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OUTMIGRATION OF YOUTH AS INTERNATIONAL
STUDENTS**

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Rising Political Populism and Outmigration of Youth as International Students

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Abstract

Populism is on the rise, and democratic rights are deteriorating in many countries as a result of authoritarian policies adopted by populist leaders. This study analyzes how rising political populism in developing countries affects whether their citizens pursue higher education abroad. Applying the Synthetic Control Method, student migration patterns from Hungary, Ukraine, Venezuela, and Indonesia are explored as cases constituting early examples of populism. The estimates show that the rise of populism in these countries increases the number of citizens who attend universities in foreign countries. Limited evidence for worsening higher education options in the origin countries suggests that more students start pursuing foreign education to increase their chances of living abroad after graduation.

JEL codes: F22, I23, J24, O15

Key Words: International Students, Outmigration of Skilled People, Political Populism, Synthetic Control Method

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I. Introduction

Populist ideas have become prevalent all around the world in recent decades, and populist leaders have come into power in various countries, from Hungary and Poland in Europe to Venezuela and Brazil in Latin America and India and Indonesia in Asia.¹ Despite differences in opinion among populist leaders about fundamental policy issues, they all claim to defend the interests of “the people” against “the elites” in their country. In their fight against “the elites”, populist leaders have not refrained from attacking the long-standing institutions of their countries. As a result, the eroding of democratic institutions, such as independent courts and free media, and the deterioration of civil liberties, such as the freedom of thought and expression, have been experienced in most of the countries governed by populist leaders.² Resentment towards such adverse implications of rising political populism have emerged especially among young people. As a manifestation of this discontent, massive demonstrations have taken place in urban centers of many countries with the active participation of young people. However, these protests have mostly been suppressed by force, and the authoritarian tone of populist leaders has intensified over time. Moreover, the economic outlook has deteriorated noticeably over time in some of the countries governed by populist leaders. All these adverse consequences of the rise in political populism in their origin country might cause young people to explore new destinations as countries in which to study and live. In this paper, I analyze how the rise of political populism in a country affects the outmigration of its citizens as international students.

Political populism might increase the tendency to study abroad for two main reasons. First, rising populism in a country might diminish higher education options provided in its universities. In particular, limitations to fully exercising the freedom of thought in teaching might weaken the quality of education. Moreover, in a country with rising populism, hiring new faculty members from abroad and retaining existing faculty members might become more challenging, which consequently impinges on the enrollment capacity of its universities. To cope with these limitations, more students from such countries might prefer to study abroad. Second, a larger

¹ Defining populism is not easy. Guriev and Papaioannou (2020) state some commonly accepted pillars of populism, including the strong distinction between “the people” and “the elites”, heavy reliance on identity politics, and taking an authoritarian angle in policy issues. Despite these common pillars, the stand of populist leaders is mixed in relation to fundamental policy issues. For instance, left-wing populists are mostly culturally liberal and usually favor redistributive policies, whereas right-wing populists are culturally conservative and usually against redistribution.

² Several institutes report the decline in democratic rights globally in recent years. See “Global Democracy Has Another Bad Year” from the Economist (2020) and Repucci (2020) from Freedom House for a review of recent trends in global democracy. Section II of this paper also provides an analysis of the Freedom House data.

number of young people might start planning to live abroad after the election of populist leaders in their country of origin to escape from the deterioration of personal freedoms and economic outlook. For young people with such a plan, education abroad might serve as a pathway to long-term residency in foreign countries. Earlier studies in the literature show that most college-educated immigrants obtained their highest post-secondary degree in the country of destination, and most international students have continued to stay in the destination country after their graduation.³ Given such a strong relationship between foreign education and migration, rising political populism might encourage more students to pursue degrees from foreign universities to increase their likelihood of living abroad.

Although the political discourse of populism and the vote share of populist parties have been on the rise in many countries, including those with a long tradition of democracy, only in a relatively small number of countries have populist leaders obtained the power to govern and the chance to apply their authoritarian policies.⁴ This study focuses on earlier examples of such countries: Hungary, Ukraine, Venezuela, and Indonesia in the 2004-2016 period and analyzes student migration from these to countries that were members of the Organization for Economic Co-operation and Development (OECD). In particular, in each of these origin countries, either a new leader was elected or new constitutional amendments that extended the power of an already-ruling populist leader were approved approximately during the middle of the analyzed sample period. According to Freedom House data, civil liberties deteriorated in these countries as a result of political changes of this kind. Since these elections were decided in favor of populist leaders by close margins, their results and the associated deterioration of civil liberties can plausibly be considered as events whose outcome was not certain in advance. They can therefore serve as quasi-experiments to explore the effect of rising populism on student migration.

³ For instance, Bound et al. (2015) show that 59 percent of college-educated immigrant workers who were aged between 25 and 34 and resided in the United States as of 2010 held a bachelor's degree obtained from a U.S. institution, and this rate was even larger among advanced degree holders. A few other studies analyze the location choice of international students graduating from US universities. For instance, Finn (2014) shows that 76 percent of the 2006 graduates of science and engineering doctoral programs continued to stay in the United States one year after their graduation. Demirci (2019) reports that 72 percent of international students from the 2004-2011 graduation cohorts initially stayed in the United States, and that this rate was even higher among graduates of master's and doctoral programs. In addition, a few other papers show that studying abroad short-term via exchange programs increases the likelihood of working in a foreign country after graduation (e.g., Oosterbeek and Webbink 2011, Parey and Waldinger 2011).

⁴ Rodrik (2018) reports that the vote share of right-wing populist parties in Europe was less than 5 percent in 2000, but exceeded 20 percent as of 2015. Based on a textual analysis of leaders' speeches, Hawkins et al. (2019) find that the index of populism almost doubled globally during the 2000-2018 period, with countries in Western Europe experiencing the largest increase. Funke et al. (2020) analyze 60 countries and find that populist leaders were in power only in 4 in 2000 and that this number increased to 15 in 2018.

I analyze the effect of the rise of populism on student migration from Hungary, Ukraine, Venezuela, and Indonesia in the framework of the Synthetic Control Method (SCM). I select countries located in Europe, the Americas, and Asia, and which had a stable level of civil liberties as an indicator of populism during the sample period, as a set of potentially comparable countries to construct the synthetic units. Estimates show that the population of students who pursued higher education in foreign OECD countries increased annually by 19.1% among Hungarian citizens, 83.5% among Ukrainians, 32.1% among Venezuelans, and 21.2% among Indonesians after the deterioration of civil liberties in these origin countries compared to the population of international students originating from their synthetic control units.

The lack of information on the intentions of international students in the data presents limitations to identifying the reasons behind the estimated increase in student outmigration. However, the analysis of patterns in student migration by characteristics of destination countries and the analysis of economic outcomes in origin countries provide some insights. In particular, estimates show that more students from the origin countries of interest started attending universities in destinations that were historically less popular and had fewer high-quality universities.

Moreover, estimates provide no statistical evidence for worsening higher education options in the origin countries of interest (as measured by the total number of scientific articles written by researchers in its universities), except in Venezuela, with respect to their synthetic control units. These findings suggest that a larger number of students started pursuing higher education abroad with the intention of facilitating their migration as workers in their post-graduation period rather than obtaining high-quality education abroad due to worsening higher education options in their origin country. Moreover, the analysis of economic outcomes shows that output per capita and unemployment deteriorate only in Ukraine and Venezuela and only a certain period after the rise in populism. This result suggests that not just deteriorating economic conditions but also increasing authoritarianism in the origin countries grow intentions of living abroad among youth.

A growing body of the literature analyzes potential reasons for the rise of political populism and its potential implications. (See Guriev and Papaioannou 2020 for a detailed review of this literature.) For instance, some studies highlight the adverse effects of rising populism on economic output (e.g., Born et al. 2019, Funke et al. 2020), whereas some studies explore its impact on social norms and hate crimes (e.g., Burzstyn et al. 2020, Müller and Schwarz 2020).

This study highlights the possibility of outmigration of skilled citizens as a possible consequence of rising political populism.

This finding provides a potential channel to explain the adverse effects of populist leaders on the institutions and on the long-term economic prospects of their countries. There is a well-established relationship between the quality of institutions and economic growth (e.g., Acemoglu et al. 2001, Rodrik et al. 2004). Some studies in the literature find evidence also for the relationship between migration and the quality of institutions. For instance, Powel et al. (2017) show that the influx of immigrants to Israel after the collapse of the Soviet Union increased the quality of economic institutions in Israel. In particular, this study highlights the participation of immigrants into the political system by establishing new political parties as the main channel through which migration affects institutions. Similarly, Nowrasteh et al. (2020) find the positive effects of migration on institutions in Jordan after the First Gulf War. They claim that the economic boom generated by the influx of Kuwaiti-Palestinian migrants made the passage of economic reforms possible by the new government consisting of a record number of Palestinian ministers. These findings suggest that people are key for establishing and sustaining sound institutions. The outmigration of youth as international students after the adoption of authoritarian policies by populist leaders might adversely affect the quality of institutions in their origin countries, particularly if most of these international students stay abroad after graduation and do not actively participate in the political process of their origin countries. Such an adverse implication due to the lack of skilled citizens in the origin countries might cause lower economic performance in the long-term.

This study also contributes to the literature on determinants of international migration by highlighting the rise of political populism in origin countries as a potential push factor.⁵ In a related strand of the literature, some studies explore the effect of political and civil liberties in

⁵ In the literature focusing on student migration, some studies show the importance of destination-specific characteristics, such as quality of universities (e.g., Beine et al. 2014, Kahanec and Kralikova 2011), income level (e.g., Beine et al. 2014, Caruso and Wit 2015, Wei 2013), tuition fees (e.g., Beine et al. 2020, Van Bouvel and Veugelers 2013), visa policies (e.g., Amuedo-Dorantes et al. 2019, Arenas 2020, Shih 2016), and fiscal conditions of hosting universities (e.g., Bound et al. 2020), whereas some studies highlight the importance of dyadic factors between the destination and origin countries, including common language (e.g., Abbot and Silles 2016), distance (e.g., Bessey 2012, Van Bouvel and Veugelers 2013), migration network (e.g., Beine et al. 2014), and trade volume (e.g., Wei 2013). A number of studies focus on origin-specific factors, such as income level (e.g., Kaushal and Lanati 2019) and college-aged population (e.g., Bird and Turner 2014, Thomas and Inkpen 2017). Two recent studies analyze the effect of rising populism in destination countries on the migration behavior of international students. In particular, Falkingham et al. (2021) explore the effect of Brexit on return intentions of international students graduating from U.K. universities, and Amuedo-Dorantes and Romiti (2021) explore its effect on international student applications to U.K. institutions.

origin countries and do not find evidence for outmigration.⁶ Unlike the earlier studies, this paper analyzes the effect of populism, which has caused an immediate deterioration of civil liberties but not necessarily of political rights in the countries analyzed.⁷ Moreover, populism might affect other determinants of migration, such as economic conditions in origin countries. Populism therefore might change migration behavior for a variety of reasons, and this paper consequently estimates the overall impact of the adoption of authoritarian populist policies on international mobility. Analyzing such a relationship in the context of student migration is preferred because it is not restricted by visa policies.⁸

This study also makes a methodological contribution to the literature in terms of the manner in which it analyzes determinants of international migration. The earlier studies estimate a gravity equation and rely on variation in the value of explanatory variables across a wide spectrum of countries. For instance, the studies about the effect of political and civil liberties in the origin countries on international migration exploit the variation in these liberties that results from the overthrow of governments by means of coups and civil wars in the least democratic countries. In such cases, the current conditions of liberties are likely to be associated with past migration patterns, which raises concerns about the endogeneity. In contrast, this study analyzes student migration from relatively more democratic countries where elections were held and populist leaders gained power in closely contested elections. The analyzed events therefore can be

⁶ For instance, in their analysis of determinants of the mobility of international students, Bessey (2012) and Kaushal and Lanati (2019) find no evidence for a statistically significant association between political and civil liberties in countries of origin and outflow of international students. Analyzing determinants of broader classes of migration, some studies show that deteriorating liberties in origin countries decreases outmigration (e.g., Ashby 2010, Karamera et al. 2000, Vogler and Rotte 2000). They interpret this finding as evidence that governments in less free countries adopt policies that restrict outmigration. However, student migration is probably one of the least restricted migration types in terms of visa policies. Moreover, it involves the decisions of younger people who are likely to enjoy the benefits of migration longer and presumably are subject to lower costs of migration than an average migrant.

