The boulevard of broken dreams? Long-run effects of labor-managed socialism

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Abstract

This study investigates the long-term impact of socialism on economic growth, focusing on the unique case of labor-managed socialism in former Yugoslavia. By comparing Slovenia with OECD and East Asian donor countries that did not undergo postwar socialist transitions, we estimate counterfactual scenarios using synthetic control methods. Our findings show that labor-managed socialism led to a temporary growth deviation, followed by a structural collapse in the 1980s. Our estimates suggest that Slovenia's per capita GDP would be 22 percent higher today had there been postwar economic and political liberalization in place. By contrast, if socialist policies had continued after 1990, Slovenia's per capita GDP would be 63 percent lower today. These results remain robust across various robustness checks.

1. Introduction

Economic growth and its institutional determinants are by now a large body of literature (Knack and Keefer 1995, Landes 1998, Hall and Jones 1999, Acemoglu et. al. 2001, Dell 2010, Besley and Persson 2010, Nunn 2020). Since the work of Douglas North and others (Alesina and Perotti 1994), economists have been promoting different theories to explain how institutions shape economic development (North 1990, 2005, Weingast 1995, Rodrik et. al. 2004, Aidt 2009). Many different empirical studies have provided multiple assessments of the role played by institutions in determining successful versus unsuccessful economic growth episodes (Billmeier and Nannicini 2013, Bove and Nistico 2014, Grier and Maynard 2016).

A key point in these discussions is how institutional changes explain growth trajectories. A significant institutional "laboratory" is Korea (Glaeser et. al. 2004). Subject to the same political, social, cultural and legal institutions until 1945, it suffered

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an external shock in the period 1945-1953, and has been divided in two since then. Institutions differ considerably between North and South Korea after 1953. Up to the late 1950s there is no big difference in terms of GDP per capita. However, by the late 1960s differences emerge - South Korea was one of the Asian miracles while North Korea was a central planning economy. By the late 1990s the difference in terms of nominal GDP per capita was astronomical - USD 11,500 in South Korea against less than USD 1,000 in North Korea. In 2024, the numbers were about USD 50,000 against less than USD 1,700 respectively.[1] Clearly, political and legal institutions in South Korea promote economic growth, whereas in North Korea they foster poverty and economic stagnation.

Institutional quasi-natural experiments, such as the case of Korea, are exceptionally rare. In this article, we investigate the impact of institutional change on economic growth trajectories by employing synthetic control estimation, a methodology that offers immediate and valuable empirical contributions to the literature on economic development. Specifically, our approach revisits longstanding debates that have lacked rigorous counterfactual analysis, thereby providing new insights. Furthermore, we advance the growing application of synthetic control estimation in development economics (Gilchrist et al., 2022).

By employing this methodology, we also address an important theoretical gap: the distinction between temporary changes and structural changes, which has been underexplored in more traditional literature. We illustrate how institutional variations can generate markedly different economic effects in the short term versus the long term. Using a data-driven counterfactual approach, we construct an artificial control entity to compare the same economy under different institutional arrangements—namely, with and without socialism. This approach not only corroborates established findings from short-term analyses but also enables a nuanced discussion of long-term impacts.

Our theoretical contribution centers on differentiating between temporary shifts—those that influence economic growth in the short run but lack enduring significance—and structural changes, which either trigger sustained economic growth or long-term stagnation by fundamentally altering GDP trajectories. With the exception of Korea and, arguably, the European colonization process, the institutional literature

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[1] CIA World Factbook [last checked January 29, 2025]

often fails to disentangle these two types of changes. This is primarily due to the limited observational windows, which typically span only a few years or, at most, a decade. As a result, temporary shocks and structural transformations—especially in the context of political and economic liberalization—are frequently treated as equivalent, largely because a credible counterfactual is unavailable.

The key advantage of our approach lies in its ability to document and differentiate these phenomena, thus offering an alternative exploratory framework. By addressing this distinction, we contribute to a deeper understanding of institutional changes and their role in shaping long-term economic success or failure (Morganti 2022, Lòpez-Gomez 2023).

Our contribution to the economic growth literature is twofold. First, we examine the impact of institutional shocks on long-term economic growth by analyzing the introduction of labor-managed socialism in former Yugoslavia. Focusing on Slovenia, we compare its growth trajectory with a robust donor pool comprising OECD and East Asian economies over the period 1870–2022. By leveraging the absence of economic and political liberalization following 1943, we estimate the long-term effects of labor-managed socialism on economic growth and development. Using the synthetic control method, we construct a counterfactual scenario to assess the hypothetical outcomes of sustained political and economic liberalization during this period (Billmeier and Nannicini, 2013).

In contrast to the Soviet economic model adopted across Central and Eastern Europe, the Yugoslav variant of self-managed, labor-based socialism introduced limited economic reforms without pursuing comprehensive political and economic liberalization. Our empirical findings reveal that this combination of institutional reforms yielded short- and medium-term GDP per capita growth but exacerbated a structural breakdown in long-term growth trajectories. Despite achieving political independence in the 1990s, this structural breakdown persisted and began to gradually diminish only after the EU Commission's Rescue and Policy Restructuring Package of 2015. This intervention provided the critical economic liberalization necessary to close Slovenia's growth gap with OECD economies, reducing the gap's magnitude and statistical significance. Our counterfactual estimates suggest that, in the hypothetical absence of labor-managed socialism, Slovenia's GDP per capita would have been

approximately 22% higher by the end of the study period in 2022. Contrary to prevailing claims in the literature, our evidence indicates that the Yugoslav model of socialism represents a mix of temporary upward deviation in the short run and structural breakdown in the long run.

Second, we extend our analysis by reversing the counterfactual scenario, asking how Slovenia's long-term growth trajectory would have evolved in the absence of political and economic liberalization in the 1990s, with a continuation of socialist-oriented economic policies. Comparing Slovenia with a donor pool of states maintaining uninterrupted socialist economic policies under state-led development, our results suggest that GDP per capita decline under such a scenario would have been approximately three times greater than observed. Furthermore, by the end of the study period, Slovenia's per capita GDP would have been around 62% below its actual level. These findings underscore the substantial long-term economic benefits of political and economic liberalization (Giavazzi and Tabellini, 2005; Acemoglu et al., 2019).

Our empirical analysis contributes to the ongoing scholarly debate on the long-term consequences of socialism for economic growth and development (Hayek, 1988; Kornai, 1992; Carnevali and Pedersen Ystehede, 2022). This debate has experienced a recent revival (Phillips and Rozworski, 2019; Niemitz, 2021; Bergh et al., 2024), coinciding with the growing popularity of socialism, particularly among younger generations in countries such as the United Kingdom, the United States, and beyond.[2]

The virtues of centralized decision-making and socialist planning in fostering growth and development outcomes have also been increasingly emphasized in both academic and policy discussions. Scholars have highlighted the achievements of socialist transformation in advancing virtuous policy goals, including improvements in health and education under socialist rule in Venezuela (Stiglitz, 2003, 2006). Broader critiques have underscored the human costs of capitalist development (Arrow, 1978; Sen, 1999) and the limitations of market-based solutions in addressing critical challenges such as rising inequality, climate change, and the pitfalls of globalization (Banerjee and Duflo, 2019).

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[2] See: Jason Clemens and Steven Globerman, New poll finds strong support for socialism in the U.K. Commentary, Fraser Institute: https://www.fraserinstitute.org/commentary/new-poll-finds-strong-support-socialism-uk [last checked January 27, 2025].

Against this backdrop, our analysis offers policy-relevant evidence on the long-term economic effects of labor-managed socialism. By providing a rigorous empirical assessment, we contribute to a deeper understanding of the balance between the short-term gains and long-term structural consequences of socialist institutions, offering valuable insights into the broader debate on the trade-offs between market-based and centrally planned economic systems.

The article proceeds as follows. Section 2 builds the conceptual framework and presents the historical and institutional background behind labor-managed socialism. Section 3 discusses the identification strategy. Section 4 presents the results and the associated robustness checks. Section 5 concludes.

2. Conceptual Framework

2.1. Related Literature

In their classical survey of the literature, Acemoglu et al (2005) summarized the most important ideas. Institutions shape economic features; therefore, they matter for growth. Institutions constrain economic actors, produce (positive or negative) incentives (from investment decisions to acquisition of human capital and technology), and influence the organization of production at micro and macroeconomic levels.

Consequently, institutions are important determinants for economic outcomes. The authors point out that a vast economic literature analyzes the extent to which institutions help or hurt these economic outcomes. Variables such as distribution of political power (Przeworski et. al. 1995, Alesina et. al. 1996), social organization (Helliwell and Putnam, 1997; Knack and Keefer, 1997b), legal institutions and enforcement of property rights (Levine, 1998; Clague et. al., 1999; Henisz, 2000), constraints on the executive (Keefer and Knack 1997a), likelihood of capture and rent seeking (Rajan 2009) fare prominently in this particular stream of literature. In a related article (Acemoglu and Johnson 2005), the authors suggested that there are two kinds of institutions, (i) property rights institutions, limiting expropriation by the state, and (ii) contracting institutions, facilitating exchange between private parties. The authors concluded that property rights institutions prevail in the long run, they shape growth, whereas contracting institutions seem to be less important, because individuals can find alternative ways to ineffective contracting institutions.

A new theme has emerged from this vast literature on institutions and growth – institutional reform (King and Levine, 1993; Posner, 1998; Chong and Calderon, 2000). If certain institutions promote economic growth, it is only natural that economists should discuss how less successful economies should adjust and change their institutions in order to narrow the per capita GDP gap (or other relevant economic indicators) and make their economies more successful. Nevertheless, there are important considerations. If institutions are not shaped by outside shocks, not only are they slow to change, but the necessary redistribution of political power is challenging. Alternatively, institutional reform could be driven by external shocks. However, such mechanism requires a confluence of factors, such as beliefs, leadership, opportunity, that makes a sustained growth episode difficult to achieve. For example, Alston (2017) described two cases – United States 1783-1789 and Brazil 1985-2015. Yet the results seem hardly deterministic, and chance seems to play a significant role. Alston et al (2018) added two other examples, Argentina 1912-1955 (from checks and balances to populism) and Ecuador 1998-2016 (from neoliberal to inclusive politics), that illustrate how external shocks seem better at determining institutional failure rather than actual successes.

