The Olympic Effect: Fact or Fiction?

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September 12, 2022

Abstract

Hosting the Olympic Games implies tremendous costs and uncertain profits, yet countries historically have been striving to host this mega event and bidding decisively. More recently though, countries are withdrawing their bids from the election procedure. This puzzling historical interest in hosting the games and the recent trend of withdrawals cast doubt on the existence of the so-called Olympic effect: the positive impact of the Olympics on international trade. In this paper, we estimate the Olympic effect on long-term exports using the synthetic control method. We show that the Olympic effect is more pronounced for countries that stand to gain from an international publicity. The results also present the novel insight that a substantial positive Olympic effect is only associated with earlier games.

JEL Codes: F02, F14, O19

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1 Introduction

Recent years have seen countries withdrawing their bids to host the Olympic games: Budapest (Hungary), Hamburg (Germany), and Rome (Italy) withdrew their bids for the 2024 Summer Olympics. Munich (Germany), Oslo (Norway), Krakow (Poland), and Stockholm (Sweden) withdrew their bid from the 2022 Winter Olympics. This is in sharp contrast with the historic trend of countries vying for the opportunity to host the mega event. The bids were often withdrawn due to local backlash in response to the tremendous costs of hosting the Games, while potential benefits are uncertain.

The effects of mega sports events on national economies is a much-debated topic (Baade & Matheson, 2016; Matheson, 2006). The Olympic Games, standing out as the most international and costly mega sport event a country can host, has received substantial scholarly attention that focuses on its long-run impact – the so-called *Olympic effect* – on economic outcomes, such as foreign direct investment, economic growth, and international trade (Brückner & Pappa, 2015; Rose & Spiegel, 2011; Veraros et al., 2004). These studies, however, only run a pooled analysis of host and bidder countries without investigating the individual cases. Accordingly, their findings swing from *no Olympic effect at all* to *universal positive Olympic effects for all host or bidding countries*. The Olympic effect, on the other hand, is likely to vary across countries and over time, and might be positive only under specific circumstances. In this paper, addressing several shortcomings of previous works, we investigate the question of an Olympic effect on long-term exports using the synthetic control method (SCM) in a country-level analysis. Doing so, we generate fine-grained evidence that gives partial credits to the studies with findings swinging between the two extremes, and uncover previously unknown patterns.

Historically countries have been vying to host mega sports events, especially the Olympic Games, although the scientific works on the short-run benefits of Olympics report rather a limited short-run net benefit – if any – for the hosts. So why would a country bid on the Olympics if the cost is tremendous yet the profit so uncertain? One strand of studies on Olympic effect contend that countries use the Olympics as a "positive signal to businesses and consumers about the future state of the economy" (Baade & Matheson, 2016). More specifically, being qualified as an official candidate for hosting the next Olympics is a ticket to the world stage for better reputation and recognition, because it is considered a costly, highly-visible, and infrequent signal with long lead times (Rose & Spiegel, 2011; Song, 2010).

Signalling through bidding would be especially needed and effective for countries going through, or that are planning to go through, a period of trade liberalization. On the other hand, countries that have a longer history of open trade and are typically leading nations in international trade would not experience such boost in long-term exports due to such signalling. This emphasizes that the very question of Olympic effect calls for a country-by-country analysis to investigate whether bidding on this costly event gains the bidding countries an international publicity and recognition, leading to increased exports. This distinction, between the countries that do stand to benefit from Hosting the Olympic games and those do not, could explain the proceedings of the 2022 Winter Olympics. When the four candidates withdrew their bids, the International Olympic Committee was left with two alternatives: Beijing (China) and Almaty (Kazakhstan). Both candidates are arguably more in a position to benefit from international signalling than the Western countries that withdrew their bids (Baade & Matheson, 2016).

A second strand of studies refutes the long-term positive impact of the Olympics on exports, and view these findings as an artifact of the ill-suited empirical designs of the studies belonging to the first strand (Bista, 2017; Maennig & Richter, 2012). It might be that this absence of an effect is only the case for countries who do not stand to benefit from signalling trade liberalization, again underlining the need for a more detailed study of the effect.

Against this backdrop, we put the very question of an Olympic effect to an empirical test. In particular, we estimate the effect of hosting or bidding on the Olympic Games on exports using the synthetic control method (SCM) of Abadie et al. (2010). Since this type of an analysis provides us with country-specific results, we are able to provide fine-grained evidence regarding the presence of the Olympic effect and a discussion with respect to the signalling mechanism at work. By using the SCM, we avoid the common pitfalls and problems that arise frequently in this specific literature. One such pitfall, for example, is grouping together countries with a long history of openness with countries that are in the process of trade liberalization (Rose & Spiegel, 2011). Such an analysis compares units that are structurally different from each other, and hence, is likely to produce biased results.