⁷ Civil liberties refer to freedom of expression and belief as well as associational and organizational rights. Although the presence of civil liberties and political rights are positively correlated, their values do not change simultaneously. For instance, the deterioration of civil liberties was followed by the deterioration of political rights in Hungary. In contrast, initially political rights were eroded in Venezuela, which were followed by the deterioration of civil liberties. On the other hand, political rights worsened only temporarily in Ukraine after the deterioration of civil liberties, and they did not worsen in Indonesia during the sample period analyzed (Appendix Figure 1).

⁸ In none of the origin countries of interest, were visa policies that restricted the rights of their citizens to study abroad adopted in the sample period analyzed, whereas major destination countries do not have caps on the number of admitted international students. Therefore, the main obstacles to study abroad have been tuition fees as well as language and cultural barriers. Because of its European Union (EU) membership, Hungarian students seemed to have the least costly options for foreign education as they have been eligible to study in many universities in the other EU countries. Similarly, Ukrainian students have some less costly options in nearby countries as well. For instance, they can study at some public German universities; whereas Poland also offers them many affordable options by charging less than \$2000 annually for tuition, and the similarity between the languages of these two countries make universities in Poland popular among Ukrainian students (Wdowiska, 2018). On the other hand, while Indonesia seems to be more isolated geographically than Hungary and Ukraine, its historical heritage with a long colonial era might provide Indonesian citizens with the advantage of finding education options abroad. Unlike the other origin countries of interest, Venezuelan citizens seemed to have the most restricted access to foreign education options as Venezuela is not part of a union and is geographically close only to the United States among major hubs for international students. However, considering the wide range of U.S. universities, it can be claimed that Venezuelans were able to find affordable foreign education options as well.

considered as quasi-experiments, and the estimation of their impact can be achieved by comparing the migration patterns from the country that experienced the event to those from similar countries that did not. The SCM allows for a data-driven technique to find an appropriate comparison unit for that purpose.⁹

The paper proceeds as follows: Section II discusses trends in populism and international student migration; Section III explains the empirical methodology; Section IV describes data; Section V presents results; and Section VI constitutes the conclusion.

II. Research Background

A. Trends in Populism and Democracy

There has been a rise in populism globally in the last two decades based on various indicators, such as the presence of populist leaders in governments, the vote share of populist parties, voters' attitudes to populist ideas, and populist rhetoric in politicians' speeches. A growing body of literature explores the reasons for the rise in populism, including changes in industrial production, trade, immigration, and technological progress (Guriev and Papaioannou 2020). Since most populist leaders have adopted authoritarian policies, one of the immediate consequences of their attaining power has been a decline in democratic rights.

To discern the relationship between the rise of political populism and the endurance of democratic rights, I analyze data from Freedom House, which tracks different dimensions of democracy worldwide. In particular, Freedom House assigns values for the Political Rights (PR) and Civil Liberties (CL) indices in each country and for each year since 1972. The PR index evaluates the quality of democratic institutions in relation to electoral process, political pluralism and participation, and the functioning of government, whereas the CL index evaluates freedom of expression and belief, associational and organizational rights, rule of law, personal autonomy

⁹ Abadie et al. (2015) discuss advantages of using the SCM in the analysis of comparative case studies. In recent years, the SCM has become an increasingly popular tool of quantitative analysis. For instance, Funke et al. (2020) apply the SCM to analyze the effect of being governed by populist leaders on long-term economic outcomes, whereas Born et al. (2019) apply it to understand the effect of Brexit on various economic indicators. There are a few studies using the SCM in the migration literature to estimate its impact on labor market outcomes. For instance, Peri (2017) and Borjas (2018) apply the method to estimate the effect of refugees on the labor market in the United States, Makela (2017) applies it to estimate the effects of migrants on the labor market in Portugal, and Araci et al. (2021) apply it to estimate the effects of Syrian refugees on the labor market in Turkey. To my knowledge, the present study is the first paper using the SCM in the analysis of determinants of international migration patterns.

and individual rights. Each index can take integer values between 1 and 7, and the smaller values indicate the presence of more democratic rights. As shown in Figure 1, the global average of the strength of civil liberties had been stagnant, whereas the global average for that of political rights had improved slightly in the 1970s and 1980s. Following the end of the Cold War, the prevalence of political rights and civil liberties had improved noticeably worldwide in the 1990s. But this trend ceased when populist leaders gained power. Consequently, the global average of the strength of civil liberties started to deteriorate in 2005.

Figure 2 illustrates the evolution of the CL index in the post-2005 period across countries that have been classified based on their initial level of freedom. Civil liberties have deteriorated in “free” and “partially free” countries on average, whereas they have stayed stable in “not free” countries.¹⁰ The observed deterioration in civil liberties in countries classified as “free” and “partly free” was mostly driven by the authoritarian policies enacted by recently elected populist leaders. In such countries, elections were held and new leaders came to power based on election outcomes. In many instances, a deterioration of civil liberties was evident after the election of a new populist leader or the approval of new constitutional amendments.

This study focuses on four countries that have gone through such a process: Hungary, Ukraine, Venezuela, and Indonesia. This sample of origin countries was chosen for several reasons. First, each country in this sample represents a particular type of populism, which helps to understand the generalizability of the relationship between political populism and outmigration. Second, these countries provide early examples of these types of populisms. Therefore, there is a sufficiently long period before and after the change in civil liberties because of populist policies in these countries to allow reasonable statistical inferences to be made from the available data. Lastly and more importantly, the deterioration in civil liberties in these countries can be associated with the outcome of closely contested electoral processes (either parliamentary elections or constitutional referendums). Since the outcome of such events is not certain in advance, they can therefore be considered quasi-experiments that help to obtain the causal effect of rising populism on student migration.

¹⁰ Freedom House categorizes countries as “free”, “partly free” and “not free” based on the average of the CL and PR scores. If the average is between 1 and 2.5, then the country is classified as “free”. If the average is between 3 and 5, then it is classified as “partly free”. If the average is between 5.5 and 7, then it is classified as “not free”.

Viktor Orban, the leader of a right-wing political party in Hungary, became the prime minister after the 2010 elections by winning 53 percent of the popular vote. Orban's party approved a new constitution in the parliament, which consists of articles reflecting conservative views on social issues, and the CL index in Hungary consequently increased from 1 to 2 in 2011. Since the smaller values of the index indicate the presence of more democratic rights, the increase in the CL score of Hungary in 2011 illustrated the deterioration of civil liberties. In Ukraine, Viktor Yanukovich, a pro-Russian politician, won the presidential election in 2010 by a 3-percent margin of the popular vote with the CL index in Ukraine increasing from 2 to 3 in the same year as the Ukrainian government violently suppressed demonstrations and intensified its war against free media. In Venezuela, as an example of a country where a left-wing populist party has been in power, a new constitutional amendment was approved in the 2009 referendum with 54 percent of voters supporting the abolishing of the limit on the number of terms a president can serve. This amendment increased the political power of Hugo Chavez, which resulted in more oppression against the opposition as well as an increase of the CL index in Venezuela from 4 to 5 in 2010. In Indonesia, the election of Joko Widodo as governor of Jakarta in the 2012 local elections changed the political landscape in favor of outsiders against establishment figures. In the period preceding the 2014 presidential elections, the rise of populism resulted in an increase in the CL index of Indonesia from 3 to 4 in 2013. Widodo was elected as the new president by winning 54 percent of the popular vote in 2014 with the support of some Islamic groups, and his administration continued to enact some populist policies, such as strict rules against blasphemy and policies targeting homosexuality.

B. Mobility of International Students

The mobility of international students has increased noticeably in the last decades.¹¹ For instance, the population of international students increased globally from about 2.8 million students in 2005 to 5 million in 2016. OECD countries hosted the majority of international students, who reached a population of 3.5 million in these countries in 2016 (OECD, 2018). In 2016, the United States was the most popular destination country, hosting 27.5% of all international students in OECD countries, followed by the United Kingdom, Australia, France,

¹¹ See Chellaraj (2019) for a review of the literature related to determinants of international student mobility and the consequences for connectivity between countries. Bound et al. (2021) provide a more recent review article by focusing on international students in the United States.

and Germany, respectively (Table 1, Panel A). However, the predominance of the top destination countries had already begun to decline over time, as the top five countries' share of the international student population dropped from 72.2% in 2004 to 64.3% in 2016.

Among origin countries, China has sent the largest number of students to universities in OECD countries (Table 1, Panel B). Since the population of Chinese students increased at a faster rate than that of most other countries, the share of Chinese students rose from 18.6% to 23.8% among all international students in OECD countries between 2004 and 2016. In 2004 China was followed by India, South Korea, Japan, and Germany respectively, whereas Saudi Arabia became the fifth largest origin country in 2016 due to a generous fellowship program introduced by the government. As displayed in Panel C of Table 1, the population of students originating from each country of interest (i.e., Hungary, Ukraine, Venezuela, and Indonesia) also increased between 2004 and 2016. In Section IV, a detailed analysis of student migration patterns from these countries is provided after a description of the data and sample restrictions.

III. Empirical Strategy

A. The Synthetic Control Method

To identify the impact of the rise in populism in a particular country on the population of international students originating from it, the corresponding population that would be observed in the absence of populism needs to be known. The Synthetic Control Method (SCM), initially developed by Abadie and Gardeazabal (2003), provides a systematic method to construct the path of an outcome variable for the counterfactual scenario in which the event of interest does not occur. In particular, the SCM assigns weights to each possible comparison unit and calculates the counterfactual path of the outcome in the unit of interest as a weighted sum of values of the outcome variable observed in the comparison units. The method works as follows.

Let $K + 1$ countries exist, indexed by $k = 0, 1, 2, \dots, K$. The country 0 is the treated country where an event occurred (i.e., the rise in political populism as evidenced by the deterioration of civil liberties in this context). All other countries make up the donor pool, with none of the countries in the donor pool having experienced the event. Let X be an M by K matrix of predictor variables for countries in the donor pool where M shows the number of predictors. Let

\mathbf{X}_0 be the vector of predictors for the treated country. The optimal vector of weights, $\mathbf{W}^* = (w_1^*, w_2^*, \dots, w_K^*)$, are determined as

$$(1) \quad \mathbf{W}^* = \operatorname{argmin} (\mathbf{X}_0 - \mathbf{XW})' \mathbf{V} (\mathbf{X}_0 - \mathbf{XW})$$

subject to $\sum_{k=1}^K w_k^* = 1$, $w_k^* \geq 0$ for each k , and \mathbf{V} is an M by M diagonal positive-definite matrix that determines the importance of each predictor.¹² After \mathbf{W}^* is obtained, the effect of the event on the value of the outcome variable in the treated country for year t is calculated as

$$(2) \quad \Delta_{0t} = Y_{0t} - \sum_{k=1}^K w_k^* Y_{kt}$$

where Y_{0t} is the value of the outcome variable in the treated country at time t and Y_{kt} is the corresponding value for country k at time t .

Abadie et al. (2010) propose a permutation-based inference technique to decide the statistical significance of the estimated effect. To apply this method, the effect of the event is estimated for each country as described above regardless of whether the country actually experienced the event or not. Then, the ratio of the root mean squared prediction error (RMSPE) in the post-event period to the RMSPE in the pre-event period is calculated for country k as

$$(3) \quad r_k = \sqrt{\frac{\sum_{t=T_0+1}^T (\Delta_{kt})^2 / (T-T_0)}{\sum_{t=1}^{T_0} (\Delta_{kt})^2 / T_0}}$$

¹² The diagonal elements of \mathbf{V} assign the importance of each predictor in \mathbf{X} . The default option in STATA is adopted to estimate \mathbf{V} .

where T denotes the last period of observation and T_0 denotes the last period before the event. These ratios are ranked from the largest to the smallest among countries, and the p-value for the n^{th} ranked country is calculated as n divided by $(K + 1)$.