Natural experiments to produce an exogenous source of variation in economic growth are rare. It is difficult to compare the same economy with and without institutional changes to assess the extent to which these shocks made a significant difference in long-run growth. Acemoglu et al (2005) discussed two intriguing examples. One example is the already mentioned Korea. A second example is European colonies. They were not the same economies, but similar areas of the world subject to different patterns of European colonization. The literature seems to uncover a multitude of factors that could explain current successes and failures in long-run growth - "latitude-specific" technology (Parente and Prescott, 1994), extractive institutions determined by mortality rates of settlers (Acemoglu et. al,. 2001), and legal transplants (Berkowitz et. al., 2003) among several others.

a.   Models of Institutional Change

Following (Spruk and Garoupa 2022), we distinguish three distinct models of institutional change:

Gradual Change:

gradual change refers to a process in which no major event initiates institutional reform; rather, a series of continuous, incremental changes collectively reinforce long-run growth trajectories. In an ideal scenario, a fully democratic regime achieves institutional change through negotiation and incremental reform, facilitating sustainable growth. For example, constitutional amendments—rather than disruptive constitutional shocks—serve as instruments of gradual change. While such amendments may mark significant milestones, they do not result in observable deviations from the long-term growth trajectory, even in the short run.

Temporary Change:

temporary change occurs when a major event imposes institutional reforms that produce short-term effects on growth, either boosting or reducing it, depending on the nature of the shock. However, these changes do not alter the long-term growth trajectory, which eventually reverts to its original path once the short-term effects dissipate.

Structural Change:

structural change arises when a major event fundamentally alters the long-term growth trajectory, leading to either a sustained acceleration or deceleration in growth, depending on the nature of institutional shock. Institutional breakdowns, such as revolutions or transformative political upheavals, are prime examples of events capable of inducing structural change.

While the existing literature draws a clear distinction between gradual change and the other two forms of institutional change, it often conflates temporary and structural change. This confusion stems from the fact that, within the typical timeframe of short-run analysis (e.g., a decade), both temporary and structural changes may appear similar. To address this, our approach introduces a rigorous empirical framework to distinguish between these three models of institutional change.

Each of these models can be tested empirically:

Gradual Change:

if an economy undergoes only gradual change, the effects of any plausible institutional shock on growth trajectories should be negligible. Over time, the long-term growth trajectory should remain unchanged but maintain a consistent positive slope.

Temporary Change:

in the case of temporary change, institutional shocks may cause significant short-term deviations in growth paths. However, these deviations will not affect long-term outcomes, and the economy will eventually return to its pre-shock growth trajectory.

Structural Change:

if structural change occurs, the growth trajectory will diverge significantly from the counterfactual scenario constructed using synthetic control methods. This divergence reflects a fundamental alteration in the long-term growth path, whether positive or negative.

By applying this empirical framework, we provide a robust method to disentangle and analyze the distinct impacts of gradual, temporary, and structural institutional changes on economic growth.

2.3. Historical Background

Yugoslavia's labor-managed socialism remains a fascinating yet cautionary tale of ideological ambition and economic reality. While initially celebrated as a viable alternative to Soviet-style centralization, its internal contradictions, inefficiencies, and inability to adapt to global economic pressures ultimately led to its downfall. The lessons from Yugoslavia's experiment underscore the challenges of balancing socialist ideals with economic sustainability and highlight the risks of gradualist transitions in post-socialist economies.

During the Cold War, the Socialist Federative Republic of Yugoslavia presented itself as a viable alternative to the Soviet model of socialism. Grounded in workplace self-management, the Yugoslav system ostensibly granted workers the right to exercise democratic control over enterprise operations. This distinct Yugoslav approach to socialism attracted global admiration. In the capitalist West, democratic socialists viewed it as a more "human" form of socialism. However, by the early 1980s, the country had

entered a severe crisis. The labor-managed socialism once celebrated in the West deteriorated rapidly, ultimately collapsing amid hyperinflation and crippling foreign debt. This economic collapse exacerbated nationalist tensions, unraveling the social fabric and culminating in the brutal civil wars of the 1990s in Croatia, Bosnia and Herzegovina, Macedonia, and Kosovo, marked by ethnic cleansing and genocide.

However, Yugoslavia's systemic issues did not originate solely from the Cold War's conclusion. The seeds of its collapse were sown much earlier, as the labor-managed system inadvertently created conditions that undermined its viability. While a detailed account of the Yugoslav model exceeds the scope of this paper (Prinčič, 1979, Robertson, 2017), key features merit discussion to contextualize its rise and fall.

Recent scholarship challenges the idealized rhetoric of party theorists, suggesting that the introduction of self-management in Yugoslavia was less about empowering workers and more about rationalizing and disciplining them (Borak, 2002). Unlike the Soviet Union, which relied on administrative commands and mass mobilizations to achieve economic policy goals, Yugoslav communists sought less coercive methods to implement their policies. Workers' councils were established to decentralize economic control, transferring decision-making to the enterprise level (Kardelj, 1979). These councils tasked workers with responsibilities such as bookkeeping, boosting productivity, enforcing wage restraints, and making decisions about layoffs (Kardelj, 1949). In return, workers were promised higher wages supplemented by profit-sharing mechanisms.

While this approach aimed to incentivize workers by tying their financial well-being to their enterprise's success, it also compelled them to operate in a competitive market where efficiency and productivity were paramount. Yet, in practice, the system produced contradictory results. Despite claims of establishing a competitive market, much of the Yugoslav economy remained centrally planned and tightly controlled by the communist party, with the "social ownership" of productive assets dominating the landscape.

Labor self-management did open Yugoslavia to the global economy. Western aid and investments flowed in, and some Yugoslav enterprises began trading internationally. However, these reforms also undermined the system's economic promises (Robertson, 2017). Fearful of alienating their base, communist leaders rejected Soviet-style

industrialization in favor of gradual, stabilized growth. This approach necessitated restricting the influx of workers into factories and focusing instead on enhancing the efficiency of the existing labor force. The state tightly controlled prices, dictated investment priorities, set production targets for key industrial sectors, allocated resources from wealthier republics to underdeveloped regions, and maintained centralized control over the majority of investment resources through five-year economic plans (Gorupić, 1962; Ward, 1968; Sirc, 1979; Vejzagić, 2023).

Ultimately, the labor self-management system, combined with the "social ownership" model—where no one effectively owned anything, leading to pervasive "tragedy of the commons" issues—and the inefficiencies of central planning, culminated in economic collapse. Hyperinflation and the erosion of the social fabric ensued (Horvat, 1985, 1971; Sirotković, 1990). By the early 1990s, the labor self-management experiment had completely unraveled, paving the way for a series of devastating civil wars that fractured the region along ethnic lines, culminating in ethnic cleansing and genocide.

Despite the inherent inefficiencies and eventual collapse of Yugoslavia's labor self-management experiment, some Western economists expressed notable admiration for the Yugoslav model of socialism. This admiration may have stemmed from misconceptions about how the system operated in practice (Bergson, 1967, 1987, 1992; Ward, 1976; Gapinski et al., 1989). For instance, Marschak (1968) suggested that the Yugoslav system, though evolving slowly, appeared to be acquiring key characteristics of established market economies. He highlighted enterprise decision-making that responded to competitive pressures and aimed for satisfactory—if not maximum—profits for a given workforce, as well as investment decisions guided by profitability criteria.

Furthermore, Strauss (1980) also identified a theoretical compatibility between socialism and market principles, citing the Yugoslav Constitution and the Associated Labor Act as evidence supporting Yugoslavia's unique interpretation of socialism. Furubotn (1971) argued that the structure of the Yugoslav firm was theoretically consistent with a wide range of consumption-investment solutions. However, he acknowledged significant limitations: workers' narrow self-interest often dictated investment decisions. He noted that unless decision-makers were entirely oblivious to

broader economic conditions, there could be scenarios where optimal long-term consumption streams required current investments in non-owned assets. Yet, Furubotn pointed out that the political dynamics of the system imposed unique constraints on wealth-maximizing activities.

To fill the void in the literature, Sapir (1980; 1986) provided a critical analysis of the post-war Yugoslav economy, identifying three major trends. First, the growth of manufacturing and industrial output slowed dramatically after the 1965 economic reforms. Second, this deceleration coincided with a trend toward capital deepening, driven by high rates of capital accumulation and sluggish labor growth. Third, Sapir attributed these outcomes to the policy of maximizing income per worker, which workers increasingly pursued following the 1965 reforms. These findings underscore the complexities and contradictions of Yugoslavia's economic model, which—despite its theoretical appeal to some Western observers—ultimately struggled to sustain its promises in practice.

On the other hand, numerous scholars have been more critical of the labor self-management socialist system, highlighting its significant deficiencies (Sirc, 1979; Bajt, 1986). Bajt (1968; 1993) underscored the near-total suppression of private ownership and property rights in socialist economies as a key factor undermining economic performance and severely impacting system efficiency. Estrin and Uvalic (2008) argued that socialist features remained dominant in Yugoslavia's economy, stifling many elements of economic democracy. Their analysis highlights that the most notable contributions of the labor-management literature on Yugoslavia were theoretical, focusing on supply responses of worker-controlled firms, decentralized resource allocation, and the incentive, organizational, and efficiency challenges inherent in labor-management systems.

More recently, Kukić (2018) examined the socialist "Golden Age" of economic growth, noting that while total factor productivity became increasingly important in sustaining growth, distorted labor incentives emerged as a significant constraint by the mid-1960s. These distorted incentives, driven by the increased devolution of power to labor-managed firms, help explain the economic slowdown during the 1980s.

