Escaping the Reputation Trap: An empirical investigation

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Abstract

A reputation trap indicates a state of holding a bad reputation and not being able to escape it due to history dependence. It perpetuates itself because rational agents know that, even if they invest in good reputation, it is unlikely that the others will recognize this signal and deem it credible (Levine, 2019). However, one way out of the reputation trap is to have a third party or an international agency to signal the investment in good reputation to others on behalf of the bad reputation agent. In this paper, we test the empirical relevance of this argument by using the Olympic Games as the international agency to boost the reputation in terms of international trade. We specifically test whether hosting or bidding on the Olympic Games affects the international trade patterns of the host and bidding countries. We do so by building synthetic controls for host and bidder countries and identifying the trade effects of the Summer Olympics in the aftermath of the WWII. Our findings indicate that the hosting or bidding on Olympic Games bring about substantial trade effects. Nevertheless, the findings provide limited support for the reputation trap mechanism.

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1 Introduction

The main argument of the scholarly work on the Olympic effect is that hosting, and even just bidding on, the Olympic Games leads to an increase in trade, exports, economic growth, tourism and other positive outcomes. The competitive bidding process that countries enter in the hopes of hosting the mega-event shows that many believe that the tremendous initial costs will be compensated by both these economic and socio-cultural gains. Although a great deal of attention has been paid to the so-called 'Olympic effect', previous research does not provide one clear answer to the question whether there is a positive 'Olympic effect' on hosting or bidding countries (Matheson, 2006). Moreover, it seems that the effects of hosting the Olympics differ by country and are positive only under specific circumstances (Baade and Matheson, 2016). In this paper, we first investigate the question of the presence of a positive Olympic effect on exports using an empirical design that addresses the shortcomings of the empirical methods adopted by previous studies. We then discuss one of the factors, namely reputation, that might condition the Olympic effect.

More specifically, we re-estimate the effect of the Olympic games on exports using the synthetic control method (SCM) of Abadie, Diamond, and Hainmueller (2010). Using this method we avoid the common traps and problems that arise frequently in this specific strand of the literature –selection bias, structurally different comparison units, choices regarding the timing of the treatment (as also mentioned in, among others, Maennig and Richter (2012) and Bista (2017)). By doing so, we hope, not only to give a causal interpretation (within the potential outcomes framework) to the estimated effects, but also to shed some light on the mechanisms that drive the effects. We therefore first contribute to the relevant literature by using a better suited empirical method for the question at hand than the previous one. Furthermore, since our analysis focuses on countries individually, we are able to provide more fine-grained evidence regarding the presence of the Olympic effect, and also to test a specific mechanism, namely the Olympic games being way out of the reputation trap, which is elaborated below.

Why would a country decide to bid on the Olympics if the outcome is so uncertain? One explanation would be that the country wants to send a signal of economic liberalization and trade openness to the world. This idea has been put forth by Rose and Spiegel (2011). We make a modification to this idea and argue that such a signal would only be effective for countries that want to go through a process of liberalization and increase their economic

openness. The immediate implication of it is that developed countries with high trade levels and economic openness (good-reputation countries) would not experience positive benefits of hosting (or bidding on) the Olympics through signaling openness. On the other hand, countries who want to endorse open trade (bad-reputation countries) would find it valuable to signal economic liberalization and trade openness to the rest of the world.

The key difference therefore between our signaling mechanism and the one in Rose and Spiegel (2011) is that our mechanism implies not all countries will experience the same positive Olympic effect because not all countries expect a reputation gain from signaling openness. This idea resonates well with the theory of Levine (2019), according to whom, a bad-reputation player, who finds itself in a reputation trap, does not find it profitable to invest in a good signal. One way to make this player to invest in the good signal is to subsidize the cost of the investment for the good signal. However, the welfare analysis of his theory indicates that the bad-reputation player is strictly better-off when it receives the amount of subsidy than investing it in the good signal. Therefore, it is not very straightforward for a bad-reputation country to invest in a good signal to tell the rest of the world that it is endorsing free trade. The model, however, points to another possibility of escape: an outside agency may have an advantage over the bad-reputation player in disseminating credible information to the outsiders and make the investment in the good signal profitable for this bad-reputation player. The key outside agency in our setting is the Olympic Games itself as is also proposed by Levine (2019).

For this very reason, if we consider the Olympic Games acting as such a signaling device, lumping good-reputation venues with bad-reputation venues would not be the right way of assessing the Olympic effect as is the practice in Rose and Spiegel (2011). In this paper, we address this problem by creating a synthetic comparison unit for all countries who hosted or bid on the Olympics. Doing so enables us to ensure that we are not comparing structurally different units/countries.

We consider bidding on or hosting the Olympic games as a credible, costly signal to escape the reputation trap. Note that only countries that have a reputation to gain will experience the effect of the signal and escape the reputation trap, enjoying higher levels of trade or exports with the rest of the world. Countries that already have a good reputation and enjoy its benefits will experience a much smaller, if even positive, effect of hosting or bidding on the Olympics. It might be that in this case the tremendous costs involved with the event do not out-weigh the potential positive pay-offs. The results of Maennig and Richter (2012) hint

at this, when they show that using propensity score matching (and pairing OECD countries with arguably good reputations) the positive significant effect of the Olympics disappears.

We hypothesize that the Olympic games might act as the costly and credible signal needed to positively affect the host country's reputation. By increasing their reputation, countries might be able to increase trade levels, especially their exports. We test this hypothesis empirically and estimate the effect of hosting and bidding on the Olympics on total export levels of countries that arguably find themselves in a reputation trap. Our findings indicate that the Olympic effect is indeed present for some countries but not for all. The reputation trap theory, on the other hand, explains only a part of the story.

The rest of the paper is organized as follows: Section 2 provides the institutional background related to the host selection process of the Olympic Games. Section 3 summarizes the previous related works. Section 4 describes our empirical strategy and data. Section 5 presents the results of our analyses, Section 5 presents a discussion of results, and finally, Section 6 concludes.

2 Institutional background

Hosting the Olympics is the final stage of a process that spans multiple years. This process starts at the invitation phase, where potential candidates are invited to Lausanne, in Switzerland, to discuss their ideas and visions for the Olympic Games. They receive feedback, support and assistance in developing these ideas into a formal application. This formal application is the next stage of the candidature process. These formal applications are the first time most countries, or cities, publicly announce that they plan on bidding on the Olympic Games. In this paper, we refer to countries who have formally applied (i.e., completed this phase) as bidders.

The formal applications are submitted roughly two years before the Olympic Committee makes the final decision on what country will be asked to host the Olympic Games. During these two years, the bidders enter a process of fine-tuning their initial application with the help of the Olympic Committee. In the final step of the process, the Evaluation Committee decides each bidders' ability to "deliver successful Games and assesses whether the Games would leave a positive legacy that meets the individual needs and long-term development

plans of the respective city and region".[1] The decision which country gets to host the Olympic Games is made five to eight years prior to the Games.

3 Related Literature

The previous literature does not provide a straightforward conclusion as to whether hosting or bidding on the Olympics has a positive effect on exports. For a full review of the literature on the Olympic effect with respect to both short and long term and ex-ante and ex-post effects, see Matheson (2006). Below, we will focus on the work done with respect to the long term, ex-post effects of the Olympics on export levels.

Rose and Spiegel (2011) investigated the effect of hosting and bidding on the Olympic Games on trade flows and were among the first to introduce the idea of considering hosting or bidding on the Olympic games as a signal of liberalization and openness to trade. The authors found that both imports and exports increased, and that the effect of hosting the Summer Olympics was especially strong.

Others have also found a positive effect of hosting the Olympics. Song (2010) estimates the effect of hosting the Summer Olympics on exports and tourism, using a gravity model following Rose and Spiegel (2011). Song (2010) takes an important step and estimates when, first, the effect of the Olympics on exports starts, and second, how long they last. The findings suggest that the effect on exports is slow but persistent. There is some evidence that the effect starts a little before the Olympics, but this is not fully supported by all model specifications. Finally, the positive effect holds for both Summer and Winter Olympics, though the latter has a smaller effect on exports.

Additionally, Brückner and Pappa (2015) consider the effect of the Olympics and view the bidding on the Olympics as a news shock. The shock takes place when the countries bid on the Olympics, around nine to seven years before the actual event would take place. This news shock results in significant increases in investment, consumption and output. Countries that go on to host the Olympics experience another significant increase in these three areas five to two years before the Games take place.

Not all studies find unambiguously positive results of hosting (or bidding on) the Olympic Games. Considering the stock market and net exports, Veraros, Kasimati, and Dawson

[1] Official information by the Olympics Committee: All about the candidature process, 2020.

(2004) find that the announcement of winning the Olympic bid had a positive effect on the Athens' stock market but not on the Australian stock market.

Importantly, there seems to be evidence that the positive results found are sensitive to the empirical method used. Contrary to estimating a gravity model using OLS, Bista (2017) employs a Poisson pseudo-maximum likelihood (PPML) model and notes that this estimation allows for heteroskedasticity that is prevalent in trade data. Using this set-up, Bista (2017) finds no significant effect of hosting, or bidding on, the Summer Olympics on total export levels.

Additionally, Maennig and Richter (2012) raise an important issue with respect to the methodology of Rose and Spiegel (2011). The authors argue that comparing certain nations with high levels of exports that have hosted the Olympics to all other nations (with lower levels of exports and that did not host the Olympics) might imply a selection bias. Maennig and Richter (2012) re-estimate the model of Rose and Spiegel (2011) using a matching and treatment methodology and show that the positive significant effect disappears.

4 Empirical Framework

4.1 Sample and Data

Our main data set in this study is the publicly available TRADHIST data set, which includes trade information for an extensive list of countries and covers the period 1827-2014 (Fouquin, Hugot, et al. (2016)).[2] From this data set, we specifically use aggregate export levels, population size, and the real GDP variables at the country level. For each country analysis we first subset this data set to our period of interest, and second subset it to countries within a specific trade agreement or economic community (such as GATT).

We complement this data set with the information of the host and bidder countries for the post-war summer Olympic Games, which is reported in Table A.1 (Rose and Spiegel (2011)). A binary variable, at the country-year level, that captures being the host or a bidder for an Olympic Games constitutes the treatment in this study. In our analyses, we consider individually each treated country since the 1960 Olympic Games, except those for which the data are not available. We also exclude countries who became a member of

[2] The TRADHIST data set is available online.

GATT/WTO during the study period since it would confound the treatment effect. In the cases of countries bidding multiple times consecutively, we only focus on the first bids.

4.2 Empirical Strategy

We estimate the effect of hosting and bidding on the Olympic games on total export levels using the SCM.[3] In short, the idea behind the method is that a weighted combination of various control units (the group of control units is called the 'donor pool') is better suited to match the pre-intervention trend of the treated unit than one control unit individually. The SCM offers an objective and rigorous way of assigning weights to donor pool countries based on a set of predictor variables. These predictor variables are chosen carefully in such a way that they predict the outcome variable as well as possible. The weighted combination of the control units is referred to as the 'synthetic control'. If the SCM is conducted correctly, this synthetic control is identical to the treated unit in all aspects except that it did not undergo treatment (in our case, treatment being the bidding on or hosting of the Olympics). We refer the reader unfamiliar with this method to Abadie, Diamond, and Hainmueller (2010), Abadie, Diamond, and Hainmueller (2015), and Abadie (2019) where the method is discussed in detail.

The literature review touched upon some potential empirical shortcomings of earlier estimations of the Olympic effect. The SCM allows us to address these issues and causally estimate the effect that hosting the Olympic Games has on exports, and thereby whether it is a credible and effective signal that allows a country to escape the reputation trap.

An issue that arises in the previous literature is lumping good-reputation countries with bad-reputation countries when assessing the Olympic effect. However, to test a reputational mechanism for driving the Olympic effect, such an analysis is ill-suited. We address this problem by applying our synthetic control method to individual countries and assess the effect case by case for good-reputation and bad-reputation countries.

Another empirical shortcoming in the previous works is caused by unobservable characteristics of the treatment and control groups that drive the effect instead of the actual hosting of the Olympics. Rose and Spiegel (2011) note this, but argue that the problem is avoided by comparing trade patterns for countries that host the games to those that un-

[3]We run our synthetic control applications with the 'Synth' package by Abadie, Diamond, and Hainmueller (2011), and our placebo tests with the 'SCtools' package by Silva and DeWitt (2019), both in R.

successfully bid for the games. Maennig and Richter (2012) state that some estimations of the Olympic Effect suffer from selection bias with respect to what countries are compared to each other: "We challenge the empirical findings of Rose and Spiegel (2011) because they compare Olympic nations such as the United States, Japan, Germany, Canada, Italy, Spain, and Australia, which have been among the leading export nations for centuries, to all other nations (p 635-636)".

We mitigate this common pitfall of empirical research by the pre-treatment match between our treated units and their synthetic controls. The quality of pre-treatment trajectory match in synthetic control methods provides us the required credibility to claim that any discrepancy in trends after the treatment is due to our treatment. We also mitigate the sample selection problem thanks to the simple and explicit optimization problem underlying the synthetic control methods. Moreover, since we perform a country by country analysis, we can carefully distinguish between countries who need to costly and credibly signal to repair their reputation, and countries that do not. Thereby we can precisely test our hypothesis.

Finally, the timing of the treatment is a difficult but crucial modeling choice for assessing the Olympic effect. In regression-based methods, the coefficient of the treatment variable is the average of the treatment effect for the entire post-treatment time period. It may occur that the effect starts much later, and thereby biases the coefficient. Getting the timing right is a difficult matter, given that the moment of the decision to award the Olympic Games varies, as well as the fact that the effect might start sometime after the event took place or gets stronger over time (this is shown to be the case by Song (2010)). It might also occur that the treatment starts in different years in different countries.

The synthetic control method allows us to backdate the time of the treatment without losing the causal interpretation of the estimated post-treatment difference between trends (Abadie, 2019). The backdating approach of SCMs frees us from making a difficult modeling choice, that is, determining the exact timing of the treatment. It also frees us from having to specify an identical treatment year for all the countries.

4.3 Donor pool

As noted by Maennig and Richter (2012), it is important to compare countries that are similar to each other to avoid selection bias and thereby unreliable results. For this reason, a few words on the construction of the donor pool for our analysis follows.

Since our outcome of interest is export levels, we consider GATT membership as an important factor in determining the donor pool. Therefore, as recommended in Abadie (2019), we restrict the donor pool (initially consisting of all countries that did not bid or host the Olympics in the time-period considered) to countries that have a similar GATT-membership status. This is in line with the recommendation of Abadie (2019) that any comparison units that (might) have experienced large shocks that affect the outcome variable should be excluded.[4] If we would not do so, we would fail to control for the large impact that this membership has on export levels.

In addition, we exclude countries that hosted the Olympics or bid on the Olympics simultaneously with the treated country from the donor pool, and also the countries that hosted or bid on the Olympics within the corresponding study period. This sample restriction ensures that we compare treated units to non-treated units.

