**Institutional integration and the enlargement of the European Union: Evidence from Ukraine[[1]](#footnote-1)**

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**Abstract**

*We examine the contribution made by institutional integration to institutional quality. To this end, the 2007 political crisis in Ukraine is considered along with the effects of remaining outside the European Union for 28 Ukrainian provinces between 1996 and 2020. Novel subnational estimates of institutional quality for Ukraine and Central and Eastern European (CEE) countries are constructed based on the latent residual component extraction of institutional quality from existing governance indicators by making use of Bayesian posterior analysis under a non-informative objective prior function. By comparing the residualised institutional quality trajectories of the Ukrainian provinces with their CEE peers admitted to the European Union in 2004 and later, we assess the institutional quality cost of being under the Kremlin’s political influence and interference. Based on a large-scale synthetic control analysis, we find evidence of large-scale negative institutional quality effects of staying outside the European Union such as heightened political instability and the rampant deterioration of the rule of law and control over corruption. The statistical significance of the estimated effects is evaluated across a comprehensive placebo simulation containing over 34 billion placebo averages for each institutional quality outcome.*

**JEL Classification Codes**: C12, C13, C21, C23, O17, O19, O43, R11

**Keywords**: institutional integration, Ukraine, European Union, synthetic control method

**Introduction**

The notion that institutional integration matters for economic growth and development is well established in both the scholarly literature and policy discussions (Rivera-Batiz and Romer 1991, Eichengreen 2007, Campos et al. 2019). Scholars traditionally distinguish two types of integration (Lawrence 1996). A shallow form of integration is typically based on trade liberalisation where regulatory and structural policies remain unaffected. In contrast, a deep institutional integration occurs not only with the liberalisation of trade but with broader policies as well like competition and regulation and brings deeper provisions. The economic effects of institutional integration are relatively well understood. For instance, Campos et al. (2019) examine the economic growth effects of European Union membership, find positive yet mixed effects in a sample of non-founding member states, and show that trade openness, financial development, and adoption of the single currency account for those effects. Similarly positive, yet heterogeneous effects of EU membership were shown by several authors, including Maudos et al. (1999), Badinger (2005), Crespo Cuaresma et al. (2008) and Garoupa and Spruk (2020).

These studies’ *raison d'être* is the search for a counterfactual scenario for institutional integration. By making use of methods like difference-in-differences or the synthetic control estimator (Abadie et al. 2015, Maseland and Spruk 2022), an appropriate policy counterfactual scenario can be estimated with parallel trends being either present or absent. The general thrust of this approach is to compare countries that have joined the institutional integration against an appropriate donor pool of countries that have not joined. Reproducing the pre-entry trajectory of economic outcomes allows the post-entry differences between the observed trajectory and its hypothetical counterpart to be observed with a view to assessing the institutional integration’s impact.

Several limitations apply to the existing approach to estimating the effects of the institutional integration. First, whilst the search for a counterfactual scenario and its estimation may shed light on the effects of admission to the institutional integration for those countries that joined, the question that remains less clear is: what is the effect of staying outside the institutional integration? If a certain type of institutional integration promotes growth, trade and specialisation, estimating the costs of remaining outside such a growth-enhancing type of integration would be more informative than estimating the benefits of admission. Second, most scholarly studies deal with the economic effects of institutional integration. Yet, perhaps a more pertinent question to first ask is whether being included in the institutional integration improves or deteriorates the quality of the institutions with regard to the rule of law, efficacy of public administration, and control over corruption, for instance, to better understand whether the institutional integration is a curse or a cure for institutional quality. This paper seeks to fill these two shortcomings in the literature.

In particular, we look at the effects of staying outside the EU on institutional quality in Ukrainian provinces between 1996 and 2020. We first approximate the institutional quality of Ukrainian provinces by estimating a series of governance indicators by extracting the residual component from existing aggregate governance series. In the next step, we conduct Bayesian posterior analysis through use of the Metropolis-Hastings random-walk algorithm to compute the ideal points of institutional quality, and smooth the series through a high-frequency filter-based variance decomposition. Comparing the full set of Ukrainian provinces with the full sample of regions from Central and Eastern Europe (CEE) admitted to the European Union before 2020 underpins an assessment of the institutional quality effects of staying out of the EU, which may reveal potential institutional quality losses of the Kremlin’s political influence as a proxy for shallow institutional integration. Our contribution may be relevant for policymakers who wish to better understand which actions to take in view of the possibility that EU membership will be granted to Ukraine. In particular, it adds clarity to the disastrous economic consequences that would await Ukraine should Russia take power and hopefully will contribute to sound policymaking decisions being made by both Ukraine and Europe as a whole. The article also adds to the literature with regard to the effect created by Russian institutions abroad.

On 24 February 2022, Russia started its military invasion of Ukraine, gradually escalating to become the first war Europe has experienced in decades. While it is impossible to estimate casualties among civilians (the Emergency Service estimates over 4,000), the United Nations High Commissioner for Refugees claims that more than 14 million Ukrainian people have already fled the country, giving rise to one of the biggest refugee crises since the Second World War. In response, European states have imposed tough financial sanctions on Russia. However, the penalties imposed on Russia and Ukraine’s military resistance might not be sufficient to prevent Russia from taking full or partial control of the country. While political experts are discussing the possibility of the conflict expanding, Ukraine’s Prime Minister Zelenskyy is increasing pressure on the EU to give it immediate membership in a desperate attempt to stop Russia taking over.

In his seminal work, Lynch (2001) illustrated how Russian influence is generally successful (unsuccessful) when the stake of the West is the least (most) intense. In an attempt to ‘maintain the appearance of great power status abroad’ following the 1991 decay of the Soviet Union, Russia has been obliged to remain active in its international commitments, including political consultations with respect to both the Balkans and NATO. On this subject, Tolstrup (2009) observed that in the post-Soviet area Russia’s foreign policy in the ‘Near Abroad’ – including Belarus, Armenia, Azerbaijan, the Central Asian republics, the Baltic states, Moldova, Ukraine and Georgia – has had a significantly negative impact on democratic perspectives, including the civil and political rights of people. After the Kremlin’s annexation of Crimea, Götz (2016) provided evidence of Russia’s “increasingly assertive behavior in the post-Soviet space”.

Following the disintegration of the Soviet Union, Russia’s attempts to re-establish its identity abroad have become ever more frequent. By counting on support from Russian diaspora populations, Russia has exploited public diplomacy to persuade foreign publics top–down (Just 2016). As a result, Putin has managed to reinforce ‘the populist desire to see Russia return to the world stage as an economic and military superpower’ (Mersol 2017), particularly where hybrid or authoritarian polities persist in the non-Baltic post-Soviet space (Cameron and Orenstein 2012). Unlike China, Russia seems to be encouraging an ethnocentric viewpoint of a country and a regime that needs to be defended from Western threats (Popovic et al. 2020). With the recent invasion of Ukraine, Russia’s international reputation has certainly plummeted and, at the same time, confirmed how its actions directly arise from an evident fear of Western influence in the Near Abroad (Kerrane 2020).

Ukraine formally declared its independence from the Soviet Union in 1991. Early institutional and political development after the Soviet Union’s demise was characterised by the conflicting policy overtures made to Western nations and the alliance with Russia leading to a political crisis. In 2004, opposition leader Viktor Yushchenko launched a mass protest campaign in the light of rigged elections that had handed victory to pro-Russian candidate Viktor Yanukovich. The election results were later nullified by the Supreme Court of Ukraine. By the end of 2005, Viktor Yushchenko had won the elections, leading to souring relations with Russia and frequent gas supply and pipeline shortages/disruptions. At the 2006 parliamentary elections, power struggles and tensions emerged between the pro-Western president and the pro-Russian parliamentary majority, leading to the parliament being dissolved. Early in 2007, several opposition members launched support for the ruling coalition, creating a high likelihood of securing a two-thirds majority that would give parliament the power to override the president’s veto right and thereby begin constitutional changes. In 2007, the president dissolved the unicameral parliament (*Verkhovna Rada*). The president’s authority to dismiss the parliament was immediately challenged in the Supreme Court whilst the president intervened directly in the Constitutional Court’s operations by dismissing two judges to ensure that the Court did not rule on the decree’s constitutionality. At the elections, a coalition of two electoral blocs associating themselves with the Orange Revolution won a narrow majority. Yet, significant regional variation was seen between western Ukraine, chiefly in favour of the pro-Western electoral bloc, and eastern Ukraine, where the pro-Russian coalition obtained the majority of the popular vote amid allegations of electoral fraud. Although the elections generally met international standards, observers noted delays in the forming of district election commissions, the inadequate quality of voter lists, the disenfranchisement of voters due to legal amendments that had abolished absentee ballots, the removal of voters from the ballot list who had crossed the border after 1 August 2007, the modalities for voting at home, and the extensive campaigning by state and local officials in violation of the law.

The uniqueness of the 2007 political crisis as a prelude to the subsequent institutional instability can hardly be overlooked. In Figure 1, we formally test whether the 2007 political crisis is responsible for a structural break. From the Worldwide Governance Indicators database (Kaufmann et al. 2011) we compute the first principal component of the institutional quality from six baseline indicators,[[2]](#footnote-2) and apply a simple version of the synthetic control estimator (Abadie et al. 2015) to compare Ukraine’s trajectory of latent institutional quality with a donor pool of 101 countries for the period 1996–2016. The evidence reveals a pervasive structural break in response to the 2007 political crisis, permanently derailing Ukraine’s observed institutional quality and producing a large-scale structural breakdown. Still, the observed institutional quality of Ukraine worsened considerably after the 2007 political crisis compared to the control group[[3]](#footnote-3) that contains similar pre-2007 attributes. The average institutional quality effect of the 2007 political crisis is around -0.98, which entails a large-scale downward deviation from the pre-2007 equilibrium. In this paper, we consider the 2007 political crisis as a source of the counterfactual scenario and estimate the institutional quality of Ukraine and its region in a hypothetical case of admission to the European Union in a temporally similar round of enlargement to the remaining CEE countries. Since Ukraine remains outside the European institutional integration after 2007 in both de jure and de facto terms, the resulting gap in its institutional quality may partly reflect the institutional quality effect of staying outside the EU and being prone to policy overtures under the Kremlin’s influence and subsequent political and institutional destabilisation attempts. Our results show massive institutional quality benefits of the European integration. It is estimated that substantial improvements exist in political stability, control over corruption, liberal democratic governance and the rule of law that are fully comparable with the development of post-enlargement institutional quality seen among CEE peers. Our identification strategy allows the pre-treatment imbalance to be almost entirely removed in outcomes and covariates, lending credence to the notion that the post-2007 effects reflect the institutional quality cost of staying outside the EU rather than a misfit, an imbalance, or alternative institutional and policy shocks.