Moreover, when the process of trade liberalization coincides with hosting or bidding on the Olympic Games, it then becomes impossible to disentangle the export effect of trade liberalization from the Olympic effect itself when the countries are grouped together and analyzed as such. We overcome these problems by creating an individual comparison unit – i.e., a synthetic control – for each country that hosted or bid on the Olympics, and by interpreting country-specific results within the context in which countries were hosting or bidding on the Olympics at the time. We discuss the other common pitfalls of previous works – comparison of structurally different units, biases stemming from staggered treatment adoption and two-way fixed effects, and choices regarding the timing of the treatment – in depth in Section 3.

Our results from the SCM estimations cast serious doubt on a one-size-fits-all Olympic effect on long-term exports. By examining 11 different cases of countries that hosted or bid on the Olympics in the last 60 years, we show that the Olympic effect on exports can actually be positive or negative while the size of the effect changes remarkably across countries and over time. This level of insight into the extent to which the sign and size of the effect varies presents a novel contribution to the literature on the Olympic effect.

In particular, we find that France – bidder on 1968 Olympics – and Spain – host of the 1992 Olympics and recently transitioning into a democracy – both experience a sizeable positive Olympic effect. On the other hand, the Netherlands, France, and the United Kingdom – all developed countries with a longer history of openness – seem to have experienced a modest decrease in their exports when they bid on the 1992 Olympics. More recently, when both South Africa and Sweden bid on the 2004 Olympics, South Africa experienced a modest positive effect, whereas Sweden experienced a modest negative effect. Taken together, these results suggest that the Olympic effect is both country- and time-dependent, and roughly overlaps with the pattern that the countries needing the signal more also benefit more from the Olympics signal.

These results also reveal another previously unavailable empirical pattern. We find that many of the cases, where bidding on the Olympics resulted in a positive and substantial long-term effect on exports, date back to the games before 1992. The estimates for the Olympic effects since the 1992 Games, on the other hand, are often negative, albeit with effect sizes much smaller compared to the ones in former games. We postulate that this might be due to a decreasing need for a signal with respect to openness in an increasingly global world with information being easily accessible thanks to a plethora of mediums. Moreover, this result ties into the observation that fewer countries are bidding on, and countries withdrawing their bid for, the Olympics in the recent years.

By addressing the common econometric pitfalls, and documenting that the Olympic effects are ambiguous and varies by country and time, we contribute to the understanding of the effects of Olympic Games and other large sport events on trade.[1] The studies in this literature typically focus on economic outcomes, such as stock exchanges (Veraros et al., 2004), investment, consumption, and output (Brückner & Pappa, 2015; Giesecke & Madden, 2011), employment (Baade, Matheson, et al., 2002; Baumann et al., 2012; Feddersen & Maennig, 2013; Hotchkiss et al., 2003; Jasmand & Maennig, 2008), tourism (Baade et al., 2010; Porter & Fletcher, 2008; Song, 2010), as well as the costs of hosting the Games (Flyvbjerg et al., 2021).

More specifically, this paper contributes to the specific strand of the literature that focuses on the effect of the Olympics on export levels (Bista, 2017; Maennig & Richter, 2012; Rose & Spiegel, 2011; Song, 2010). The majority of these works provide mixed evidence regarding the Olympic effect. In particular, whereas Song (2010) and Rose and Spiegel (2011) both report a positive Olympic effect on exports, Bista (2017) and Maennig and Richter (2012) contrast their results by documenting statistically not significant effects on exports. This paper focuses on the countries that host or bid on the Olympics, and suggests that both positive and null Olympic effects are possible depending on the country of analysis and the year of the Olympics. I JUST FINISHED! NORTHERN EUROPEAN LUNCH TIMES.

The rest of the paper is organized as follows: Section 2 provides a brief institutional background with respect to the bidding and eventual host selection process of the Olympic Games. Section 3 describes our methodology, and includes a discussion on how the SCM addresses empirical short-

[1] 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 Baade and Matheson (2016) and Matheson (2006).

comings frequently appeared in previous works. Section 4 presents the results of our analyses, interpretation of the results, and robustness tests. Section 5 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 key stage of the candidature process. In this paper, we refer to countries who have formally applied (i.e., completed this phase) as bidders. This implies that all countries that are considered bidders have made a significant initial investment with respect to their bid on the Olympics and have successfully completed the first round.

The formal applications are submitted roughly two years before the Olympic Committee makes the final decision on which 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".[2] The decision which country gets to host the Olympic Games is made five to eight years prior to the Games.