4.4 Moment of treatment

Equally important as selecting the units of our donor pool is determining the correct moment of treatment. According to Abadie (2019), it is crucially important to align the timing of the treatment, and thereby the pre-treatment period, with when the first effects of the (policy) change or intervention take place. As the economy consists of forward-looking agents, the anticipation of the event (in our case, the Olympics) taking place in the future can already have an impact. This ensures that the full effect of the intervention can be estimated (Abadie, 2019).

Signs of this anticipation are found in the literature as it is often found that the effect starts a few years prior to the Games taking place. Song (2010) found that the effect starts a few years prior to hosting the Olympics. Brückner and Pappa (2015) also find that the effect starts prior to the eventual hosting of the Olympics, and conclude that the effect starts nine to seven years prior to the Games while it most significantly increases five to two years prior to the Games for host countries. These timelines roughly coincide with the moment a country officially declares its candidacy.

As we consider the bidding on the Olympics as a signal about the reputation of the country (to lift itself out of the reputation trap), a straightforward assumption is that the

[4]This is similar to donor pool restriction to OECD members in Abadie, Diamond, and Hainmueller (2015) who study the effects of German Unification on West Germany GDP through a synthetic control method.

effect will start at the time of the announcement. This would suggest that the effect starts about seven to five years prior to the year the Games take place. We show in our robustness tests that this is a reliable and robust choice.

Choosing the Olympics host announcement year as the start of the treatment coincides with backdating approach in SCMs. Since we start the Olympics treatment as early as possible (in other words, at the host announcement year for the host countries), we actually allow the treatment effects to start at anytime after the treatment starting year. This grants us some flexibility in capturing the treatment effects. In our robustness checks, we replicate our results when the treatment year is specified as two years before the host announcement year.

Moreover, the backdating approach ensures that any effect that emerges at any time after the treatment starting year –even in the presence of some time periods that show no treatment effects immediately after treatment year– can be interpreted as the causal effect of the treatment (Abadie (2019)). This implies that we allow our treated units to exhibit heterogeneity in when they start to experience the positive export effects of the Olympic Games, and we see this as a substantial improvement over the empirical designs of the previous studies.

5 Results

In what follows we first provide an example of our country-level analysis by focusing on South Korea and the 1988 Olympics. We explain in detail the baseline specification, robustness checks, and placebo-in-place tests. In all the analyses for other countries, unless otherwise stated, our econometric specifications and other modeling choices regarding the baseline analyses, robustness checks, and placebo-in-place tests are identical across countries.

Second, we present the results for all countries in our sample and provide a discussion of these results.

5.1 Country-level Analysis

Our exampler for the country-level analysis is that of South Korea, who hosted the 1988 Olympic Games. In the baseline analysis, our dependent variable is total export and its pre-

dictors for constructing the synthetic control are population size, real GDP, and total export itself. We start the treatment when the host of the Olympic Games has been announced (which is 1981 for the 1988 Olympics). We go back eight years before the announcement year so that the optimization problem that generates the synthetic control has enough time to yield a good pre-treatment match of trends. We then track the trends of our treated unit (South Korea in this example) and its synthetic control for 15 years after the treatment started.

Figure 1 shows the results of our application of synthetic control method. The good pre-treatment fit lends credibility to a causal interpretation of the observed differences between the treated unit and its synthetic control after the treatment started. Figure 1 shows that, after South Korea was announced as the host of the 1988 Olympics Games in 1981, a difference starts to emerge between the export trends of South Korea and its synthetic control. This difference corresponds to the effect of the Olympic Games on the exports of South Korea, and it seems persistent throughout the 15 years after the treatment.

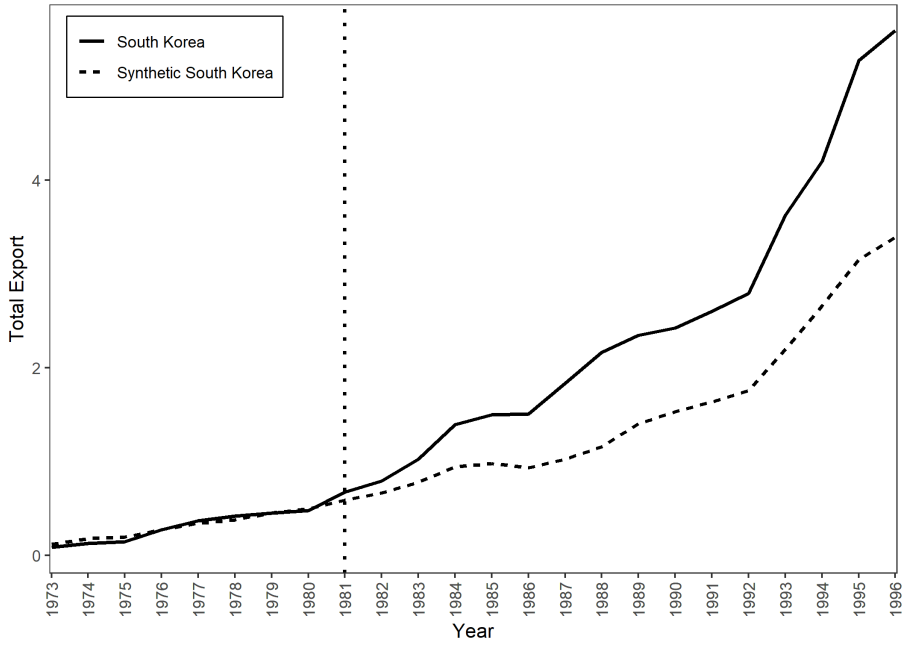

Figure 1: Baseline results for South Korea, 1988 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of South Korea and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Korea, and the red line corresponds to the total exports of the synthetic control.

We conduct two robustness checks to our baseline results. We first take our treatment

year back to two years before the host announcement year, to 1979 in this example. This is the backdating approach and it does not harm the causality of the estimated differences even if the actual treatment starts later (Abadie (2019)). We still optimize over eight years before the treatment and track the export trends for 15 years after the treatment. Figure 2 shows that, even if the treatment starts in 1979, we still observe a difference in export levels between South Korea and its synthetic control.

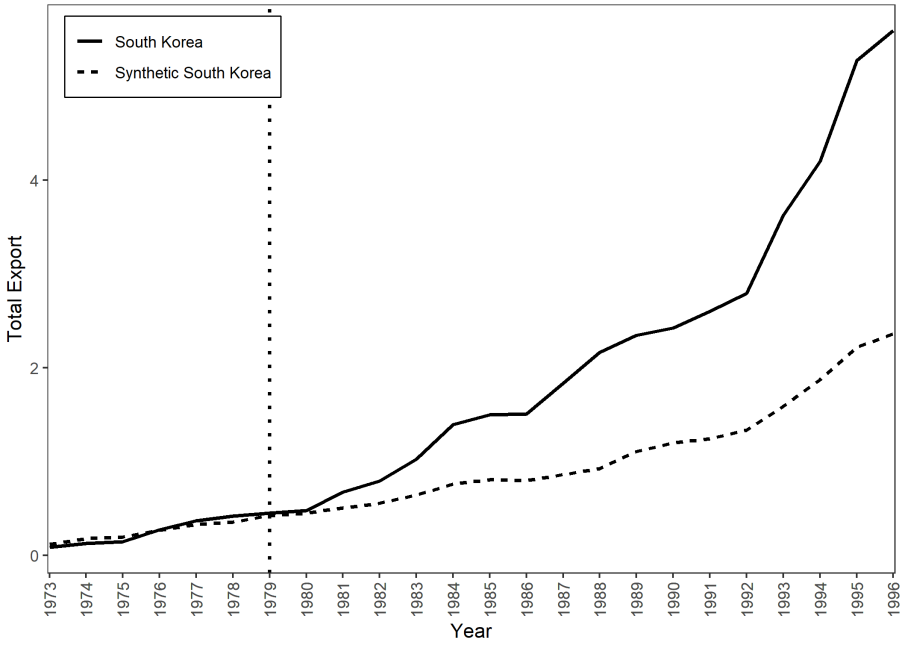

Figure 2: Robustness-I for South Korea: backdating treatment 2 years, 1988 Olmypics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of South Korea and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Korea, and the red line corresponds to the total exports of the synthetic control.

In our second robustness check, we construct our synthetic control with a single predictor, which is the export level itself. The aim of this robustness analysis is to show that the pre-treatment fit and the results in the baseline analysis are not an artifact of our choices regarding the predictor variables. In this analysis we use the host announcement year as the treatment starting year as in the baseline specification. Figure 3 confirms that the baseline results are not due to our selection of predictor variables.

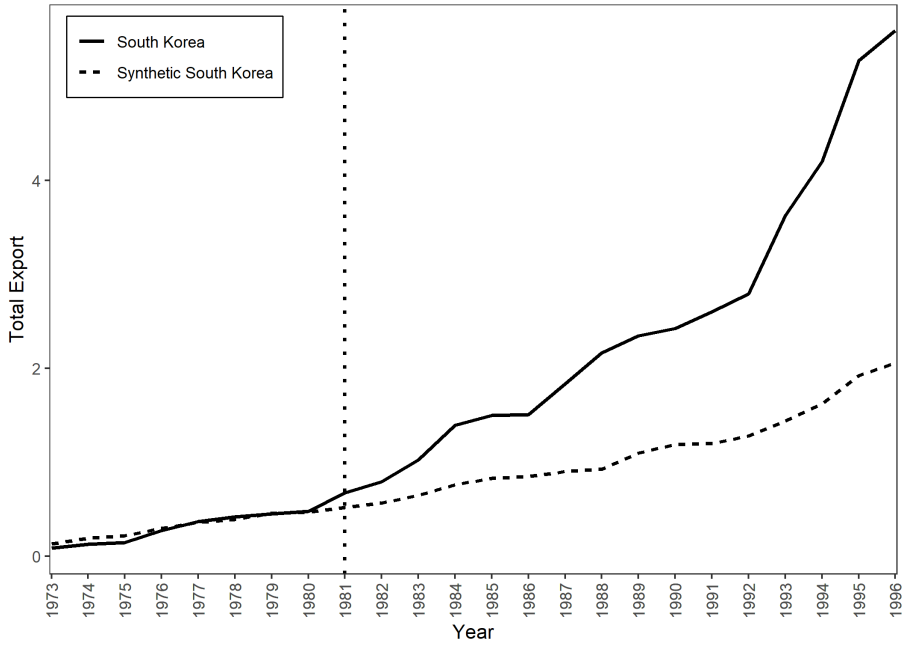

Figure 3: Robustness-II for South Korea: single predictor, 1988 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Japan and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Korea, and the red line corresponds to the total exports of the synthetic control.

Finally, we run placebo-in-place tests to further strengthen the causal interpretation of our baseline results. In this analysis we rotate over all countries in our sample by choosing each country as the treated unit, and construct a synthetic control for each one of them. Since our sample in this subsection does not include any country that hosted or bid on the Olympics (except our treated country of interest), we do not expect to see a positive difference between the treated unit and its synthetic control in terms of export levels. If we happen to see such positive differences for placebo countries, this then would cast a serious doubt on the credibility of positive effects of the Olympic Games on exports.

Our modeling choices in constructing the synthetic control in this placebo-in-place analysis are identical to the ones in our baseline analysis. Figure 4 presents the outcome gaps between the treated units and their synthetic controls for each country in our sample. The placebo-in-place analyses reported in Figure 4 confirm that our actual treated unit, South Korea, is the one that experiences the positive effects of the Olympic Games distinctively more, compared to the our countries in our sample who did not host or bid on the Olympics.

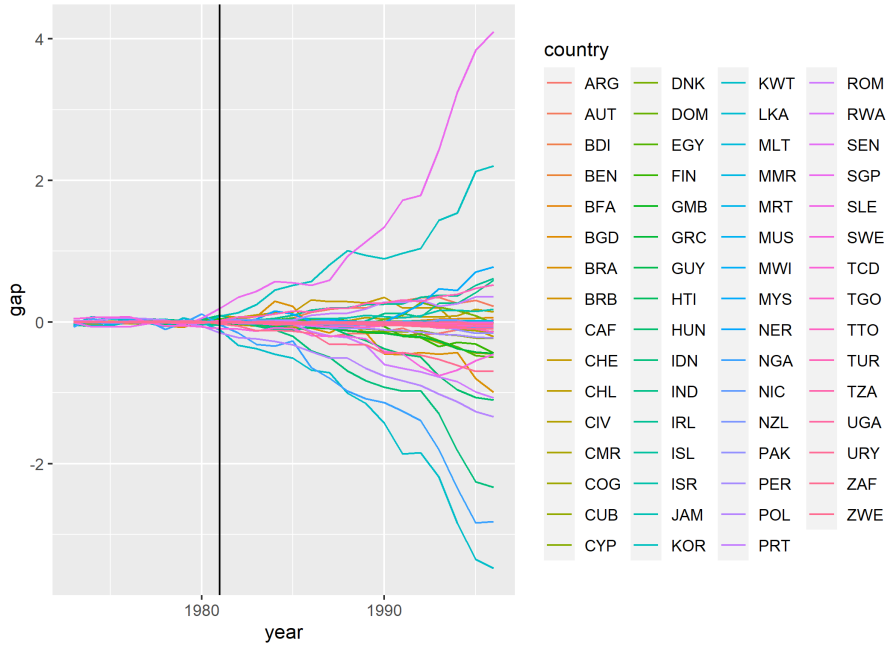

Figure 4: Placebo analysis for South Korea, 1988 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between South Korea and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

In overall, our results indicate that the Olympic Games has a positive effects on exports in the case of South Korea as a host of the 1988 Olympic Games. We see this result as suggestive evidence for the presence of a reputational mechanism since we consider South Korea as a country who can receive benefits from signaling economic liberalisation and trade openness to the rest of the world. In the next section, we replicate the above analyses for 12 other countries who hosted or bid on the Olympics and discuss our findings.

5.2 Results & Discussion

Table 1 summarizes the results of 13 synthetic control method applications for countries who hosted or bid on the Olympic Games. The 'Olympic effect' column in Table 1 reports the standardized Olympic effect, which is the 10-year average of the gap between the exports of actual treated unit and its synthetic control immediately after the treatment, divided by the total exports of the treated unit at the starting year of the treatment. More formally, let T be the treatment year, $X_{T,treated}$ be the exports of treated unit at time T, and Gap_t be

the difference between the exports of treated unit and its synthetic control at time t. The standardized Olympic effect then is given by:

$$\frac{\sum_{i=1}^{10} Gap_{T+i}}{X_{T,treated}}.$$

The last column of Table 1 reports the probability of randomly picking a country from the placebo units that exhibits a larger standardized Olympic effect than the standardized Olympic effect estimated for the actual treated unit. If the placebo probability is relatively small, this indicates that the estimated export gap between the treated unit and its counterfactual is more likely to be caused by the Olympic games.