B. Application of the SCM

In this study, the impact of rising political populism on student migration and the associated p-value are estimated separately for each origin country. The event year for each country is taken as the year when the civil liberties deteriorated according to the CL index of Freedom House (i.e., 2011 for Hungary, 2010 for Ukraine and Venezuela, and 2013 for Indonesia). The estimation is calculated with the data of international students from the 2004-2016 period for Hungary and Venezuela and from the 2005-2016 period for Indonesia and Ukraine because civil liberties had improved in the latter countries in 2004 (Appendix Figure 1).

The gross domestic product (GDP) per capita, youth unemployment, youth population, and civil liberties in origin countries as well as the share of students in each of the three most popular destination countries are used as predictors (\mathbf{X}) to determine the optimal weights of units in the donor pool. These variables have been selected because they are considered as main determinants of international student migration. GDP per capita in particular controls for the affordability of foreign education, whereas youth unemployment and youth population measure job opportunities and the competition for education options in origin countries. The index of civil liberties controls for initial freedom conditions in origin countries. The share of students in each top destination country controls for the effect of destination-specific factors on student migration and enhances the similarity of the treated country and the countries in its synthetic control.¹³ As discussed in the next section, the number of international students and the youth population take values from a wide spectrum. Abedie (2019) suggests normalizing such variables with respect to their average in the pre-event period in applications of the SCM, and this suggestion is adopted for these two variables in this paper.

¹³ To determine top destination countries, the share of international students in each destination country among all international students originating from the origin country of interest is calculated for the pre-event period. Then, three destination countries with the largest shares are detected separately for each treated country, and the share of students in these destination countries are used as predictors in the SCM estimations. Particularly, Austria, Germany, and the United Kingdom appear to be the top three destination countries for Hungary, whereas they are Germany, Poland, and the United States for Ukraine; the United States, France, and Germany for Venezuela; Australia, the United States, and Japan for Indonesia.

Abadie (2019) also suggests constructing the donor pool from units that have similar characteristics to the treated unit. To achieve some level of similarity between units in the application of the SCM in this study, countries in the donor pool are restricted to those in Europe, the Americas, and Asia because the treated countries analyzed are located on these continents. Also, China and India as well as countries whose population is less than one million are excluded from the donor pool because of the large divergence in their scale.¹⁴ Thus, the donor pool consists of the remaining 56 countries where the index of civil liberties had been stable during the 2004-2016 period. (See Appendix Table 1 for the full list of countries in the donor pool.) As discussed below, results using different subsets of this donor pool are similar.

IV. Data

A. International Students

The population of international students studying in each OECD country is obtained from the OECD. Each destination country reports the total population of foreign students studying in its universities as well as their origin country in each year for the 2004-2016 period.¹⁵ Countries reported the population statistics of international students under two classifications: “non-citizen” and “non-resident”. Students in the non-citizen category refer to all foreign students, including those who migrated with their parents as minors, whereas statistics in the non-resident category demonstrate a subset of foreign students by referring only to students who came to the destination country for the purpose of pursuing higher education.¹⁶ Using statistics of non-resident students is more appropriate for the empirical analysis in this study because it directly measures the migration for education. However, only Australia, Canada, Denmark, Ireland,

¹⁴ The data of the freedom index for Hong Kong, Palestine, and Puerto Rico and the data of international students for Kosovo, Montenegro, Taiwan, Timor-Leste, and Serbia are not available for the entire 2004-2016 period. These countries are excluded from the analysis for that reason.

¹⁵ The most recent year for which the data are available was 2016 when this project was started. The data before 2004 was available only for a few destination countries and these data do not look compatible with more recent statistics. During the 2004-2016 period, 27 countries reported statistics of international students during the sample period, but the information about origin country for most students pursuing education in Belgium, Norway, Spain, Sweden, and Turkey is missing in the data. For this reason, these destination countries are excluded from the analysis. Also, student flows to Hungary are excluded because it is one of the treated countries of interest. Thus, the sample of destination countries consists of the remaining 21 members of OECD as listed in the main text.

¹⁶ The non-citizen category refers to students who do not hold the citizenship of the destination country. Thus, the non-citizen category includes students who migrated as minor age and are therefore residents of the destination country. Thus, the non-resident category is a subset of the non-citizen category and refers to students who came to the destination country for the purpose of pursuing higher education. Some countries reported the population of students under the “foreign” category rather than that of the “non-resident” students in some years, and these values are used as statistics of non-resident students in the analysis. In particular, this classification was used by Ireland, Germany and Switzerland for the 2004-2007 period and by the Netherlands in 2004.

Germany, the Netherlands, New Zealand, Slovakia, Switzerland, the United Kingdom and the United States reported statistics for non-resident students throughout the sample period. This information is employed for these countries in the analysis. On the other hand, Czech Republic, Iceland, Italy, and South Korea reported statistics for non-citizen students, and this type of data is used for these countries. Since the population of immigrants is small in these destination countries, their statistics for non-citizen students include mostly non-resident international students who entered these countries for educational purposes.

The remaining destination countries in the sample, namely Austria, Finland, France, Japan, Poland, and Portugal, changed the manner of their reporting over time by providing the population of non-citizen and non-resident students separately in some years. To have consistent statistics over the period under review, the population of non-resident students in Portugal for the 2004-2007 period and the population of non-citizen students in Austria, Finland, France, Japan and Poland for the 2013-2016 period are inferred. This inference is conducted by calculating the population of non-citizen students who are residents of the destination country and by assuming that the population of residents remained unchanged in each year during the relevant period. (See Appendix for details.) Thus, unreasonable jumps or drops that are observed in the population of international students in the year when the type of reporting in these countries was changed are corrected without altering the variation in annual changes in the population statistics that are reported for the rest of the sample period. As shown in the online appendix (Appendix Table 2), results are robust but statistically less precise if the raw data based on inconsistent classification of international students in these destination countries are used in the empirical analysis.

B. Other Variables

Data for the GDP per capita in 2010 US dollars, the unemployment rate for people aged between 15 and 24 (i.e., youth unemployment), and the population of people aged between 20 and 24 in origin countries (i.e., youth population) are obtained from the World Bank Indicators. Values of the CL index are obtained from Freedom House. As a measure of higher education options in origin countries, the total count of international scientific publications written by researchers located in each country and by those affiliated with best universities of each country is obtained

from SCImago statistics.¹⁷ Lastly, the THE and the QS world university rankings are used to identify best universities in origin countries and to classify destination countries based on the quality of education options provided by their universities.

C. Sample Statistics

Table 2 provides summary statistics of the variables for the 2004-2016 period, classifying countries in the donor pool according to their democracy level. The most democratic countries where the CL index was constant at one throughout the 2004-2016 period had a considerably larger average income compared to other countries. Partially democratic countries where the CL index was constant at the value of two, three or four are developing middle-income countries with high levels of youth employment. The least democratic countries where the CL index was constant at the value of five, six or seven had slightly higher average income but a considerably lower unemployment rate than partially democratic countries did, whereas their average income and unemployment rate are considerably lower than those in the most democratic countries.

As presented in Table 2, the unemployment rate in the origin countries of interest, where populist policies were adopted and civil liberties deteriorated, was similar to the average unemployment rate of the most democratic and partially democratic countries. Their average income was similar to those of partially democratic and the least democratic countries, with the exception of Ukraine and Indonesia which had considerably lower average income than the other countries. Also, youth population and the number of international students originating from each country varied considerably across the countries analyzed. For instance, Indonesia had the most crowded youth cohort and the number of international students originating from there was larger compared to that from the other origin countries of interest.

Table 3 displays the top destination countries for international students originating from the countries of interest. These tabulations show the importance of distance in international student migration as students usually preferred geographically closer countries in which to study, such as Austria for Hungarian citizens, Poland for Ukrainians, the United States for Venezuelans, and Australia for Indonesians. However, the preference of international students on top destination

¹⁷ This variable captures both the quantity and quality of higher education options in origin countries. Alternatively, the enrollment in universities in origin countries might measure the quantity, but the enrollment data are not available for all countries in the sample.

countries differs according to the origin of students. The preferences of Venezuelan students display the most noticeable concentration in that 70% went to the United States to study, whereas the destination countries for students from Hungary, Ukraine, and Indonesia were more diverse.

V. Results

A. Main Results

Table 4 shows the estimated average annual effect of the rise in political populism (as measured with the deterioration of civil liberties according to the CL index of Freedom House) on the population of international students originating from each country of interest (i.e., the average of Δ_{0t} values in equation (2) for the post-event period). Because of the above-mentioned normalization of the outcome variable with respect to its average in the pre-event period, the reported coefficients multiplied by 100 in the table can be interpreted as percentage changes in the annual population of international students originating from the country of interest after the deterioration of civil liberties in that country.

The column (1) of Table 4 displays the estimated effects from the specification that employs the donor pool consisting of all origin countries in the sample (See Appendix Table 1). The estimates show that the population of international students who originated from Hungary and attended universities in other OECD countries increased by 19.1% annually on average after civil liberties deteriorated as a consequence of the rise of political populism in Hungary. The estimates also indicate an 83.5% increase in the population of Ukrainian students studying in OECD countries and a 21.2% increase in the population of Indonesian students, whereas the estimated effect for Venezuela is not statistically significant.

Results in column (2) are obtained from the specification where the most democratic and partially democratic countries of the donor pool are employed. Similar to the previous specification, the estimates show statistically significant increases in the population of international students originating from Hungary (21.8% annually on average) and Ukraine (72.2%) after the deterioration of civil liberties in these countries. Unlike column (1), estimates in column (2) indicate a statistically significant increase in the population of international

students originating from Venezuela (32.1%), whereas the estimated effect for Indonesia becomes insignificant.

The major difference between the donor pools in columns (1) and (2) is the exclusion of the least democratic countries, and the majority of people in most of these countries are Muslim. Their exclusion from the donor pool in column (2) decreases the success of the method in finding a similar synthetic unit for Indonesia but improves the fit for Venezuela.¹⁸ Column (3) shows results from a specification that includes the least democratic and partially democratic countries but excludes those that are the most democratic from the donor pool. The estimated effect for Indonesia (17.6%) becomes significant in this specification, but the effect for Venezuela becomes insignificant similar to column (1), whereas the estimated effects for Hungary (32.6%) and Ukraine (90.4%) are still statistically significant.

Figure 3 displays the pattern of student migration from each treated country and its synthetic control unit that is obtained based on the specification in column (1) of Table 4 for Hungary, Ukraine, and Indonesia and the one in column (2) for Venezuela (i.e., from the specifications providing a better fit in the pre-event period and statistically significant effects). The population of international students originating from each country of interest noticeably differs from the population of students originating from its synthetic control unit after the year when civil liberties deteriorated in these countries. The largest divergence between the treated country and its synthetic control unit is observed for Ukraine, which is consistent with the results reported in Table 4.

Lastly, column (4) of Table 4 shows the estimated effects from the specification that employs the narrowest donor pool consisting of only partially democratic countries. As discussed before, these countries are the most similar group to the countries of interest. However, since the number of countries in this subset of the donor pool is smaller (exactly 21 countries), obtaining statistical significance becomes more difficult.¹⁹ Despite this limitation, the estimates with this

¹⁸ One method to decide which model provides a better fit is to compare the RMSPEs in the pre-event period (i.e., the denominator of equation 3) across specifications. According to that criterion, the specification of column (1) provides a better fit for Indonesia, whereas the specification of column (2) provides a better fit for Venezuela. In particular, the RMSPE for Indonesia is 0.042 in column (1) and 0.093 in column (2), and that for Venezuela is 0.074 in column (1) and 0.039 in column (2).