3 Empirical framework

Our analysis in this paper is at the country level. More specifically, we compute the Olympic effect on long-term exports for each host and bidder country, independently from the other host and bidder countries, using the synthetic control method (SCM).

The idea behind the SCM is that a weighted combination of various control units (the *donor*

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

pool) may be well-suited to match both the pre-intervention trend of the treated unit and the trend that it would have followed had it not received the treatment.[3] This approach offers an objective and rigorous way of assigning weights to donor pool countries based on a set of predictors and the outcome variable. The weighted combination of the control units is referred to as the *synthetic control*. The goal of this method is to find a synthetic control unit whose outcome variable exhibits the same pre-treatment trend as the outcome variable of the treated unit. Any difference in the outcome variables of the synthetic control and treated unit after the treatment is then interpreted as the treatment effect.

Using the SCM, we address three main empirical design problems that commonly appeared in previous studies. The first problem arises when the analysis lumps together countries with a long history of trade and openness with countries that are in the process of economic liberalization (as in Rose and Spiegel (2011)). Such an analysis is likely to conceal the potentially heterogeneous effects of the Olympics, and ill-suited to test the hypothesis that countries use the Olympics as a signalling device for boosting the exports. The SCM, on the other hand, allows us to estimate the Olympic effect for each host and bidding country independently from the other host and bidding countries. Having country-level Olympic effect estimates in turn enables us to make inferences about the economic signalling hypothesis specifically, and heterogeneous effects in general, such as effects on bidder vs. host countries.

Second, the recent literature on the two-way fixed effects (TWFE) has brought to light a variety of issues one can run into with a staggered treatment adoption.[4] First and foremost, a staggered treatment adoption causes already treated units to be compared with newly treated units, making it very difficult to provide a causal interpretation of the results. Moreover, in case of heterogeneous effects, the bias is further worsened. Many studies focusing on the Olympic effect leverage inevitably the staggered treatment since not all countries host or bid the Olympics simultaneously, and hence run into the above-mentioned TWFE problems. The present study analyzes the Olympic effect on

[3]We refer the readers who are not familiar to this method to Abadie (2019) and Abadie et al. (2010, 2015).

[4]The issues with the TWFE are discussed in detail in Borusyak and Jaravel (2017), de Chaisemartin and D'Haultfœuille (2021), Goodman-Bacon (2021), and Sun and Abraham (2021).

a country-by-country basis using the SCM. It therefore avoids the staggered treatment adoption, and does not allow for the possibility that the effect estimated for one host/bidding country to be biased by the size or direction of the effects estimated for other host and bidding countries.

Third, the timing of the treatment is a crucial modeling choice for assessing Olympic effects. In regression-based methods (such as in Rose and Spiegel (2011)), the coefficient of the treatment variable reflects the average treatment effect for the entire post-treatment period. One problem regarding this is that the effect may start much later, and thereby may bias the effects downwards. On the other hand, such a treatment definition is problematic also because it assumes that countries are always treated once they hosted or bid on the Olympics. This sort of treatment definition is especially dubious for countries that hosted or bid on an early Olympics since it implicitly assumes a treatment effect even after 40 years of the treatment starting year.

Getting the year of the treatment right is a difficult matter, given the uncertainty around when the treatment effects start. The effect might start sometime after the event took place, or it may become stronger over time (the latter has been shown to be the case by Song (2010)), or it might fade over time. The SCM method provides us with the flexibility to pick up short-term and long-term export effects of the Olympics, as well as the effects that potentially only start a few years after the treatment has taken place. Moreover, our estimated treatment effects concern a period of 15 years after the treatment for each host and bidding country, in contrast to extrapolating this effect to the entire remaining time horizon as in previous works.

3.1 Data

The main data set used in this study is the publicly available TRADHIST data set, which includes trade data for an extensive list of countries, and covers the period 1827-2014 (Fouquin, Hugot, et al., 2016).[5] From this data set, we specifically use aggregate export levels, population size, and the real GDP variables at the country level. We also include a political measure from the Polity IV project, which captures how democratic a regime is.

The TRADHIST data is complemented with the information of the host and bidder countries

[5]The TRADHIST data set is available online.

for the post-war summer Olympic Games, which is presented in Table A.1. The treatment is a binary variable at the country-year level that captures being an official candidate for a summer Olympics. To formally define it, let T_i be the year when the country was announced as an official candidate by the Olympics committee. Let $Candidates$ be the set of all countries that bid on the Olympics. The treatment status of country i at year t is then given by:

$$D_{it} = \begin{cases} 1 \quad \text{if} \quad t \geq T_i \quad and \quad i \in \{Candidates\} \\ 0 \quad otherwise \end{cases}$$

The treatment definition above implies that the treatment starts from the year when the country was announced as an official candidate, and lasts until the end of the study period.[6] This treatment duration amounts to 16 post-treatment years (the starting year of the treatment and the following 15 years).