The main finding of Table 1, which is in line with the results of Rose and Spiegel (2011), is that both the host and bidder countries experience a positive Olympic effect, with the former experiencing a much larger effect. The average standardized Olympic effect for host countries is 0.68, whereas it is 0.15 for bidder countries. These baseline results, however, are not fully supported and lent credibility by placebo-in-place analyses.[5]

Among 12 countries to which we apply our synthetic control method, we are able to document a positive causal Olympic effect for five countries: 1) France experiences an Olympic effect of 0.77 by bidding on the 1968 Olympics, 2) South Korea, an Olympic effect of 0.97 by hosting the 1988 Olympics, 3) Japan, an Olympic effect of 0.49 by bidding on the 1988 Olympics, 4) Spain, an Olympic effect of 0.60 by hosting the 1992 Olympics, and 5) South Africa, an Olympic effect of 0.17 by bidding on the 2004 Olympic games. The causal interpretation of these effects are supported by the corresponding placebo-in-place analysis.

Although we have some strong evidence for the Olympic effect for some countries, this does not seem like a universal robust effect as it is argued by Rose and Spiegel (2011). A careful country by country analysis suggests that, for most of the host and bidder countries of Olympic Games, the Olympic effect is not present. On the other hand, our results seem to partly resonate with the reputation trap theory of Levine (2019), who predicts that a third party/outside agency (the Olympics in our case) can help the bad reputation country credibly signal that it invests in good reputation.

Our results indicate that Mexico (1963), South Korea (1981), Spain (1986), and South Africa (1997) may have experienced the positive Olympic effect as these countries had much

[5]The results of placebo-in-place analysis are reported in the Appendix E.

Table 1: Summary of the results

Country	Host/bid	Olympics year	Treatment year	Olympic effect	V2	GATT (no. of years)	GDPcap (x1000)	XPTOT /GDP	Placebo probabili
Austria	bid	1964	1959	0.19	0.38	8	285.91	0.38	
Mexico	host	1968	1963	0.46	-0.04	-23	144.22	0.14	
France	bid	1968	1963	0.77	0.77	15	626.06	0.20	0.65
Canada	bid	1972	1966	0.12	0.11	18	1075.25	0.34	
South Korea	host	1988	1981	0.97	1.22	14	979.79	0.62	0.10
Japan	bid	1988	1981	0.49	0.45	16	5082.10	0.25	0.39
Spain	host	1992	1986	0.60	0.59	23	4437.06	0.25	0.05
Netherlands	bid	1992	1986	-0.20	-0.20	38	9283.29	0.84	0.37
France	bid	1992	1986	-0.04	-0.05	38	9249.65	0.33	0.83
UK	bid	1992	1986	-0.19	-0.19	38	7239.87	0.39	0.18
South Africa	bid	2004	1997	0.17	0.16	49	2277.401	0.34	0.25
Sweden	bid	2004	1997	0.01	-0.09	47	18263.65	0.56	

Note: The table summarizes the results of several synthetic control method applications. 'Olympic effect' column shows the standardized effect, which is the 10-year average of the gap between the exports of the actual treated unit and its synthetic control immediately after ment, divided by the total exports of the treated unit at the starting year of the treatment. 'GATT Membership' column reports th of years between the treatment year and the year when the host/bidding country has become a member of the GATT. A negative val that the country has hosted/bid on the Olympics before becoming a member of the GATT. The last column reports the probability of picking a country from the placebo units that exhibits a larger standardized Olympic effect than the standardized Olympic effect esti the actual treated unit.

to gain from a credible signaling. On the contrary, the results indicate that the developed western economies such as Canada (1966), Netherlands (1986), France (1986), the UK (1986), and Sweden (1997) do not exhibit a positive Olympic effect at all or exhibit a very small positive effect. Nevertheless, the results for Austria (1964) do not accord well with the reputation trap theory.

In overall, although we think there are good reasons to expect a positive Olympic effect for countries who are especially in need of credibly signaling to the rest of the world that they invest in good reputation, the empirical evidence we generate hereby do not fully support the presence of such an effect. We conclude by emphasizing the necessity of further research that would explain why some countries enjoy a positive Olympic effect while others do not. Reputation may still be one of the conditioning factors but our analysis suggests it is only part of the story.

6 Conclusion

In this paper, we revisit the Olympic effect problem with a better-suited empirical tool: the synthetic control method. Previous works on whether hosting or bidding on the Olympic Games leads to increases in exports provide us with mixed findings. These empirical studies, however, suffer from very typical empirical research problems such as the selection bias. Furthermore, these studies make quite restrictive assumptions on the timing of the treatment. Neither they take into account the case of multiple bidders, nor they separate the good reputation countries from bad reputation ones.

We propose synthetic control method to overcome these problems. Several features of synthetic control methods such as the pre-treatment matching, backdating approach, selection of donor pool help us overcome the aforementioned problems and give a causal interpretation to our estimates. We apply our method to each host or bidder country individually. We also complement our baseline analysis with placebo-in-place analyses to strengthen the credibility of the results.

Our findings indicate that although there is a positive Olympic effect for some countries, it clearly does not apply to all hosts or bidders. A reputation trap theory is partly successful in explaining why some countries experience a positive Olympic effect while others do not. We however believe that further research is required to pin down the other mechanisms that play a role in the trade effects of the Olympic Games.

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APPENDIX

A Tables

Table A.1: The host and bidders of post-war summer Olympic Games

	Host	Unsuccessful Bidders
1960	Rome, Italy	Brussels, Budapest, Detroit, Lausanne, Mexico City, Tokyo
1964	Tokyo, Japan	Brussels, Detroit, Vienna
1968	Mexico City, Mexico	Buenos Aires, Detroit, Lyon
1972	Munich, Germany	Detroit, Madrid, Montreal
1976	Montreal, Canada	Los Angeles, Moscow
1980	Moscow, USSR	Los Angeles
1984	Los Angeles, USA	None
1988	Seoul, Korea	Nagoya
1992	Barcelona, Spain	Amsterdam, Belgrade, Birmingham, Brisbane, Paris
1996	Atlanta, USA	Athens, Belgrade, Manchester, Melbourne, Toronto
2000	Sydney, Australia	Beijing, Berlin, Istanbul, Manchester
2004	Athens, Greece	Buenos Aires, Cape Town, Rome, Stockholm
2008	Beijing, China	Istanbul, Osaka, Toronto, Paris

Source: Rose and Spiegel, 2011.

B Baseline Results

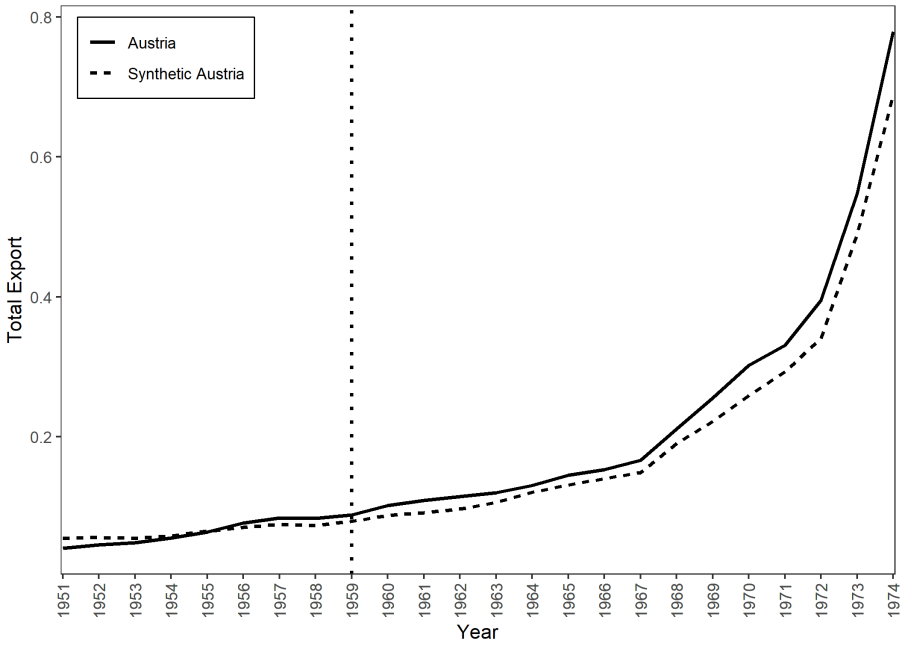

Figure B.1: Baseline results for Austria, 1964 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Austria and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Austria, and the red line corresponds to the total exports of the synthetic control.

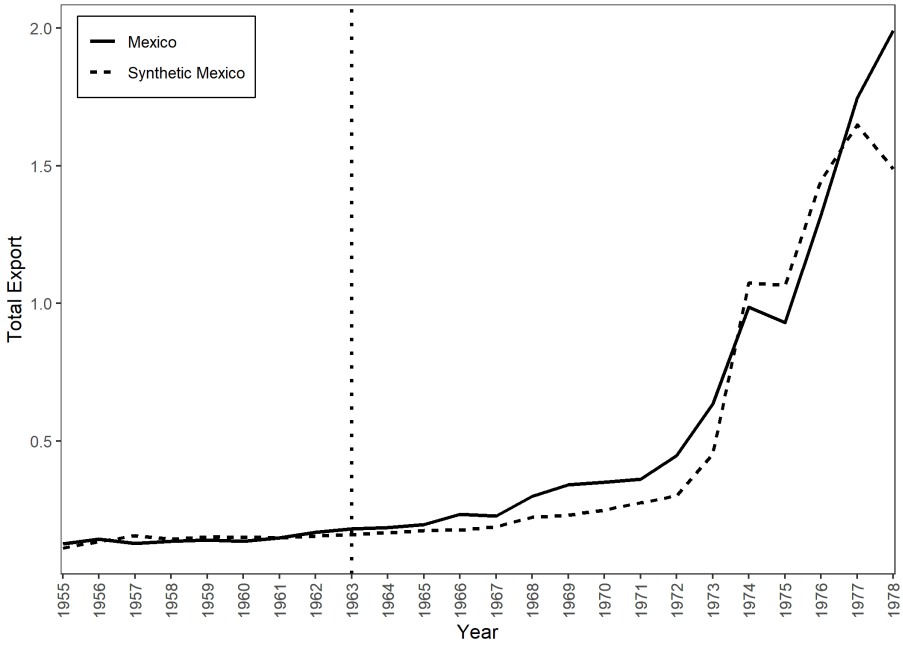

Figure B.2: Baseline results for Mexico, 1968 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Mexico and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Mexico, and the red line corresponds to the total exports of the synthetic control.

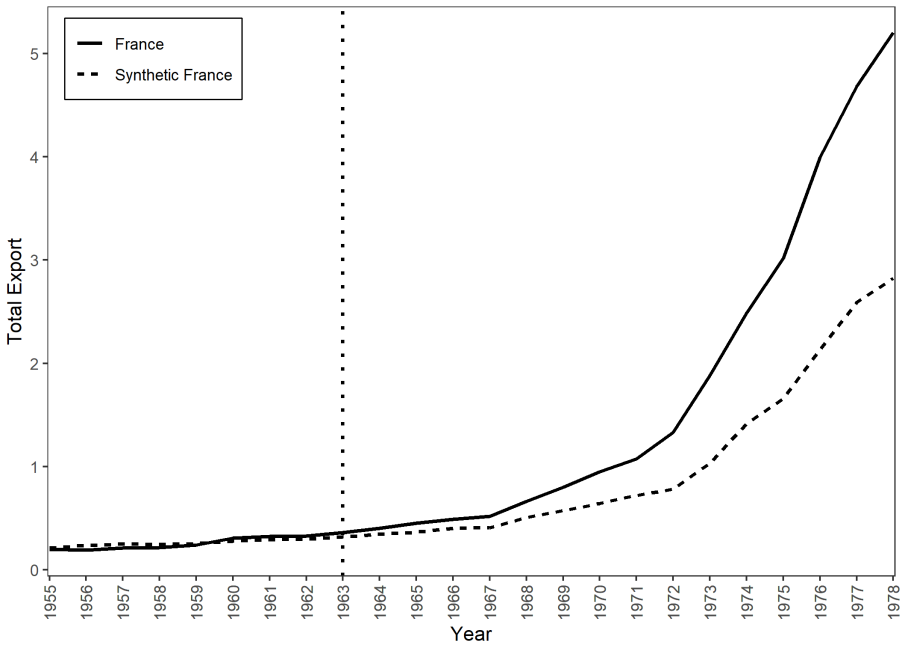

Figure B.3: Baseline results for France, 1968 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of France and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of France, and the red line corresponds to the total exports of the synthetic control.

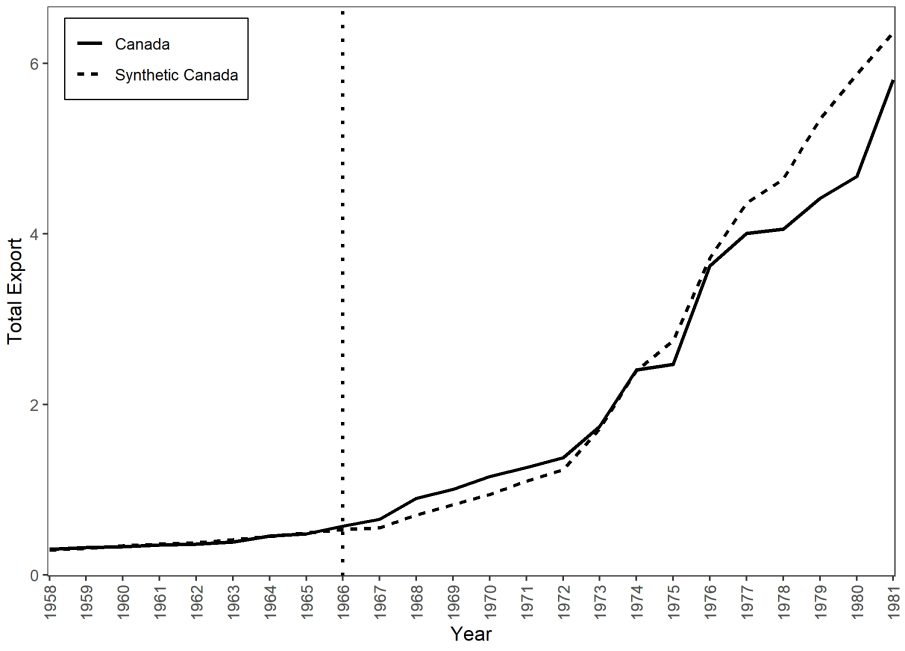

Figure B.4: Baseline results for Canada, 1972 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Canada and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Canada, and the red line corresponds to the total exports of the synthetic control.