¹⁹ More specifically, the p-value can be 0.045 at minimum in this specification, which is equal to 1 over 22 (i.e., the ratio of the rank of the country with the largest r-statistics to the total number of countries).

specification show that the rise of political populism statistically increased the outmigration of youth as international students from Hungary (32.8% annually on average), Ukraine (86.8%), and Venezuela (33.1%), whereas the estimated effect is not statistically significant for Indonesia.

B. Robustness

This section presents the results of several robustness checks. Abadie (2019) notes that results of SCM applications might be sensitive to the choice of the donor pool or predictor variables. While robustness of the results of this study to using different donor pools is presented in the previous section (Table 4), their sensitivity to using different sets of the predictors is explored in this section. To do so, each predictor is excluded from the benchmark analysis one at a time. Appendix Table 3 provides the estimated effects from these specifications where the donor pool consists of the origin countries of all freedom levels with stable CL index for Hungary, Ukraine, and Indonesia and of the most democratic and partially democratic ones for Venezuela (i.e., from the specifications providing the best fit in the pre-event period). Most estimates from this robustness check show that the deterioration of civil liberties due to the rise in populism increases the outmigration of citizens from the analyzed countries as international students.²⁰ This robustness exercise displays that the findings are not sensitive to using a particular predictor.

As another robustness check, the event year is shifted to a date that is three years earlier than the actual event year for each origin country of interest. This exercise is labelled as “backdating” in Abadie (2019), and it serves to check whether any anticipation effects exist. Two important features of the results of this exercise are noteworthy (Appendix Figure 2). First, the synthetic units closely track the evolution of student outmigration from the treated countries of interest in the period between the backdated event year and the actual event year. This finding suggests no anticipation effect in this context. Second, the student migration patterns of the treated countries diverged from those of their synthetic units after the actual event date, which bolsters the credibility of our estimates.

²⁰ The estimated effect is not statistically significant in some specifications. However, it is important to note that the pre-treatment fit of these specifications is not well as reflected by their high RMSPE statistics.

C. Potential Reasons

Estimates presented in the previous section show that the rise in political populism in origin countries increases the number of their citizens pursuing higher education abroad. Rosenzweig (2006), in his pioneering work, conceptualizes the mobility of international students by means of two motives: the lack of high-quality education options in origin countries and the intention to stay in destination countries after graduation. Relying on the same framework, the estimated increase in student outmigration from the countries with rising populism in this study can be attributed to two reasons: 1) increasing demand to obtain high-quality education abroad because of worsening higher education options provided in origin countries, and 2) growing intention to migrate in long-term and seeing education abroad as a pathway to the labor market of the destination country.

To explore the validity of the first reason, I employ the total number of publications written by researchers who reside in origin countries as a measure of conditions of their higher education system and analyze the effect of rising populism on this outcome via the SCM. Estimates show that none of the origin countries of interest, except Venezuela for some specifications, experienced a statistically significant drop in its scientific production after the rise in political populism compared to its synthetic control unit (Appendix Table 4). It is important to highlight that the characteristics of populism observed in Venezuela differ than those observed in other origin countries of interest. In particular, Venezuela has experienced “left-wing populism” emphasizing redistribution policies, whereas the analyzed examples of populism in other countries can be classified as “right-wing populism” focusing on cultural issues. Due to this distinction, the quality of universities is likely to be negatively affected in Venezuela as redistributive populist policies might target to increase the enrollment capacity of universities at the expense of scientific publishing in international journals. Our results are consistent with that conjecture.

In order to hold this hypothesis to closer scrutiny, I also analyze the effect of the rise in populism on the scientific production of best universities in the origin countries of interest.²¹ Results of our

²¹ I used the THE world university rankings for the 2010-2019 period to construct the list of best universities in origin countries. The THE used to rank top 200 universities of the world together with the QS until 2010. Since no university from the origin countries of interest was included in the rankings for the pre-2010 period, I do not use this information.

analysis display a similar pattern such that the total number of publications in top universities deteriorated only in Venezuela after the rise of populism compared to its synthetic control (Appendix Figure 3). Moreover, the scientific production in top universities of Venezuela deteriorated more noticeably compared to the deterioration experienced by all universities in Venezuela (Appendix Figure 4). This result provides further evidence about adverse effects of redistribution policies on the quality of higher education in the populism era. On the other hand, the scientific production in top universities of Hungary, Indonesia, and Ukraine followed a similar pattern to that in top institutions of their synthetic controls and to that in other universities of these origin countries (Appendix Figure 4).

Next, I analyze student migration to destination countries where the best universities of the world are located.²² As shown in Panel A of Table 5, student migration from the origin countries of interest to the destination countries with high-quality education options did not differ statistically after the rise of political populism. This null result along with the lack of evidence for the worsening of higher education options in the origin countries (except Venezuela) suggest that the reason for increasing student outmigration is not the pursuit of high-quality education abroad. Instead, the estimates show that student migration to the destination countries that do not have high-quality education options increased after the rise of populism.

These findings suggest that the pursuit of long-term migration after graduation might be the main reason behind the estimated increase in the number of international students.²³ Indeed, anecdotal evidence shows that young citizens started expressing their intention to live abroad after re-election of populist leaders in the countries of interest (Than 2018). Mass demonstrations took place in the first term of populist leaders in many countries, but these protests could not succeed in eroding public support for the authoritarian leaders in the elections that followed. In such circumstances, a larger number of young people might have started considering migration as a solution to escape from undesirable conditions resulting from the rising populism in their origin

²² Destination countries where at least five institutions on average annually entered the list of the top-200 universities in the world according to the QS rankings during the 2004-2016 period are considered the destinations with high-quality education options. These countries include Australia, Canada, France, Germany, Japan, the Netherlands, Switzerland, the United Kingdom, and the United States.

²³ To directly test this claim, knowing the location choices of international students in their post-graduation period would be helpful, but the relevant information does not exist in the OECD data. The post-graduation location choices are known only in a few contexts. For instance, Finn (2014) and Kahn and MacGarvie (2019) explore stay rates of doctoral students in the United States based on survey data. Employing administrative data, Demirci (2019) analyzes stay rates for students of all levels in the United States.

country. Consistent with this conjecture, estimates show that the population of international students abroad became noticeably larger three years after the deterioration of civil liberties compared to the initial three years (Panel B in Table 5). Estimates also show that the population of international students increased mostly in destination countries that had not been popular locations previously (Panel C in Table 5). These findings suggest that a greater number of young people lost their hope in the future of their country after the rise of populism and started to explore new destinations gradually over time.

Lastly, prior studies in the literature point out adverse consequences of populism for economic performance of the countries governed by populist leaders, particularly in the long term (e.g., Funke et al. 2020). Young citizens might prefer to live abroad to escape from worsening economic opportunities in their origin countries in addition to the desire to enjoy personal freedoms abroad. In the SCM setup of this study, I analyze the effects of the rise in populism on the youth unemployment rate and GDP per capita and find that none of these outcomes in the origin countries of interest differed statistically than those in their synthetic control unit on average in the post-event period. However, exploring heterogeneities in the estimated effects over time shows that the economic outcomes in Venezuela and Ukraine worsened once a certain time had passed after the deterioration of civil liberties (Appendix Table 5). Indeed, Ukrainian and Venezuelan citizens might have anticipated the deterioration in economic opportunity in the near future because a larger number started pursuing higher education abroad even in the initial three years following the rise of political populism as shown in the empirical analysis.²⁴

The estimated effect in the initial years after the rise in populism in Ukraine and Venezuela can be also interpreted as evidence for the escape of youth from increasing authoritarianism. Similarly, finding increases in outmigration of youth as international students in Hungary and Indonesia despite the stability of economic conditions in these countries suggests that deterioration in personal freedoms is another reason for the outmigration of youth.

²⁴ The estimates in Table 5 show that student migration from Ukraine and Venezuela increased statistically compared to those from their synthetic control units even in the initial three years following the rise of populism in these countries. Despite the lack of statistical evidence for the deterioration of economic conditions in this period, some students might anticipate the worsening of economic opportunities in the near future and they might start pursuing higher education abroad with the purpose of migration in the long-term. Indeed, it is well known that the populism in Venezuela eventually resulted in an economic catastrophe and triggered very large flows of outmigration. For instance, Hausmann et al. (2017) predict that up to 2.9 million Venezuelans left the country in 2017.

VI. Conclusion

Populist leaders came to power in several countries as a result of elections over the last two decades, and their authoritarian policies resulted in the deterioration of civil liberties. This study shows that the rise of populism as evidenced by the deterioration of civil liberties increases the population of people who pursue higher education abroad among citizens of the countries governed by populist leaders. The finding that student outmigration has increased despite the lack of evidence for worsening higher education options in the origin countries suggests that more students start pursuing higher education abroad with the purpose of long-term migration. The intention to escape from the lack of freedoms and from the deterioration of the economic outlook in their origin countries appears to explain this behavior.

Populism might generate several adverse implications. One of the direct consequences of the election of a populist leader in a country is the weakening of its democratic institutions, which is likely to result in the deterioration of its long-term economic performance given the well-documented association between the quality of institutions and the growth rate of countries. In this paper, finding evidence for outmigration of youth as international students in response to the rise of populism suggests that populism might cause a decline in long-term economic outcomes partially because of the triggering of outmigration of skilled citizens. Particularly if these citizens do not return to their origin countries after their graduation and do not participate the political process of these countries, the quality of democratic institutions in these countries is likely to erode further. Backsliding in legal and economic institutions and the lack of human capital is likely to cause the further deterioration of the economic performance of these countries in the long run.

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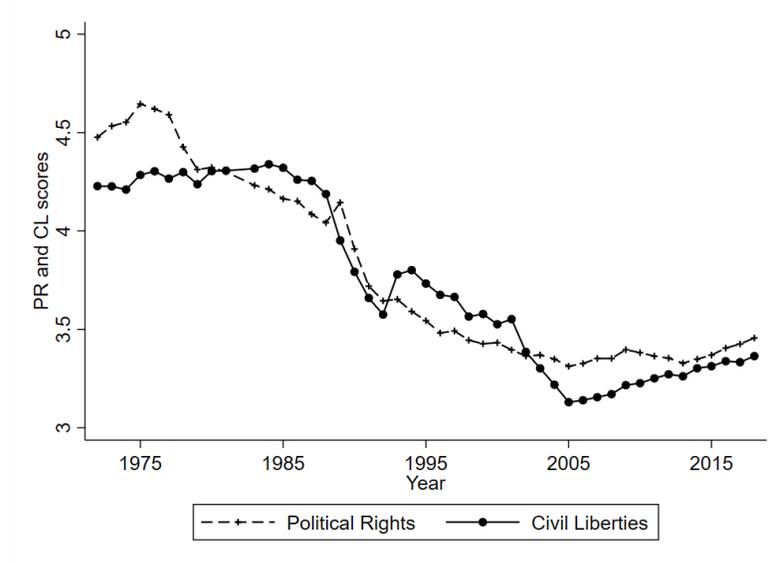
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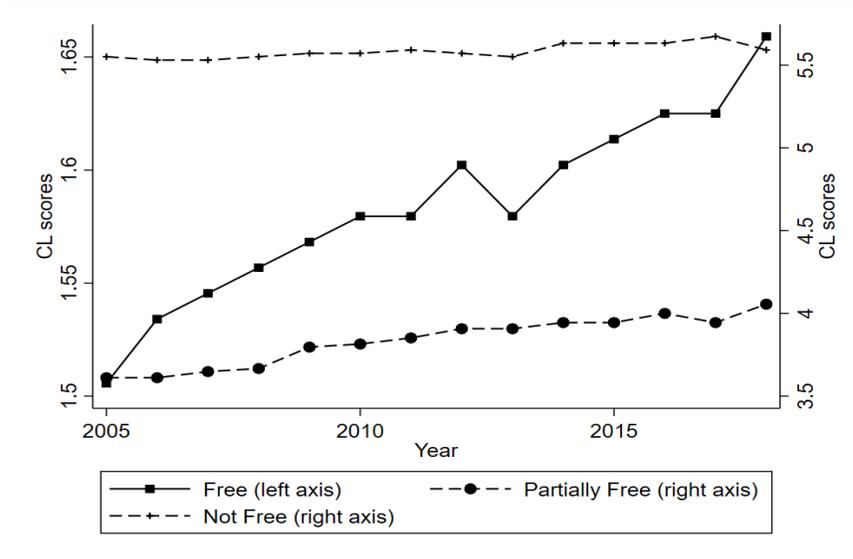
FIGURES