In the cases of countries bidding multiple times consecutively, two treatments from two different Olympics occur in the same study period for the same country. These overlapping treatments rule out a well-defined treatment definition, and hence, an appropriate SCM estimation for such countries. We therefore exclude these cases and focus on countries that do not bid consecutively. Otherwise every individual bidder country since the 1960 Olympic Games is considered, except those for which the data are not available. This procedure leaves us with 11 cases (nine bidder and two host countries) that are suitable for a country-by-country analysis using the SCM.

Note that the goal of this study is to test whether the Olympic effect is a universal phenomenon as claimed by previous studies or instead a time- and country-dependent effect. In the light of this, we acknowledge that 11 cases are not sufficient to prove that Olympic effect is a universal phenomenon, even in the case that the Olympic effects are positive and similar for each of these 11 cases. We however believe that 11 study cases might generate enough evidence to reject the Olympic effect as a universal phenomenon, and provides fine-grained evidence that is suggestive of a time- and country-dependent effect.

[6] We discuss the rationale behind this decision in Section 3.3 where we also explain the choice of treatment year.

3.2 Donor pool

We study the case of each bidder country in each Olympics separately. We therefore first partition our data set based on the host announcement year (i.e., the treatment year) of the respective Olympic Games. More specifically, for each bidder country in each Olympics, we first subset our data set to our periods of interest (eight years of pre-treatment period and fifteen years of post-treatment period). We then subset the resulting subsamples further to the countries that were members of the General Agreement on Tariffs and Trade (GATT) during our study period. We use the latter sample restriction to make sure that the effects of GATT membership on exports – for countries that have changed GATT membership status during our study period – do not confound or contaminate the Olympic treatment effects.[7]

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 strictly to non-treated units.

3.3 Moment of treatment

Equally important as selecting the units of donor pool is the choice of treatment year. As the economy consists of forward-looking agents, the anticipation of an event taking place in the future can already have an impact on the outcome of interest. To estimate the full effect of the intervention, the treatment year should start before the very first effects of the intervention may take place. The SCM method provides us with this flexibility (Abadie, 2019).

Previous works note that the effects actually commence before the actual event takes place, consistent with the hypothesis that the signal is sent through bidding and official candidacy. Song (2010), for example, shows that the effects start a few years prior to hosting the Olympics. Brückner and Pappa (2015) similarly find that the effect starts prior to the eventual hosting of the Olympics.

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

Though the official candidates for the Olympics are sometimes confirmed a year before the host announcement by the International Olympic Committee (IOC), this study considers the official host announcement year as the treatment year for both the host and bidding countries as the most international publicity is gained during the host announcement year.

We support our results by backdating the treatment year and showing that they are not sensitive to small changes in the year of treatment. This backdating approach ensures that any effect that emerges any time after the treatment starting year – even in the presence of some time periods that show no treatment effects immediately after the treatment started – can be interpreted as the causal effect of the treatment in the absence of confounding factors (Abadie, 2019). This implies that we allow the treated units to have some heterogeneity in the year when they start to experience the positive effects of the Olympic Games – if any –, which is a substantial improvement over the empirical designs of previous studies.

3.4 Country-level analysis

In our baseline analysis, the dependent variable is the total exports. We use population size, real GDP, the polity measure, and total exports itself to construct the synthetic control for the treated unit. As discussed in Section 3.3, the treatment year is the year that the official bidders and eventual host of the Olympics are announced, five to seven years prior to the Games. Our study period, on the other hand, starts eight years before the treatment year.

The eight pre-treatment years allow the optimization problem that generates the synthetic control to have a long enough time periods to yield a good match of the pre-treatment trends of the treated and the synthetic control unit. The good pre-treatment fit in turn lends credibility to the causal interpretation of the observed differences between the treated unit and its synthetic control in the post-treatment period. We track the export trends of the treated unit and its synthetic control for 15 years after the treatment starts. The longer post-treatment period allows us to observe how long the Olympic effect on exports lasts.

We support our results from this baseline analysis with two robustness checks. We first repeat the baseline analysis with backdating the treatment year to two years before. Our results remain unchanged, lending credibility to the choice of treatment year as the official host announcement year. Second, we repeat the baseline analysis without any predictor variables except the total exports itself. More specifically, we use only the total export levels itself for constructing the synthetic control unit. Our results are robust to this alternative model specification too, suggesting that our baseline results are not an artifact of model specification.