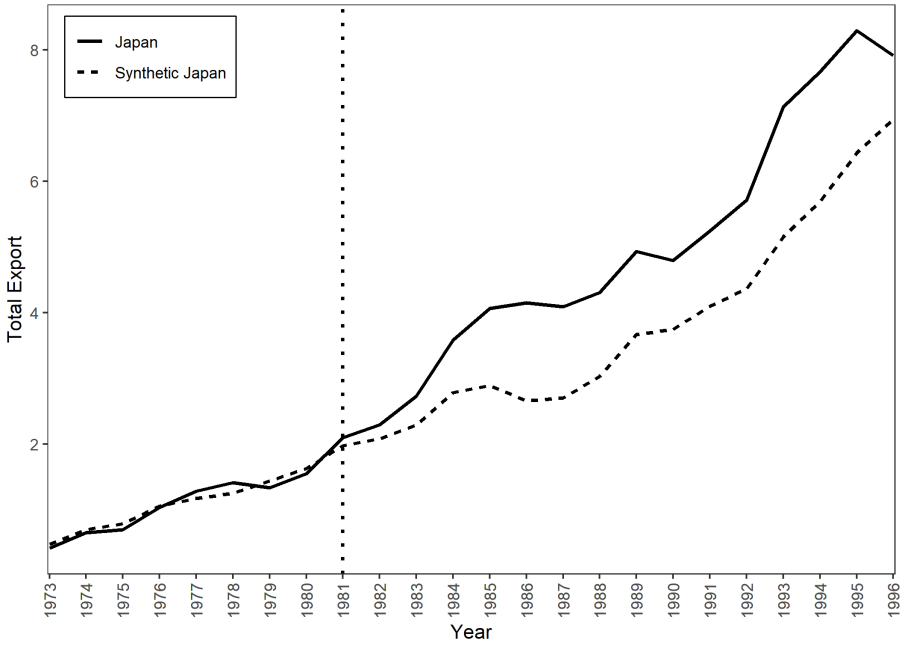

Figure B.5: Baseline results for Japan, 1988 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Japan and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Japan, and the red line corresponds to the total exports of the synthetic control.

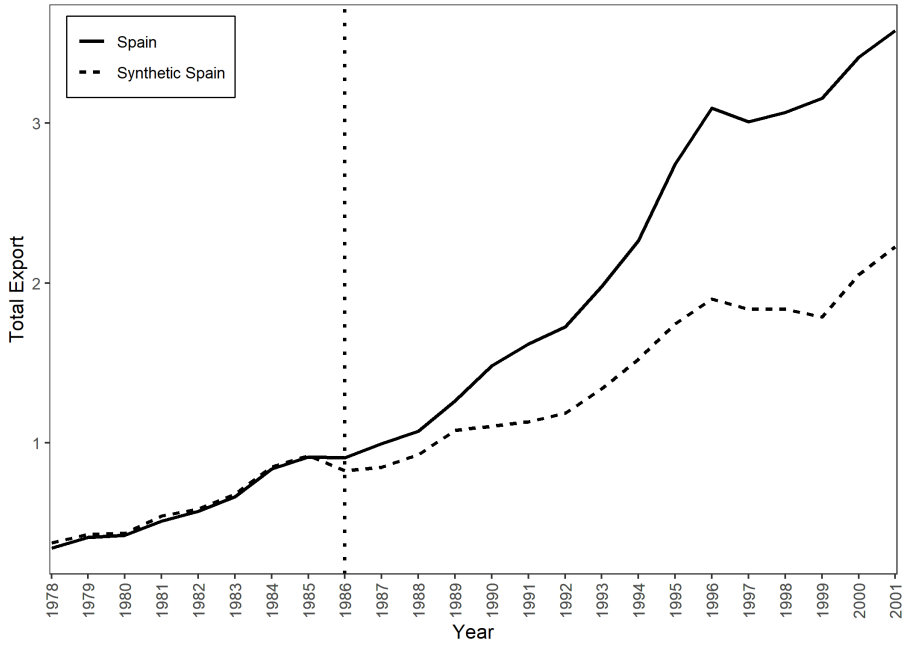

Figure B.6: Baseline results for Spain, 1992 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Spain and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Spain, and the red line corresponds to the total exports of the synthetic control.

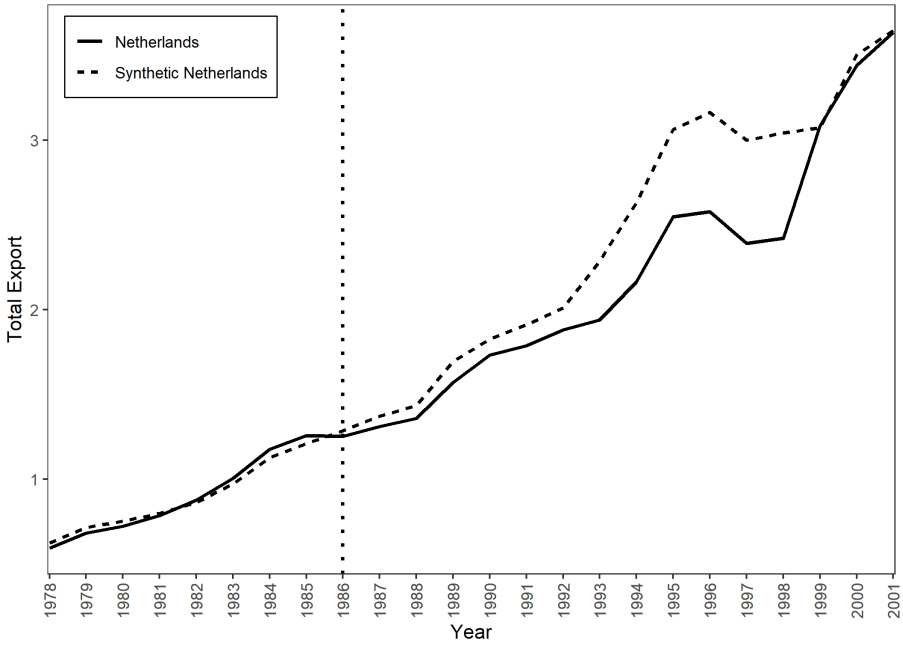

Figure B.7: Baseline results for Netherlands, 1992 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Netherlands and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Netherlands, and the red line corresponds to the total exports of the synthetic control.

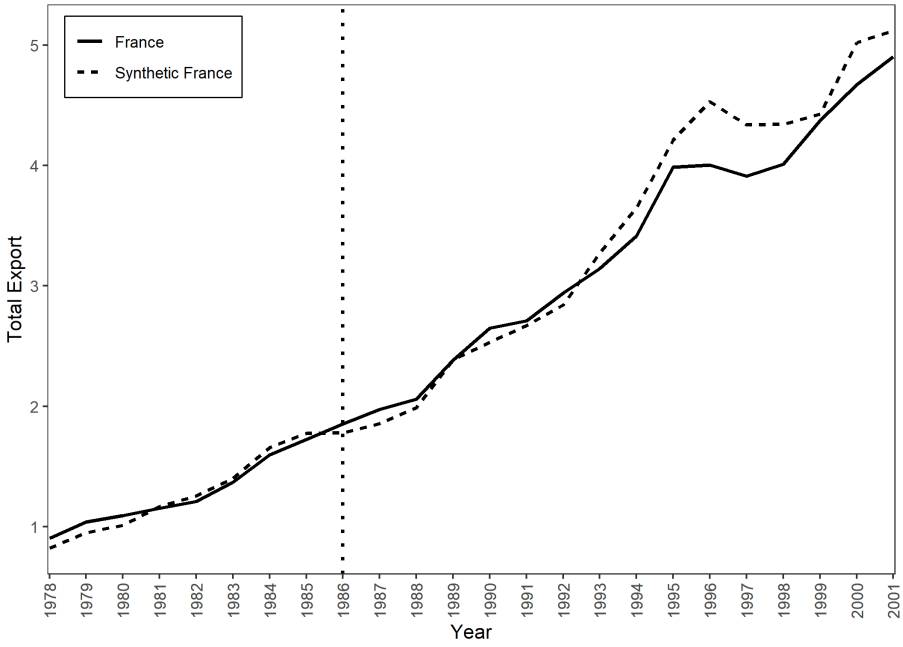

Figure B.8: Baseline results for France, 1992 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of France and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of France, and the red line corresponds to the total exports of the synthetic control.

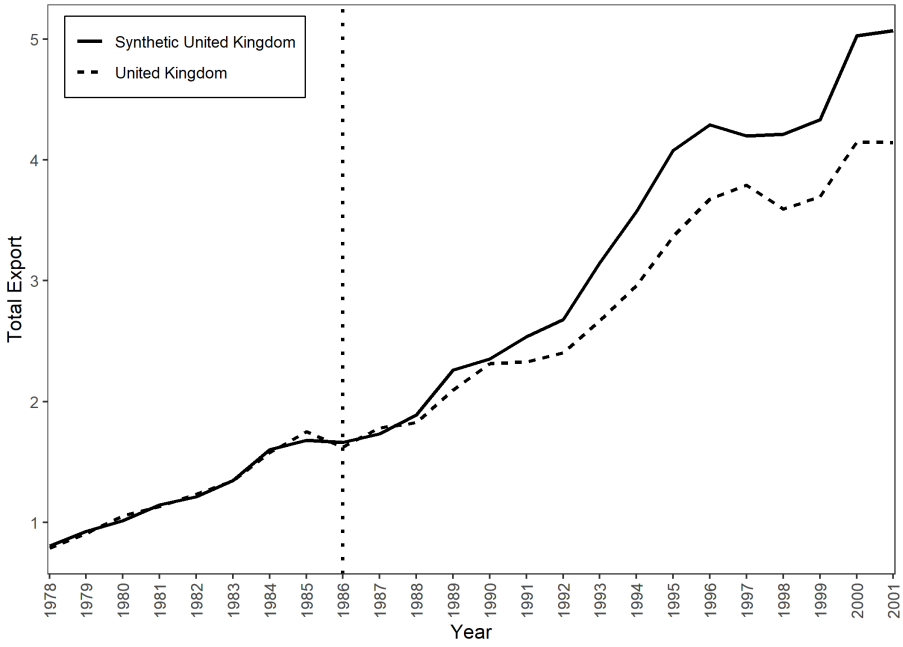

Figure B.9: Baseline results for Great Britain, 1992 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Great Britain and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Great Britain, and the red line corresponds to the total exports of the synthetic control.

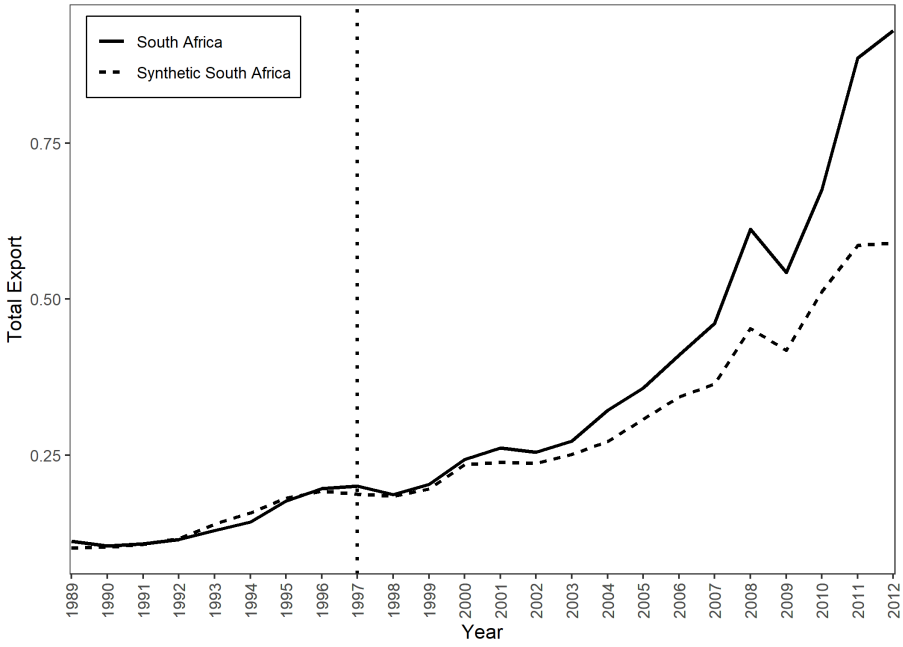

Figure B.10: Baseline results for South Africa, 2004 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of South Africa and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Africa, and the red line corresponds to the total exports of the synthetic control.

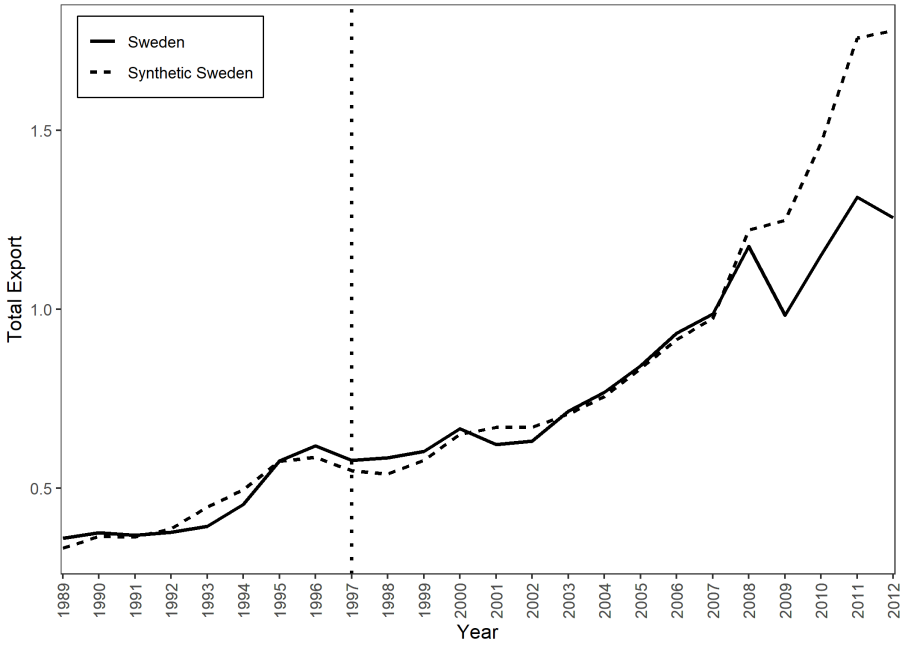

Figure B.11: Baseline results for Sweden, 2004 Olympics.

Note: The plot summarizes the results of baseline analysis. It shows the total export levels of Sweden and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Sweden, and the red line corresponds to the total exports of the synthetic control.