Finally, Miladinović (2024) provided novel insights by analyzing economic performance across 498 Yugoslav municipalities during the census years 1961, 1971, and

1981. His findings reveal that higher ethnic diversity, measured using an ethnic fractionalization index, was associated with slower economic growth. While socialist ethnic inclusivity policies, known as a popular slogan Brotherhood and Unity, may have generated some economic benefits, Miladinović suggests they were insufficient to offset the economic disadvantages of ethnic diversity, particularly under a dictatorship and in a non-market-driven economy.

The gradualist approach to economic transition, rooted in Yugoslav-era policies, became the developmental model for Slovenia after its independence in 1991. This strategy was championed by the country's first Minister of Economic Affairs, Professor Jože Mencinger (1995), who advocated for extensive state ownership of the Slovenian economy. However, this approach ultimately fostered a system of crony capitalism marked by nepotism and adverse selection issues. Slovenia exemplifies the gradualist approach to transition, with Mencinger (2003) even famously arguing that Slovenia had no need for direct foreign investment. As a result, strategic foreign investors were largely ignored or actively deterred until the enactment of the EU Commission's Rescue and Policy Restructuring Package in 2015.

While the gradualist approach was widely regarded in Slovenia as the optimal solution, its long-term consequences reveal significant drawbacks. Rojec et al. (2004) argued that while the approach yielded positive results in the initial phases, it ultimately slowed the pace of reforms and delayed critical steps, leading to deteriorating economic trends. Specifically, they and Šušteršič (2009) identified several key issues: (i) a gradual decline in export competitiveness and delays in restructuring Slovenia's manufacturing sector, which hindered real economic convergence; and (ii) persistent inflation, driven by slow restructuring in tradable sectors and a lack of reforms in non-tradables, which became a major obstacle to Slovenia's nominal convergence. Rojec et al. (2004) and Šušteršič (2009) further argued that Slovenia's EU accession provided a much-needed exogenous shock, creating pressure on economic policy to accelerate reforms. They emphasize that economic policymakers should leverage such external pressures to complete the structural reforms necessary for sustainable growth and convergence with more competitive economies.

3. Identification Strategy

Our identification strategy for assessing the effects of labor-managed socialism on economic growth is grounded in the synthetic control method for comparative case studies, a well-established approach in the literature (Abadie, 2021; Gilchrist et. al., 2023). This single-treatment framework assumes a finite set of countries, with Slovenia as a unique case subjected to the absence of economic and political liberalization. This institutional shock serves as the treatment, while OECD and East Asian countries constitute the donor pool for evaluating the long-term effects of bypassing such liberalization after World War II. The central assumption underlying our analysis is that the absence of liberalization does not influence pre-shock per capita GDP dynamics, nor does it interfere with the characteristics of the donor pool. This allows us to construct a counterfactual scenario by comparing Slovenia's observed per capita GDP trajectory with two synthetic counterparts, enabling us to isolate the long-term effects of missing both full liberalization and political liberalization alone.

Since the synthetic control method serves as the backbone of our analytical approach, it is crucial to note that the synthetic Slovenia is created by assigning weights to countries in the donor pool based on their attributes, which closely match Slovenia's pre-shock growth and development characteristics. Our analysis prioritizes minimizing the distance between Slovenia and its synthetic counterpart in terms of pre-shock covariates and benchmark per capita GDP levels. Assuming a plausible synthesis of Slovenia's pre-shock economic growth trajectory via a dynamic latent factor model, we estimate both the short-term and long-term deviations in per capita GDP resulting from the absence of economic and political liberalization.

To frame the analysis, we draw on three potential effect regimes associated with institutional shocks: (i) gradual institutional change with no significant deviation from long-term growth, (ii) temporary deviations followed by recovery, and (iii) permanent deviations signaling institutional breakdown. Our synthetic control setup allows us to empirically identify the direction and magnitude of economic growth effects stemming from the absence of liberalization. This three-regime classification enables us to disentangle short-term and long-term impacts while accounting for potential non-linearities and adapting the donor pool composition to ensure the robustness of our counterfactual estimates.

Finally, inference regarding the impact of institutional shocks involves comparing Slovenia's post-shock per capita GDP gap with placebo effects derived from unaffected countries during the postwar period. We employ a non-parametric testing approach to evaluate the statistical significance of observed deviations over time (Cavallo et. al., 2013). To enhance robustness, adjustments to placebo effects account for the quality of pre-shock matches, mitigating biases in the estimation process. These adjustments address empirical challenges in counterfactual analysis, such as unobserved heterogeneity and potential biases in the composition of synthetic control groups, thereby ensuring reliable estimates of the economic consequences of labor-managed socialism.

4. Data and Samples

We perform our analyses of the long-term effect of the Yugoslav socialism in two stages. In the first stage, the long-term per capita GDP trajectory of Slovenia is compared to the sample of OECD countries that implemented both economic and political liberalization in the post-intervention period. Based on our theoretical framework of institutional shocks, such analysis can potentially uncover whether the Yugoslav socialism has promulgated either to a temporary deviation of the growth trajectory from its long-run equilibrium or a more permanent derailment of the economic growth trajectory. To this end, we assemble a dataset of 25 countries for the period 1870-2023 using recently updated GDP per capita estimates for the period 1870-2022 (Bolt and Van Zanden, 2023) together with the corresponding estimates of real GDP for Slovenia for the same period (Spruk, 2018). As our outcome of variable, real per capita GDP is expressed in 2011 constant prices and adjusted for differences in purchasing power parity (PPP) using Geary-Khamis exchange rate conversion to international dollar. Based on the previous work, we build our first country-level donor pool where economic and political liberalization unfolded after the end of World War II by restricting our control sample to the OECD member states and recently identified economic liberalization episodes (Billmeier and Nannicini, 2013) based on previous established liberalization criteria (Sachs and Warner, 1995; Rodríguez and Rodrik, 2000; Wacziarg and Welsh, 2008) concerning both trade and investment liberalization.

Compared to the previous literature, our criteria of economic liberalization do not only hinge on trade openness but also encompassed openness to foreign direct investment which improves the compactivity of the singular liberalization measures. The normative criterion for political liberalization is based on the comprehensive indicator of free political contestation and participation where political leaders are chosen by free and fair election under universal suffrage. Therefore, we capture the political liberalization by a binary indicator of democracy proposed by Boix et. al. (2003) which has been widely used in cross-country growth analyses of the political liberalization (Acemoglu et. al., 2019). Under such normative criteria, the comparison between treatment and control sample yields the long-term effect of the interaction between economic and political liberalization that has been proposed by Giavazzi and Tabellini (2005) which yields a strongly balanced panel of 24 countries[3] containing 3,825 country-year paired observations for the period 1870-2022 of our investigation from which the counterfactual representation of the long-term economic growth trajectory in the hypothetical absence of the Yugoslav labor-managed socialism can be estimated and discussed empirically.

In our second quasi-experiment, we isolate the long-term growth effect of Yugoslav socialism from the full liberalization episode and estimate the effect of the missing political liberalization only. To this end, we restrict our donor pool to the sample of countries that have become democracies under free and fair regular elections and universal suffrage in the period 1945-2022. In comparison to the scenario of economic and political liberalization in our first experiment, the second experiment can potentially uncover the long-term effects of missing democratization after the consolidation of the socialist regime in 1943. Since economic liberalization in our first sample is detectable in several countries that had not undergone the political liberalization until late 1970s and early 1980s such as Greece, Portugal, South Korea, Spain and Turkey, we restrict our donor pool to a control sample of 19 countries[4] that completed a full-fledged democratization before 1950. Under such criteria, the

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[3] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, Türkiye, United Kingdom, and United States.

[4] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States.

counterfactual realization of per capita GDP highlights the trajectory of economic growth under the scenario of full-fledged democratization after the end of World War II whilst permitting varying intensity of economic liberalization in the post-intervention period. This yields a strongly balanced panel of 2,907 country-year paired observations in the period 1870-2022.

4.1.   Choice of predictors

Our set of predictors used to match Slovenia on pre-socialism growth and development characteristics and estimate counterfactual growth scenarios consist of four different classes of variables. First, set of initial persistence covariates comprises the level of per capita GDP in benchmark years and the year prior to the institutional shock following Barro (1991) and Barro and Sala-i-Martin (2004) conditional convergence framework. The full set of initial persistence covariates comprises the level of per capita GDP in the six specific benchmark years between 1870 and the beginning of World War II as well as the average change in per capita GDP in the pre-World War I and interwar period (1918-1939).

Second, the data on physical geographic predictors is from Nunn and Puga (2012). The set of geography-related covariates comprises non-binary variables indicating soil quality, latitude coordinate, size of the area (in km2), and the centroid-based distance from the coastline. These indicators allow us to control for the potential time-invariant effects of physical geography on growth and development. Third, the institutional covariates consist of the variables measuring the quality and inclusiveness of political institutions in the long-term perspective. To this end, the data on the structure of political institutions comprises V-DEM indicators of democracy from Coppedge et. al. (2016) to capture the effect of political institutions on long-run growth and development given the critique of traditionally used and widely popular Polity IV indices (Vreeland, 2008). Specifically, we consider two high-level democracy indicators as a proxy for the level of political institutions. First, electoral democracy index captures the degree to which the electoral principle of democracy is achieved through electoral competition in the presence of extensive suffrage. And second, liberal democracy index captures the level of protection of individual and minority rights against the tyranny of the state considering constitutionally protected civil liberties, strong rule of law,

independent judiciary and effective checks and balances on the exercise of executive power. Following Acemoglu and Robinson (2006), the values of institutional covariates are set in the benchmark year for which we selected the last year before World War I (i.e. 1913) to mitigate potential lack of institutional and political stability in the interwar years that could compromise salience of the estimated counterfactual. And lastly, the data on the country-level legal history is from Chang et. al. (2020).

We proxy the country-level legal history by distinguishing between different legal families broadly aligned between the civil law and common law tradition. We match the per capita GDP data for the period 1820-2015 with the full set of binary variables indicating the legal family to which the national legal systems belong. For the sake of brevity, we distinguish between French and German legal family to which Slovenia belongs in the period 1870-1943 and afterwards to ensure that the counterfactual realization of economic growth trajectory does not conflate a misleading on unreasonable comparison.