We repeat the aforementioned procedure for each of 11 cases in our sample and provide the corresponding results in the next section. The country specific results are discussed with respect to each individual bidder or hosts' economic and political context, as to provide a discussion for the presence of the so-called positive Olympic effect on exports.

4 Results

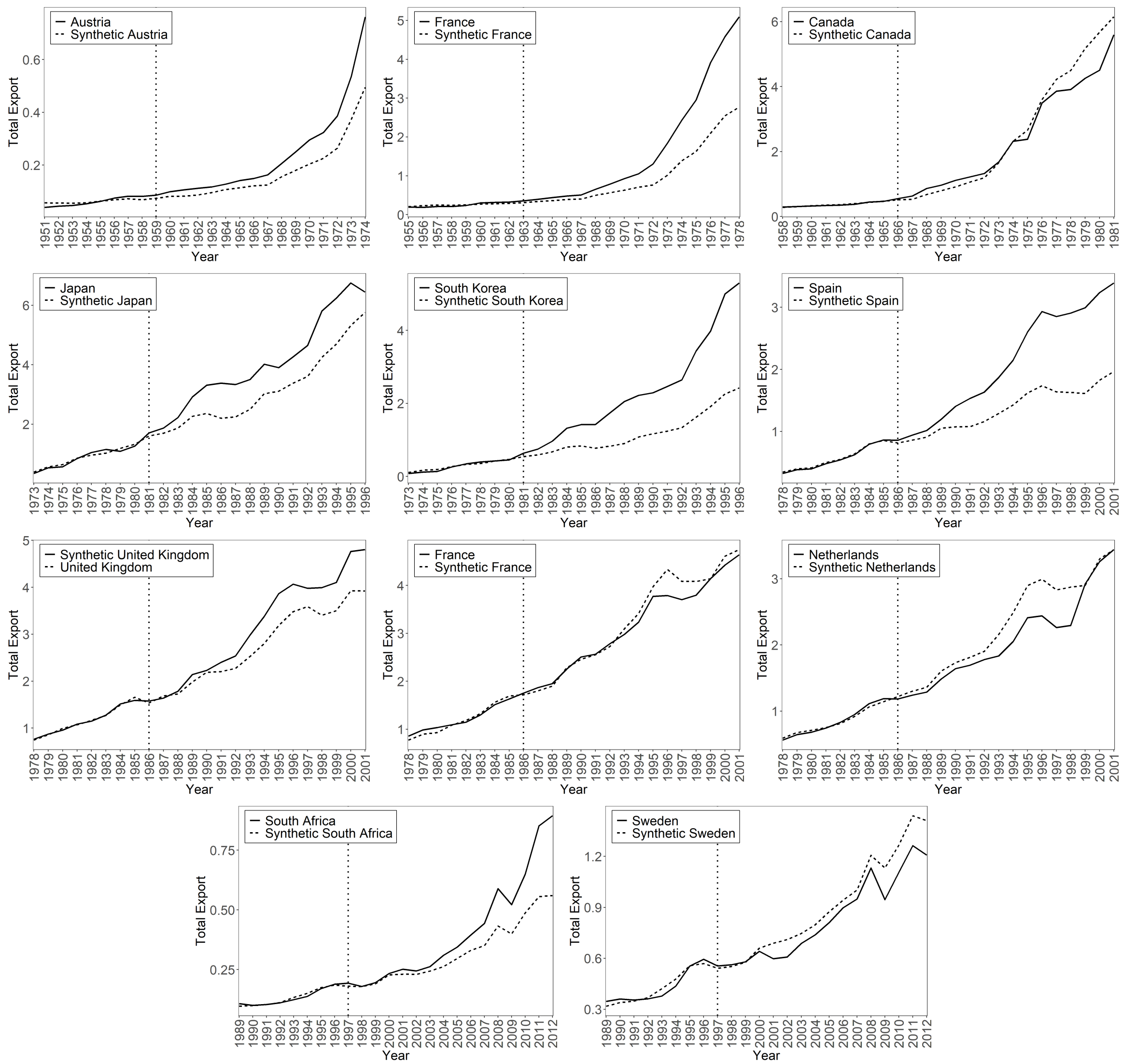
In this section, we discuss our findings from the country-level SCM estimations.[8] Figure 1 presents these results at the country level. The dashed vertical lines correspond to the treatment year. The treated and synthetic control units in each plot show a good pre-treatment match in terms of their total exports, which sets the stage for discussing discrepancies –or lack thereof– in outcome trends after the treatment.