FIGURE 1: THE EVOLUTION OF DEMOCRATIC RIGHTS



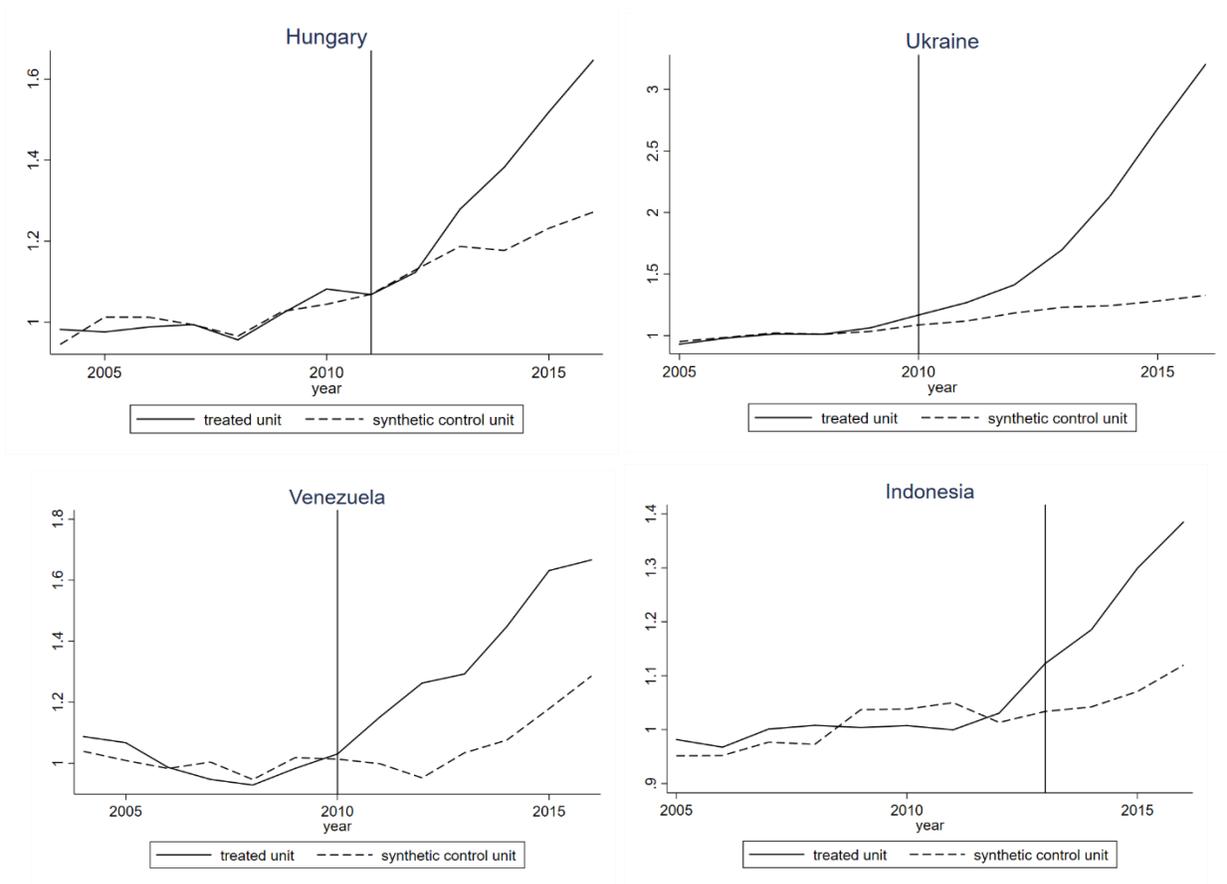
Notes: Freedom House data. The figure shows the average Political Rights (PR) and Civil Liberties (CL) scores among countries. Each index takes an integer value from 1 to 7 in each country. The PR score evaluates the quality of democratic institutions in electoral process, political pluralism and participation, and functioning of government, whereas the CL score evaluates freedom of expression and belief, associational and organizational rights, rule of law, personal autonomy and individual rights. Lower scores indicate the presence of more democratic rights.

FIGURE 2: RECENT TRENDS IN CIVIL LIBERTIES



Notes: Freedom House data. The figure shows the average of the CL scores for various groups of countries that are classified by Freedom House based on their level of freedom in 2004. See notes to Figure 1 for further explanations of the CL index.

FIGURE 3: THE POPULATION OF INTERNATIONAL STUDENTS



Notes: The OECD data. Each solid line shows the normalized population of international students who originate from the specified country of interest and attend universities in OECD countries. The normalization for a particular year is achieved by dividing the population of international students originating from the specified country in that year to the annual average population of international students originating from that country in the pre-event period. The vertical line in each subfigure shows the event year for the specified country (i.e., the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the normalized population of international students originating from the synthetic control unit for the country of interest. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all freedom levels in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries. In particular, the synthetic control units consist of the following countries with the associated weights displayed in parentheses: Slovenia (0.485), Bulgaria (0.367), Macedonia (0.084), Austria (0.044), and Estonia (0.020) for Hungary; Belarus (0.448), Bulgaria (0.461), Czech Republic (0.052), Mongolia (0.039), and Slovakia (0.001) for Ukraine; Jamaica (0.404), El Salvador (0.399), Singapore (0.169), and Canada (0.028) for Venezuela; Malaysia (0.471), New Zealand (0.249), Jamaica (0.199), and Macedonia (0.080) for Indonesia.

TABLES

TABLE 1: INTERNATIONAL STUDENTS IN OECD COUNTRIES

Panel A: Top Destination Countries

	Year 2004			Year 2016	
	Population	Percentage		Population	Percentage
The United States	572,509	28.5%	The United States	971,417	27.5%
The United Kingdom	300,056	15.0%	The United Kingdom	432,001	12.2%
France	210,180	10.5%	Australia	335,512	9.5%
Germany	198,565	9.9%	France	288,109	8.2%
Australia	166,954	8.3%	Germany	244,575	6.9%

Panel B: Top Origin Countries

	Year 2004			Year 2016	
	Population	Percentage		Population	Percentage
China	318,963	18.6%	China	790,138	23.8%
India	119,034	6.9%	India	258,500	7.8%
South Korea	91,269	5.3%	Germany	113,271	3.4%
Japan	58,984	3.4%	South Korea	107,493	3.2%
Germany	51,611	3.0%	Saudi Arabia	81,989	2.5%

Panel C: The Origin Countries of Interest

	Year 2004			Year 2016	
	Population	Percentage		Population	Percentage
Hungary	6,722	0.39%	Hungary	11,284	0.34%
Ukraine	14,128	0.82%	Ukraine	51,518	1.55%
Venezuela	7,505	0.44%	Venezuela	11,508	0.35%
Indonesia	24,950	1.45%	Indonesia	33,398	1.01%

Notes: The OECD data. Each number in the Population column shows the number of international students attending universities in the specified destination country and year in Panel A and the number of those originating from the specified country and year in Panel B and Panel C. Each number in the Percentage column shows the percentage share of the population of the specified group of international students within the population of all international students in the OECD countries. The destination countries analyzed in Panel A include Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Japan, South Korea, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. In Panel B and Panel C, Belgium, Norway, Spain, Sweden, and Turkey are excluded due to the lack of reliable origin-specific information for these destination countries.

TABLE 2: SUMMARY STATISTICS

Panel A: Origin Countries in the Donor Pool

	The Most Democratic		Partially Democratic	
	Mean	S.D.	Mean	S.D.
GDP per capita	\$39,279	\$19,476	\$9,119	\$10,686
Youth Unemployment	16.9	8.4	18.5	13.8
Youth Population	1.78	4.20	2.07	3.36
Population of International Students	15,378	18,910	15,384	24,123

	The Least Democratic	
	Mean	S.D.
GDP per capita	\$12,485	\$19,558
Youth Unemployment	7.9	7.3
Youth Population	3.43	5.48
Population of International Students	7,371	8,969

Panel B: Origin Countries of Interest

	Hungary		Ukraine	
	Mean	S.D.	Mean	S.D.
GDP per capita	\$13,645	\$710	\$3,006	\$200
Youth Unemployment	21.1	5.1	17.5	3.5
Youth Population	0.64	0.03	3.41	0.41
Population of International Students	7,903	1,565	23,335	11,629

	Venezuela		Indonesia	
	Mean	S.D.	Mean	S.D.
GDP per capita	\$13,568	\$1,261	\$3,158	\$510
Youth Unemployment	15.9	3.2	19.0	3.7
Youth Population	2.56	0.09	20.90	0.37
Population of International Students	8,207	1,744	25,993	3,185

Notes: The OECD data and the World Bank Indicators data. The sample is restricted to the 2004-2016 period. Youth unemployment refers to the percentage of unemployed people among those aged between 15 and 24. Youth population shows the population of people aged between 20 and 24 in millions. Countries where the CL index was constant at the value of one during the 2004-2016 period are defined as "the most democratic", at the value of two, three, or four as "partially democratic", and at the value of five, six, or seven as "the least democratic" countries.

TABLE 3: TOP DESTINATION COUNTRIES FOR STUDENTS FROM THE ORIGIN COUNTRIES OF INTEREST

	Hungary			Ukraine	
	Population	Percentage		Population	Percentage
Austria	1,905	24%	Poland	8,470	36%
The United Kingdom	1,790	23%	Germany	5,979	26%
Germany	1,129	14%	Czech Republic	1,665	7%
Denmark	744	9%	Italy	1,397	6%
The United States	620	8%	France	1,376	6%
All countries	7,903	100%	All countries	23,335	100%

	Venezuela			Indonesia	
	Population	Percentage		Population	Percentage
The United States	5,792	71%	Australia	9,891	38%
France	576	7%	The United States	7,923	30%
Canada	352	4%	The United Kingdom	1,972	8%
Germany	352	4%	Japan	1,677	6%
Italy	312	4%	Germany	1,542	6%
All countries	8,207	100%	All countries	25,993	100%

Notes: The OECD data. The table shows the number and percentage of international students in the top five destination countries for each origin country of interest. Each cell in the Population column shows the annual average number of students who originated from the specified origin country and attended universities in the specified destination country in the 2004-2016 period. Each cell in the Percentage column shows the percentage share of the population of international students in the specified destination country within the average population of all students originating from the country of interest in the 2004-2016 period.

TABLE 4: SCM ESTIMATES ON THE POPULATION OF INTERNATIONAL STUDENTS

	(1)	(2)	(3)	(4)
Hungary	0.191 [0.018]	0.218 [0.021]	0.326 [0.097]	0.328 [0.091]
Ukraine	0.835 [0.035]	0.722 [0.021]	0.904 [0.032]	0.868 [0.045]
Venezuela	0.239 [0.404]	0.321 [0.063]	0.092 [0.839]	0.331 [0.045]
Indonesia	0.212 [0.088]	-0.006 [0.958]	0.176 [0.097]	0.074 [0.773]

Notes: Each coefficient estimate shows the average annual effect of the rise in populism (evidenced by the deterioration of civil liberties) on the normalized population of international students originating from the specified country of interest and attending universities in OECD countries. After normalization, the effects are estimated in terms of the fraction of the average annual population of international students originating from the specified country in the pre-event period. Numbers that are in squared brackets show the associated p-values. Column (1) covers countries of all levels of freedom in the donor pool, column (2) covers the most democratic and partially democratic countries, the column (3) covers partially democratic and least democratic countries, and column (4) covers only partially democratic countries. See notes to Table 2 for the classification of countries in the donor pool.