FIGURE 1 – INSERT ABOUT HERE

At a 2014 meeting of the Royal Institute of International Affairs organised by Chatham House, experts included the Kremlin’s desire to expand the ‘Russian World’ and solidify a Russian style of governance in the countries ‘in its sphere of influence’ as the ultimate goal of Russian foreign policy. Today, Ukraine serves as an example of this goal, risking an economic – and political – crisis similar to that experienced by other states before it. Projections indicate that Europe’s GDP is likely to fall by 4 percentage points, also due to the cut in Russian gas supply, while inflation is expected to rise by 1.5 percentage points. With respect to what awaits Ukraine more specifically, some evidence is provided by the current literature on other cases that escaped or surrendered to Russian domination.

As a contrasting example, the Polish economy, for instance, grew significantly in the post-Soviet period (Slay 2014), especially thanks to boosts in its foreign trade following EU membership (Kowalski and Shachmurove 2018), and also on the local level (Young and Kaczmarek 2000). Lithuania, Estonia and Latvia managed to successfully turn to capitalism while industrial relations in Belarus did not see any substantial progress due to the system of ruling elites and their attitude to Russia (Savchenko 2002). The Commonwealth of Independent States (Russia, Belarus, Ukraine) is generally also less integrated with the world economy, leading to a decline in its manufacturing and agricultural sectors (Lane 2011). When looking at trade matters, Isakova et al. (2016) showed that the constitution of a customs union between Belarus, Kazakhstan and Russia only and partly benefitted Russia, while it has negatively impacted imports from China and the EU to, respectively, Kazakhstan and Belarus. For the latter, this is also an outcome of the political economy that started to disincentivise entrepreneurial social groups (Yarashevich 2014). With our analysis, we seek to provide some answers to a widely debated issue; namely, whether a similar destiny awaits Ukraine should Russia take it over.

The paper is structured as follows. Section 2 sets out the historical and institutional background discussion. Section 3 presents the data and variables used in our analysis. Section 4 describes the identification strategy. Section 5 discusses the results and robustness checks, while section 6 concludes.

**2 Background**

As well illustrated by Wydra (2004), Ukraine has sought to become independent of its larger and more powerful neighbour, Russia, since August 1991 when the first tensions started to emerge. Months after the Republic of Crimea declared its independence, the December referendum revealed that only 54% of voters in Crimea supported Ukraine’s independence. Simultaneously, Russian populist leader Zhirinovsky and others claimed ownership of Crimea, considered a strategic port for the Black Sea Fleet. Tensions rose in 1994 when the office of the President of Crimea was set up and held by Meshkov, who pushed for a Crimean Constitution and rights autonomous from Ukraine. A constitution accepted by the Ukrainian government would only be put in place in 1998 when it was guaranteed that relations with the Russian Communist Party would be suspended and that local decisions would not contradict Ukrainian laws. Still, this did not exclude the predominance of the Russian language and influence among the Crimean population.

Neither Ukraine nor Russia initially recognised reciprocal independence, but insisted on each other’s ‘sovereignty’, with Ukraine giving in to an economic union with Russia to avoid the economic pressures of isolation. At the time, Minister Kuchma saw access to the European Community as unlikely (Morrison 1993). In 1997, a bilateral inter-state treaty between Ukraine and Russia was signed declaring the inviolability of the countries’ existing borders coming into effect in 1999, with member of the Russian parliament and Communist Party Seleznev calling it ‘a great victory for Russia’ (Tolz 2002).

The revisionist voice of Russian politics would make it ever more difficult to strengthen ties with the West. Following the explosion of the pro-Western Orange revolution and consequent elections of President Yushchenko in 2005, the imperialistic powers of the Kremlin made it clear in 2009, when the Duma passed legislation, that it would ‘permit Russian forces to intervene abroad in defence of Russian citizens’, that Ukraine would represent ‘a real driving force’ towards the West and thus a threat to Soviet power (Larrabee 2010). In this period – when gas tensions between Ukraine and Russia also became more frequent – it became gradually clear that the idea of a Russian world would only be positively and significantly accepted in areas of mainly ethnic Russians or Russian speakers, who perceived the Kremlin’s assertive policy as protecting their community (Feklyunina 2016).

Further tensions emerged in April 2014 when Russia withdrew the gas price discount granted to Ukraine under President Yanukovich (elected in 2010) and called for the repayment of Ukraine’s debt (Loskot-Strachota and Zachmann 2014). This followed the coup in February against President Yanukovich, committed to national pragmatism, or the establishment of good or neutral relations with Russia, for the sake of Ukraine's future in Europe (Kolosov 2018). In June, the Association Agreement between the European Union and Ukraine was finalised, with President Poroshenko stating that being in the EU ‘would mean the world to his country’ (Pridham 2014). Overall, following the quite optimistic and cooperative 1992–1994 period, the time of troubles between 1994 and 2000, when the Agreement on Partnership and Cooperation was signed, insisting on ‘democracy and human rights as an essential element of the PCA’, and the Putin era since 2000, 2014 marked a year of no-return in the Ukraine (and EU) relationship with Russia.

Unable to create a stable and cooperative regime in Kyiv, Russia progressively sought to solidify local regimes’ dependence on Russian support so as to maintain control over parts of the country, including efforts at state-building in Donbas (Malyarenko and Wolff 2018). This culminated in the illegal annexation of the Republic of Crimea and Sevastopol by Russia in March 2014, with a referendum that declared 96.7% of Crimean voters in favour. The growing fighting in the Donbas area is strongly propelling Ukraine’s interest in joining the EU and NATO. Following several cyberattacks in Ukraine on behalf of Russia, current President Zelenskyy was elected in the context of a stagnating economy and ongoing conflict with Russia, worsened by US President Trump’s suspension of military aid.

After Russia’s Armed Forces started to amass in Crimea and along the border with Ukraine in the spring of 2021, the level of tension between Ukraine and Russia became worrying when in February 2022 Putin recognised the Donetsk People's Republic and the Luhansk People's Republic. Thousands and thousands of troops were sent to Ukraine’s borders on the morning of 24 February, explicitly demanding that European countries and the USA bar Ukraine from ever joining NATO. The request was not accepted as the devastating military assault on Ukraine from the territories of Russia, Belarus and Crimea continued to destroy cities, kill civilians (a total of 4,169 on 1 June 2022), and lead to mass migration to neighbouring countries. This ultimately forced the USA, the UK and the EU member states to join forces and implement sanctions targeting Russian oligarchs and banks. While the consequences of a Russian take over of Ukraine might be evident, it remains critical to provide empirical evidence concerning the perils of the Kremlin’s influence for Ukraine today and in the future.

**3 Data**

 *3.1 Measuring institutional quality*

Our approach to measuring institutional quality in the Ukrainian regions is constrained by the lack of observable and measurable characteristics that could provide insights into the variation in institutional quality. To address these concerns, our empirical strategy for measuring subnational institutional quality relies on extracting the residual component of institutional quality from an observable aggregate institutional quality series using the variation in pre-determined geographical characteristics. Therefore, our aim is to extract a latent variable component from higher-level aggregation and project it to the subnational level using a set of pre-determined characteristics that cannot be empirically manipulated.

Our approach is similar to Magnusson and Tarverdi’s (2020) method of estimating governance quality, which we combine with plausibly orthogonal characteristics used to linearly project institutional quality to the subnational level. Our set of aggregate institutional quality variables consists of the well-established Worldwide Governance Indicators (Kaufmann et al. 2011) and encompasses five distinctive variables. First, the voice and accountability component captures the perception of the extent to which citizens are able to participate in selecting the government and to which they enjoy freedom of expression, association and media. This dimension partly captures the degree of liberal democracy that can be compared across space and time. Second, the political stability and absence of violence component indicates the perception of the likelihood of the government being destabilised or overthrown by unconstitutional or violent means, which includes politically-motivated violence and terrorism. This dimension largely captures the degree of political and institutional stability.

Third, the government effectiveness component captures the overall quality of public services and civil service, and the associated degree of independence from political pressures, the quality of policy formulation and implementation, and the government’s credibility and commitment regarding such policies. This dimension mainly captures the institutional effectiveness and quality of bureaucracy, policy stability, quality of government administration and public goods provision. Fourth, the regulatory quality component indicates the ability of government to formulate and implement sound economic and structural policies that facilitate and enhance the private sector’s development. It includes the presence of policy distortions such as unfair competitive practices, price controls, discriminatory tariffs, excessive trade and non-trade protection and barriers, discriminatory taxes, state ownership and intervention in the private sector, the extent of labour regulation as well as the efficacy and enforcement of competition regulation. This dimension largely captures the institutional and policy constraints on the private sector’s development. Fifth, the rule of law component captures the extent to which citizens have confidence in and abide by the rules of society with respect to contract enforcement, the police, the courts, and the likelihood of crime and violence. The rule-of-law dimension encompasses the fairness and speediness of the judicial process, private property protection, judicial independence, efficiency of the legal framework, intellectual property rights protection as well as trust in the courts and police. It captures the strength of the rule of law and public trust in institutions. And sixth, control of corruption refers to the extent to which public power is exercised for private gains through petty and grand forms of corruption as well as state capture by economic and political elites and private interests. Control of corruption measures are constructed from variables indicating corruption among public officials, the diversion of public funds, transparency, accountability and corruption in the public sector, the strength and enforcement of anti-corruption policy, and the frequency of paying bribes to various branches of the public sector.