The key result in Figure 1 is that the Olympic effect changes remarkably across countries and over time. First of all, our SCM estimations show that not all countries experienced a positive effect on exports due to the Olympics (e.g., France, 1986; Sweden, 2004). Second, when some countries did experience a positive Olympic effect on exports (e.g., France, 1968; South Korea, 1988; Spain, 1992), these effects seem to be persistent. Taken together, the country-level results in Table 1 suggest that a positive long-term effect on exports is not the typical outcome of bidding on or hosting the Olympics. Rather, the Olympic effect is heavily country-specific.

The plots in Figure 1 are helpful for assessing an Olympic effect in each country separately, but not so much when comparing Olympic effect across countries and over time. To enable such comparison, we standardize the Olympic effect as the sum of the 10-year post-treatment gap between

[8] We run our synthetic control applications with the 'Synth' package provided by Abadie et al. (2011) in R. We report the donor pool unit weights for each synthetic control in Table B.1.

Figure 1: Country-level baseline results



Note: The baseline synthetic control results for all countries in the sample. From left to right, starting in the top left corner (country, Olympics year): Austria (1964), France (1968), Canada (1972), South Korea (1988), Japan (1988), Spain (1992), Netherlands (1992), France (1992), United Kingdom (1992), South Africa (2004), Sweden (2004). The bold line is the treated unit; the dashed line is the synthetic control unit.

the total exports of the treated unit and its synthetic control divided by the total exports of the treated unit at the treatment starting year. More formally, let T_i be the treatment starting year for country i, Y_{i,T_i} be the total exports of country i at time T_i, and $Gap_{i,t}$ be the difference between the exports of country i and its synthetic control at time t. The standardized Olympic effect, for country i treated at time T_i, is then given by:

$$\text{Olympic effect}_{i,T_i} = \frac{\sum_{t=1}^{10} Gap_{i,T_i+t}}{Y_{i,T_i}}.$$

Table 1 summarizes the findings for all countries that bid on the Olympic Games in the sample. The 'Olympic effect' column reports the standardized Olympic effect, which varies remarkably across countries and over time with a mean of 0.29 and a standard deviation of 0.45. To illustrate the interpretation of these effects, take the example of France bidding on the 1968 Olympics. The corresponding Olympic effect in Table 1 is 0.77. This estimate implies that the sum of the gap between the total exports of France and its synthetic control in the 10 years following 1963 (i.e., treatment year) is 77% of France's total exports in 1963.

Table 1: Summary of the results

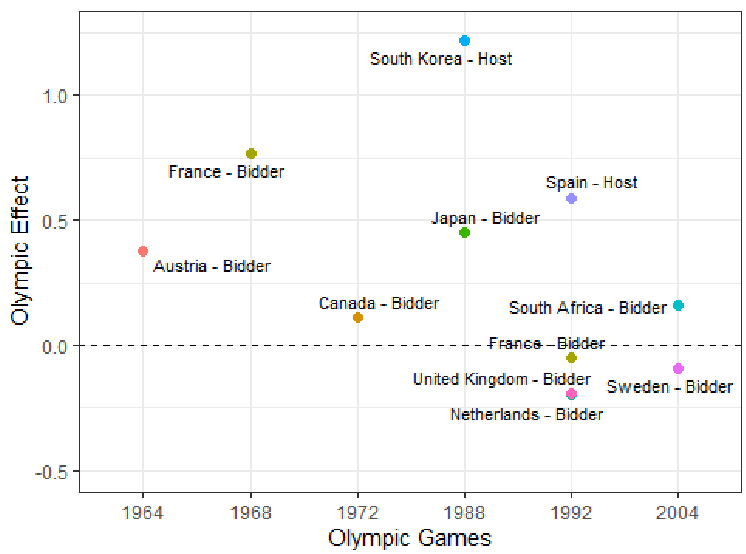
Country	Host/bid	Olympics year	Treatment year	Olympic effect
Austria	bid	1964	1959	0.38
France	bid	1968	1963	0.77
Canada	bid	1972	1966	0.11
South Korea	host	1988	1981	1.22
Japan	bid	1988	1981	0.45
Spain	host	1992	1986	0.59
Netherlands	bid	1992	1986	-0.20
France	bid	1992	1986	-0.05
United Kingdom	bid	1992	1986	-0.19
South Africa	bid	2004	1997	0.16
Sweden	bid	2004	1997	-0.09

Note: The table summarizes the results of several synthetic control method applications. 'Olympic effect' column shows the standardized Olympic effect, which is the 10-year sum of the gap between the exports of the 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.

Figure 2 visualizes the Olympic effects reported in the last column of Table 1. It suggests that the time might also be playing a role in the size and direction of the Olympic effect. In particular, the Olympic Games before the 1992 Olympics seem to be especially more effective in generating a positive and substantial increase in total exports compared to the games that happened since 1992, where the effects are quite small, and sometimes even negative, compared to the effects of former Olympics.