TABLE 5: HETEROGENEITY IN EFFECTS BY DESTINATION CHARACTERISTICS AND OVER TIME

	Hungary	Ukraine	Venezuela	Indonesia
Panel A: Quality of Education in Destination Countries				
Higher Quality	-0.074 [0.684]	0.107 [0.439]	0.279 [0.125]	0.022 [0.895]
Lower Quality	0.612 [0.035]	2.187 [0.018]	-0.830 [0.333]	0.941 [0.140]
Panel B: Time after the Rise in Populism				
The initial three years	0.097 [0.088]	0.282 [0.035]	0.241 [0.063]	0.212 [0.088]
Post-three years	0.434 [0.018]	1.544 [0.035]	0.488 [0.104]	X
Panel C: Popularity of Destination				
Top-3 countries	0.009 [0.649]	1.082 [0.018]	0.208 [0.396]	-0.097 [0.614]
Other countries	0.385 [0.035]	0.407 [0.088]	0.356 [0.042]	0.576 [0.070]

Notes: Each coefficient estimate in Panel A and C shows the average annual effect of the rise in populism (evidenced by the deterioration of civil liberties) on the normalized population of international students originating from the specified country and attending universities in the specified type of OECD countries in the post-event period. Each coefficient estimate in Panel B shows the effect on the normalized population of international students originating from the specified country and attending universities in all OECD countries in the specified period. After normalization, the effects are estimated in terms of the fraction of the average annual population of international students originating from the specified country in the pre-event period. Numbers that are in squared brackets show the associated p-values. The donor pool consists of countries of all levels of freedom for Hungary, Ukraine, and Indonesia, while it includes the most democratic and partially democratic countries for Venezuela. Destination countries with high-quality education options are determined based on the QS world university rankings, and they include Australia, Canada, France, Germany, Japan, the Netherlands, Switzerland, the United Kingdom and the United States. The top three destination countries in the pre-event period are Austria, Germany, and the United Kingdom for Hungary; Germany, Poland, and the United States for Ukraine; the United States, France, and Germany for Venezuela; Australia, the United States, and Japan for Indonesia.

ONLINE APPENDIX

A. Sample of Destination Countries

27 OECD countries reported the population of international students each year during the 2004-2016 period, including Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Japan, South Korea, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. Among these countries, for Belgium, Slovakia, Spain, Sweden, and Turkey, some information is missing about the population of international students from some major origin countries. These countries are excluded from the empirical analysis for that reason. Hungary is also excluded from the sample of destination countries because it is one of the treated countries. Thus, the destination sample consists of the remaining 21 countries. The population of international students was approximately 0.26 million in the excluded countries as of 2016, which made up 7.5 percent of all international students attending universities in the OECD countries.

B. Missing Data and Inference

For some destination countries in the sample, the information for a few origin countries is missing although the population of international students from these origin countries in the adjacent years is considerably large. For such cases, the missing statistic is inferred as the average of the relevant available data from the closest years. In particular, the population of students originating from Qatar in Australia in 2013 and from Cyprus in the United Kingdom in 2013 and 2016 are inferred as the average of the corresponding data from the adjacent years.

As mentioned in the main text, Austria, Finland, France, Japan, Poland, and Portugal changed the manner of their reporting over time. More specifically, Austria and Poland reported the statistics only for non-citizen students until 2012, separately for non-resident and non-citizen students in 2012, and only for non-resident students after 2012. The difference between non-citizen and non-resident students from each origin country provides the population of foreign students who are residents but non-citizens of the destination country. It is assumed that the number of resident students calculated for each origin country in 2012 remained unchanged in the following years for Austria and Poland. Subsequently, to infer the population of non-citizen students for each year in the 2013-2016 period, the population of resident students from a particular origin country in 2012 is added to the population of non-resident students from that origin country. Thus, the sequence of the population of non-citizen students in Austria and Poland for the entire 2004-2016 period is obtained.

On the other hand, Finland, France, and Japan reported statistics only for non-citizen students between 2004 and 2012 and only for non-resident students after 2012. To apply the inference method described above, it is initially assumed that the population of non-resident students for each origin country in Finland, France, and Japan was the same in 2012 and 2013. The population of non-citizens in Finland, France, and Japan is consequently inferred for the post-2012 period. In particular, the population of resident but non-citizen students is calculated for

2012 and is added to the population of non-resident students for each year in the 2013-2016 period.

Lastly, Portugal reported statistics only for non-citizen students between 2004 and 2007, both for non-citizen and non-resident students between 2008 and 2012, and only for non-resident students after 2012. The population of resident but non-citizen students from each origin country in Portugal is calculated for 2008. Assuming that the population of resident students in the pre-2008 period was the same as the population of resident students in 2008, the population of non-resident students for each year in the 2004-2007 period is calculated as the difference between the population of non-citizen students and the population of resident students. Thus, the sequence of the population of non-resident students in Portugal is obtained for the entire 2004-2016 period.

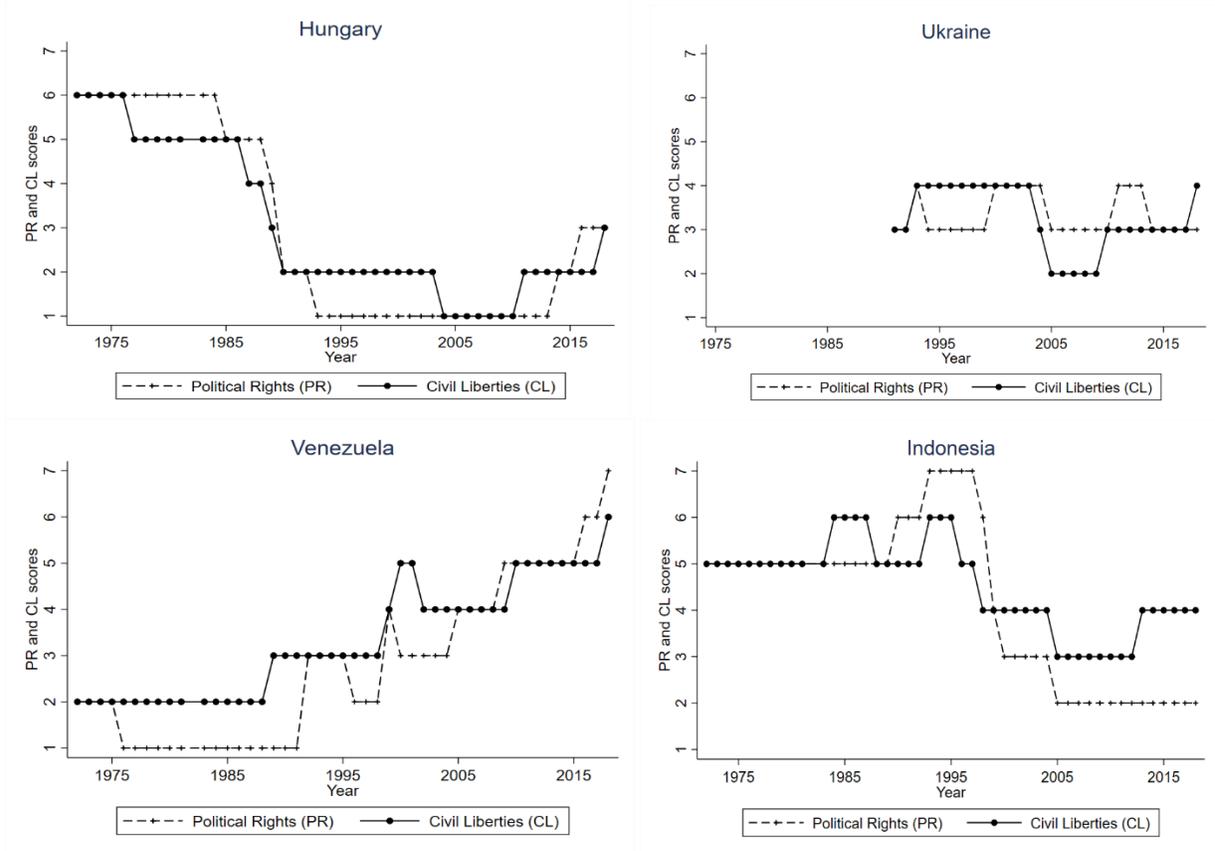
C. Robustness of Results

The sensitivity of the results reported in the main text to this inference process is explored by applying the SCM estimates to the raw data. As shown in Appendix Table 2, most of the estimated effects remain similar. In sum, the estimates in the table show that the population of international students who originated from Hungary, Ukraine, Venezuela, and Indonesia and attended universities in OECD countries increased after civil liberties deteriorated in these countries. However, the estimates are statistically less precise compared to the results in the main text. In particular, the estimated effect for Venezuela becomes statistically insignificant in terms of conventional levels of significance.

The inference strategy corrects for the unreasonable jumps or drops that are observed in the population of international students around the year when the manner of reporting was changed in Austria, Finland, France, Japan, Poland, and Portugal. It is important to highlight that the applied method does not alter the annual variation observed in the population of international students during the sample period, except the year of the change in reporting. The method only adjusts the level of the population statistics by adding a specific constant to the population statistic of each origin country for a part of the sample period. Without such an adjustment, the SCM estimates would be biased if the ratio of the population of resident students to the population of non-resident students in these destination countries differs across origin countries and if the variation in these ratios is correlated with the variation in the impact of the estimated event. Apparently, in the context of this study, the magnitude of the bias is not substantial.