Henceforth, we exploit the variation in each dimension of institutional quality using the updated version of the Kaufmann et al. (2011) *Worldwide Governance Indicators* data. Following Magnusson and Tarverdi (2020), our goal is to extract the residual component of each governance indicator from the aggregate level based on the variation. From the aggregate governance score, we use the set of pre-determined time-invariant covariates that are orthogonal to the institutional quality of interest. This approach allows us to residualise the aggregate institutional quality score to the regional level. Without loss of generality, suppose we observe a finite sequence of countries indexed by that is observed over time and a continuum of regions where. For each and the full cross section of regions, we estimate a simple canonical regression of the following form:

 (1)

where denotes the institutional quality variable of interest, and **X** represents the vector of pre-determined physical geographic covariates such as latitude, longitude, a landlocked indicator, precipitation, mean temperature and elevation level as well as indicators of climatic zone based on the Köppen-Geiger climate classification scheme (Kottek et al. 2006, Peel et al. 2007). The random error is denoted by and captures the stochastic disturbances and transitory shocks to institutional quality with an i.i.d. structure. From the canonical regression in Eq. (1), we compute the residual component of the respective dimension of institutional quality for the full section of Ukrainian regions and its donor pool, which are both indexed by :

 (2)

where denotes the observed realisation of institutional quality and refers to the predicted institutional quality level. The recovered residual component provides an important guide for interpreting the series. First, a positive residual component invariably suggests that the level of institutional quality observed in the *j*-th treated and control region is higher than the level plausibly expected in geographically similar areas on the regional level. Second, a zero residual component indicates the level of institutional quality at the same level as expected in a geographically similar environment. Third, a negative residual component suggests that the implicit institutional quality level is worse than expected in places with geographically similar conditions. Such spatial variation in the residual component is consistent with the notion of institutional quality delineated between the inclusive-participatory type and the extractive-exclusionary one popularised by Acemoglu et al. (2005). Hence, the residual component can be used to determine spatial disparities in institutional quality based on the difference between the observed and predicted levels of institutional quality. The substantive insight of the residual component may indicate whether the observed institutional quality appears to be more inclusive and participatory than expected in geographically similar endowments, or if it appears to entail a cluster of more exclusionary economic and political institutions. The overall level of institutional quality is recovered from the observed aggregate component across the dimension and the exogenous component that captures region-level idiosyncratic institutional specificities:

 (3)

where denotes the overall institutional quality, is the observed institutional quality in the j-th region projected from the level of aggregation, while is the exogenous residual component. Our primary interest lies in the spatial and temporal variation in , which reflects region-level institutional idiosyncrasies and denotes whether the observed quality is better or worse than the expected one based on the variation in pre-determined physical geographic characteristics.

One key limitation of the repeated cross-sectional estimation of the residual component scores of institutional quality concerns the time invariance of geographical characteristics like latitude and longitude or binary indicators of coastal access and landlocked status. This implies that the resulting variation in the residual component may only shift the intercept upwards or downwards whilst rendering it constant over time. In these circumstances, most of the variation in would be absorbed by the unobserved effects, precluding any panel-level analysis.

Albeit imperfectly, we partially overcome these limitations by making use of the Monte Carlo Markov Chain (MCMC) sampling algorithm for the probability distribution of the recovered residual component of institutional quality. By constructing the Markov chain with the specified distribution as the equilibrium, a sequenced sample of the target distribution can be obtained by recording the states of institutional quality from the chain (Jarner and Roberts 2007). Our aim is to obtain an uninterrupted sequence of random samples from the pre-specified probability distribution where random sampling is difficult since our data are observational per se. We may build such a sequence of random samples by adopting the well-known Metropolis et al. (1953) and Hastings (1970) algorithm approximating the true distribution of institutional quality on the regional level indexed by . Notice that randomly sequenced samples can be drawn from any probability distribution that has a known probability density function which is proportional to the density of the target density function. The general intuition behind the algorithm is that the generated random sequence of samples can be produced in such a way that as more samples are produced the observed distribution of institutional quality parameter more closely approximates the target distribution through an iterative procedure that creates the Markov Chain. Upon each respect iteration, the algorithm selects a candidate for the proximate sample value from the current sample. If the probability threshold is specified ex-ante, the candidate value of institutional quality is either accepted or rejected if it exceeds the threshold.

Let be a density function in proportion to the target probability distribution denoted by . Our goal is to obtain a posterior parameter of the residualised institutional quality on the regional level for evaluation, denoted by . We assume a single parameter will be sampled from a one-dimensional distribution space characterised by To generate a sequence of random samples from , the algorithm must specify a plausible probability density function denoted as with the implicit required density ratio, . In this respect, the algorithm draws a candidate value first that will either be accepted or rejected based on the acceptance probability. Similar to Gibbs’ sampling algorithm, our approach consists of a two-stage sampling procedure:

Step #1: Draw from the proposed density

Step #2: Accept with probability where:

where the key requirement for generating a sequence of random samples is that the posterior parameter values are drawn from the proposed distribution of the random variable to evaluate the acceptance and rejection criteria. Using these two steps, the algorithm decomposes the unrecognisable conditional distribution into a recognisable one through the randomly sequenced generation of candidate points, and the unrecognisable part from which the acceptance criteria are set. Such an iterative procedure adjusts the equilibrium distribution by specifically allowing for a non-analytic functional form of the model. One advantage of the algorithm is that sampling can be conducted on a specific tail of the distribution to analyse the parameter restrictions imposed by the prior values. However, imposing prior values to restrict parameters in space requires a nearly complete information matrix and may also be driven by subjective beliefs. Henceforth, our approach is to abstain from the imposition of priors. To facilitate the generation of random samples through the Markov chain, our approach is to impose a non-informative objective prior distribution on the parameter space (Jeffreys 1946) where the density function is in proportion to the square root of the determinant from Fisher’s information matrix . A notable advantage of the non-informative prior comes from the non-thin tails of the distribution compared to its target counterpart, ensuring the straightforward and fast convergence of the algorithm.

By imposing objective non-informative prior to approximating the shape of the target distribution of institutional quality, we adopt an adaptive random-walk version of the Metropolis-Hastings algorithm whereby a candidate value of the institutional quality residual for each region is drawn from a simple random walk model characterised by where is the random component assumed to be a symmetric density function with thick tails of the t-distribution. Our choice of the density function is generic and therefore ignores the structural features of the target density. Given the symmetry in the proposed density functions, , the algorithm used to estimate the subnational institutional quality converges to the following two-stage procedure:

**Step #1**: Draw from the proposal density

**Step #2**: Accept with probability where:

Two chief advantages arise when estimating the latent institutional quality. First, the simplified algorithm is able to control the variance of the error term, further reducing the measurement error. Second, the algorithm must be adjustable for the variance of the error term to obtain an acceptable level of accepted draws. Due to relatively large size of our sample, we set the number of iterations to obtain a sequence of random samples at 12,500 for each outcome-year combination and set the acceptance rate at 25 percent, which appears to be in the conventional range between 20 percent and 40 percent. At 12,5000 iterations per outcome and year, the number of discarded observations through the burn-in amounts to 2,500. This implies that for the 24 years and the 6 outcomes under consideration, the overall number of iterations performed in our analysis is around 1,800,000 million randomly sequenced samples. Therefore, for each we construct the mean and median MCMC estimate of the posterior parameter. By inverting the test statistics, the upper and lower confidence bounds are constructed for the full panel.

An intrinsic limitation of the random-walk version of the Metropolis-Hastings algorithm is the potential instability and composition of the latent component over time due to the simultaneous presence of noise and signal in the series. Estimating a chained sequence of randomly generate samples through the MCMC algorithm typically invokes a confluence of both cyclical and deterministic components that might not disappear when the non-informative objective prior function is introduced. While the deterministic component captures long-run behaviour and the trend of the institutional quality series, the cyclical component may capture short-run transitory deviations of the posterior parameter values from their long-run equilibrium. For the sake of brevity, suppose that the posterior parameter of institutional quality for each and can be decomposed into a deterministic and cyclical component:

 (4)

where denotes the deterministic (i.e. long-run) component and the cyclical (i.e. short-run) component of the institutional quality parameter. Without loss of generality, it may be noted that the deterministic component captures the signal of the institutional quality parameter whereas the cyclical component reflects the noise behind the latent institutional quality trait. If the latent trait denotes transitory deviations from the long-run equilibrium, has a tendency to exhibit a stationary mean-reverting pattern since it is dominated by instead of . Therefore, if component prevails over time, the MCMC simulated latent quality trait will converge to the random-walk behaviour. In contrast, if the latent trait exhibits little deviation from the cyclical component, the underlying posterior parameter is dominated by . Our goal is modest and seeks to recover a smooth long-run trend component of the posterior parameter for the *j*-th region through the Hodrick and Prescott (1997) solution to the following optimisation problem:

 (5)

where represents the residual component of the latent quality trait that satisfies the inner stability condition such that . Parameter captures the speed of the dynamic quality parameter adjustment over time to extract the cyclical component from its long-run counterpart. To avoid compressing the temporal variation, we adopt the criteria advocated by Ravn and Uhlig (2002), stating that should vary by the fourth power of the frequency observation ratio. For annual observations, this implies that (=) is needed to smooth the series of the latent institutional quality trait for a considered dimension.

*3.2 Sample*

Our treatment sample consists of 24 Ukrainian provinces (i.e. oblasts)[[4]](#footnote-4) and two cities holding special status.[[5]](#footnote-5) Our control sample comprises 195 regions from CEE countries admitted to the European Union in 2004 or later. For the 2004 enlargement round, this includes Czech Republic[[6]](#footnote-6), Hungary[[7]](#footnote-7), Latvia[[8]](#footnote-8), Lithuania[[9]](#footnote-9), Poland[[10]](#footnote-10), Slovakia[[11]](#footnote-11) and Slovenia[[12]](#footnote-12), whilst Estonia is not included.[[13]](#footnote-13) For the 2007 enlargement round, the control sample comprises regions from Bulgaria[[14]](#footnote-14) and Romania[[15]](#footnote-15). In addition, the regions in Croatia[[16]](#footnote-16) admitted to the EU in 2013 are included in the control sample. Our period of investigation is between 1996 and 2020. Our overall sample covers 5,525 region-year observations pooled into a strongly balanced panel. The size of the treatment sample is 650 region-year paired observations whilst the size of control sample is 4,875 paired observations.

Figure 2 depicts the evolution of Metropolis-Hastings estimated institutional quality residuals across Ukrainian provinces for the full period under investigation. The figure exhibits mean MCMC estimates of the particular latent institutional quality trait for the Ukrainian provinces from 1996 onwards along with the 95-percent confidence bounds. Note that the zero threshold indicates the boundary between the inclusive-participatory and extractive-exclusionary institutions characterised as the difference between high-quality and low-quality ones in our analysis. The evidence indicates a noteworthy variation in the estimated latent series along with the notable contrasts. The general thrust of the intertemporal comparison emphasises a substantial deterioration in the estimated institutional quality in the post-2007 period. For instance, the series on voice and accountability appears to be close to the zero residual threshold in the initial year of investigation (i.e. 1996) whilst it tends to deteriorates considerably after 2007. A similar pattern is seen in the estimated series on residualised political stability and absence of violence amid a sharp drop in the post-2007 period. Not all series tend to exhibit the path of a pervasive decline in institutional quality. For instance, the residualised series on regulatory quality and government effectiveness reveal a pattern of accelerated growth after 2013, indicating some improvement in the efficacy of the public administration and civil service as well as some improvement in economic freedom. Yet, the end-of-sample MCMC estimates are below the zero threshold, suggesting a more exclusionary institutional structure than the expected level in the geographically similar regions in the control sample. Further, the estimated residual series for the rule of law and control of corruption indicate a persistent and irreversible decline since the beginning of the sample. This pattern reveals the continuous loss in the effectiveness of legal institutions and ability to control corruption, which began soon after the dissolution of the Soviet Union.