4.2. Pre-Socialism Outcome and Covariance Balance

Table 1 compares the imbalance in per capita GDP and its auxiliary covariates during the pre-intervention period between Slovenia and its synthetic peer. The comparison clearly suggests that the synthetic control estimators provide an excellent fit in the pre-intervention period, where the synthetic control groups offer a reasonable and plausible characterization of Slovenia's economic growth trajectory prior to the consolidation of socialist economic and political institutions. Specifically, the root mean square prediction error in the pre-intervention period ranges between 153 and 168 international dollars across both variants of the quasi-experiments involving the missing liberalization. This error represents less than 1 percent of the observed pre-intervention level of per capita GDP, reinforcing the high-quality fit and indicating no imbalance that would compromise the validity or feasibility of the comparison. The very low degree of imbalance further suggests that Slovenia's pre-war economic growth dynamics did not exhibit any significantly distinct upward or downward trajectory prior to the transition to socialism.

Against this backdrop, the synthetic version of Slovenia closely resembles its actual counterpart, not only in terms of per capita GDP levels and growth dynamics but

also in terms of physical geographic characteristics. For instance, the synthetic Slovenia shares similar latitude, soil quality, and accessibility to coastlines with the actual Slovenia, without any loss of generality. As an example, the synthetic version mirrors the same land area size and exhibits very similar distance to the coast and temperate climate as the real Slovenia. Furthermore, the population size and density of both the real and synthetic Slovenia are remarkably similar across both quasi-experiments involving the missing liberalization.

Additionally, the level of liberal and electoral democracy before World War I in Slovenia and its synthetic counterpart is closely aligned, further reinforcing the robustness and feasibility of the comparison in approximating the long-term effects of labor-managed socialism on economic growth. In the first experiment, which examines the absence of both economic and political liberalization, around 35 percent of the synthetic control group originates from countries within the French-German legal family. Meanwhile, in the second experiment, the entire synthetic control group is composed of countries from the civil-law legal family.

Table 1: Pre-Socialism Covariate Imbalance

	Economic and Political Liberalization			Political Liberalization	
	Treated	Synthetic		Treated	Synthetic
RMSE	168.93		RMSE	153.40	
R2	0.89		R2	0.91	
Panel A: Pre-Socialism Per Capita GDP					
GDP per capita (1870)	1242	1204	GDP per capita (1870)	1242	1243
GDP per capita (1900)	1740	1774	GDP per capita (1900)	1740	1720
GDP per capita (1913)	2148	2074	GDP per capita (1913)	2148	2088
GDP per capita (1920)	2329	2155	GDP per capita (1920)	2329	2090
GDP per capita (1930)	2711	2713	GDP per capita (1930)	2711	2550
GDP per capita (1939)	2952	3035	GDP per capita (1935)	2952	3165
Intra-WW2 GDP per capita (1940-1944)	2612	2842	Intra-WW2 GDP per capita (1940-1944)	2612	2867
Δ GDP per capita (1870-1913)	0.01	0.01	Δ GDP per capita (1870-1913)	0.01	0.01
Δ GDP per capita (1918-1939)	0.03	0.02	Δ GDP per capita (1918-1939)	0.03	0.02
Panel B: Physical geography covariates					
Latitude	46.11	30.73	Latitude	46.11	41.13
Soil quality	67.60	67.44	Soil quality	67.60	48.98
Distance to coast	0.09	0.08	Distance to coast	0.09	0.07
Land area (log)	9.91	9.91	Land area (log)	9.91	12.73
Panel C: Demographic covariates					
Population density (log)	4.14	4.16	Population density (log)	4.14	4.74
Population size (log)	14.03	14.02	Population size (log)	14.03	17.46
Panel D: Institutional quality covariates					
Pre-WW1 V-DEM electoral democracy (1913)	0.27	0.26	Pre-WW1 V-DEM electoral democracy (1913)	0.27	0.27
Pre-WW1 V-DEM liberal democracy (1913)	0.24	0.28	Pre-WW1 V-DEM liberal democracy (1913)	0.24	0.31
Civil law	1	0.35	Civil law	1	1.00

Figure 1 presents the pre-socialism per capita GDP benchmarks and covariate weights during the training stage, highlighting the relative importance of each pre-intervention outcome and auxiliary covariate in explaining the variance in economic growth between Slovenia and the donor pool. The results indicate a reasonably strong degree of covariate balance in the ex-post selection of country-specific weights used to estimate the counterfactual economic growth trajectory without labor-managed socialism.

In the first quasi-experiment, the size of the land area and demographic variables carry the highest relative weight in minimizing the predictive discrepancy between Slovenia and its economic liberalization-based donor pool. Pre-intervention benchmark values of per capita GDP emerge as the second most important class of predictors in reducing predictive discrepancies. Conversely, in the second quasi-experiment, which focuses on the absence of political liberalization, pre-1943 per capita GDP values appear to be the most critical set of predictors. For example, the relative covariate-specific weight of per capita GDP during the interwar period is approximately 21 percent, while per capita GDP levels in 1900 account for around 10 percent of the pre-intervention variance between Slovenia and its donor pool. In contrast to the first experiment, demographic variables demonstrate relatively weaker explanatory power during the training stage.

The differences in covariate- and outcome-specific weights underscore the importance of employing a compact yet diverse set of variables to explain pre-intervention variance. However, this raises a standard caveat regarding the trade-off between overfitting and omitted variable bias. For instance, a smaller set of predictors can reduce the risk of overfitting the pre-treatment outcome trajectory but may inflate omitted variable bias. Conversely, a larger set of predictors can mitigate omitted variable bias while increasing the risk of overfitting the latent factor model.

In our experiments, the frequency distribution of covariate- and outcome-specific weights appears balanced, with no covariate receiving a zero weight that would render it redundant. Additionally, the full set of predictors explains approximately 89 percent of cross-country variation in per capita GDP in the first experiment and about 91 percent in the second experiment. These results indicate that neither overfitting nor omitted variable bias poses a significant threat to the validity or feasibility of our identification strategy during the training stage.

Figure 1: Optimal pre-treatment outcome and covariate weights

(a) Economic and political liberalization

	V weight
log land area	0.3205
log population density	0.1833
log population size	0.1623
GDP per capita (1930)	0.0661
GDP per capita (1913)	0.0597
GDP per capita (1939)	0.0531
GDP per capita (1900)	0.0447
GDP per capita (1870)	0.0279
GDP per capita, 1940-1943	0.0250
GDP per capita (1920)	0.0203
Electoral democracy (1913)	0.0177
Liberal democracy (1913)	0.0077
Distance to coast	0.0052
GDP growth, 1918-1939	0.0019
GDP growth, 1870-1913	0.0016
Latitude	0.0014
Civil law	0.0012
Soil quality	0.0002

(b) Political liberalization

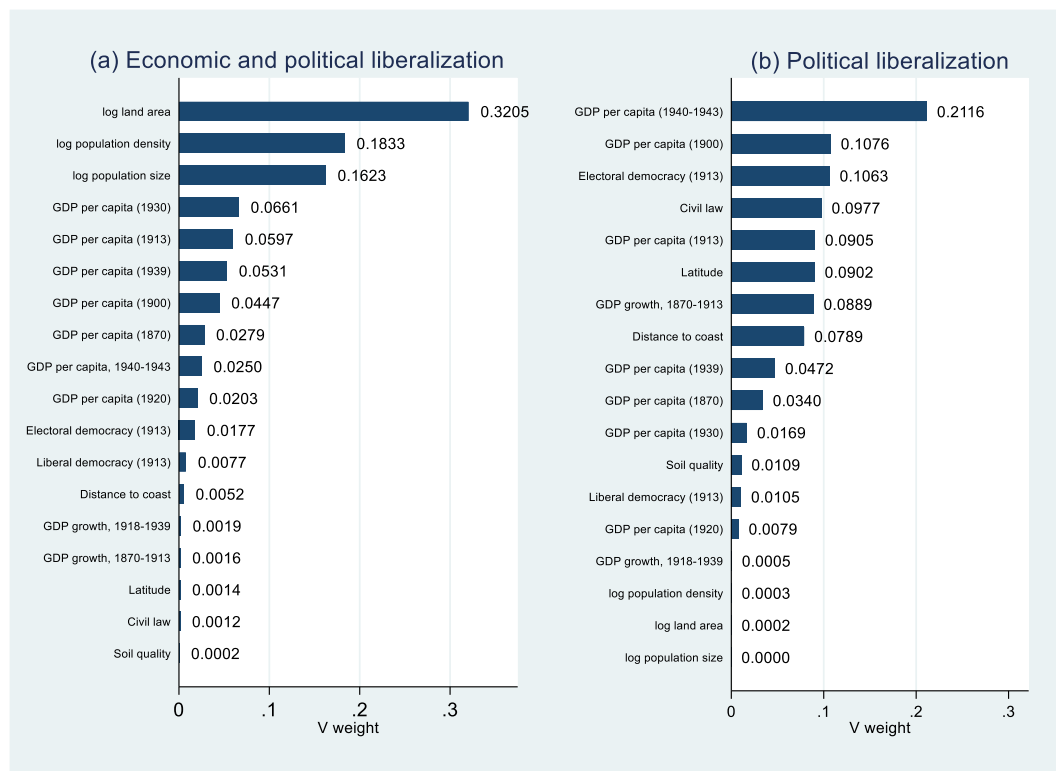|	V weight
GDP per capita (1940-1943)	0.2116
GDP per capita (1900)	0.1076
Electoral democracy (1913)	0.1063
Civil law	0.0977
GDP per capita (1913)	0.0905
Latitude	0.0902
GDP growth, 1870-1913	0.0889
Distance to coast	0.0789
GDP per capita (1939)	0.0472
GDP per capita (1870)	0.0340
GDP per capita (1930)	0.0169
Soil quality	0.0109
Liberal democracy (1913)	0.0105
GDP per capita (1920)	0.0079
GDP growth, 1918-1939	0.0005
log population density	0.0003
log land area	0.0002
log population size	0.0000

Figure 2 presents the country-specific weights during the validation stage that best replicate Slovenia's economic growth trajectory prior to its transition toward socialism. These weights are derived from the convex minimization of discrepancies between Slovenia and its donor pool in the pre-intervention period, capturing the degree of similarity in economic growth trajectories and their implicit attributes during the pre-socialism period.