C Robustness-I

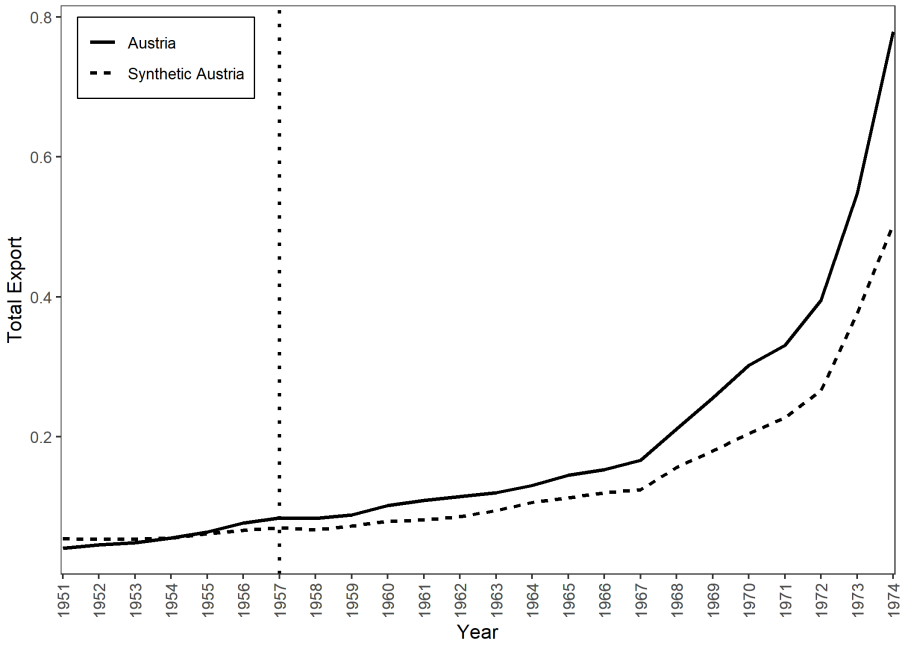

Figure C.1: Robustness-I for Austria: backdating treatment 2 years, 1964 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Austria and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Austria, and the red line corresponds to the total exports of the synthetic control.

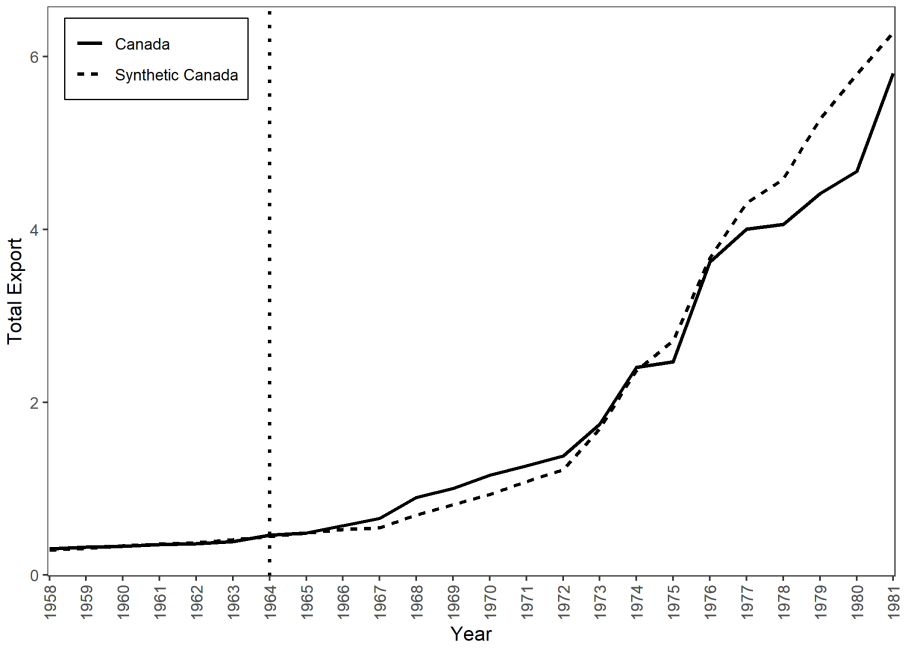

Figure C.2: Robustness-I for Canada: backdating treatment 2 years, 1972 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Canada and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Canada, and the red line corresponds to the total exports of the synthetic control.

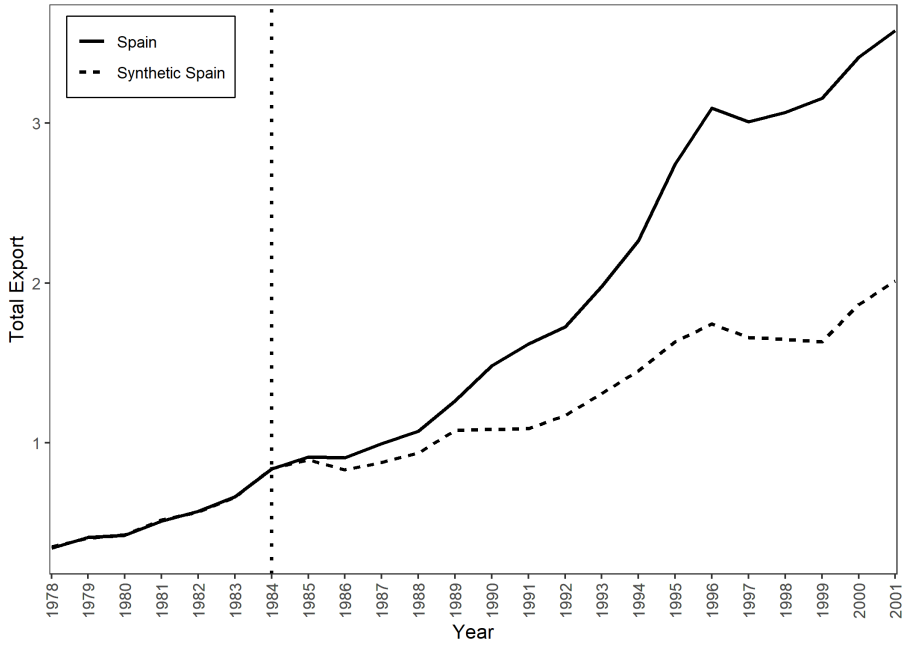

Figure C.3: Robustness-I for Spain: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Spain and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Spain, and the red line corresponds to the total exports of the synthetic control.

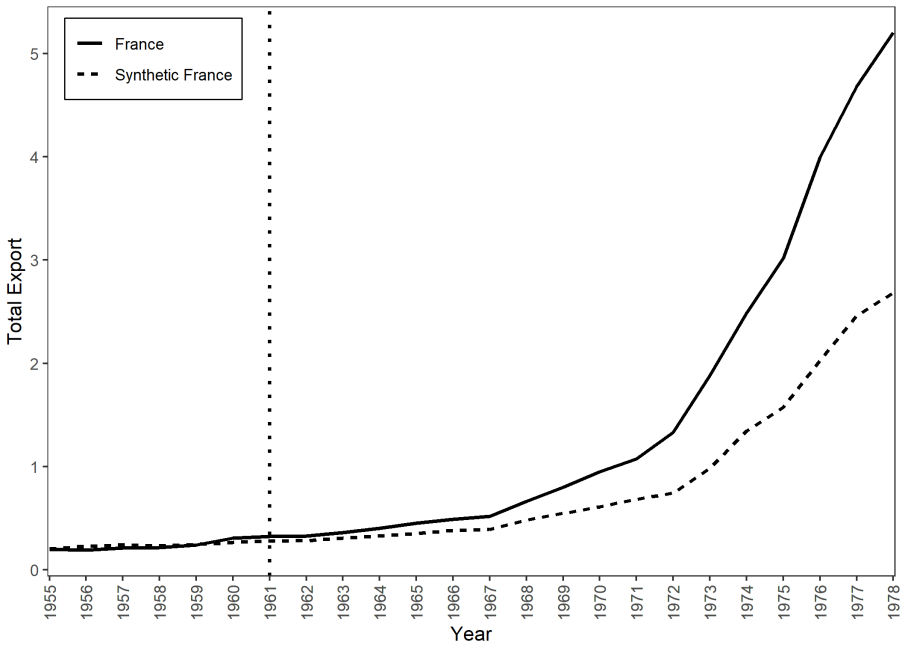

Figure C.4: Robustness-I for France: backdating treatment 2 years, 1968 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of France and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of France, and the red line corresponds to the total exports of the synthetic control.

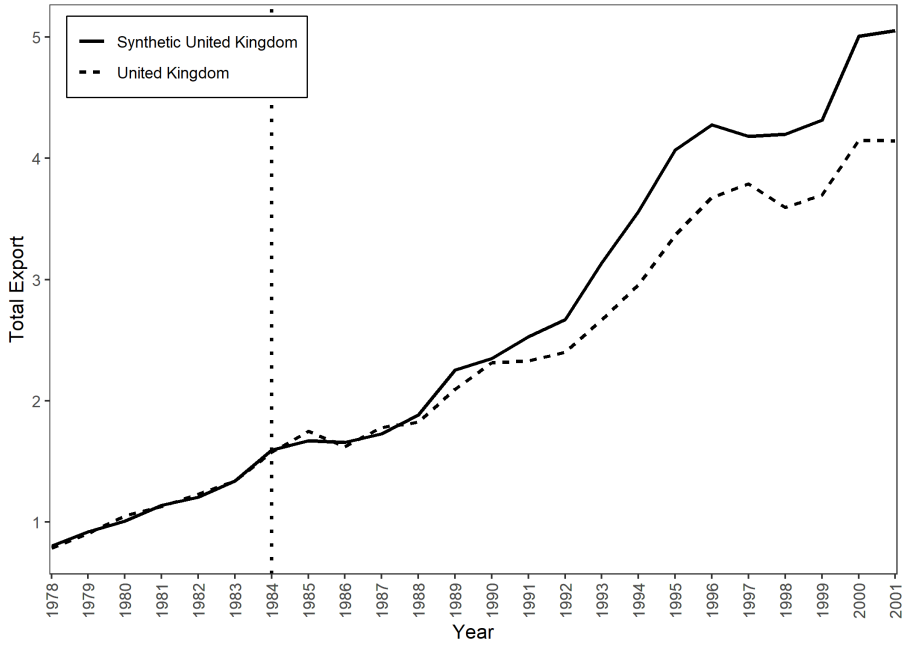

Figure C.5: Robustness-I for the United Kingdom: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of the United Kingdom and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of the United Kingdom, and the red line corresponds to the total exports of the synthetic control.

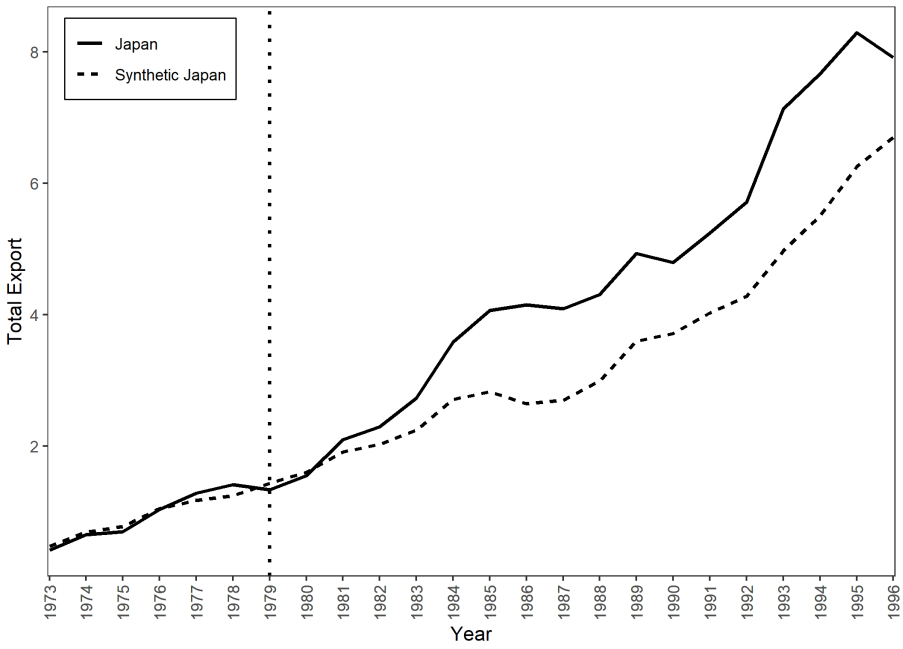

Figure C.6: Robustness-I for Japan: backdating treatment 2 years, 1988 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Japan and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Japan, and the red line corresponds to the total exports of the synthetic control.

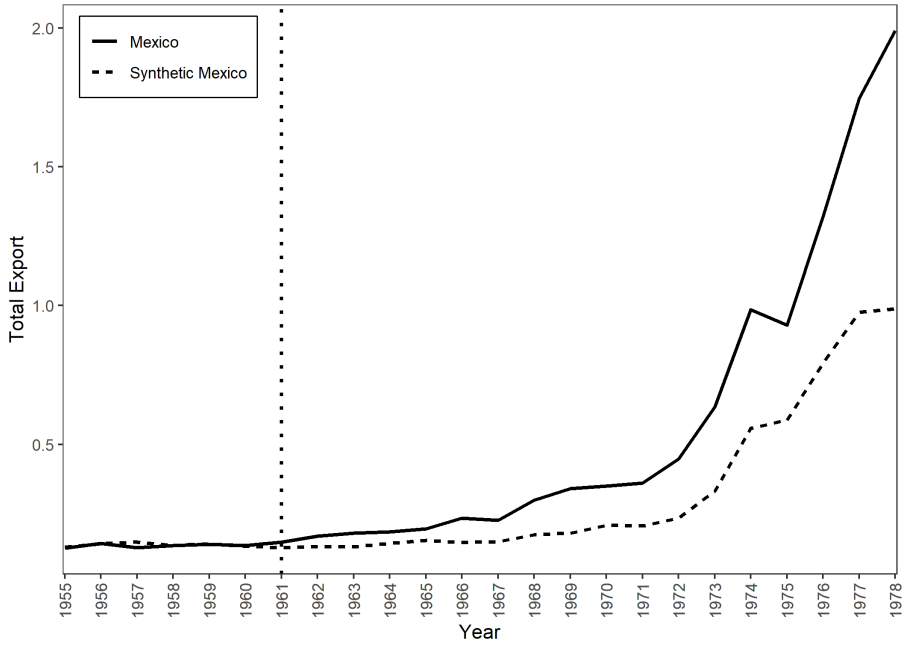

Figure C.7: Robustness-I for Mexico: backdating treatment 2 years, 1968 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Mexico and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Mexico, and the red line corresponds to the total exports of the synthetic control.