FIGURE 2 – INSERT ABOUT HERE

Figure 3 exhibits the institutional quality trajectory for each dimension for individual regions in Ukraine.[[17]](#footnote-17) The patterns of institutional quality development generally show a range of contrasts and notable similarities in post-1996 institutional development. It is observed that some regions have a simulated latent institutional quality trajectory above the zero-residual threshold, revealing somewhat better institutional quality than their pre-determined exogenous geographic characteristics. For instance, provinces like Donetsk and Dnipro are characterised by relative stable institutional development until the 2014 Maidan revolution, but later deteriorate with respect to residualised voice, accountability, and political stability. Other regions such as Kharkiv exhibit a pattern of sharp deterioration in government effectiveness after 2007 and notable growth after 2014. The series on regulatory quality for Lviv further sheds light on the presence of relatively more exclusionary economic institutions during the full period of investigation given that both the mean MCMC estimate and respective confidence bounds are below zero. Despite some improvement after 2014, the mean point estimate fails to exceed the zero threshold, indicating the ongoing persistence of exclusionary economic institutions. A similar description also applies to a region such as Odessa with respect to the rule of law. In particular, following a period of stable zero-residual series until early 2010, a sharp drop is later seen amid a shift towards a stronger the rule of law that is considerably worse than expected considering Odessa’s pre-determined geographic characteristics. We also uncover evidence of a widespread weakness to control corruption in the capital city (Kyiv), on a steady level for the post-independence period.

FIGURE 3 – INSERT ABOUT HERE

**4 Identification Strategy**

*4.1 Setup*

Our goal is to examine how deep institutional integration consistently contributes to governance and institutional quality. To this end, our aim is to estimate the appropriate counterfactual governance quality scenario to determine the institutional quality cost of staying out of the institutional integration.

Suppose we observe a finite set of regions over periods where . Entry into the institutional integration that entails the characteristics of a treatment-based policy shock occurs at time , begins in , and without interruption lasts until the end of the time period such that and (Abadie 2021).

Let be the potential governance outcome in the j-th region in the hypothetical absence of the integration for and , and let represent the observed realised the governance outcome in the full period . Without loss of generality, the average governance effect of the institutional integration is defined as:

 (6)

where captures the difference between the observed realisation of the governance outcome and the potential governance in the institutional integration’s hypothetical absence. Since joining the institutional integration can be like a binary variable switching between 0 and 1 and sub-periods and , entry to the integration can be described as a dummy variable taking the value and otherwise. The effect of entering the institutional integration may be written as follows:

 (7)

The biggest identification constraint while estimating is that cannot be observed by the economist and must thus be estimated to gauge the effect of staying outside the institutional integration. In this respect, our aim is to estimate the full vector of post-treatment effects of the institutional integration . Let be approximated through a simple latent factor model:

 (8)

where denotes the full set of time-fixed effects that absorb time-varying technology shocks common to all regions with a constant loading, is a simple vector of observed auxiliary covariates unaffected by entry to the institutional integration, is a vector of prior unknown parameters, is a vector of observed common factors, and is a vector of unknown factor loadings, while is the set of region-level transitory shocks under an structure (Xu 2017).

As advocated by Firpo and Possebom (2018), let be a vector of the observed realisation of outcomes for region in the pre-intervention period where , and let be a vector of covariates. Moreover, let be a matrix with dimensions, and a corresponding . Then let be a simple vector of weights with dimensions that captures the entire composition of the donor pool. Each particular value of the weighted vector captures the weighted average of the donor pool’s characteristics that best reproduce the institutional quality trajectory prior to the institutional integration implied from the and matrices. The fitted value of the outcome variable constructed from the donor pool characteristics for the given is thus as follows:

 (9)

which implies that for each , we estimate . The optimal weights are derived by dividing the pre-treatment period training and validation sub-periods, which consists of the training and validation periods. In the training period, the covariates’ and pre-treatment outcomes’ relative importance is identified through a diagonal matrix denoting the normalised variable weights. In the validation period, the weighing vector for each captures the relative importance of each region in the loci of the treated region’s convex hull where (Botosaru and Ferman 2019) state the set of weights is selected based on the similarity between and and given as a closed-form solution to the nested minimisation problem (Becker and Klößner 2018):

 (10)

where and is a diagonal, positive, semi-definite matrix with dimensions with a trace equal to one:

 (11)

where it is noted that is a weighting vector measuring the relative importance of the potential sequence of weights from in the donor pool in composition of the synthetic control group, while measures the relative predictive importance of each K covariate and pre- outcome (Billmeier and Nannicini 2013). Both weighting vector and covariate-level vector track and reproduce the institutional quality trajectory of a treated region as closely as possible. Hence, choosing an appropriate distance matrix like Euclidean or Trigonometric allows the relative discrepancy between the treated region and its synthetic control group to be evaluated (Doudchenko and Imbens 2016). Without loss of generality, the treatment effect of the institutional integration on the institutional quality for the region and each can be written as:

 (12)

*4.2 Inference*

To evaluate the significance of the effect of institutional integration, our approach relies on the standard permutation test. The question we ask here is whether the estimated institutional quality gap is obtained by chance. Following Abadie and Gardeazabal (2003), Bertrand et al. (2004), Abadie et al. (2010), McClelland and Gault (2017), and Firpo and Possebom (2018), we perform a series of in-space placebo simulations by iteratively applying the synthetic control estimator to the full set of regions that have joined the European Union to address the significance of the estimated effect of staying outside the EU. The intuition behind the placebo simulations is simple and straightforward. If the permutation of staying out of the EU for the unaffected regions generates gaps at a level similar to those observed for Ukrainian regions, we would have to interpret that as meaning the synthetic control analysis does not provide evidence of a significant effect of staying outside the EU. In contrast, if the placebo simulation creates institutional quality gaps across Ukrainian regions that are unusually large relative to the gaps for those regions that joined the EU during the CEE enlargements in 2004[[18]](#footnote-18), 2007[[19]](#footnote-19) and 2013[[20]](#footnote-20), then the notion of a significant effect of staying outside the EU becomes more plausible. To assess the significance of the estimated gaps, the synthetic control estimator is iteratively applied to every other region except Ukrainian ones, effectively shifting the latter from the treatment set to the donor pool. Henceforth, we compute the estimated effect for each placebo simulation which provides the distribution of the estimated gaps for those regions that have not stayed outside the EU.

Our approach is based on a benchmark for a small-sample inference similar to Fisher’s exact hypothesis test. With this test, staying outside the EU is permuted to the unaffected regions for each . Therefore, for each , is estimated for the sub-periods and . In the next step, the full vector of post-treatment effects of staying outside the EU, is compared with the empirical distribution of based on the treatment permutation procedure. The notion behind the comparison leads to a simple decision. If the vector of estimated effects for the treated regions is relatively large compared to the vector of effects for the quasi-treated regions, the null hypothesis of no effect whatsoever of staying outside the EU can be rejected.

A major caveat regarding comparing and is that can be abnormally large relative to the empirical distribution of for some periods within but not for others. To partly account for the imperfect pre- fit of the institutional quality trajectory, we construct an empirical distribution of the root mean square error as summary statistics:

 (13)

where denotes the pre- mean square predictive discrepancy between and , and represents the post- predictive discrepancy between the treated region and its synthetic peer. To determine whether the estimated gap between for and is statistically significant, we compute the two-sided p-value based on the treatment permutation procedure:

 (14)

where is the indicator function revealing whether from the permuted treatment is, in absolute terms, larger than the benchmark RMSE of the treated region (). Without loss of generality, the distribution of in-space placebos can be described as and . When the treatment is randomly assigned, the p-values may be interpreted through a classical randomisation inference. In contrast, if the treatment is not randomly assigned, the p-value may be interpreted as the proportion of quasi-treated regions with an estimated institutional quality gap at least as large as the treated region. By inverting the p-values in the intertemporal distribution, the confidence bounds based on the pre-specified significance threshold can then be constructed. Under the null hypothesis, for each and . Since our donor pool is reasonably large, our benchmark rejection rule stipulates an exact null hypothesis of no effect whatsoever where the p-values are constructed by inversely weighting the estimated placebo gaps:

 (15)

where denotes the analytical weight in the placebo set where placebos with smaller magnitude pre- than that of are overweighted to avoid obtaining a p-value driven by the extreme relative rarity of obtaining a large effect from poorly fit placebos. As noted by Abadie et al. (2010, p. 502), placebo runs with a poor fit quality do not provide meaningful information to measure the relative rarity of estimating a large post- gap for a unit with a good fit prior to the treatment. For this reason, weighs the placebos based on the size of and overweights those whose quality fit is closer to to avoid artificially low p-values as the result of poorly fitting placebos.

**5 Results**

 *5.1 Baseline results*

Table 1 reports the pre-2007 imbalance in institutional quality outcomes and the auxiliary covariates for each individual outcome and selected provinces. The descriptive evidence suggests the synthetic control estimator through the latent factor model from Eq. (2) provides an excellent fit of the institutional quality trajectory between the Ukrainian regions and their synthetic peers before 2007 based on the weights obtained in the training and validation period. In each respective specification, the size of RMSE appears very low and within the conventional 1% error discrepancy when compared against the zero-fit benchmark model (Adhikari and Alm 2016). This suggests that the pre-treatment imbalance in the covariates and outcomes is unlikely to taint the effect of staying outside the EU on the institutional quality of Ukrainian provinces.