Panel (a) reports the convex combination of country-specific attributes that best reproduce Slovenia's pre-1943 economic growth trajectory without exposure to the political and economic transition toward labor-managed socialism. For example, Slovenia's pre-intervention per capita GDP trajectory is most accurately reconstructed through a convex combination of implied attributes from Hong Kong (50%), Greece (20%), Finland (7%), Switzerland (6%), New Zealand (4%), the Netherlands (4%), Turkey (3%), Austria (2%), Norway (2%), and Canada (2%). Since all countries in the synthetic control group underwent large-scale economic and subsequent political liberalization—and none transitioned toward socialism—the resulting per capita GDP gap can be interpreted as a direct indicator of the long-term effects of labor-managed socialism, rather than the impacts of unrelated policies or distinctive shocks.

Panel (b), on the other hand, reports the composition of the synthetic control group for the second experiment. This panel represents the hypothetical scenario in which Slovenia experienced political liberalization following the capitulation of Italy and the defeat of Nazi Germany, instead of transitioning toward socialism. Unlike the first experiment, this scenario does not assume a specific path or direction for economic liberalization. Under this scenario, the synthetic version of Slovenia is composed of growth and development attributes from Italy (41%), France (12%), Austria (4%), and Japan (43%). Notably, this composition implies that the synthetic version of Slovenia is made up of 57 percent Western European attributes and 43 percent Japanese attributes.

With the exception of France, the countries in the synthetic control group were on the losing side of World War II, suggesting a plausible political development scenario without the rise of the communist insurgency, which led to the civil war in 1943 and the subsequent violent power seizure in 1945. Furthermore, the countries in the synthetic control group all underwent political liberalization in 1945, either through domestic institutional reforms (e.g., France) or through externally imposed institutions by Allied forces (e.g., the United Kingdom and the United States). Consequently, the post-1943 gap between Slovenia and its synthetic control group inherently reflects the long-term effects of the missing political liberalization.

Figure 2: Full composition of Slovenia's synthetic control groups.
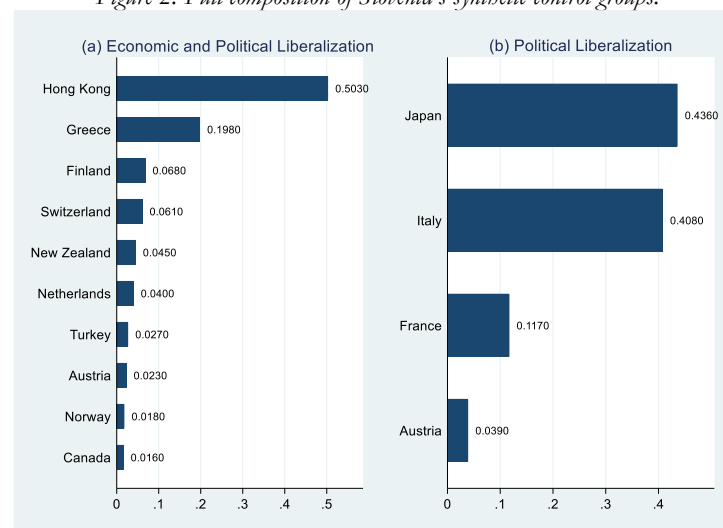
5. Results

5.1. Baseline results

Figure 3 presents the baseline results on the long-term effects of missing political and economic liberalization on economic growth. These results are reported in two stages.

In the first stage, Panel (a) examines the long-term effect of missing economic and political liberalization. Under this scenario, the counterfactual growth trajectory reflects the most plausible per capita GDP dynamics in the absence of labor-managed socialism, assuming economic liberalization followed by political liberalization (Giavazzi and Tabellini, 2005). The evidence strongly suggests that labor-managed socialism had a negative long-term effect on economic growth. By the end of the sample period, Slovenia's per capita GDP was approximately 22 percent lower than that of its synthetic control group.

However, the trajectory of this effect evolved over time. In the early years of labor-managed socialism, Slovenia's per capita GDP fell sharply behind its synthetic peer, with a gap of 74 percent in 1948. Following Yugoslavia's split from the Soviet Union and its limited economic liberalization—along with normalized relations with the United States and Western Europe—Slovenia's per capita GDP rebounded rapidly, achieving parity with its synthetic counterpart by the early 1970s.

If labor-managed socialism had caused only a temporary negative deviation in the growth trajectory, Slovenia's per capita GDP would have continued to move in tandem with its synthetic counterpart over the long term. However, the absence of economic liberalization in the 1980s, shortly after the convergence with the synthetic control group, derailed Slovenia's growth trajectory. By 1992, Slovenia's per capita GDP lagged behind its synthetic peer by approximately 52%. Despite gaining political independence in 1991 and rapidly integrating into the European Union (EU) and the Organization for Economic Cooperation and Development (OECD), the end-of-sample gap between Slovenia and its synthetic counterpart persisted, remaining at approximately 18 percent in 2022. Thus, our comparative analysis indicates that while labor-managed socialism initially caused a temporary deviation in Slovenia's growth trajectory, it ultimately introduced structural long-term economic challenges.

Panel (b) examines the long-term effect of missing political liberalization by comparing Slovenia's per capita GDP trajectory with that of a donor pool consisting of uninterrupted democracies (Boix et al., 2003). Unlike the combined scenario of missing economic and political liberalization, where evidence points to temporary deviations followed by structural breakdowns, this analysis suggests that the absence of political liberalization resulted in a prolonged deviation from the long-run equilibrium of economic growth.

In the early years of socialism, Slovenia's per capita GDP was approximately 52 percent lower than the synthetic counterfactual in 1948. Throughout the postwar period, the GDP gap narrowed significantly. After limited economic liberalization in 1953, the gap decreased from 34 percent to just 5 percent by 1980. However, the violent disintegration of Yugoslavia in the late 1980s, combined with the slow pace of economic and institutional reforms in the post-independence period, caused the GDP gap to widen again—from 8% in 1980 to 62 percent in 1992.

Unlike the scenario of missing economic liberalization, Slovenia eventually achieved complete parity with its synthetic counterpart under the scenario of sustained political liberalization. This parity was reached in the aftermath of the COVID-19 pandemic, and by the present day, Slovenia's per capita GDP is approximately 8% higher than that of the synthetic control group.

These findings align with the conventional narrative that political liberalization has a positive and beneficial long-term effect on economic growth (Acemoglu et al., 2019). However, they also reveal that political liberalization alone, without deep and comprehensive economic reforms, results in a less dynamic growth trajectory. For instance, the average per capita GDP growth rate under the counterfactual scenario of missing political liberalization was 2.5 percent, compared to 2.8 percent in the scenario involving both economic and political liberalization.

Thus, in the post-independence period, the combination of economic reforms and rapid integration into the EU and OECD unleashed growth dynamics that enabled Slovenia to converge with—and eventually surpass—its synthetic counterpart. Notably, the synthetic peer was composed of 60 percent Western European democracies (Italy, France, Austria) and 40 percent East Asian attributes (Japan).

Figure 3: Long-term effect of missing economic and political liberalization on economic growth in Slovenia, 1870-2022
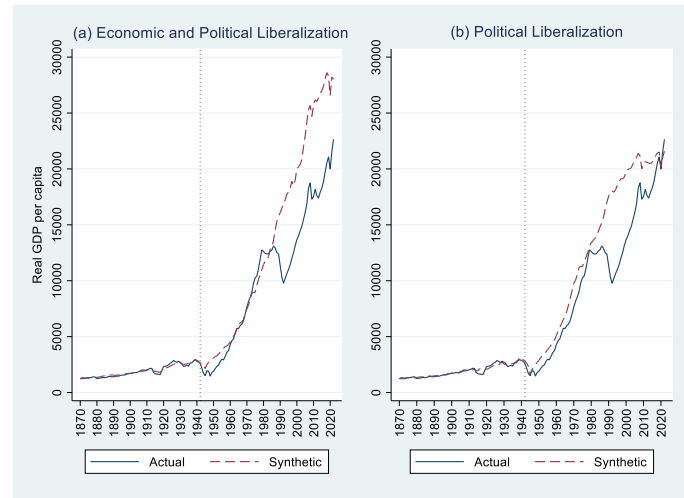
Our findings align closely with the predictions of Acemoglu and Robinson (2006). Specifically, as government policies and institutions shape the incentives for productive behavior and directly influence the trajectory of growth and development, our results reveal that postwar political and economic elites systematically blocked long-term institutional and technological transformation.

The process of innovation and creative destruction inherently threatens the rents and advantages enjoyed by incumbent elites. In the context of postwar Yugoslavia, the blockade of technological transformation and rapid economic growth by the ruling elites can be attributed to the political replacement effect, whereby the fear of losing power incentivized elites to obstruct a dynamic development trajectory. Without political competition—absent until the first multi-party elections in 1990—the elites had little fear of external threats, which directly shaped the policies of labor-managed socialism to safeguard their positions.

However, the split between Yugoslavia and the Soviet Union posed a significant threat to the survival of the party elites. In response, the regime implemented limited economic liberalization alongside the normalization of relations with Western Europe and the United States. Despite these measures, the communist party maintained heavy control over the economy and preserved the formal structures of socialism. By limiting the scope of economic liberalization, the elites minimized the threat of political replacement, as evidenced by the tandem movement of growth trajectories during the postwar period.

The violent disintegration of Yugoslavia in the 1980s, combined with the collapse of internal markets and institutional structures, resulted in severe economic losses. Yet, the newly formed political and economic elites failed to undertake the necessary institutional and economic reforms to revitalize growth. Instead, they entrenched themselves further, consolidating both political and economic power. These entrenched interests, deeply rooted in the production process, perpetuated the stagnation of institutional and economic development.