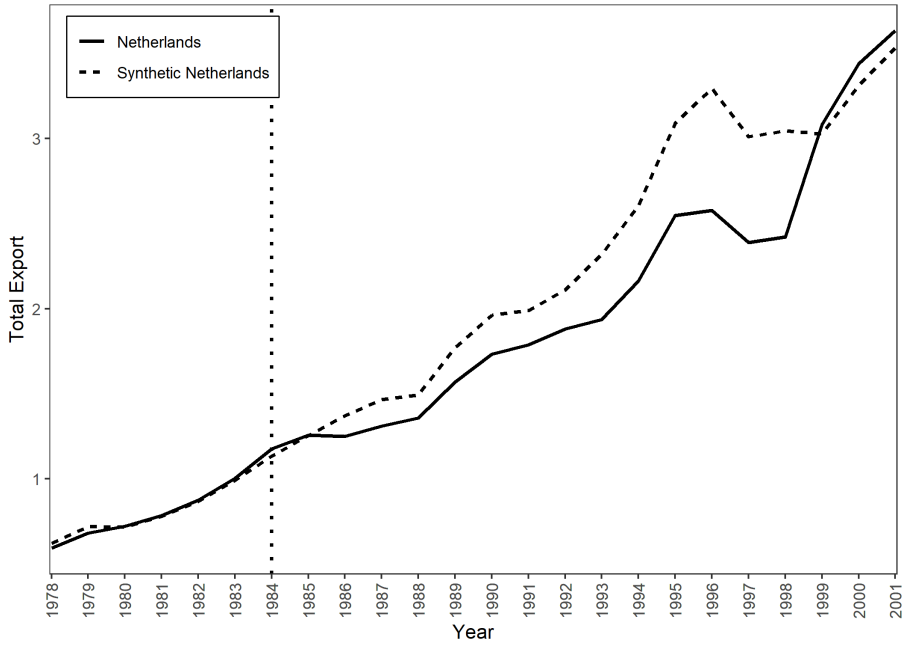

Figure C.8: Robustness-I for the Netherlands: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of the Netherlands and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of the Netherlands, and the red line corresponds to the total exports of the synthetic control.

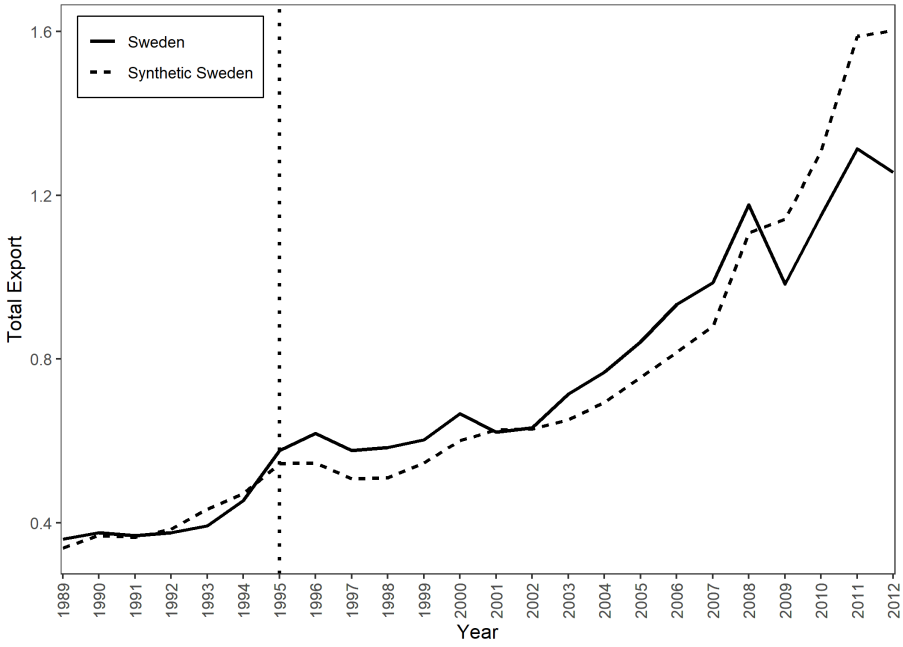

Figure C.9: Robustness-I for Sweden: backdating treatment 2 years, 2004 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Sweden and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Sweden, and the red line corresponds to the total exports of the synthetic control.

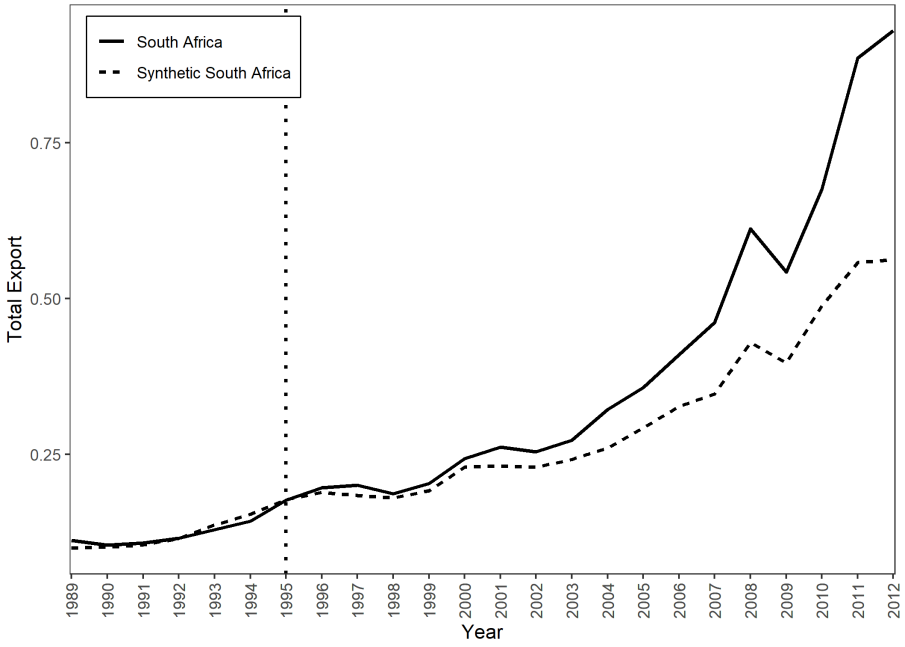

Figure C.10: Robustness-I for South Africa: backdating treatment 2 years, 2004 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of South Africa and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Africa, and the red line corresponds to the total exports of the synthetic control.

D Robustness-II

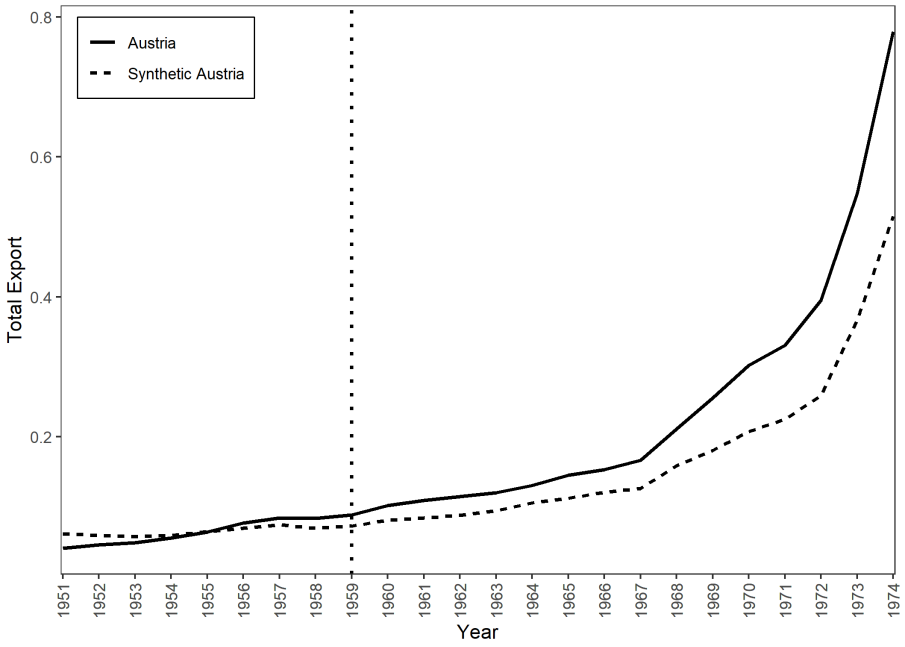

Figure D.1: Robustness-II for Austria: backdating treatment 2 years, 1964 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Austria and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Austria, and the red line corresponds to the total exports of the synthetic control.

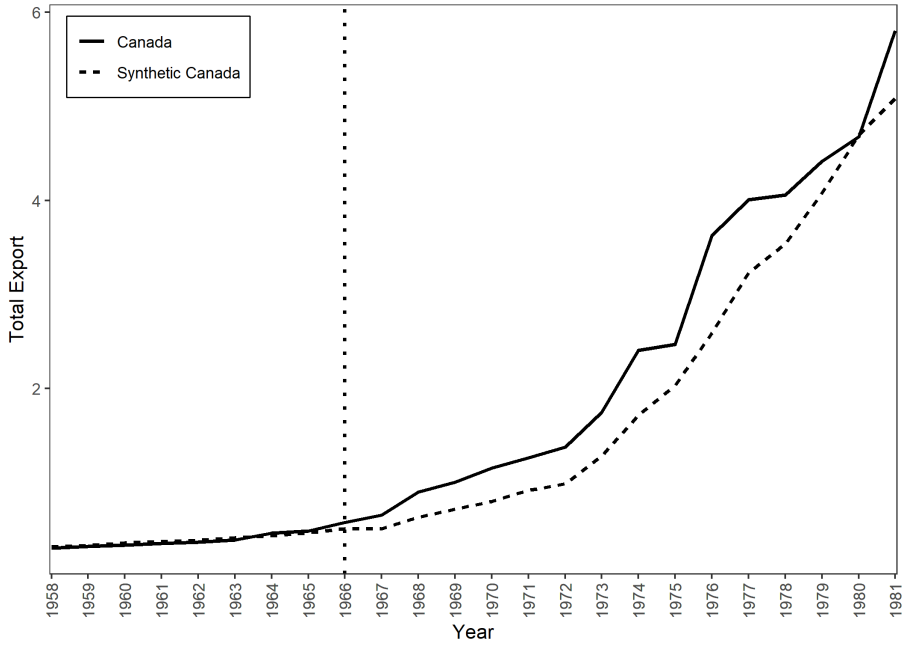

Figure D.2: Robustness-II for Canada: backdating treatment 2 years, 1972 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Canada and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Canada, and the red line corresponds to the total exports of the synthetic control.

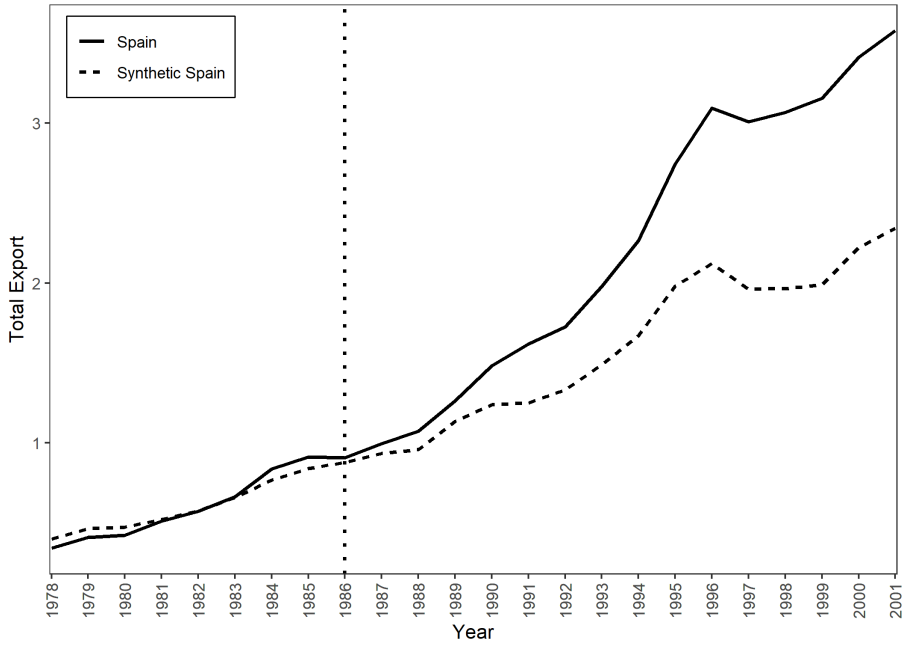

Figure D.3: Robustness-II for Spain: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Spain and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Spain, and the red line corresponds to the total exports of the synthetic control.

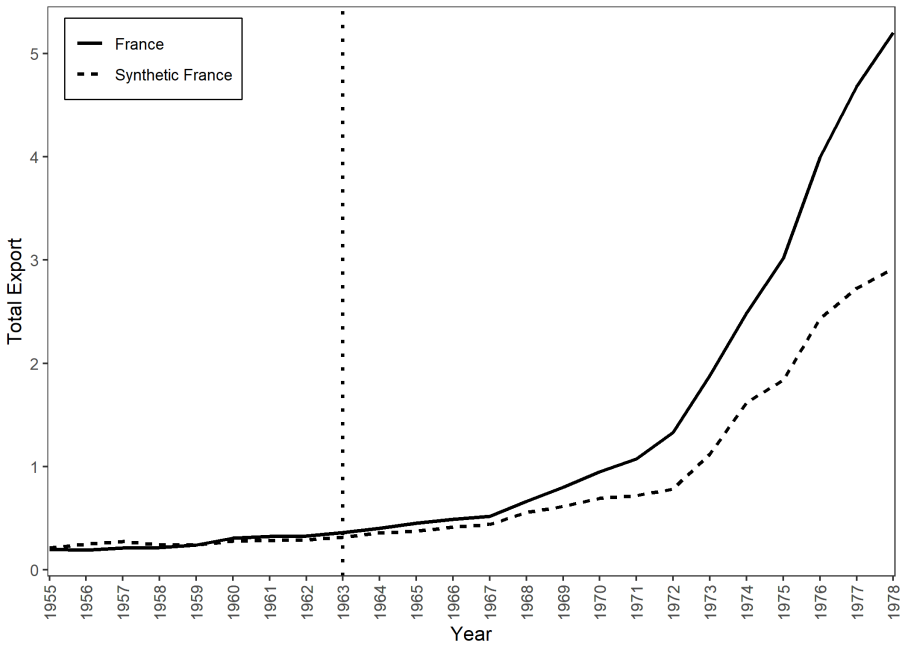

Figure D.4: Robustness-II for France: backdating treatment 2 years, 1968 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of France and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of France, and the red line corresponds to the total exports of the synthetic control.

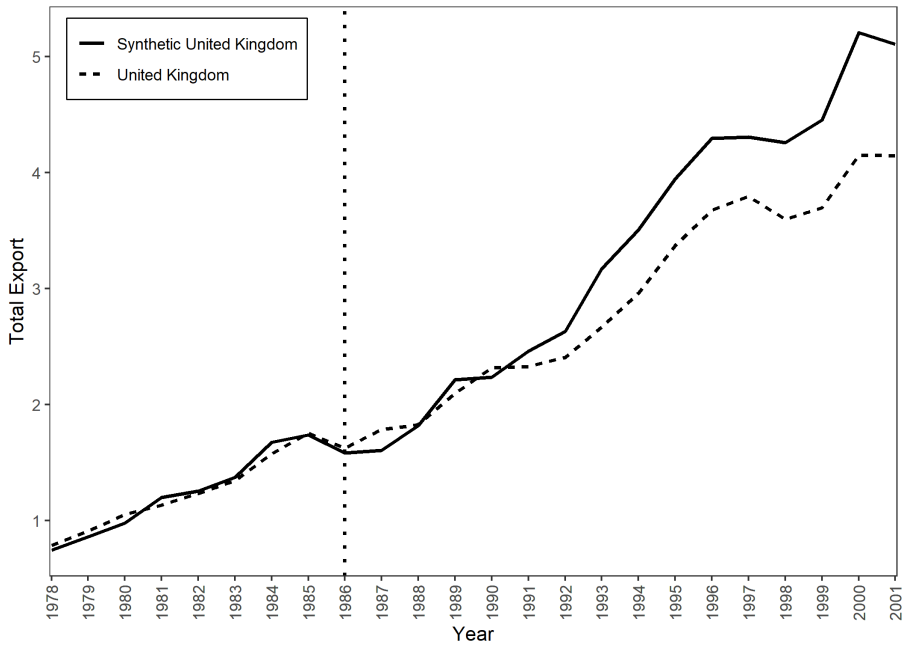

Figure D.5: Robustness-II for the United Kingdom: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of the United Kingdom and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of the United Kingdom, and the red line corresponds to the total exports of the synthetic control.