TABLE 1 – INSERT HERE

Figure 4 presents the average treatment effect of staying outside the EU for the full province-level treatment sample. The evidence invariably shows large and persistent institutional quality losses from remaining outside the EU. In particular, the synthetic control estimates suggest that Ukrainian provinces have developed substantially worse institutional quality by staying outside the EU than regions and counties from those countries that joined the EU in 2004 or later. Although the estimated set of average treatment effects indicates the invariably worse trajectory of institutional quality after 2007, outcome-specific heterogeneity is notable. Specifically, the biggest drop in the institutional quality outcome is seen for the level of political stability and absence of violence. The estimated average treatment effect on the treated (ATET) is -0.39 basis points, implying that Ukrainian provinces’ political stability since 2007 is around 40 percentage points lower than it would be had Ukraine hypothetically been admitted to the EU at the same time as the rest of CEE. In a similar vein, the estimated ATET of staying outside the EU on the ability to control corruption is -0.21 basis points, namely about half as large as the effect on political stability. This invariably reveals a widespread drop in control of corruption after 2007 compared to Ukraine’s CEE peers admitted to the EU. Our estimates thus suggest a marked improvement in the ability to control corruption had Ukraine been hypothetically admitted to the EU along the same lines as the CEE control group from 2004 and subsequent rounds of enlargement. Similarly, the estimated ATET with respect to the rule of law is around -0.15 basis points which demonstrates large and negative effects of staying outside the EU on strength of the rule of law. The behaviour of ATET with respect to control of corruption and the rule of law especially particularly informative. It indicates a marked and pervasive drop in the observed series after 2007 amid a slight but slow increase after 2014. Our estimates hence show some improvement in the strength of rule of law and the ability to control corrupt behaviour after the Maidan Revolution, albeit the magnitude of closing the gap is small compared to the speed of its decline since 2007. A similar pattern is observable with respect to the quality of regulation. In particular, the estimated ATET is around -0.14 basis points, indicating a considerable drop in regulatory quality after 2007. By contrast, the magnitude of the drop in residualised voice and accountability is small and around 0.07 basis points during the post-treatment period. Similar to the patterns found elsewhere, the voice and accountability series show a trend of recovery in the years following the Maidan Revolution, yet the gap appears to be far from recovery compared to pre-2007 peak. In stark contrast, the effect of staying outside the EU on the effectiveness of government administration appears to be temporary. Unlike the evidence uncovered for the five other dimensions of institutional quality, government effectiveness exhibits a sharp fall after 2007, and a rapid increase and recovery after 2014. The end-of-sample ATE estimate indicates the full recovery of government effectiveness compared to the pre-2007 peak level. This implies that, despite staying outside the EU, government effectiveness and quality improved substantially and to the same extent as in the CEE synthetic control groups of Ukrainian regions. On balance, the estimates based on our analysis show evidence of the pervasive breakdown of institutional quality beginning in 2007 with respect to political stability, control of corruption, level of liberal democracy, the rule of law, and regulatory quality. In comparison, staying outside the EU only induced a temporary deviation in the residual government effectiveness series from its pre-2007 equilibrium. From a normative perspective, our estimates show Ukraine’s hypothetical admission to the EU would substantially improve its institutional quality whereas admission to the EU does not appear to be a necessary condition for improving the institutional quality of government administration where plausible policy alternatives can equally improve the administration’s efficacy. Given the previously recognised importance of the rule of law, political stability and control of corruption for sustained economic growth and social development, we contend that Ukraine’s entry to a more inclusive institutional integration than Russia’s institutional orbit would generate clear, substantial and permanent gains in institutional quality.

FIGURE 4 – INSERT HERE

Figure 5 reports the estimated institutional quality effect of staying outside the EU for selected Ukrainian provinces between 1996 and 2020. Our empirical strategy is able to almost perfectly reproduce the pre-2007 trajectory of the residualised institutional quality of Ukrainian provinces from the convex mix of the intrinsic attributes and characteristics of CEE European regions, which effectively brings the RMSE parameter close to zero. Without loss of generality, the province-level evidence is fully consistent with the average region-level treatment effect of staying outside the EU. In particular, the provincial institutional quality trajectory appears to exhibit a structural breakdown after 2007 indicated by the permanently lower quality level compared to the counterfactual scenario based on admission to the EU in 2007. The only exception to the structural breakdown comes from the post-2007 effect on government effectiveness where the treated region (i.e. Zaporizhznia) tends to gradually close the gap induced by the post-2007 instability behind its CEE peers. The evidence suggests that certain regions tend to be lagging well behind their respective synthetic control group. For instance, the ability to control corruption in Kyiv City permanently deteriorates relative to its synthetic peer, creating a large quality gap despite some improvement after 2014.[[21]](#footnote-21)

FIGURE 5 – INSERT HERE

Figure 6 presents the frequency distribution of the synthetic control groups. Given the size of the treatment sample and the donor pool, our preferred approach is to report the frequency of donor regions in the synthetic control groups of Ukrainian provinces to determine the most powerful and important donor regions with a non-zero weight in the synthetic control group of Ukrainian provinces. Notwithstanding the contrasts, notable variation in the synthetic control groups’ composition is visible across the provinces considered. For instance, Kyiv City’s trajectory for the residual control of corruption prior to 2007 is best reproduced as a convex combination of those regions whose implied attributes fall within the convex hull of a respective city, such as Bihor [Romania] (30%), Riga [Latvia] 16%, Satu Mare [Romania] 15%, Krapina-Zagorje [Croatia] (12%), Zilinsky Kaj [Slovakia] 9%, Maramures [Romania] (7%), Medjimurje [Croatia] 7%, Sofia Stolitsa [Bulgaria] 3%, and Bucharest [Romania] (2%). As another example, Kharkiv’s political stability and absence of violence trajectory are best reproduced as a weighted combination of the implied institutional quality attributes and the exogenous characteristics of Heves [Hungary] 35%, Pernik [Bulgaria] 22%, Szabolcz [Hungary] 11%, Jihomoravsky kraj [Czech Republic] 8%, Carinthia [Slovenia] 7%, Zilinsky kraj [Hungary] 7%, Pardubicky kraj [Czech Republic] 6%, and Trnavsky kraj [Slovakia] 4%, respectively. Further, Odessa’s residual rule of law trajectory can best be reproduced as a weighted combination of the implied institutional quality attributes and auxiliary characteristics of Gorj [Romania] 61%, Zala [Hungary] 11%, Ogres [Latvia] 9%, Liberecky kraj [Czech Republic] 9%, Varazdin [Croatia] 5%, Prague [Czech Republic] 3% and Veliko Tarnovo [Bulgaria] 3%. From a more general perspective, the synthetic control groups of the treated Ukrainian provinces in the voice and accountability specifications are dominated by Prague and Medjimurje followed by the attributes of Czech regions and several Bulgarian and Hungarian regions. This implies that a convex combination of attributes made up of Czech regions, Croatian counties and several other CEE regions is very well able to reproduce the observed dynamics of voice and accountability prior to the year of hypothetical admission to the EU. In the specifications of the political stability and absence of violence models, the synthetic control groups are dominated by Medjimurje [Croatia], Lubuskie [Poland] and Zilinsky kraj [Slovakia]. Other important donors with a non-zero weight include capital cities in central Europe like Prague and Zagreb as well as several regions in Eastern Europe, especially Romania and Bulgaria, such as Constanta, Montana and Bistrita-Nasaud. In contrast, the synthetic control groups in the specifications using government effectiveness as the outcome of interest are disproportionately dominated by Romanian regions followed by Slovak and Polish regions, whilst other regions enter the control groups considerably less frequently. In addition, the synthetic control groups in the regulatory quality specifications appear to be the most homogenous given the considerably smaller number of donors with a non-zero weight. The synthetic control groups are dominated by Prague, Sofia, three Croatian counties (Krapina-Zagorje, Medjimurje, Koprivnica-Krizevci) and one Polish region (Kujawsko-Pomorskie). Similarly, the rule-of-law trajectories of Ukrainian provinces prior to 2007 are most eloquently reproduced as a weighted combination of the quality-related and auxiliary attributes dominated by Croatian counties, Czech regions and Bulgarian provinces whereas others enter the groups much less frequently. An interesting insight arises from the donor frequency comparison in specifications involving the control of corruption as the underlying outcome. The synthetic control groups disproportionately consist of Zagreb City whose additive weight almost equals the sum of the weights for the other donor regions. Moreover, the synthetic control groups reflecting the effect of staying outside the EU are also characterised by the presence of several Romanian regions and Latvian and Lithuanian districts.

FIGURE 6 – INSERT HERE

*5.2 In-space placebo analysis*

In-space placebo analysis is used to consider the statistical significance of the effect of staying outside the EU on the Ukrainian provinces’ institutional quality. In particular, EU-stay-out is assigned to regions in the donor pool that have not remained outside the EU, which effectively shifts Ukrainian provinces into the donor pool. By iteratively applying the synthetic control estimator to the unaffected regions, we estimate a large vector of placebo gaps and evaluate the estimated effects for Ukrainian provinces compared to the effect sequence from the placebo runs. If the institutional quality effects estimated for Ukrainian provinces are particularly large and unique, the notion of significant effects of staying outside the EU becomes more credible. However, if the gaps estimated for the Ukrainian provinces do not seem substantially different from the placebo gaps our conclusion must be that the analysis fails to provide evidence of a significant effect of staying outside the EU. For each institutional quality outcome considered, we compute two-tailed p-values as and proceed with the benchmark rejection rule to imply no effect whatsoever through inversely weighted placebo gaps. Given the size of the treatment sample and the donor pool and length of the pre-treatment period, we calculate more than 34 billion placebo gap averages. The relatively large number of placebo averages allows us to use almost a full random sampling approach to the treatment permutation and improves the consistency of the estimated p-values denoting the probability of no effect whatsoever. Apart from the standard p-values, we conduct a simple difference-in-differences analysis of the placebo gap coefficients to parametrically determine whether the gaps estimated for the Ukrainian provinces are statistically significantly different from the placebo gaps. Each specification also contains the full set of region-fixed effects and time-fixed effects to absorb the confounding influence of the heterogeneity bias from the estimated post-treatment coefficient.

Table 2 presents the in-space placebo analysis of staying outside the EU. Our key parameter of interest is the , which denotes the average post-2007 institutional quality gap across Ukrainian provinces for each institutional outcome being considered. The placebo analysis reveals a high degree of uniqueness of the institutional quality gap. Controlling for the unobserved region-specific and time-variant heterogeneity, the estimated coefficients for the Ukrainian province-level post-treatment gaps are large and statistically significant at the 1-percent level. Consistent with the estimated magnitudes, the biggest post-treatment coefficients are found with respect to political stability and the absence of violence, control of corruption, and strength of the rule of law. The difference-in-differences analysis thus largely confirms the significance of the estimated gaps for the Ukrainian provinces and highlights the relatively considerable losses of remaining outside the EU.

TABLE 2 – INSERT HERE

Figure 7 reports the p-values for the institutional quality effect of staying outside the EU through the simulation-based placebo analysis. The figure shows the share of regions in the donor pool with at least as large an effect of staying outside the EU as the Ukrainian regions. Namely, a high proportion indicates a considerably weaker effect of EU-stay-out whilst a low proportion corresponds to a statistically more significant effect of staying outside. More specifically, the figure does not report average p-values from the placebo runs but the exact p-values on no effect whatsoever for each post-treatment period and each respective institutional quality outcome. Without loss of generality, the p-values may be used to make an inference about the institutional quality effect of remaining under Russia’s institutional and political patronage. The evidence suggests unequivocally low p-values associated with staying outside the EU after 2007. In particular, the simulated p-values are around a 0.000 threshold for the entire post-treatment period for the series reflecting voice and accountability, political stability, rule of law, and control of corruption. From a substantive perspective, the inference concerning the effect of staying outside the EU implies that by hypothetically joining the EU Ukrainian regions would have developed a superior rule of law, great political stability, the absence of violence and substantially stronger control over corruption along with a more liberal democratic governance compared to what they have managed to develop themselves under Russia’s institutional and political influence. In contrast, the p-values for the quality of regulation do not indicate a statistically significant effect of staying outside the EU on the respective institutional quality. As another example, the statistical significance of the effect on government effectiveness almost entirely disappears in the end-of-sample post-treatment period when the p-value for the EU-stay-out effect moves from 0.04 to 0.68, implying that the improvement in the quality and efficacy of government administration due to the EU institutional integration is a long-lasting yet temporary institutional quality shock. On balance, the improvements in the strength of anti-corruption legislation and enforcement, liberal democratic governance, freedom of the press, level of the rule of law, and political stability invariably suggest that the institutional quality improvement outside the extractive institutional orbit is both large, statistically significant and outweighs the temporary nature of the effect on government effectiveness as well as the non-significant effect on the quality of regulation.