With high political stakes, the elites actively blocked broad-based economic liberalization, favoring expansive state ownership and interference in the private sector to preserve their rents. This rent-seeking behavior became pervasive, preventing the adoption of wide-ranging reforms that could have significantly boosted economic growth.

Figure 4: Treatment effect of missing economic and political liberalization on economic growth in the postwar period
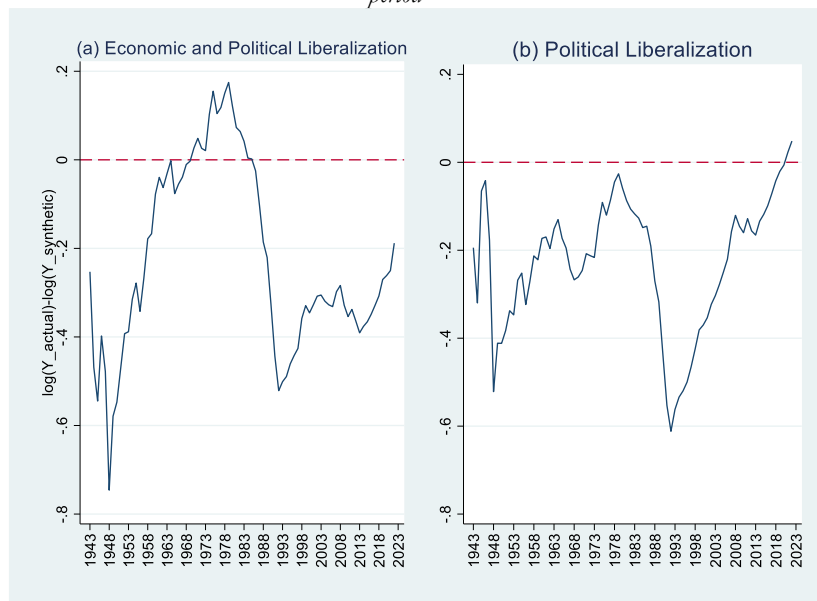
Against this backdrop, Slovenia's economic growth trajectory consistently lagged behind that of the donor pool, which did not adopt labor-managed socialism. This gap has persisted to the present day, as evidenced by a 22 percent disparity between Slovenia and its synthetic peer. While labor-managed socialism initially caused a short-term deviation in the growth trajectory, its long-term impact was far more significant. It enabled the straightforward survival of political and economic elites, effectively blocking

a rapid and dynamic catch-up with the synthetic frontier. This preservation of rents vested in the production process (Parente and Prescott, 2002) inhibited innovation and stifled growth dynamics. Consequently, Slovenia remained poorer and less dynamic, with a lower per capita GDP than it could have achieved if it had pursued comprehensive economic liberalization followed by political liberalization.

Figure 4 illustrates the gradual evolution of the treatment effect stemming from the absence of economic and political liberalization in greater detail. It confirms the dual characteristics of a temporary deviation in the short- and medium term, coupled with a structural break in the long-term perspective.

5.2. Robustness Checks

In the remainder of our analysis, we submit the baseline short-term, medium-term and long-term effect of labor-managed socialism to the battery of the robustness checks that form the backbone of the sensitivity analyses in the evaluation of the significance of the estimated effect of government policies and institutional changes. In particular, we perform a series of in-space placebo analyses (Firpo and Possebom, 2018) as well as analyses with falsely assigned policy year (Abadie et. al., 2015), leave-one-out analysis (Klößner et. al., 2018) and covariate sensitivity check (Kaul et. al., 2022).

5.2.1. In-space placebo analysis

The most common approach to evaluating the significance of the treatment effect of government policies and institutions involves permuting the treatment to unaffected units and comparing the observed treatment effect distribution with the placebo distribution of the pseudo-effect. Specifically, our confidence in the synthetic control estimator's ability to capture the short-, medium-, and long-term effects of labor-managed socialism would diminish if countries in the donor pool that underwent political and economic liberalization exhibited per capita GDP gaps of similar magnitude and direction to Slovenia's after 1943. Conversely, if Slovenia's per capita GDP decline relative to its synthetic counterfactual is relatively unique compared to the placebo distribution, our analysis becomes more credible in revealing the long-term economic growth effects of labor-managed socialism.

We conduct the placebo analysis in several steps. First, we iteratively apply the synthetic control estimator to each country in the donor pool, generating

representations of their economic growth trajectories before and after 1943. This process effectively shifts Slovenia from the treatment sample to the donor pool. Second, we compile the pseudo-effects after 1943 into a coherent dataset and construct an empirical placebo distribution. Finally, we compare Slovenia's estimated post-1943 per capita GDP trajectory with the full empirical distribution of placebo gaps.

The significance of the short- and long-term effects is assessed by comparing post- and pre-1943 RMSE ratios and calculating a non-parametric, simulation-based p-value. This p-value indicates the proportion of donor pool countries with post-1943 GDP per capita gaps and RMSE discrepancies comparable to Slovenia's.

Figure 5 presents the ratio of post- to pre-1943 RMSE for Slovenia compared to the empirical placebo distribution. The results underscore the uniquely negative post-1943 per capita GDP gap in Slovenia relative to the placebo distribution. Notably, Slovenia's ratio ranks second in the distribution, surpassed only by Portugal. However, unlike Slovenia, Portugal neither implemented labor-managed socialism nor experienced a socialist political dictatorship or a radical overhaul of private property ownership. This distinction highlights that Slovenia's negative per capita GDP gap relative to its synthetic control group after 1943 reflects the direct effects of missing economic and political liberalization. It does not represent a rare or extreme event, nor does it reflect common temporal variations in per capita GDP typically induced by time-varying common effects. These findings distinguish the impact of government policies and institutional change from other potential factors.

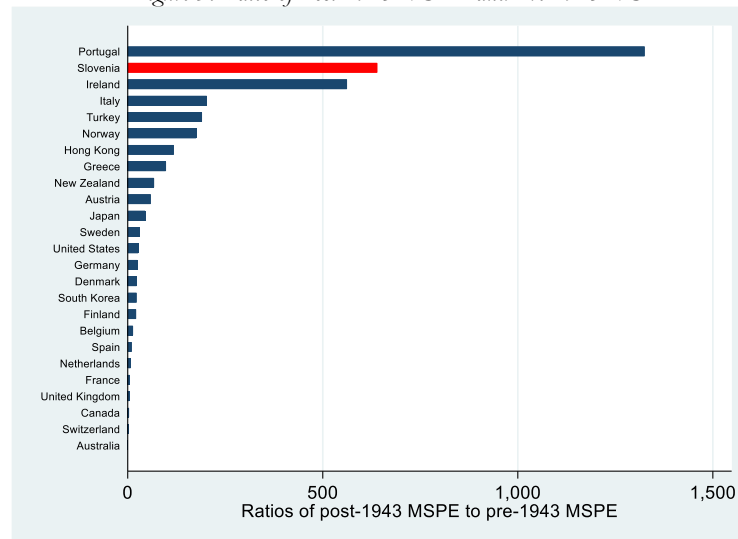*Figure 5: Ratio of Post-1943 MSPE and Pre-1943 MSPE*

Figure 6 displays the simulation-based p-values for the null hypothesis regarding the treatment effect of missing economic and political liberalization for each year in the post-intervention period. The intertemporal comparison of p-values enables us to assess the significance and progression of government policies in shaping the short-, medium-, and long-term evolution of the treatment effect. The evidence reveals a distinct and pervasive decline in Slovenia's per capita GDP until the limited economic liberalization and U.S. aid program were initiated in 1953, with less than a 10 percent probability of observing this effect by chance.

The country's ascent to a leadership role in the Non-Aligned Movement, alongside greater trade openness and limited economic reforms introduced after decentralization, appear to be key mechanisms moderating the medium-term effects of labor-managed socialism. By the early 1980s, our estimates suggest an insignificant difference between Slovenia's per capita GDP and that of its synthetic control group. The p-values for the null hypothesis fail to reach significance, even under artificially high thresholds.

However, the diminishing significance of the treatment effect during this period does not persist. It resurfaces almost immediately following the rise of ethnic tensions in the 1980s and the subsequent violent disintegration of the former Yugoslavia. The failure to implement comprehensive economic liberalization during the post-independence period is reflected in relatively low p-values, indicating a substantial and statistically significant per capita GDP gap when compared to the control group of countries that undertook full economic and political liberalization.

A modest turning point emerges in 2015, when the treatment effect of missing liberalization begins to reverse, transitioning from a permanent impact to a more temporary one. This reversal is associated with the European Commission's Rescue Plan, which restructured economic policies and public finances and enacted liberalization measures to prevent a Troika-style bailout, similar to those experienced by Mediterranean peers like Greece and Portugal.

Figure 7 complements this analysis by presenting simulation-based p-values for the missing political liberalization alone. The results strongly support the hypothesis of a temporary deviation in Slovenia's long-term per capita GDP trajectory from its equilibrium, as opposed to a permanent structural break caused by the joint absence of economic and political liberalization.