Accordingly, the average Olympic effect for the Olympic Games before the 1992 Olympics is 0.58, whereas the average Olympic effect for the Olympic Games since 1992 is 0.03. The only country that experienced a substantial positive Olympic effect since the 1992 Olympics in the sample is Spain. This positive Olympic effect on Spain however is not surprising, as Spain had recently transitioned into a democracy at the time of its treatment (1986), and it could greatly benefit from a credible signal to the rest of the world about its future policies.

Figure 2: Olympic effects



Note: The figure plots the country-level Olympic effect estimates from the SCM estimations. The Y-axis shows the standardized Olympic effects that are reported in table 1. The X-axis shows the Olympic Games that we study in this paper.

The case of France bidding on the 1968 and 1992 Olympics also examples the declining effectiveness of Olympic games in generating an exports boost. When it was first announced as an official candidate for the 1968 Olympics, France experienced a substantial increase in its total exports following the years of official candidacy. When it was announced as an official candidate for a second time – this time for the 1992 Olympic Games –, the French exports experienced a decrease, albeit a small one. The declining effectiveness of the Olympics as a signal with respect to openness over time is intuitive. As many countries already engaged in free trade by the 1990s, the signaling function of the Olympics would have become less relevant.

Although it seems that the overall effectiveness of the Olympics as a signaling device decreases over time, our results suggest that the Olympics could still function as a signalling device – even in the early 2000s – for countries that have relatively more uncertainty surrounding their economic and trade policies. For example, when both South Africa and Sweden were the official candidates of the 2004 Olympics, our estimates show that South Africa experienced a modest increase in its exports whereas Sweden experienced the opposite effect.

The declining effectiveness and need for the Olympics as a signal with respect to openness ties into the observed trend that fewer countries are bidding on the Olympics in the recent years. Whereas the promise of economic gains and international attention caused by hosting the Olympics spurred on no less than eleven countries to bid on the 2004 Olympics, the uncertainty with regards to the benefits in more recent years has resulted in countries withdrawing their bid for the Olympics.[9]

By applying the SCM and thereby overcoming many empirical shortcomings documented in the literature with respect to estimating the Olympic effect, our results show that the Olympic effect is a highly country- and time-dependent phenomenon. In this paper, we generate empirical evidence that is against the hypothesis of a universal Olympic effect on exports, and contribute suggestive evidence on the declining effectiveness of Olympics over time in generating export boosts. We however acknowledge that the question of why some countries experience negative effects – despite being relatively small – on their exports after becoming an official candidate remains unanswered.

4.1 Robustness and Placebo In-place Tests

In this section, we run several robustness and placebo in-place tests to support the main findings in the previous section. Our first robustness test first takes our treatment year back to two years before. Doing so allows to test the robustness of the baseline results to the specification of the treatment year. The pre-treatment period is seven years before the treatment and the export are tracked for 17 years after the treatment. This robustness test is called the backdating approach,

[9]The bidding process for the 2022 Winter Olympics saw four potential bidders withdraw their candidacy in response to local voter referendums or public polling indicating a lack of local support (Matheson & Zimbalist, 2021). Moreover, the situation has become so dire that the Olympic Committee awarded the 2024 Games to Paris and 2028 to Los Angeles, without going through the usual selection process.

and it does not jeopardize the causal interpretation of the estimated differences even if the actual treatment starts later than the specified treatment year (Abadie, 2019). Figure C.1 in the Online Appendix shows the results of this robustness test.

In a second robustness check, we construct the synthetic control using a single predictor, namely the exports 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 the choices regarding the predictor variables. In this analysis the host announcement year is used as the treatment year, as per the baseline specification. Figure C.2 in the Online Appendix confirms that the baseline results are not due to the selection of predictor variables.

To allow comparison, we present the results of these robustness tests together with baseline results in Table C.1 in the Online Appendix. In line with our expectations, the results from the single predictor analysis are similar to the baseline test. The same holds for the results of the backdating test, though naturally –due to the shorter pre-treatment period– these results deviate slightly from the baseline.

Finally, we also run placebo in-place tests for all the countries that our analyses focus on. Specifically, for each bidder and host country, we estimate the placebo treatment effect on each country in the corresponding donor pool by rotating the treatment across all the units in the donor pool. The treatment year, number of pre- and post-treatment periods are identical to the corresponding baseline analyses. We exclude donor pool units with a pre-RMSE (residual mean squared error in the pre-treatment period) that are larger than twice as pre-RMSE of the actual treated unit.