*5.3 The transmission mechanisms at work*

The key question concerning the estimated institutional quality effects of staying outside the EU is the transmission mechanisms at work, which may explain how the failure to embark on European integration path translates to lower institutional quality than the Ukrainian regions would otherwise have achieved. Our approach to determining the transmission mechanisms considers both long-term historical legacies as well as more contemporaneous channels like culture, state capacity, geographical and natural resource endowments, and level of economic development based on the region-level data provided in Gennaioli et al. (2014, 2015).

Long-term historical legacies of institutional regimes from the past matter for economic and social development. The comprehensive study by Becker et al. (2016a) stresses the positive historical legacy of the Habsburg Empire in the subjected territories in terms of a higher level of citizens' trust in local public services. Using a geo-referenced border specification as part of a two-dimensional regression discontinuity design (RDD), their findings suggest that historical Habsburg affiliation both increases the level of trust in government and is associated with lower corruption in the courts and police. Similar evidence about the persistent and long-lasting effects of historical legacies associated with the Habsburg Empire is among several others presented in Dimitrova-Grajzl (2007), Schulze and Wolf (2009), Grosjean (2011), Mendelski and Libman (2014) and Grosfeld and Zhuravskaya (2015).

The era of the Habsburg Empire in the area of modern-day Ukraine lasted from 1772 to 1918. The Habsburg Empire acquired a sizeable part of Ukrainian territory in 1772 whilst before then only Transcarpathia had integrated into the Empire. Upon the first partition of Poland in 1772, the Habsburgs acquired the territories of Galicia and Lodomeria. Three years later, the small territory of Bukovina was acquired from the Ottoman Empire and integrated into the Habsburg Empire. If the Habsburg legacy generates a positive effect on trust in public institutions, the question that remains is whether formerly Habsburg territories exhibit disproportionately larger losses of staying outside the EU. Since our observations are disaggregated to the regional level, we cannot perform an RDD because that would require individual or spatially more disaggregated data. However, given the intrinsic sample size limitations, we assess whether the Habsburg legacy explains the contrasts in the benefits and losses of staying outside the EU by testing the equality of effects estimated through the synthetic control estimator between the Ukrainian provinces integrated into the Habsburg Empire (Magocsi 2002)[[22]](#footnote-22) and those outside the empire.

Table 3 reports the tested equality of estimated institutional gaps for each outcome in the investigation before and after the date of hypothetical admission to the EU. The table reports the average differences in the outcome-specific institutional quality gap between those provinces integrated into the Habsburg Empire and those that were not. The key parameter of interest is the difference in the effect coupled with the p-values on the test statistics. The evidence offers limited empirical support for a persistent effect of the Habsburg Empire on institutional quality gaps. The provinces formerly under Habsburg rule tend to have a somewhat lower effect on political instability and absence of violence, indicting relatively larger stability benefits of joining the EU for those regions that used to be under the strong historical influence of the Russian Empire. Previously Habsburg-ruled Ukrainian regions also see a somewhat slower drop in government effectiveness and regulatory quality in response to staying outside the EU, and a marginally smaller effect with respect to the rule of law. In contrast, we find no evidence to corroborate the notion that belonging to the Habsburg Empire entails substantially better control of corruption or greater freedom of the press and more rigorous democratic accountability.

TABLE 3 – INSERT HERE

Figure 8 shows the estimated effects for the cultural, religious, geographical and economic mechanisms at work. The vertical axis depicts the first principal component of the estimated institutional quality gaps to provide a more comprehensive measure of the loss with the largest common variation without losing either generality or specificity of the gap for each outcome. The evidence consistently suggests reasonably strong links between culture, physical geography and level of economic development in contrast to the estimated effects of staying outside the EU. For instance, the notion that being exposed to the Protestant religion bolsters economic growth through its strong work ethic and spirit of entrepreneurship initially emphasised by Weber (1904) has been the subject of rigorous scholarly debate by economists, sociologists and political scientists (Ekelund et al. 2002, Becker et al. 2016b). Some find evidence in favour of the Weber hypothesis (Grier 1997, Delacroix and Nielsen 2001, Becker and Woessmann 2009, Schaltegger and Torgler 2010, Bai and Kung 2015, Becker and Won 2021), while others shown that Protestantism has no long-term effects on economic outcomes (Doepke and Zilibotti 2005, 2008, Van Hoorn and Maseland 2013, Wang and Lin 2014, Cantoni 2015). We collect data on the share of Protestants and Eastern Orthodox denominations for each Ukrainian province for the period of our investigation from Lyubitseva (2014), and find that provinces with a bigger share of Protestants tend to have considerably lower losses of staying outside the EU. Consistent with prior literature on the economic and institutional quality effects of Protestantism, the negative relationship suggests that a somewhat stronger Protestant ethic can partly compensate for the negative institutional quality effect of staying out of the EU. Yet, provinces with a greater Eastern Orthodox share tend to have considerably bigger institutional quality losses from staying outside the EU, suggesting that the deep institutional integration based on a relatively more inclusive institutional framework can disproportionately bolster quality improvements in those provinces with a large Eastern Orthodox share in the population. In addition, provinces with a bigger share of population that support Russia tend to benefit somewhat less from hypothetical admission to the EU compared to provinces with fewer pro-Russian supporters.

FIGURE 8 – INSERT AROUND HERE

By way of another example, the provinces located further from the coast tend to benefit substantially more from the EU-induced institutional quality improvement than those in closer proximity to the coast. Consistent with the economic geography literature (Limão and Venables 2001), the costs of staying outside the EU are somewhat higher for inland and landlocked provinces that lack access to international sea waters and have higher transport costs and higher costs of trade (Frankel and Romer 1999). We also show that exposure to a malaria ecology (Sachs and Malaney 2002) adversely affects the institutional quality benefits of joining the EU. Moreover, provinces with a lower level of state capacity to provide public goods like education, law and order tend to have somewhat bigger losses of staying outside the EU, which is consistent with prior findings (Besley and Persson 2010, Acemoglu et al. 2015, Dincecco 2017). In addition, provinces with a higher level of economic development, proxied either by per capita GDP or per capita luminosity (Henderson et al. 2012), tend to lose relatively less by staying outside the EU than the poorer provinces. Taken together, this implies that a deep institutional integration would be expected to deliver stronger institutional quality improvements to provinces on a lower level of economic development. By contrast, natural resource endowment, captured by the share of oil and gas production in the province-level GDP, only weakly correlates with the losses of remaining outside the EU and do not seem to play a significant role.

**6 Conclusion**

We have examined the institutional quality effects of the institutional integration in this paper. To that end, we considered the effects of staying outside the EU on the institutional quality of Ukrainian provinces between 1996 and 2020 by considering the political crisis in 20007 as a vacuum generating potential admission to the EU. Comparing the institutional quality trajectory of 24 Ukrainian provinces with a donor pool of 195 CEE regions that joined the European Union in 2004 and in later enlargement rounds allowed us to assess the institutional quality cost of remaining under Russian political influence and highlight the potential benefits of EU admission. By making use of a novel dataset measuring subnational institutional quality generated through application of Bayesian posterior analysis supported by a machine-learning-based algorithm, we were able to better unravel the heterogeneity in the benefits of hypothetical EU membership.

After applying the synthetic control estimator originally proposed by Abadie and Gardeazabal (2003) and extended by many other scholars, evidence was found of significant and substantial institutional quality improvements in response to Ukraine’s hypothetical admission to EU membership. The evidence invariably points to substantial institutional quality gains in terms of improved political stability, reduced violence, strengthened liberal democratic governance, stronger rule of law, and better control of corruption. As a slight contrast, the improvements arising from the improved regulatory quality and effectiveness of government administration seem temporary. Without loss of generality, the evidence thus suggests that hypothetical admission to the EU can generate a positive deep institutional shock leading to improvements in deeper layers of institutional quality like the rule of law which Ukraine can rarely develop from its domestic political economy equilibrium without EU membership. In contrast, policy improvements leading to better regulatory design and enforcement of the competition and structural policies do not necessitate a deep institutional integration. Given the previously recognised primacy of the rule of law and institutional instability for economic growth (Weingast 1995, Feng 1997, Rodrik et al. 2004), the benefits of deep institutional integration due to hypothetical EU membership are almost impossible to be ignored.

Our analysis provides several noteworthy policy-relevant normative implications. First, by staying outside the EU the institutional quality of Ukrainian provinces has deteriorated considerably compared to the trajectories in the donor pool of CEE regions that have been integrated into West’s economic and political circuit of influence. By remaining under the Kremlin’s political influence and interference in the domestic political economy, Ukrainian provinces have seen worsening control of corruption, the steady backdrop of the rule of law, widespread limitations on freedom of expression, and rampant deterioration of political stability. Further, the statistical significance of the post-2007 institutional quality gaps was examined through a large-scale placebo analysis that involved a simulation with over 34 billion placebo averages for each institutional quality outcome being considered. We find that, despite the noteworthy institutional reforms that occurred after 2018, the deterioration of institutional quality in the post-2007 period appears to be permanent, except for government effectiveness and regulatory quality. Second, policy efforts geared towards institutional reforms that address the negative bias due to the Kremlin’s political influence and interference abroad may generate growth- and stability-enhancing effects provided that the de facto enforcement of such policies is reasonably strong. Third, despite the setbacks created by Brexit and the COVID-19 pandemic, the EU’s institutional framework provides a superior set of institutions and policies which prospective membership candidates cannot develop themselves given the capacity constraints, knowledge and coordination failures or any inherent domestic political economy bias.

Finally, it is stressed that additional checks of external validity are needed before any definitive conclusion can be drawn about generalising the EU’s institutional integration and its effect on institutional quality and economic performance. While our investigation shows significant benefits of hypothetical EU membership for Ukraine, extending the scope of the analysis to regions with a similar historical experience and contemporaneous domestic instability like the Western Balkans which can be considered at least remote EU membership candidates would create interesting insights abut the potential admission benefits that could be compared to the benefits estimated for Ukraine.

