet Union in international trade*. World Bank Publications.

Brülhart, M., Carrère, C., and Trionfetti, F. (2012). How wages and employment adjust to trade liberalization: Quasi-experimental evidence from austria. *Journal of International Economics*, 86(1):68–81.

Chandler, A. M. (1998). *Institutions of isolation: border controls in the Soviet Union and its successor states, 1917-1993*. McGill-Queen's Press-MQUP.

Denisenko, M. and Chudinovskikh, O. (2017). Russia: A migration system with soviet roots. Accessed: 2023.

Dexter, K. and Rodionov, I. (2024). The factories, research and design establishments of the soviet defence industry: a guide: Ver. 23. *Warwick, UK: University of Warwick, Department of Economics*.

Dietz, B. (2000). German and jewish migration from the former soviet union to germany: Background, trends and implications. *Journal of ethnic and migration studies*, 26(4):635–652.

Dix-Carneiro, R. and Kovak, B. K. (2017). Trade liberalization and regional dynamics. *American Economic Review*, 107(10):2908–2946.

Djankov, S. and Freund, C. (2002). Trade flows in the former soviet union, 1987 to 1996. *Journal of Comparative Economics*, 30(1):76–90.

Donaldson, D. (2018). Railroads of the raj: Estimating the impact of transportation infrastructure. *American Economic Review*, 108(4-5):899–934.

Elvidge, C. D., Ziskin, D., Baugh, K. E., Tuttle, B. T., Ghosh, T., Pack, D. W., Erwin, E. H., and Zhizhin, M. (2009). A fifteen year record of global natural gas flaring derived from satellite data. *Energies*, 2(3):595–622.

Faber, B. (2014). Trade integration, market size, and industrialization: evidence from china's national trunk highway system. *Review of Economic Studies*, 81(3):1046–1070.

Fujita, M., Krugman, P. R., and Venables, A. (2001). *The spatial economy: Cities, regions, and international trade*. MIT press.

Fukuyama, F. (1992). *The End of History and the Last Man*. Free Press, New York.

Garver, J. W. (2015). *China's Quest: The History of the Foreign Relations of the People's Republic of China*. Oxford University Press.

Gibson, J., Olivia, S., Boe-Gibson, G., and Li, C. (2021). Which night lights data should we use in economics, and where? *Journal of Development Economics*, 149:102602.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.

Hanson, G. H. (2001). Us–mexico integration and regional economies: evidence from border-city pairs. *Journal of Urban Economics*, 50(2):259–287.

Heleniak, T. (2004). Migration of the russian diaspora after the breakup of the soviet union. *Journal of International Affairs*, pages 99–117.

Henderson, J. V., Storeygard, A., and Weil, D. N. (2012). Measuring economic growth from outer space. *American economic review*, 102(2):994–1028.

Jedwab, R. and Storeygard, A. (2022). The average and heterogeneous effects of transportation investments: Evidence from sub-saharan africa 1960–2010. *Journal of the European Economic Association*, 20(1):1–38.

Kofanov, D. and Mikhailova, T. (2015). Geographical concentration of soviet industries: A comparative analysis. *Journal of the New Economic Association*, 28(4):112–141.

Kramer, M. and Smetana, V. (2013). *Imposing, Maintaining, and Tearing Open the Iron Curtain: The Cold War and East-Central Europe, 1945–1989*. Lexington Books.

Krugman, P. (1991). Increasing returns and economic geography. *Journal of Political Economy*, 99(3):483–499.

Maurel, M. and Cheikbossian, G. (1998). The new geography of eastern european trade. *Kyklos*, 51(1):45–72.

Meyer, B. D. (1995). Natural and quasi-experiments in economics. *Journal of business & economic statistics*, 13(2):151–161.

Mubinzhon, A. and Ricardo, B. (2021). Factors explaining trade growth among the former soviet central asian countries in the context of recent globalization processes. *Journal of Globalization Studies*, 12(2):19–46.

Redding, S. J. (2022). Trade and geography. *Handbook of International Economics*, 5:147–217.

Redding, S. J. and Sturm, D. M. (2008). The costs of remoteness: Evidence from german division and reunification. *American Economic Review*, 98(5):1766–1797.

Roth, J., Sant'Anna, P. H., Bilinski, A., and Poe, J. (2023). What's trending in difference-in-differences? a synthesis of the recent econometrics literature. *Journal of Econometrics*, 235(2):2218–2244.

Smith, A. H. and Smith, A. (1993). *Russia and the world economy: problems of integration*. Routledge.

Storeygard, A. (2016). Farther on down the road: transport costs, trade and urban growth in sub-saharan africa. *The Review of Economic Studies*, 83(3):1263–1295.

Tishkov, V., Zayinchkovskaya, Z., and Vitkovskaya, G. (2005). Migration in the countries of the former soviet union. *Global Commission on International Migration*, pages 1–42.

Topalova, P. (2010). Factor immobility and regional impacts of trade liberalization: Evidence on poverty from india. *American Economic Journal: Applied Economics*, 2(4):1–41.