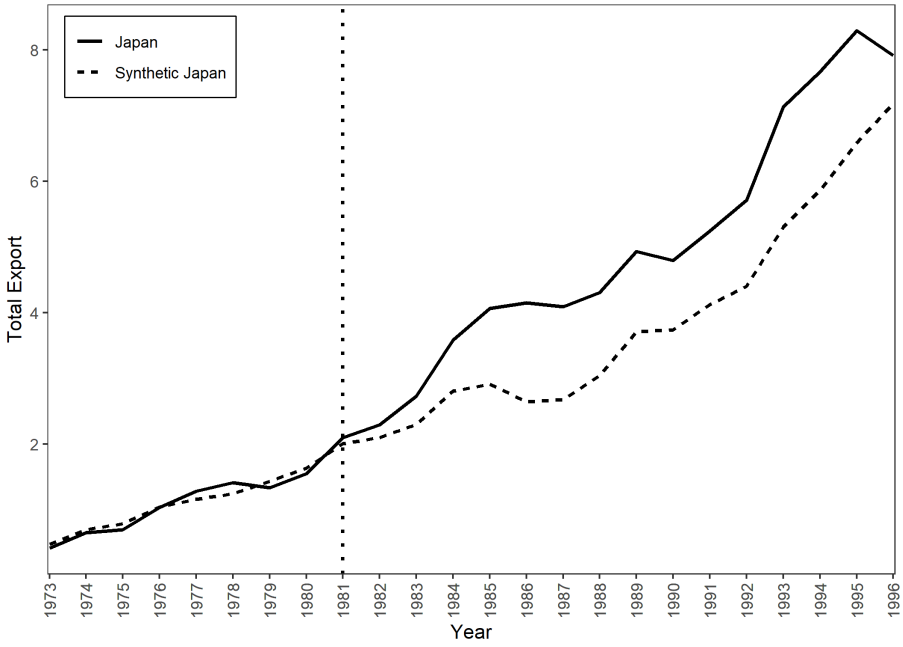

Figure D.6: Robustness-II for Japan: backdating treatment 2 years, 1988 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Japan and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Japan, and the red line corresponds to the total exports of the synthetic control.

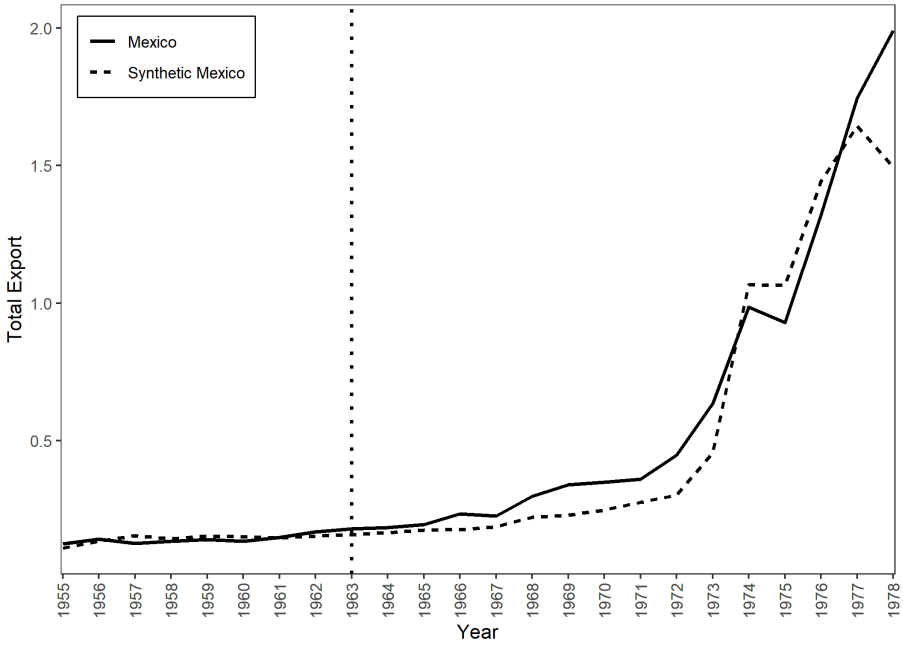

Figure D.7: Robustness-II for Mexico: backdating treatment 2 years, 1968 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Mexico and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Mexico, and the red line corresponds to the total exports of the synthetic control.

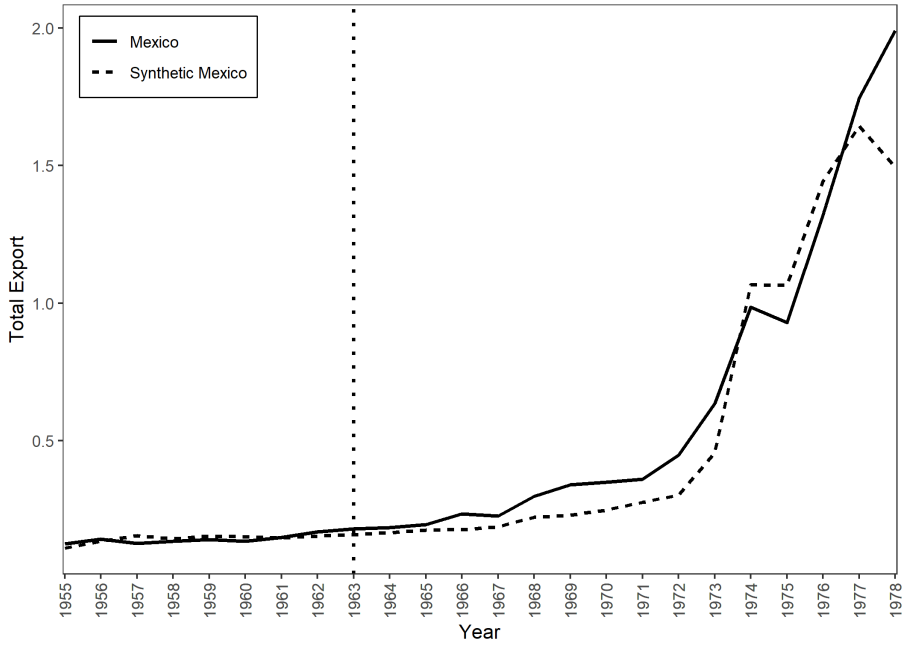

Figure D.8: Robustness-II for the Netherlands: backdating treatment 2 years, 1992 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of the Netherlands and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of the Netherlands, and the red line corresponds to the total exports of the synthetic control.

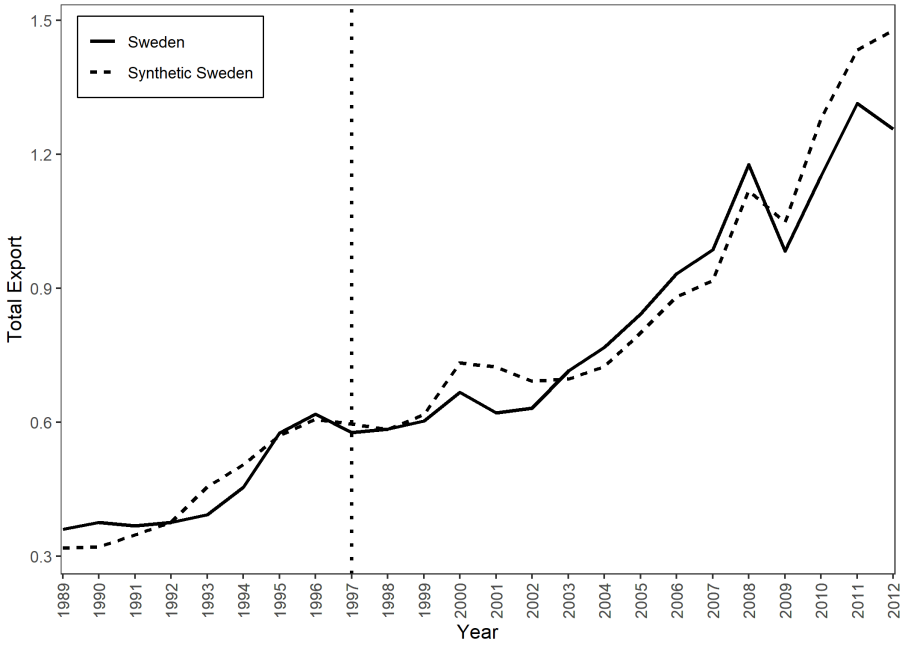

Figure D.9: Robustness-II for Sweden: backdating treatment 2 years, 2004 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of Sweden and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of Sweden, and the red line corresponds to the total exports of the synthetic control.

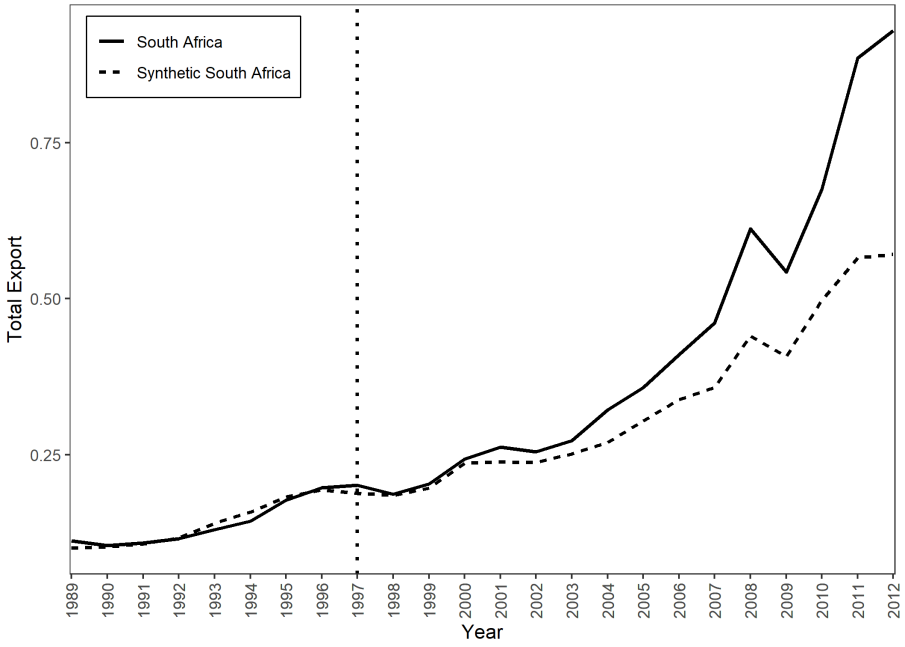

Figure D.10: Robustness-II for South Africa: backdating treatment 2 years, 2004 Olympics.

Note: The plot summarizes the results of robustness analysis. It shows the total export levels of South Africa and its synthetic control for the study period of interest. The black vertical line corresponds to the treatment year. The blue line corresponds to the total exports of South Africa, and the red line corresponds to the total exports of the synthetic control.

E Placebo Analyses

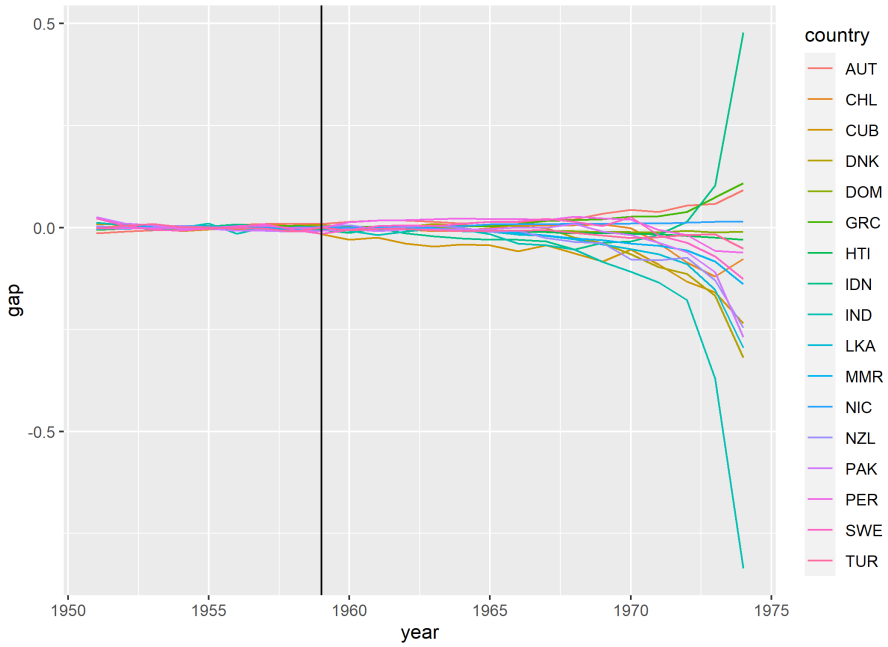

Figure E.1: Placebo analysis for Austria, 1964 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Austria and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

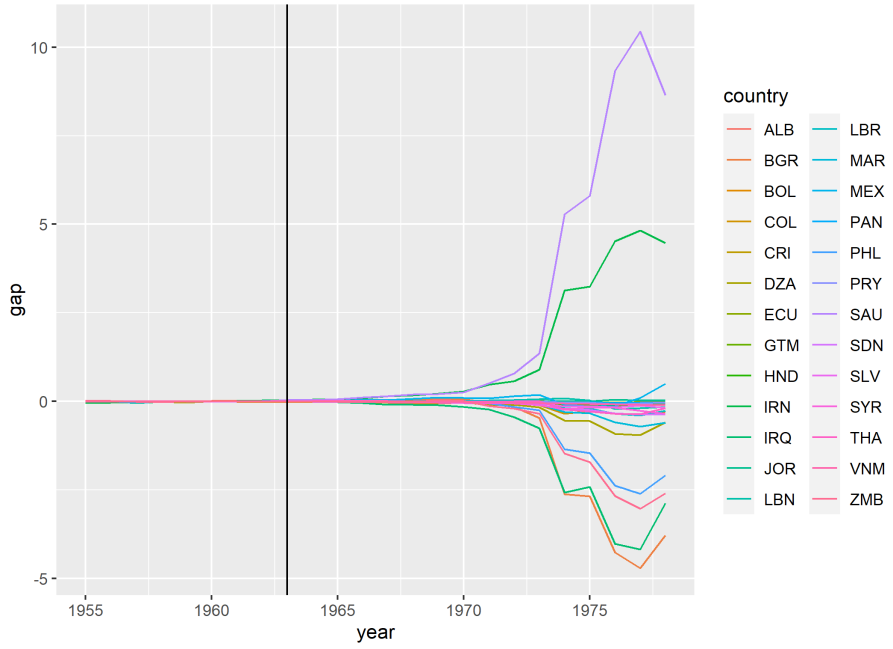

Figure E.2: Placebo analysis for Mexico, 1968 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Mexico and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