**References**

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review*, 93(1): 113-132.

Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California’s tobacco control program. *Journal of the American Statistical Association*, 105(490): 493-505.

Abadie, A., Diamond, A., & Hainmueller, J. (2015). Comparative politics and the synthetic control method. *American Journal of Political Science*, 59(2): 495-510.

Abadie, A. (2021). Using synthetic controls: Feasibility, data requirements, and methodological aspects. *Journal of Economic Literature*, 59(2): 391-425.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. In: Aghion, P. & S.N. Durlauf (eds). Handbook of Economic Growth, Vol 1, (pp. 385-472). Amsterdam, North Holland: Elsevier.

Acemoglu, D., García-Jimeno, C., & Robinson, J. A. (2015). State capacity and economic development: A network approach. *American Economic Review*, 105(8): 2364-2409.

Adhikari, B., & Alm, J. (2016). Evaluating the economic effects of flat tax reforms using synthetic control methods. *Southern Economic Journal*, 83(2): 437-463.

Aslund, A. & de Menil, G. (2000), Economic Reform in Ukraine: The Unfinished Agenda, New York, NY: M.E. Sharpe.

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates?. *The Quarterly Journal of Economics*, 119(1): 249-275.

Brou, D. & Ruta, M. (2011), ‘Economic integration, political integration or both?, Journal of the European Economic Association, 9(6).

Badinger, H. (2005). Growth effects of economic integration: evidence from the EU member states. *Review of World Economics*, 141(1): 50-78.

Bai, Y., & Kung, J. K. S. (2015). Diffusing knowledge while spreading God's message: Protestantism and economic prosperity in China, 1840–1920. *Journal of the European Economic Association*, 13(4): 669-698.

Balmaceda, M. M. (2014), ‘Will Cheap Russian Gas Save Ukraine?’, *Problems of Post-Communism*, 61(2): 61-67.

Becker, M., & Klößner, S. (2018). Fast and reliable computation of generalized synthetic controls. *Econometrics and Statistics*, 5: 1-19.

Becker, S. O., Boeckh, K., Hainz, C., & Woessmann, L. (2016a). The empire is dead, long live the empire! Long‐run persistence of trust and corruption in the bureaucracy. *The Economic Journal*, 126(590): 40-74.

Becker, S. O., Pfaff, S., & Rubin, J. (2016b). Causes and consequences of the Protestant Reformation. *Explorations in Economic History*, 62, 1-25.

Becker, S. O., & Woessmann, L. (2009). Was Weber wrong? A human capital theory of Protestant economic history. *The Quarterly Journal of Economics*, 124(2), 531-596.

Becker, S.O. & Won, C. (2021). Jesus speaks Korean: Christianity and literacy in colonial Korea. *Revista di Storia Economica*, 37(1): 7-32.

Besley, T., & Persson, T. (2010). State capacity, conflict, and development. *Econometrica*, 78(1): 1-34.

Billmeier, A., & Nannicini, T. (2013). Assessing economic liberalization episodes: A synthetic control approach. *Review of Economics and Statistics*, 95(3): 983-1001.

Botosaru, I., & Ferman, B. (2019). On the role of covariates in the synthetic control method. *The Econometrics Journal*, 22(2): 117-130.

Cameron, D. R. & Orenstein, M. A. (2012) Post-Soviet Authoritarianism: The Influence of Russia in Its "Near Abroad", Post-Soviet Affairs, 28:1, 1-44.

Campos, N. F., Coricelli, F., Moretti, L. (2019), Institutional integration and economic growth in Europe, *Journal of Monetary Economics*, 103, 88-104.

Cantoni, D. (2015). The economic effects of the Protestant Reformation: testing the Weber hypothesis in the German lands. *Journal of the European Economic Association*, 13(4), 561-598.

Crespo Cuaresma, J., Ritzberger-Grünwald, D., & Silgoner, M. A. (2008). Growth, convergence and EU membership. *Applied Economics*, 40(5): 643-656.

Delacroix, J., & Nielsen, F. (2001). The beloved myth: Protestantism and the rise of industrial capitalism in nineteenth-century Europe. *Social Forces*, 80(2): 509-553.

Dimitrova‐Grajzl, V. (2007). The great divide revisited: Ottoman and Habsburg legacies on transition. *Kyklos*, 60(4): 539-558.

Dincecco, M. (2017). *State Capacity and Economic Development: Present and Past*. Cambridge University Press.

Doepke, M., & Zilibotti, F. (2005). Social class and the spirit of capitalism*. Journal of the European Economic Association*, 3(2-3): 516-524.

Doepke, M., & Zilibotti, F. (2008). Occupational choice and the spirit of capitalism. *The Quarterly Journal of Economics*, 123(2): 747-793.

Doudchenko, N., & Imbens, G. W. (2016). Balancing, regression, difference-in-differences and synthetic control methods: A synthesis. Working Paper No. 22791, National Bureau of Economic Research.

Eichengreen, B. (2008). *The European economy since 1945*. Princeton University Press.

Ekelund, Jr, R. B., Hébert, R. F., & Tollison, R. D. (2002). An economic analysis of the protestant reformation. *Journal of Political Economy*, 110(3): 646-671.

Feng, Y. (1997). Democracy, political stability and economic growth. *British Journal of Political Science*, 27(3): 391-418.

Feklyunina, V. (2016), ‘Soft power and identity: Russia, Ukraine and the ‘Russian world(s)’, European Journal of International Relations, 22(4), 773-796.

Firpo, S., & Possebom, V. (2018). Synthetic control method: Inference, sensitivity analysis and confidence sets. *Journal of Causal Inference*, 6(2): 1-26.

Frankel, J.A. & Romer, D.H. (1999). Does trade cause growth? *American Economic Review*, 89(3): 379-399.

Garoupa, N., & Spruk, R. (2020). Does European Union Really Matter for Long-Run Growth and Development? In Search of the Missing Counterfactual. Search of the Missing Counterfactual, Working Paper No. 3568134, Social Science Research Network.

Gennaioli, N., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2013). Human capital and regional development. *The Quarterly Journal of Economics*, 128(1): 105-164.

Gennaioli, N., La Porta, R., Lopez De Silanes, F., & Shleifer, A. (2014). Growth in regions. *Journal of Economic Growth*, 19(3): 259-309.

Götz, E. (2017) ‘Putin, the State, and War: The Causes of Russia’s Near Abroad Assertion Revisited’, International Studies Review, 19(2), 228–253.

Grosfeld, I., & Zhuravskaya, E. (2015). Cultural vs. economic legacies of empires: Evidence from the partition of Poland. *Journal of Comparative Economics*, 43(1): 55-75.

Grier, R. (1997). The effect of religion on economic development: a cross national study of 63 former colonies. *Kyklos*, 50(1): 47-62.

Grosjean, P. (2011). The weight of history on European cultural integration: a gravity approach. *American Economic Review*, 101(3): 504-08.

Hastings, W. K. (1970). Monte Carlo sampling methods using Markov chains and their applications. *Biometrika* 57(1): 97-109.

Haukkala, H. (2015) From Cooperative to Contested Europe? The Conflict in Ukraine as a Culmination of a Long-Term Crisis in EU–Russia Relations, Journal of Contemporary European Studies, 23:1, 25-40

Henderson, J. V., Storeygard, A., & Weil, D. N. (2012). Measuring economic growth from outer space. *American Economic Review*, 102(2): 994-1028.

Hodrick, R. J., & Prescott, E. C. (1997). Postwar US business cycles: an empirical investigation. *Journal of Money, Credit, and Banking*, 29(1): 1-16.

Isakova, A. & Koczan, Z. & Plekhanov, A. (2016) How much do tariffs matter? Evidence from the customs union of Belarus, Kazakhstan and Russia, Journal of Economic Policy Reform, 19:2, 166-184.

Jarner, S. F., & Roberts, G. O. (2007). Convergence of Heavy‐tailed Monte Carlo Markov Chain Algorithms. *Scandinavian Journal of Statistics*, 34(4): 781-815.

Just, T. (2016) ‘Promoting Russia abroad: Russia's post-Cold war national identity and public diplomacy’, The Journal of International Communication, 22:1, 82-95.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, 3(2): 220-246.

Kerrane, E. (2020), ‘Russian Insecurities: How Fear Drives Perception in the Near Abroad’, Journal on Baltic Security, 6(1), 23-32.

Kolmogorov, A. (1933). Sulla determinazione empirica di una lgge di distribuzione. Giornale dell’Istituto Italiano degli Attuari 4, 83-91.

Kolosov V., 2018, Radical shifts in Russian-Ukrainian relations and geopolitics of neighbourhood, Journal of Geography, Politics and Society, 8(2), 7–15.

Kottek, M., Grieser, J., Beck, C., Rudolf, B., & Rubel, F. (2006). World map of the Köppen-Geiger climate classification updated. *Meteorologische Zeitschrift*, 15, 259-263.

Kowalski, T. & Shachmurove, Y. (2018), Economic development in Poland and Ukraine: The case of foreign trade, Interdisciplinary Journal of Economics and Business Law, 7(2), 35-61.

Kutan, A. M. & Yigit, T. M. (2007), ‘European integration, productivity growth and real convergence’, European Economic Review, 51(6), 1370-1395.

Lane, D. (2011) ‘The Impact of Economic Crisis: Russia, Belarus and Ukraine in Comparative Perspective’, Journal of Communist Studies and Transition Politics, 27:3-4, 587-604.

Larrabee, F. S. (2010), ‘Russia, Ukraine, and Central Europe: The Return of Geopolitics’, Journal of International Affairs, 63(2), 33-52.

Lawrence, R. Z. (2000). *Regionalism, multilateralism, and deeper integration*. New York, NY: Brookings Institution Press.

Limao, N., & Venables, A. J. (2001). Infrastructure, geographical disadvantage, transport costs, and trade. *The World Bank Economic Review*, 15(3): 451-479.

Lough, J. and Lutsevych, O. and Pomerantsev, P. and Secrieru, S. and Shekhovtsov, A. (2014), ‘Russian influence abroad: Non-state actors and propaganda’, The Royal Institute of International Affairs.

Loskot-Strachota, Agata; Zachmann, Georg (2014): Rebalancing the EU- Russia-Ukraine gas relationship, Bruegel Policy Contribution, No. 2014/15, Bruegel, Brussels.

Lynch, A. C. (2001) ‘The Realism of Russia's Foreign Policy’, Europe-Asia Studies, 53:1, 7-31.

Lyubitseva, O. (2015). Research on the geography of religion in Ukraine. *Peregrinus Cracoviensis*, 25(3): 91-100.