Figure 6: Inference on the long-term effect of missing economic and political liberalization
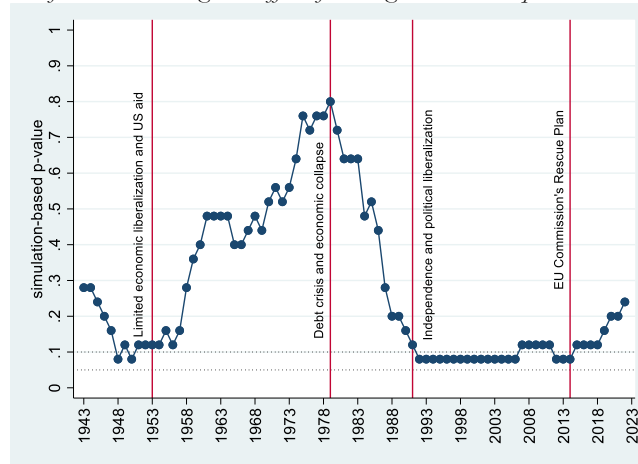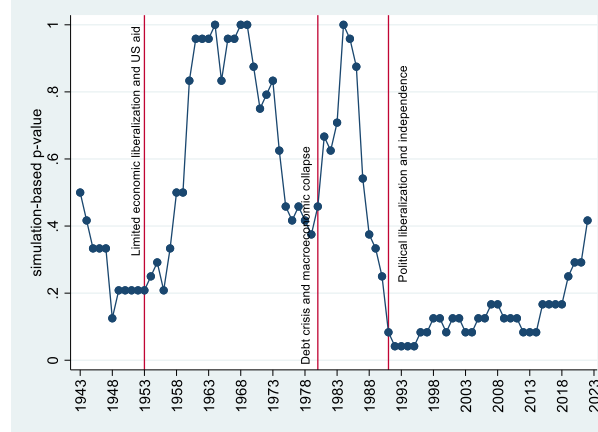
Figure 7: Inference on the long-term effect of missing political liberalization

5.2.2. In-time placebo analysis

To further examine the robustness of our baseline estimates, we conduct a series of in-time placebo analyses by assigning the date of institutional transition to an intentionally incorrect year. While the choice of the placebo year is a subject of rigorous debate, Abadie et al. (2015) and Abadie (2021) recommend selecting a placebo year within the mid-range of the pre-intervention period. To address a gap in our empirical analysis, we assign the date of the missing economic and political liberalization to 1913 to test whether the onset of World War I—a significant external shock—might produce a similar structural break that could undermine the internal validity of the estimated treatment effect.

Figure 8 illustrates the results of the in-time placebo analysis, showing Slovenia's pre- and post-1913 economic growth trajectories alongside its synthetic counterpart. Notably, the synthetic control estimator achieves a high-quality pre-intervention fit. In contrast to the institutional changes in 1943, the post-1913 deviation in Slovenia's economic growth trajectory appears temporary, as Slovenia eventually converges with its synthetic counterfactual, maintaining near parity. This trend persists in the hypothetical absence of the pseudo-shock, distinctly diverging from the structural transition initiated in 1943.

The pre-1913 economic growth trajectory is most accurately replicated by a convex combination of the growth and development attributes of Sweden (22%), South Korea (22%), Denmark (14%), Hong Kong (13%), Turkey (12%), Austria (9%), the Netherlands (6%), and Greece (1%). The estimated end-of-sample per capita GDP gap

(−187 USD) is not statistically significant at conventional thresholds, as the null hypothesis cannot be rejected, even under artificially high significance levels.

The in-time placebo analysis is conducted over both a short-term window (up to 1943) and a long-term window. These results highlight that the short- and medium-term divergence between Slovenia and its synthetic counterpart begins to unravel in 1943, followed by an ultimate breakdown after 1980.

Figure 8: In-time placebo analysis of the missing economic and political liberalization
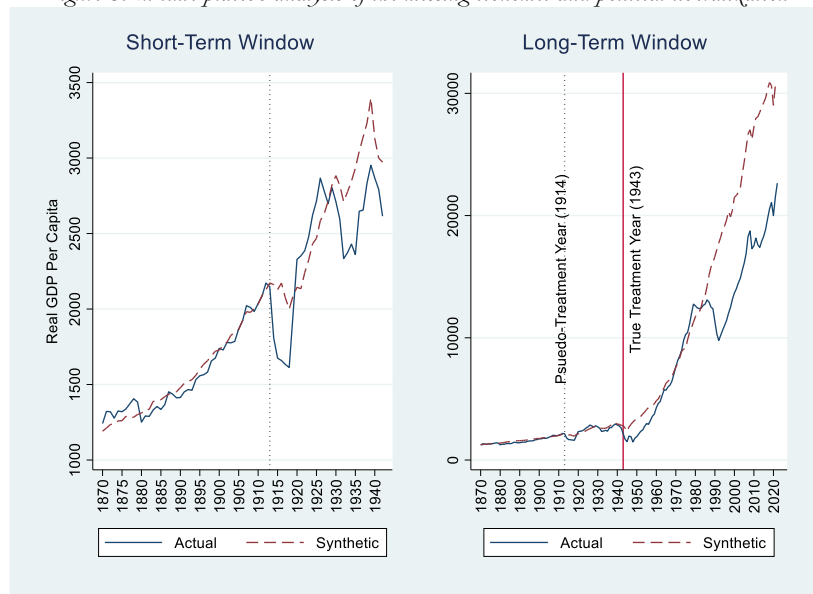
5.2.3. Leave-one-out analysis

In our baseline analysis, the composition of the synthetic control group used to evaluate the long-term effect of missing liberalization relies relatively heavily on Hong Kong and Japan. This raises the question of whether the estimated treatment effect on per capita GDP would persist if the most influential and high-leverage control units were excluded. Therefore, we replicate the economic growth effect of missing liberalization across both experiments, excluding the most influential control units, and assess the robustness of the effect.

Figure 9 presents the leave-one-out analysis of the long-term economic growth effect of missing economic and political liberalization. Panel (a) shows the effect with respect to both economic and political liberalization. The estimated per capita GDP gap is approximately 1,525 international dollars lower per capita (roughly 13% less) than the

level implied by the synthetic control group. By removing Hong Kong from the donor pool, Slovenia's pre-1943 per capita GDP trajectory is best replicated by a convex combination of the attributes of South Korea (26%), Greece (17%), Austria (16%), the Netherlands (14%), Finland (12%), Japan (9%), and Sweden (6%). The correlation between the baseline effect and the restricted leave-one-out effect is +0.94, which is statistically significant at the 1% level (p-value = 0.000).

In a similar manner, when examining the effect of political liberalization from the broader liberalization process, Slovenia's pre-1943 economic growth trajectory, excluding Japan from the donor pool, is best reproduced by a convex combination of the implied attributes of Italy (59%) and Finland (41%). By the end of the sample period, Slovenia's per capita GDP is approximately 1,385 USD higher than the level predicted by the synthetic control group. The correlation coefficient between the baseline effect and the leave-one-out effect is very high (+0.95) and statistically significant at the 1% level (p-value = 0.000). Figure 9 provides a detailed view of the full series of leave-one-out analyses.

Figure 9: Leave-one-out analysis of the long-term effect of missing economic and political liberalization
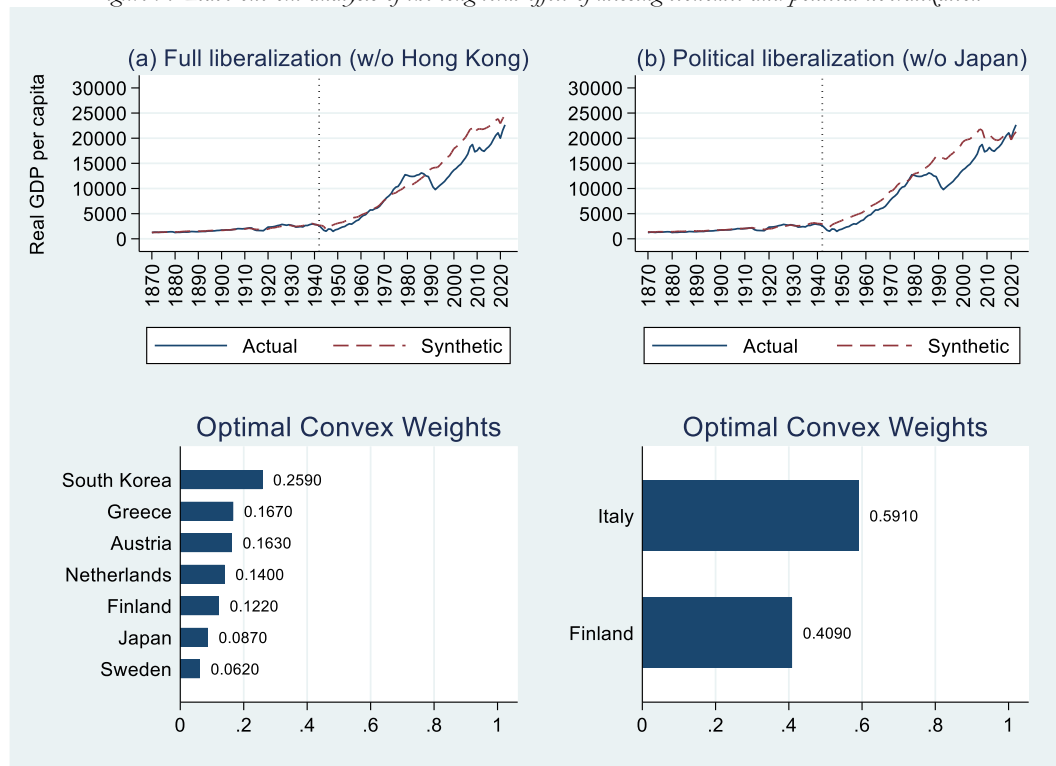
5.2.4. Capturing pre-socialism salient features: GDP outcomes only

Another potential caveat to the estimated economic growth effect of missing political and economic liberalization arises from the asymmetric distribution of pre-intervention outcomes and covariate-specific weights obtained in the training stage. It becomes evident that the cumulative weight across the full set of predictor variables is asymmetrically skewed, with a predominant explanatory power coming from pre-intervention per capita GDP levels in benchmark years. Against this backdrop, the explanatory power of several variables appears to be very low, necessitating additional sensitivity analyses before the internal validity of the treatment effect can be established.

We further assess the robustness of our baseline findings, not by discarding potentially outlying, high-leverage control units, but by excluding the full set of auxiliary covariates and retaining only pre-intervention per capita GDP levels in the benchmark years. By eliminating potentially noisy covariates that could distort the distribution and magnitude of the treatment effect, we are able to capture the most relevant features of pre-socialism GDP per capita dynamics and compare the effects against our baseline.