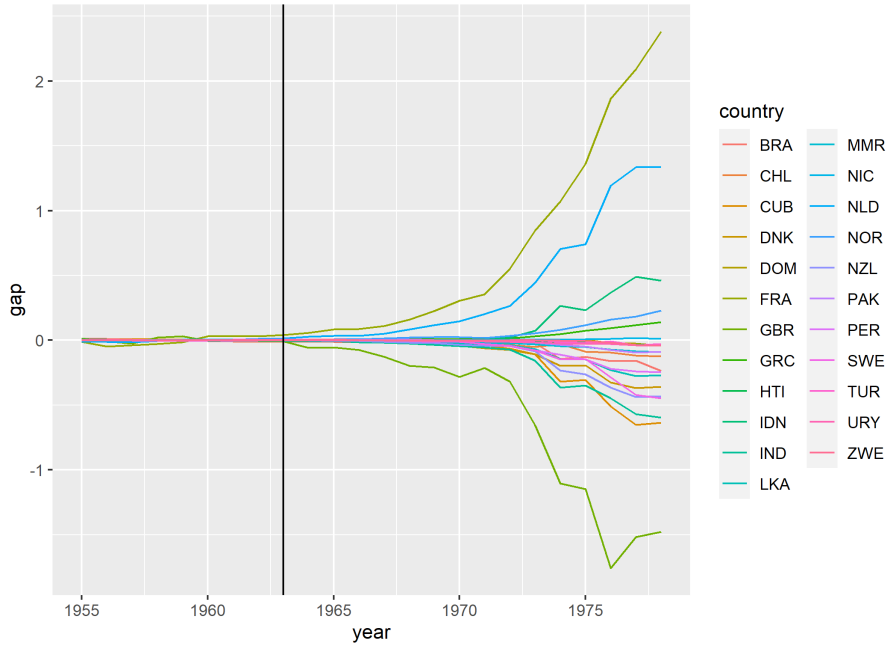

Figure E.3: Placebo analysis for France, 1968 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between France and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

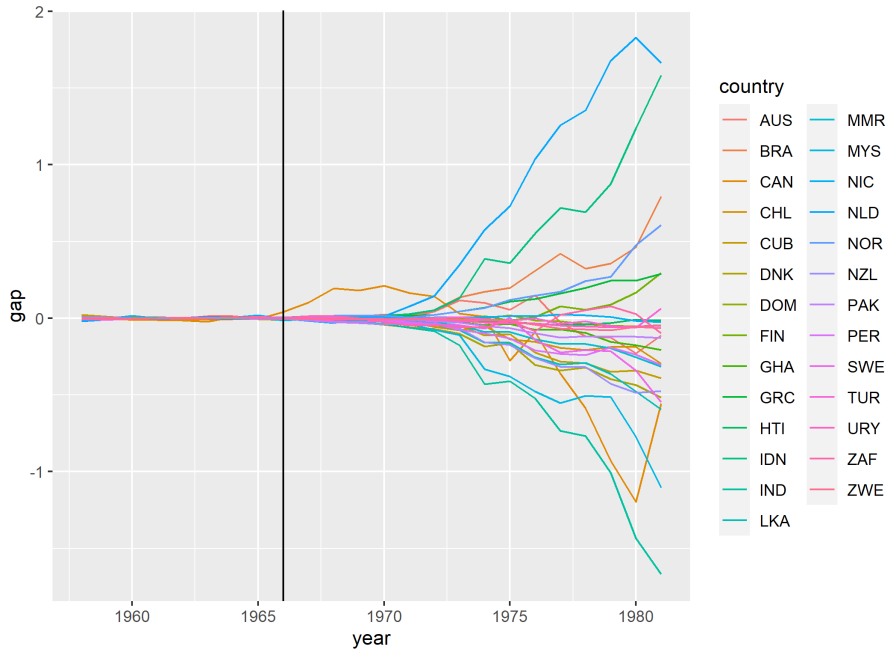

Figure E.4: Placebo analysis for Canada, 1972 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Canada and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

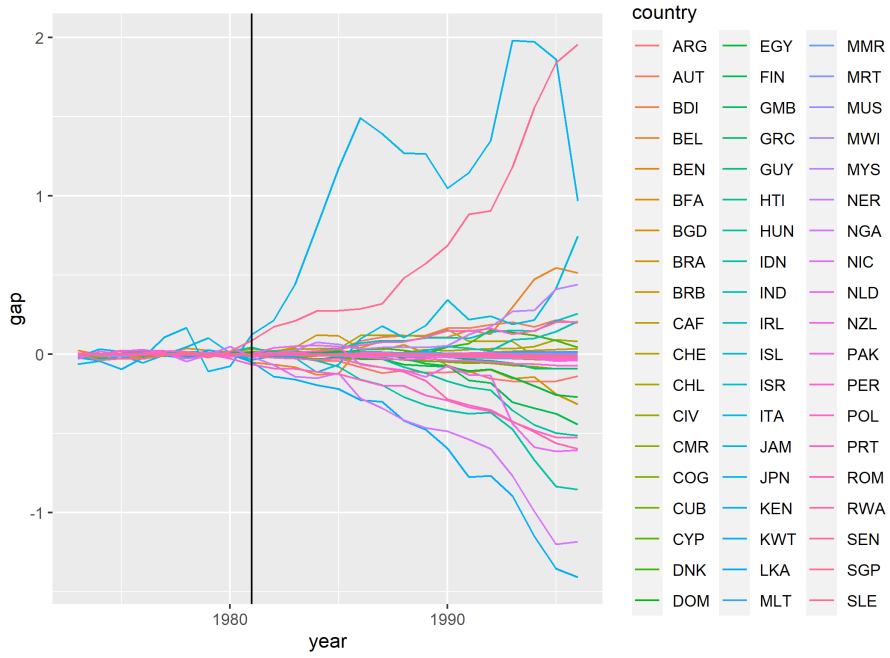

Figure E.5: Placebo analysis for Japan, 1988 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Japan and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

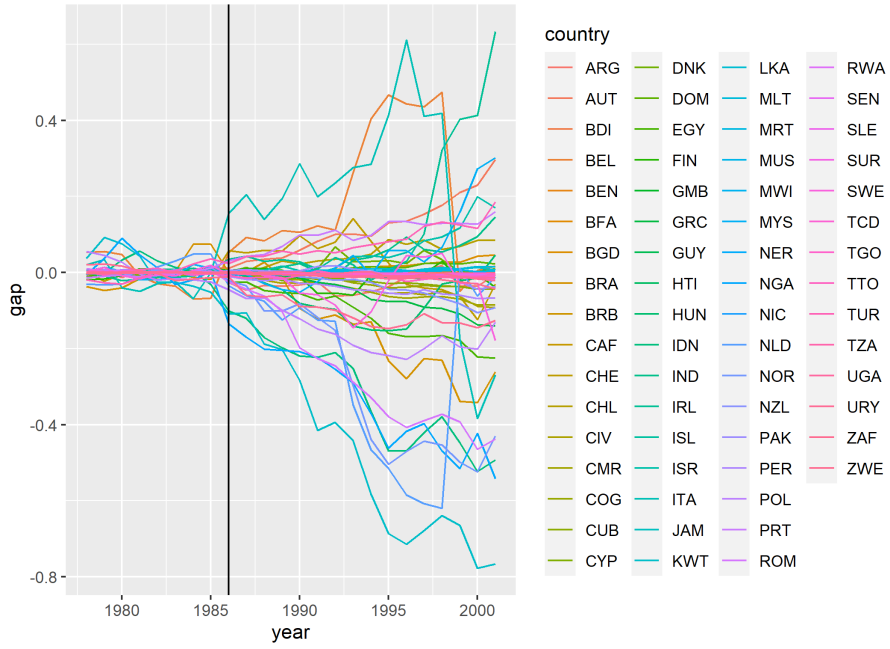

Figure E.6: Placebo analysis for Netherlands, 1992 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Netherlands and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

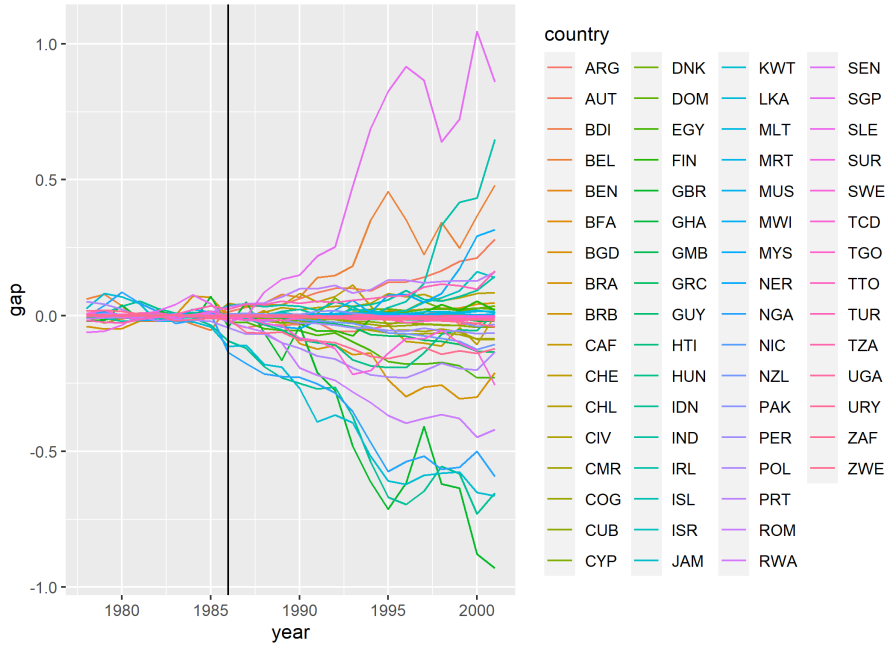

Figure E.7: Placebo analysis for the United Kingdom, 1992 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between the United Kingdom and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

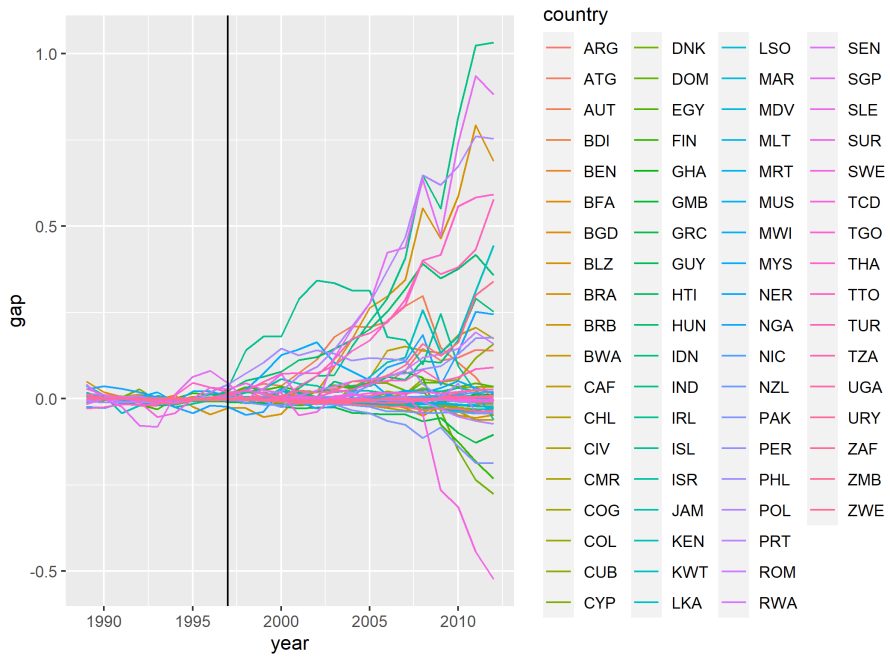

Figure E.8: Placebo analysis for Sweden, 2004 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between Sweden and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.

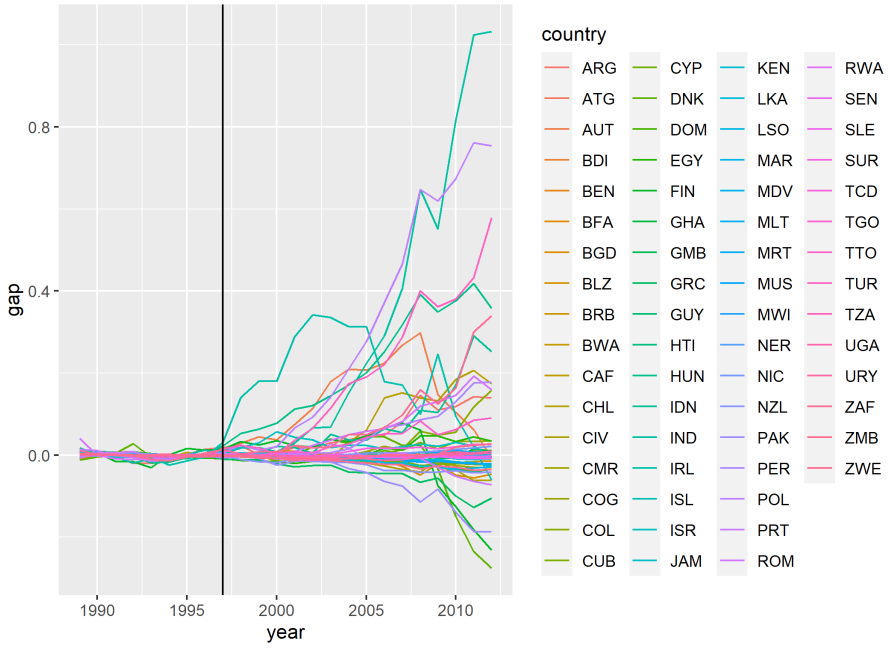

Figure E.9: Placebo analysis for South Africa, 2004 Olympics.

Note: The plot summarizes the results of placebo analysis. We apply synthetic control method to each country in our donor pool by rotating the treated unit -placebo treatment units. The trends correspond to the exports gap between *treated* units and its synthetic controls. The dashed line corresponds to the treatment year. The solid black line corresponds to the exports gap between South Africa and its synthetic control. Gray lines correspond to the exports gap of the placebo treatment units and their synthetic controls.