Magnusson, L. M., & Tarverdi, Y. (2020). Measuring governance: Why do errors matter?. *World Development*, 136(December), 1-16.

Magocsi, P. R. (2016). *The Roots of Ukrainian Nationalism*: *Galicia as Ukraine’s Piedmont*. University of Toronto Press.

Malyarenko, T. and Wolff, S. (2018) The logic of competitive influence- seeking: Russia, Ukraine, and the conflict in Donbas, *Post-Soviet Affairs*, 34:4, 191-212,

Maseland, R., & Spruk, R. (2022). The benefits of US statehood: an analysis of the growth effects of joining the USA. Forthcoming: *Cliometrica*.

Maudos, J., Pastor, J. M., & Seranno, L. (1999). Economic integration, efficiency and economic growth: the European Union experience. *Applied Economics Letters*, 6(6): 389-392.

Mendelski, M., & Libman, A. (2014). Demand for litigation in the absence of traditions of rule of law: an example of Ottoman and Habsburg legacies in Romania. *Constitutional Political Economy*: 25(2), 177-206.

McClelland, R. & Gault, S. (2017). *Synthetic Control Method as a Tool to Understand State Policy*. Research Report. Washington DC: Urban Institute

Mersol, J. (2017), ‘When Russian Values Go Abroad: The Clash Between Populism and Foreign Policy’, SAIS Review of International Affairs, 37(1), 95-100.

Metropolis, N., Rosenbluth, A. W., Rosenbluth, M. N., Teller, A. H., & Teller, E. (1953). Equation of state calculations by fast computing machines. *The Journal of Chemical Physics*, 21(6): 1087-1092.

Morrison, J. (1993), ‘Pereyaslav and after: The Russian-Ukrainian Relationship’, International Affairs, 69(4), 677-703.

Peel, M. C., Finlayson, B. L., & McMahon, T. A. (2007). Updated world map of the Köppen-Geiger climate classification. *Hydrology and Earth System Sciences*, 11(5): 1633-1644.

Pridham, P. (2014) EU/Ukraine Relations and the Crisis with Russia, 2013-14: A Turning Point, The International Spectator, 49:4, 53-61

Popovic, M. and Kenne, E. K. and Medzihorsky, J. (2020), Charm Offensive or Offensive Charm? An Analysis of Russian and Chinese Cultural Institutes Abroad, *Europe-Asia Studies*, 72(9): 1445-1467.

Ravn, M. O., & Uhlig, H. (2002). On adjusting the Hodrick-Prescott filter for the frequency of observations. *Review of Economics and Statistics*, 84(2): 371-376.

Rivera-Batiz, L. A., & Romer, P. M. (1991). Economic integration and endogenous growth. *The Quarterly Journal of Economics*, 106(2), 531-555.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, 9(2): 131-165.

Sachs, J., & Malaney, P. (2002). The economic and social burden of malaria. *Nature*, 415(6872), 680-685.

Savchenko, A. (2002), ‘Toward Capitalism or Away from Russia?: Early Stage of Post-Soviet Economic Reforms in Belarus and the Baltics’, *The American Journal of Economics and Sociology*, 61(1): 233-257.

Schaltegger, C. A., & Torgler, B. (2010). Work ethic, Protestantism, and human capital. *Economics Letters*, 107(2): 99-101.

Schulze, M. S., & Wolf, N. (2009). On the origins of border effects: insights from the Habsburg Empire. *Journal of Economic Geography*, 9(1): 117-136.

Slay, B. (1994) *The Polish Economy,* Princeton University Press.

Smirnov, N. (1948). Table for estimating the goodness of fit of empirical distributions. *The Annals of Mathematical Statistics*, 19(2): 279-281.

Tolstrup, J. (2009) Studying a negative external actor: Russia's management of stability and instability in the ‘Near Abroad’, *Democratization*, 16(5): 922-944

Tolz, V. (2002), ‘Rethinking Russian-Ukrainian relations: a new trend in nation-building in post-communist Russia?’, *Nations and Nationalism*, 8(2), 235-253.

Young, C. & Kaczmarek, S. (2000), ‘Local government, local economic development and quality of life in Poland’, *GeoJournal*, 225-234.

Wang, Q., & Lin, X. (2014). Does religious beliefs affect economic growth? Evidence from provincial-level panel data in China. *China Economic Review*, 31, 277-287.

Weber, M. (1904). *Die protestantische Ethik und der Geist des Kapitalismus*. Tübingen: Mohr Siebeck.

Wydra, D. (2004), ‘The Crimea Conundrum: The Tug of War Between Russia and Ukraine on the Questions of Autonomy and Self-Determination', International Journal on Minority and Group Rights, 10, 111-130.

Weingast, B. R. (1995). The economic role of political institutions: Market-preserving federalism and economic development. *Journal of Law, Economics and Organization*, 11(1): 1-31.

Van Hoorn, A., & Maseland, R. (2013). Does a Protestant work ethic exist? Evidence from the well-being effect of unemployment. *Journal of Economic Behavior & Organization*, 91, 1-12.

Xu, Y. (2017). Generalized synthetic control method: Causal inference with interactive fixed effects models. *Political Analysis*, 25(1): 57-76.

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2. Voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and the control of corruption [↑](#footnote-ref-2)
3. The institutional quality trajectory of Ukraine before 2007 political crisis is best reproduced as a convex combination of institutional quality and auxiliary geographical, economic and demographic characteristics of Serbia (31%), Paraguay (19%), Argentina (16%), Romania (15%), Indonesia (13%) and Iraq (6%), respectively. The predictive discrepancy between Ukraine and its synthetic control group is low with a root mean square prediction error (RMSE) of around 0.051. [↑](#footnote-ref-3)
4. Cherkasy, Chernihiv, Chernivtsi, Dnipro, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytskyi, Kyiv, Kirovohrad, Luhansk, Lviv, Mykolaiv, Odessa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhia, Zhytomyr [↑](#footnote-ref-4)
5. Kyiv City and Sevastopol-Crimea [↑](#footnote-ref-5)
6. 14 regions: Jihocecky kraj, Jihomoravski kraj, Karlovarsky kraj, Kraj Vysocina, Karlovehradecky kraj, Liberecky kraj, Moravskoslezsky kraj, Olomoucky kraj, Pardubicky kraj, Plzensky kraj, Praha, Stredocesky kraj, Ustecky kraj, Zlinsky kraj [↑](#footnote-ref-6)
7. 20 regions: Baranya, Borsod-A-Z, Budapest, Bács-Kiskun, Békés, Csongrad, Fejér, Gyor-M-S, Hajdú-Bihar, Heves, Jász-N-Sz, Komárom-E, Nógrád, Pest, Somogy, Szabolcs-Sz-B, Tolna, Vas, Veszprém, Zala [↑](#footnote-ref-7)
8. 26 regions: Aizkraukle, Aluksne, Balvi, Bauskas, Ccsu, Daugavpils, Dobeles, Gulbenes, Jckabpils, Jelgavas, Kraslavas, Kuldigas, Liepajas, Limbadu, Ludzas, Madonas, Ogres, Preiiu, Pczeknes, Riga, Saldus, Talsu, Tukums, Valkas, Valmieras, Ventspils [↑](#footnote-ref-8)
9. 10 apskritis: Alytuas, Kaunas, Klapedos, Marijampoles, Panevezio, Siauliu, Taurages, Telsiu, Utenos, Vilniaus [↑](#footnote-ref-9)
10. 15 regions: Dolnoslaskie, Kujawsko-Pomorskie, Lubelskie, Lubuskie, Lódzskie, Malopolskie, Mazowieckie, Opolskie, Podkarpacike, Pomorsko-Zachodnipomorskie, Slaskie, Swietokrzyskie, WarminskoMazurskie, Wielkopolskie [↑](#footnote-ref-10)
11. 8 regions: Banska Bystrica, Bratislava, Kosice, Nitra, Presov, Trencian, Trnava, Zilina [↑](#footnote-ref-11)
12. 12 statistical regions: Gorizia, Inner Carniola-Carso, Littoral-Carso, Carinthia, Central Slovenia, Mura, Upper Sava, Upper Carniola, Drava, Savinja, Lower Sava, Lower Carniola [↑](#footnote-ref-12)
13. One reason behind Estonia’s exclusion is that its institutional quality scores from 1996 onwards are disproportionately high compared to its CEE peers, which implies the values for the Estonian regions may not fall within the convex hull of Ukrainian provinces’ institutional quality. [↑](#footnote-ref-13)
14. 27 regions: Blagoevgrad, Burgas, Dobrich, Gabrovo, Haskovo, Karzhali, Kyustendil, Lovech, Montana, Pazardzhik, Pernik, Pleven, Plovdiv, Razgrad, Shumen, Silistra, Sliven, Smolyan, Sofia, Sofia Stolitsa, Stara Zagora, Targovishte, Varna, Veliko Tarnovo, Vidin, Vratsa, Yambol [↑](#footnote-ref-14)
15. 42 regions: Alba, Arad, Arges, Bacau, Bihor, Bistrita-Nasaud, Botosani, Braila, Brasov, Bucharest, Buzau, Calarasi, Caras-Severin, Cluj, Constanta, Covasna, Dambovita, Dolj, Galati, Giurgiu, Gorj, Harghita, Hunedoara, Ialomita, Iasi, Ilfov, Maramures, Mehedinti, Mures, Neamt, Olt, Prahova, Salaj, Satu Mare, Sibiu, Suceava, Teleorman, Timis, Tulcea, Valcea, Vaslui, Vrancea [↑](#footnote-ref-15)
16. 21 counties: Bjelovar-Bilogora, Brod-Posavina, City of Zagreb, Dubrovnik-Neretva, Istria, Karlovac, Koprivnica-Križevci, Krapina-Zagorje, Lika-Senj, Međimurje, Osijek-Baranja, Požega-Slavonia, Primorje-Gorski Kotar, Sisak-Moslavina, Split-Dalmatia, Varaždin, Virovitica-Podravina, Vukovar-Syrmia, Zadar, Zagreb County, Šibenik-Knin [↑](#footnote-ref-16)
17. The regions were randomly selected for comparison for each institutional quality dimension. A full and more exhaustive depiction is available upon request. [↑](#footnote-ref-17)
18. Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia [↑](#footnote-ref-18)
19. Bulgaria and Romania [↑](#footnote-ref-19)
20. Croatia [↑](#footnote-ref-20)
21. For the sake of the size of our treatment sample and space limitations, the figures report the average treatment effect only for selected regions. An exhaustive report for the full set of regions or for an alternative combination of regions is available upon request. [↑](#footnote-ref-21)
22. Chernitvsi, Ivano-Frankivsk, Lviv, Ternopil, Zakarpattya [↑](#footnote-ref-22)