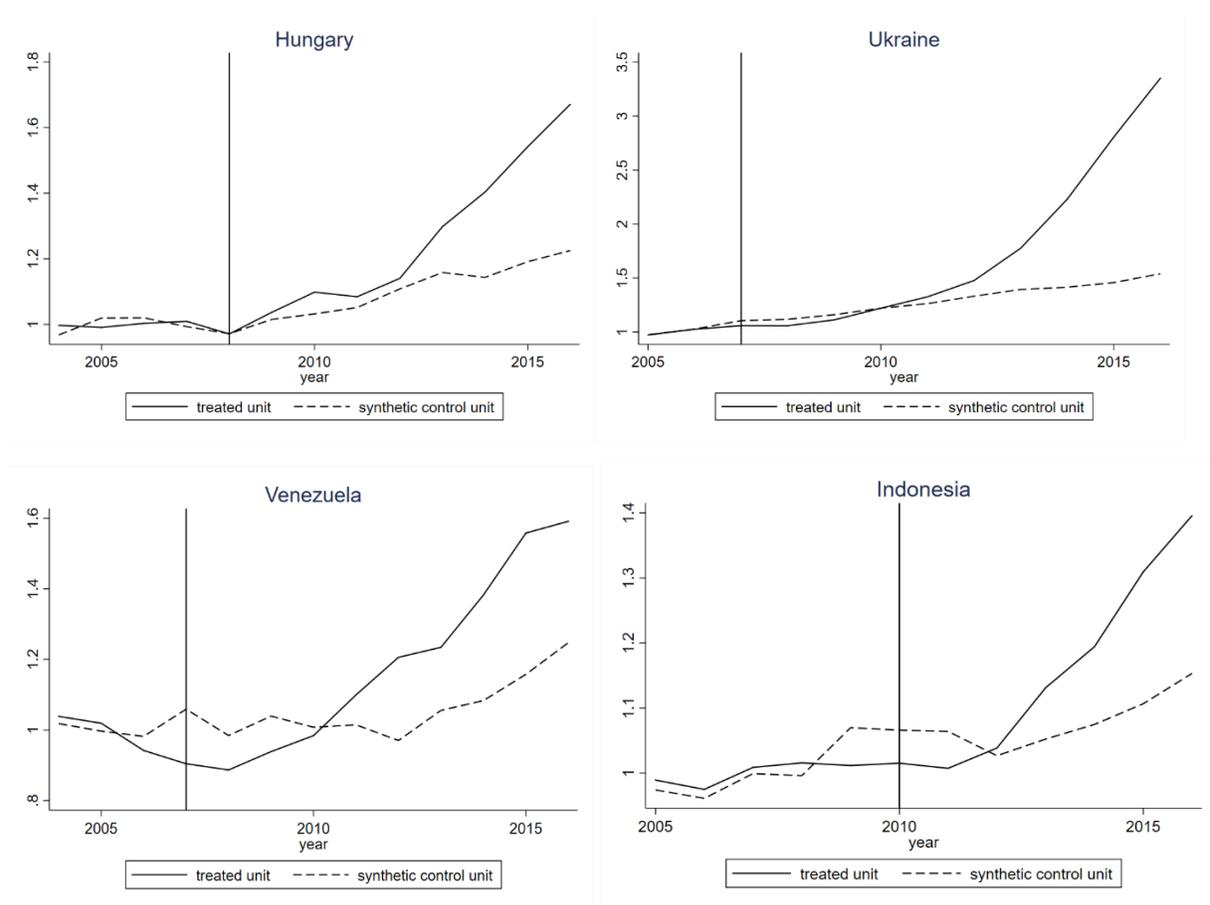
ONLINE APPENDIX FIGURES

APPENDIX FIGURE 1: TRENDS IN DEMOCRATIC RIGHTS IN THE COUNTRIES OF INTEREST



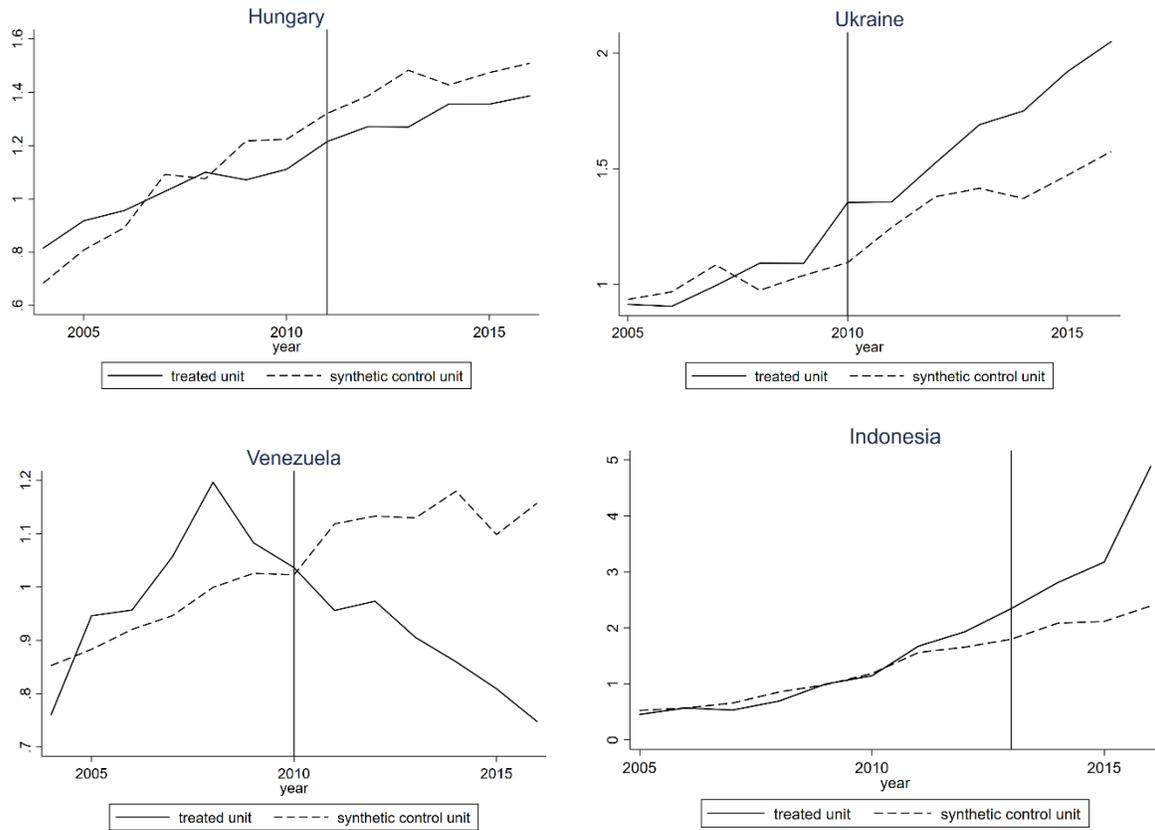
Notes: The Freedom House data. Each subfigure shows the Political Rights (PR) and Civil Liberties (CL) scores in the specified country over time.

APPENDIX FIGURE 2: BACKDATING THE TREATMENT



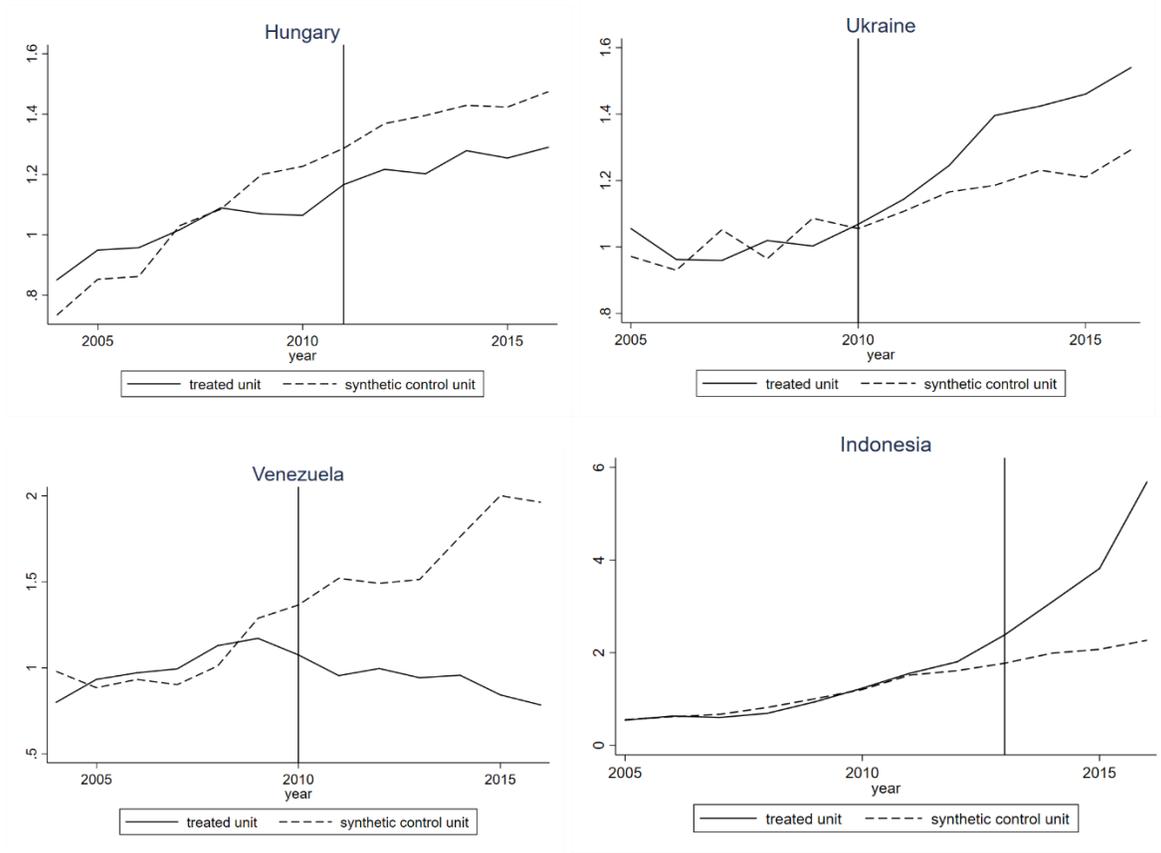
Notes: The OECD data. Each solid line shows the normalized population of international students who originate from the specified country of interest and attend universities in OECD countries. The normalization for a particular year is achieved by dividing the population of international students originating from the specified country in that year to the annual average population of international students originating from that country in the pre-event period. The vertical line in each subfigure shows the backdated event year for the specified country (i.e., three years before the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the normalized population of international students originating from the synthetic control unit for the country of interest. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all freedom levels in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries.

APPENDIX FIGURE 3: SCIENTIFIC PRODUCTION IN BEST UNIVERSITIES



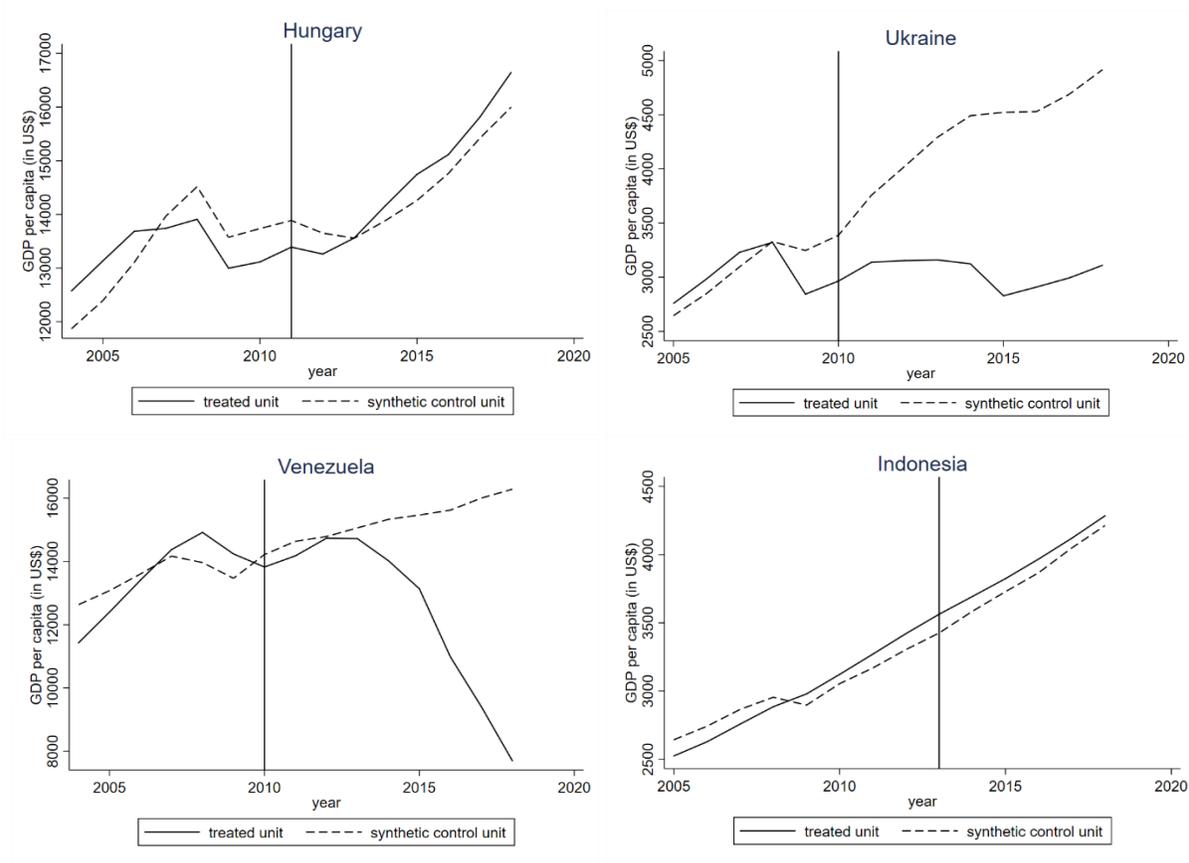
Notes: The SCImago data. Each solid line shows the normalized output of international scientific publications written by researchers affiliated with best universities of the specified country of interest. The THE world university rankings for the 2010-2019 period are used to identify best universities in origin countries. The normalization for a particular year is achieved by dividing the total number of scientific publications from best universities in the specified country by the annual average number of scientific publications from the same universities in the pre-event period. The vertical line in each subfigure shows the event year for the specified country (i.e., the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the normalized output of international scientific publications by researchers affiliated with top universities in the associated synthetic control unit. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all levels of freedom in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries.