Figure 10 reports the re-estimated per capita GDP gaps before and after 1943 for Slovenia and its synthetic control groups. Matching only on pre-socialism per capita GDP outcomes and dynamics reinforces the high quality of the fit in the pre-intervention trajectories, and suggests that the estimated magnitude of the effect is nearly equivalent to the baseline effect. Across both replications, evidence of a temporary deviation from the long-run growth equilibrium, followed by a structural breakdown, is evident.

By isolating the effect of political liberalization from the joint liberalization scenario, the long-term economic growth effect of labor-managed socialism appears to be most consistent with the characteristics of a long-running temporary setback relative to OECD democracies, followed by rapid convergence in response to political liberalization in 1991. Across both experiments, the salience is apparent from the explanatory power of GDP per capita outcomes. In the pre-intervention period, GDP per capita outcomes explain around 92 percent of the overall outcome variance.

By matching on salient features of per capita GDP dynamics only, Slovenia's pre-1943 economic growth trajectory is best synthesized by a weighted combination of the dynamic growth attributes of Hong Kong (50%), France (22%), Greece (12%), Spain

(5%), Finland (5%), New Zealand (4%), and Canada (2%), roughly divided between Western Europe (27%), Southern Europe (17%), and Western Offshoots (6%). In Panel (b), the counterfactual representation of the economic growth trajectory in the hypothetical scenario of political liberalization alone reinforces the temporary negative deviation of the growth path from its long-run equilibrium. The synthetic control group is dominated by Italy and France (59%) and Japan (41%), suggesting that Slovenia's pre-1943 growth trajectory is perfectly reproducible by OECD peers that later achieved political liberalization.

Figure 10: Treatment effect of missing economic and political liberalization by matching on pre-socialism per capita GDP outcomes

5.2.5. Reversing the treatment: effect of exiting Yugoslav socialism

The empirical analysis so far uncovers two intricate characteristics of Yugoslav labor-managed socialism. In the short- and medium-term perspective, socialism produced a temporary downward deviation in the growth trajectory, followed by an upward deviation in response to limited economic liberalization in 1953, normalization of trade ties with Western Europe and the United States, and substantial trade expansion during Yugoslavia's rise to one of the leading roles in the Non-Aligned Movement. One potential caveat regarding the internal validity of the long-term effect

of labor-managed socialism stems from the nature of the intervention considered. The combination of the temporary deviation in the short- and medium-term and the structural breakdown in the long term results from the missing economic and political liberalization after World War II. By matching Slovenia's economic growth trajectory and the auxiliary attributes before the missing liberalization with the salient characteristics of countries that embarked on a path of liberalization, the counterfactual representation of the long-term growth scenario can be appropriately estimated.

Conversely, in terms of the nature of the treatment, the missing economic and political liberalization can be reversed. In particular, if Yugoslav socialism led to a temporary deviation followed by a breakdown of the growth trajectory after the 1980s, the relevant and policy-informative question is how Slovenia's economic growth trajectory would have evolved had it not abandoned labor-managed socialism.

To this end, we compare Slovenia's per capita GDP trajectory to a sample of countries that have both established and preserved socialist economic policies, as well as socialist-oriented market economies, from 1950 to 2022. Since the perfectly ascertainable counterfactual scenario of genuine socialism is difficult to define—limited to North Korea, which does not provide much policy-informative insight—the sample of countries preserving a genuine socialist orientation that we include in our donor pool comprises Algeria, Belarus, Cuba, China, Iran, Laos, Nicaragua, Russia, and Vietnam. By matching Slovenia's economic growth trajectory with this compact donor pool of countries under socialist-oriented economic policy from 1950 until their formal exit from socialism in 1990, the per capita GDP gap between Slovenia and the respective socialist control group can indicate whether the exit from socialism and the ensuing political and economic liberalization triggered a structural break in the trajectory of economic growth. If the divergence between the liberalization-based control group and Slovenia since the 1980s is valid, then the departure from socialist-oriented economic policy and subsequent political and economic liberalization should signify a structural break in the growth trajectory relative to the synthetic counterfactual.

Given the relatively small size of the donor pool, we match Slovenia's growth trajectory with a socialist-oriented donor pool for the 1950-1990 period using the generalized synthetic control estimator (Xu, 2017). This approach incorporates country-specific intercepts with time-varying coefficients (i.e., time-fixed effects). It allows us to

relax the assumption of zero correlation between the unobserved effect and the exit from socialism and improves both efficiency and interpretability through a built-in cross-validation scheme, making the specification less relevant. Based on the cross-validation scheme, we also relax the convexity assumption behind the weight structure used to construct the synthetic control groups, allowing for both positive and negative country-level weights.

Figure 11 presents the estimated long-term effect of exiting Yugoslav socialism and transitioning to political and economic liberalization on economic growth. Specifically, it compares Slovenia's per capita GDP trajectory to the synthetic counterfactual scenario of missing economic and political liberalization, while preserving the socialist orientation of economic policy. The quality of the fit in the pre-exit period is excellent, with almost no imbalance or discrepancy. The evidence suggests that exiting Yugoslav socialism is associated with a considerably smaller decline in per capita GDP compared to the estimated counterfactual scenario. On average, Slovenia's per capita GDP in the period following political and economic liberalization is approximately 38% higher than the level predicted by the socialist-oriented synthetic control group. In particular, the per capita GDP of the synthetic socialist version of Slovenia by the end of the peak-to-bottom transition in 1996 represents only 37 percent of the actual Slovenia's per capita GDP. The counterfactual scenario exhibits a strong acceleration after 1996 and appears to achieve parity with the observed per capita GDP in the early 2010s. Like the baseline results, the convergence with respect to the synthetic counterfactual appears to be short-lived, as the socialist counterfactual scenario shows substantial deterioration up to the present day. By 2022, Slovenia's per capita GDP is 85% higher than that of the socialist synthetic control group, and this difference is statistically significant at conventional levels.

Figure 12 shows the composition of the synthetic control group that captures the pre-exit economic growth and development characteristics. The pre-exit economic growth trajectory is best reproduced by a non-convex combination of GDP per capita dynamics from Russia (+2.4), Algeria (+1.01), Cuba (+0.89), and Iran (+0.06), with negative loads on China, Nicaragua, Belarus, and Laos. Thus, by exiting Yugoslav socialism in favor of sustained political and economic liberalization, our estimates suggest that Slovenia's per capita GDP is approximately 85 percent higher than it would

have been in the hypothetical scenario of preserving the socialist orientation of economic policy since 1990.

Figure 11: Long-term effect of exiting Yugoslav socialism on economic growth, 1950-2022
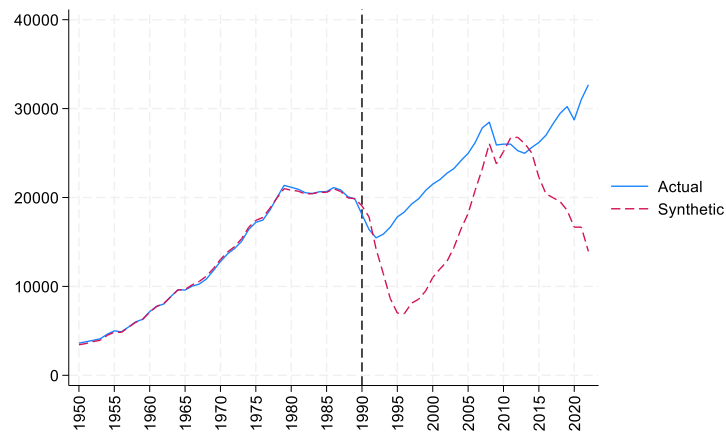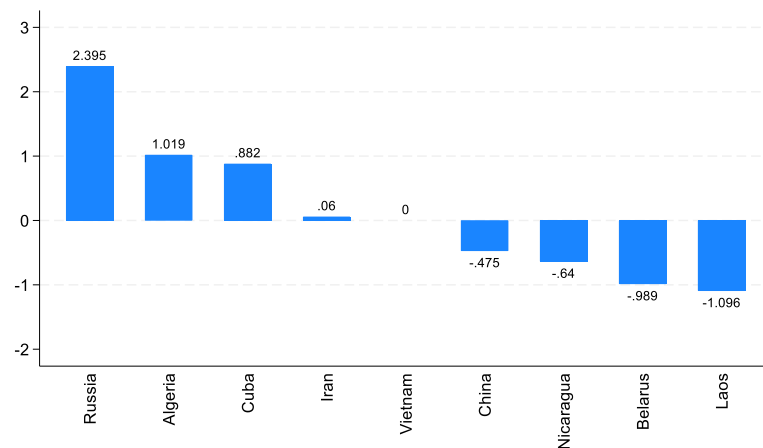

Figure 12: Countercyclical weights and the composition of synthetic version of Slovenia

6. Conclusion

This study explores the long-term economic consequences of socialism by examining the unique case of labor-managed socialism in former Yugoslavia. Using Slovenia as a representative case study, we estimate the impact of the absence of economic and political liberalization during the postwar period. By employing the synthetic control method, we construct counterfactual scenarios comparing Slovenia's economic trajectory to those of OECD and East Asian donor states that did not undergo a socialist transition. Our findings reveal that labor-managed socialism initially

caused a short- and medium-term deviation from a sustainable growth trajectory. However, these temporary effects gave way to a profound structural breakdown in the early 1980s, marking the system's inability to sustain long-term growth. Had Slovenia pursued economic and political liberalization in the immediate postwar period, we estimate that its current per capita GDP would be approximately 22 percent higher than it is today.

Furthermore, we analyze the potential consequences of Slovenia maintaining a socialist economic orientation beyond 1990. Our results suggest that under this scenario, the economic downturn of the 1990s would have been significantly more pronounced, with per capita GDP declining to levels 63 percent lower than present-day estimates. These findings highlight the detrimental effects of prolonged socialist policies on economic performance, emphasizing the critical role of market-oriented reforms in achieving sustainable growth. The robustness of our results is confirmed through a comprehensive series of sensitivity tests, underscoring the reliability of our synthetic control estimates. This analysis contributes to the broader understanding of socialism's economic legacy and offers valuable insights into post-socialist transitions in similar contexts.

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