APPENDIX FIGURE 4: SCIENTIFIC PRODUCTION IN ALL UNIVERSITIES



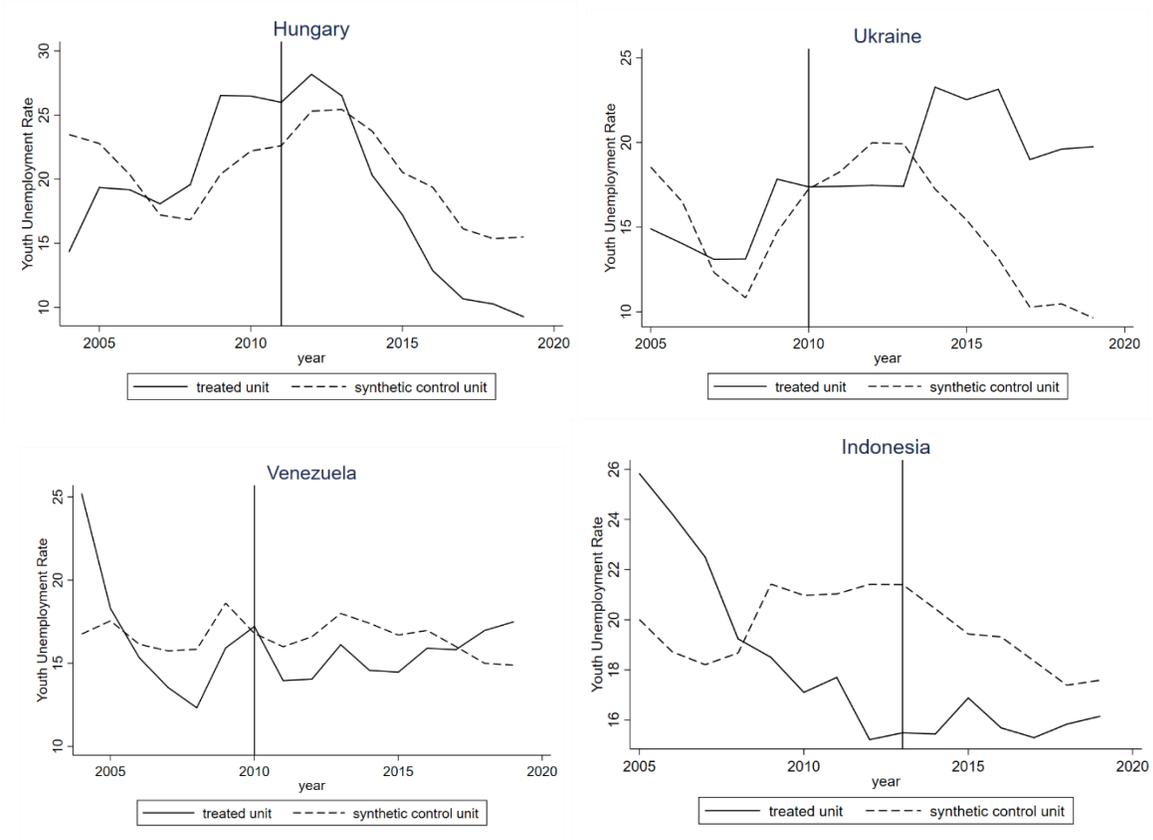
Notes: The SCImago data. Each solid line shows the normalized output of international scientific publications written by researchers residing in the specified country of interest. The normalization for a particular year is achieved by dividing the total number of scientific publications from the specified country by the annual average number of scientific publications from this country in the pre-event period. The vertical line in each subfigure shows the event year for the specified country (i.e., the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the normalized output of international scientific publications by researchers residing in the associated synthetic control unit. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all levels of freedom in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries.

APPENDIX FIGURE 5: GROSS DOMESTIC PRODUCTION PER CAPITA



Notes: The World Bank Indicators data. Each solid line shows the real gross domestic production per capita (in 2010 US \$) in the specified country of interest. The vertical line in each subfigure shows the event year for the specified country (i.e., the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the gross domestic production per capita in the associated synthetic control unit. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all levels of freedom in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries.

APPENDIX FIGURE 6: YOUTH UNEMPLOYMENT



Notes: The World Bank Indicators data. Each solid line shows the youth unemployment rate in the specified country of interest. The vertical line in each subfigure shows the event year for the specified country (i.e., the year when civil liberties deteriorated according to the CL index of Freedom House). Each dashed line shows the youth unemployment rate in the associated synthetic control unit. The synthetic units for Hungary, Indonesia, and Ukraine are constructed from the donor pool consisting of countries of all levels of freedom in the sample of origin countries, and the synthetic unit for Venezuela is constructed from the donor pool consisting of the most democratic and partially democratic countries.

ONLINE APPENDIX TABLES

APPENDIX TABLE 1: THE LIST OF ORIGIN COUNTRIES IN THE DONOR POOL

The Most Democratic Countries

Australia, Austria, Belgium, Canada, Chile, Costa Rica, Croatia, Cyprus, Denmark, Estonia, Finland, Germany, Iceland, Ireland, the Netherlands, New Zealand, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, the United States, Uruguay

Partially Democratic Countries

Albania, Argentina, Armenia, Bangladesh, Bolivia, Bulgaria, Croatia, El Salvador, Greece, Guatemala, Jamaica, Macedonia, Malaysia, Mongolia, Singapore, South Korea, Panama, Paraguay, Peru, Philippines, and Romania

The Least Democratic Countries

Belarus, Cambodia, Iran, Kazakhstan, Laos, Oman, Pakistan, Qatar, Turkmenistan

Notes: The table shows the list of countries that are located in Europe, the Americas, and Asia and where the CL index was constant during the 2004-2016 period. China and India as well as countries whose population is less than one million are excluded because these countries have large differences in their scale with respect to the origin countries of interest. The CL index was constant at one in "the most democratic" countries; at two, three, or four in "partially democratic" countries; and five, six, or seven in "the least democratic" countries.

APPENDIX TABLE 2: SCM ESTIMATES FOR THE
POPULATION OF INTERNATIONAL STUDENTS, USING RAW
DATA

	(1)	(2)	(3)	(4)
Hungary	0.174 [0.035]	0.199 [0.021]	0.338 [0.097]	0.347 [0.045]
Ukraine	0.813 [0.018]	0.714 [0.021]	0.864 [0.032]	0.848 [0.045]
Venezuela	0.196 [0.614]	0.264 [0.208]	0.038 [1.000]	0.282 [0.182]
Indonesia	0.221 [0.088]	0.025 [0.917]	0.184 [0.097]	0.088 [0.727]

Notes: Each coefficient estimate shows the average annual effect of the rise in populism (evidenced by the deterioration of civil liberties) on the normalized population of international students originating from the specified country of interest and attending universities in OECD countries. After normalization, the effects are estimated in terms of the fraction of the average annual population of international students originating from the specified country. Numbers that are in squared brackets show the associated p-values. Column (1) employs countries of all levels of freedom in the donor pool, column (2) employs the most democratic and partially democratic countries, column (3) employs partially democratic and the least democratic countries, and column (4) employs only partially democratic countries. Unlike the estimates reported in Table 4, the estimates in this table are obtained from the original data of international students without applying any correction for the implications resulting from the change in the manner of reporting.

APPENDIX TABLE 3: ROBUSTNESS TO THE CHOICE OF PREDICTORS

	Hungary	Ukraine	Venezuela	Indonesia
Excluding CL index				
Estimate	0.227	0.839	0.309	0.226
P-value	[0.018]	[0.035]	[0.188]	[0.070]
RMSPE	<i>0.031</i>	<i>0.045</i>	<i>0.072</i>	<i>0.048</i>
Excluding GDP per capita				
Estimate	0.001	0.538	0.206	0.157
P-value	[0.632]	[0.035]	[0.313]	[0.088]
RMSPE	<i>0.055</i>	<i>0.087</i>	<i>0.068</i>	<i>0.036</i>
Excluding Youth Unemployment Rate				
Estimate	0.175	0.732	0.601	0.070
P-value	[0.018]	[0.018]	[0.042]	[0.719]
RMSPE	<i>0.021</i>	<i>0.042</i>	<i>0.070</i>	<i>0.060</i>
Excluding Youth Population				
Estimate	0.191	0.835	0.321	0.212
P-value	[0.018]	[0.035]	[0.063]	[0.088]
RMSPE	<i>0.025</i>	<i>0.036</i>	<i>0.039</i>	<i>0.042</i>
Excluding Top Destination Countries				
Estimate	0.280	0.670	0.115	-0.103
P-value	[0.018]	[0.053]	[0.729]	[0.895]
RMSPE	<i>0.035</i>	<i>0.111</i>	<i>0.092</i>	<i>0.128</i>

Notes: Each coefficient estimate shows the effect of the deteriorating civil liberties on the population of international students originating from the country of interest as the ratio of the pre-treatment average of the population of international students from that country. Numbers that are in squared brackets show the associated p-values. Numbers that are in italics and below the p-values show the associated root mean squared prediction error (RMSPE). The donor set consists of origin countries of all freedom levels in the donor sample for Hungary, Ukraine, and Indonesia and of the most democratic and partially democratic countries for Venezuela.

APPENDIX TABLE 4: SCM ESTIMATES FOR SCIENTIFIC
PRODUCTION IN ORIGIN COUNTRIES

	(1)	(2)	(3)	(4)
Hungary	-0.169 [0.895]	-0.239 [0.729]	-0.040 [1.000]	-0.050 [1.000]
Ukraine	0.169 [0.702]	-0.292 [0.771]	0.224 [0.581]	-0.206 [0.591]
Venezuela	-1.021 [0.053]	-0.795 [0.208]	-1.149 [0.129]	-0.803 [0.045]
Indonesia	2.090 [0.018]	2.037 [0.021]	2.345 [0.032]	1.777 [0.045]

Notes: Each coefficient shows the average annual effect of the rise in populism (evidenced by the deterioration of civil liberties) on the normalized level of the number of international publications written by researchers residing in the specified country of interest. After normalization, the effects are estimated in terms of the fraction of the average annual number of publications from the specified country in the pre-event period. Numbers that are in squared brackets show associated p-values. Column (1) employs countries of all freedom levels in the donor pool, column (2) employs the most democratic and partially democratic countries, column (3) employs partially democratic and the least democratic countries, and column (4) employs only partially democratic countries.

APPENDIX TABLE 5: SCM ESTIMATES FOR ECONOMIC
CONDITIONS IN ORIGIN COUNTRIES

Panel A: GDP per capita (in US\$)

	Hungary	Ukraine	Venezuela	Indonesia
All Post-event Period	252 [0.947]	-1350 [0.263]	-3040 [0.167]	89 [0.930]
The initial three years	-36 [0.982]	-873 [0.298]	-284 [1.000]	102 [0.825]
After four to six years	409 [0.930]	-1560 [0.193]	-2760 [0.292]	48 [0.842]
After six years	216 [0.842]	-1167 [0.298]	-5063 [0.104]	X

Panel B: Youth Unemployment Rate

	Hungary	Ukraine	Venezuela	Indonesia
All Post-event Period	-3.3 [0.825]	5.0 [0.316]	-0.9 [0.979]	-2.9 [0.789]
The initial three years	0.2 [0.912]	-2.0 [0.877]	-2.2 [0.917]	-3.7 [0.702]
After four to six years	-5.1 [0.632]	7.7 [0.298]	-2.0 [0.896]	-2.0 [0.825]
After six years	-3.8 [0.526]	9.3 [0.140]	1.5 [0.875]	X

Notes: Each coefficient estimate shows the average annual effect of the rise in populism (evidenced by the deterioration of civil liberties) on the GDP per capita of the specified country in Panel A and on the youth unemployment rate in Panel B during the specified time frame. Numbers that are in squared brackets and below the coefficients show the associated p-values. The donor pool consists of countries of all levels of freedom in the sample of origin countries for Hungary, Ukraine, and Indonesia, while it consists of partially democratic and the least democratic countries for Venezuela.