We report the placebo treatment effects for each host and bidder country separately in the Online Appendix D. The placebo in-place tests in general paint a grimmer picture of the Olympic Effects. Among the positive Olympics effects that we report in the baseline analyses (see Table 1), only South Korea (host of the 1988 Olympics) and Spain (host of the 1992 Olympics) survive the placebo in-place tests. We however warn the reader that the placebo results from the permutation inference should be approached with caution as the validity and reliability of this mode of inference is widely debated (Ferman & Pinto, 2017; Hahn & Shi, 2017).

5 Conclusion

Previous works present mixed results with respect to the Olympic effect on exports. Moreover, various empirical shortcomings of these studies further complicate getting insight into the so-called Olympic effect. In this paper, we list some of these shortcomings, such as selection bias, issues with staggered treatment adoption, two-way fixed effect models, and the timing of the treatment. Furthermore, we note that these studies take into account neither the case of multiple bidders (i.e., multiple treatment for the same unit), nor they separate the advanced economies with open trade from the emerging ones.

This study overcomes the aforementioned shortcomings of previous studies by estimating the Olympic effect using the synthetic control method (SCM) in a country-level analysis. The SCM estimations show that the Olympic effect varies remarkably across countries and over time. More specifically, as some countries (e.g., France, 1968; South Korea, 1988; Spain, 1992) experienced a positive effect on exports after being qualified as an official candidate of the respective Olympic Games, some other countries (e.g., France 1986; Sweden, 2004) experienced either a small negative effect or no Olympic effect at all.

The results also suggest a novel interesting pattern that previous studies did not uncover. We find that most of the cases, where bidding on the Olympics resulted in an increase in exports, are associated with the Olympic Games before 1992. The later games were mostly associated with either modest decreases in exports or with practically zero effects. Our robustness checks with two-year backdating and a single predictor specification support these results. We contend that the declining effectiveness of the Olympic Games might be related to the decreasing need for a signal about trade openness in an increasingly global world. This trend also resonates well with the trend of countries withdrawing their bid for the Olympics in the recent years.

In overall, our findings in this study support the signalling mechanism initially proposed by Rose and Spiegel (2011), albeit depending on the country of analysis and the year of the respective Olympics. In particular, we find that countries that were going through a trade liberalization process or similar reforms tend to experience a positive Olympic effect on exports. On the other hand, advanced economies that had longer histories of open trade experienced a modest negative effect or practically no effect. We conclude by pointing out the need for further research to pin down the mechanisms underlying the negative Olympic effects, and also to explain why countries that have endorsed free trade for a long time keep bidding on the Olympics.

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Online 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 Synthetic Control Donor Weights

Table B.1: Synthetic Control Donor Weights

Donor	AUT-1964	FRA-1968	CAN-1972	KOR-1988	JPN-1988	ESP-1992	NLD-1992	FRA-1992	GBR-1992	ZAF-2004	SWE-2004
BFA				0.00						0.00	
BGD				0.00						0.01	0.00
BRA		0.02		0.01		0.36			0.00	0.01	0.00
BWA										0.02	0.00
CAF				0.01						0.00	
CAN										0.01	0.04
CHE	0.00			0.01	0.00					0.01	0.13
CHL		0.02		0.01						0.01	0.00
CIV				0.05						0.01	
CMR				0.02						0.01	
COG				0.01						0.01	
COL										0.01	0.00
CUB		0.02		0.01						0.01	
CYP	0.00			0.00	0.00					0.05	0.10
DNK	0.00	0.03		0.00	0.00					0.01	0.06
DOM		0.02		0.00						0.01	0.00
EGY				0.01						0.01	
FIN	0.00			0.00	0.00					0.01	0.04
GBR		0.43	0.32								
GHA										0.01	
GMB	0.00			0.00	0.00					0.00	0.00
GRC		0.02		0.00		0.49				0.01	0.02
GUY				0.00						0.01	0.00
HTI		0.02		0.02						0.00	
HUN				0.03						0.01	0.00
IDN		0.02		0.16						0.01	
IND		0.01		0.00						0.02	0.00
IRL	0.00			0.00	0.00					0.01	0.05
ISR	0.00			0.00	0.00					0.01	0.00
ITA	0.43			0.07	0.43	0.15	0.15	0.83		0.01	0.01
JAM				0.00						0.02	0.00
JPN										0.01	0.00
KEN										0.01	
LKA		0.02		0.00						0.01	0.00
LSO										0.00	
MAR										0.01	
MEX										0.01	0.00
MMR		0.02		0.02							
MRT				0.01						0.01	
MUS	0.00			0.00	0.00					0.03	0.15
MWI				0.02						0.00	
MYS				0.00					0.00	0.01	0.00
NER				0.01							

Table continues in the next page

Table B.2: Synthetic Control Donor Weights (continued)

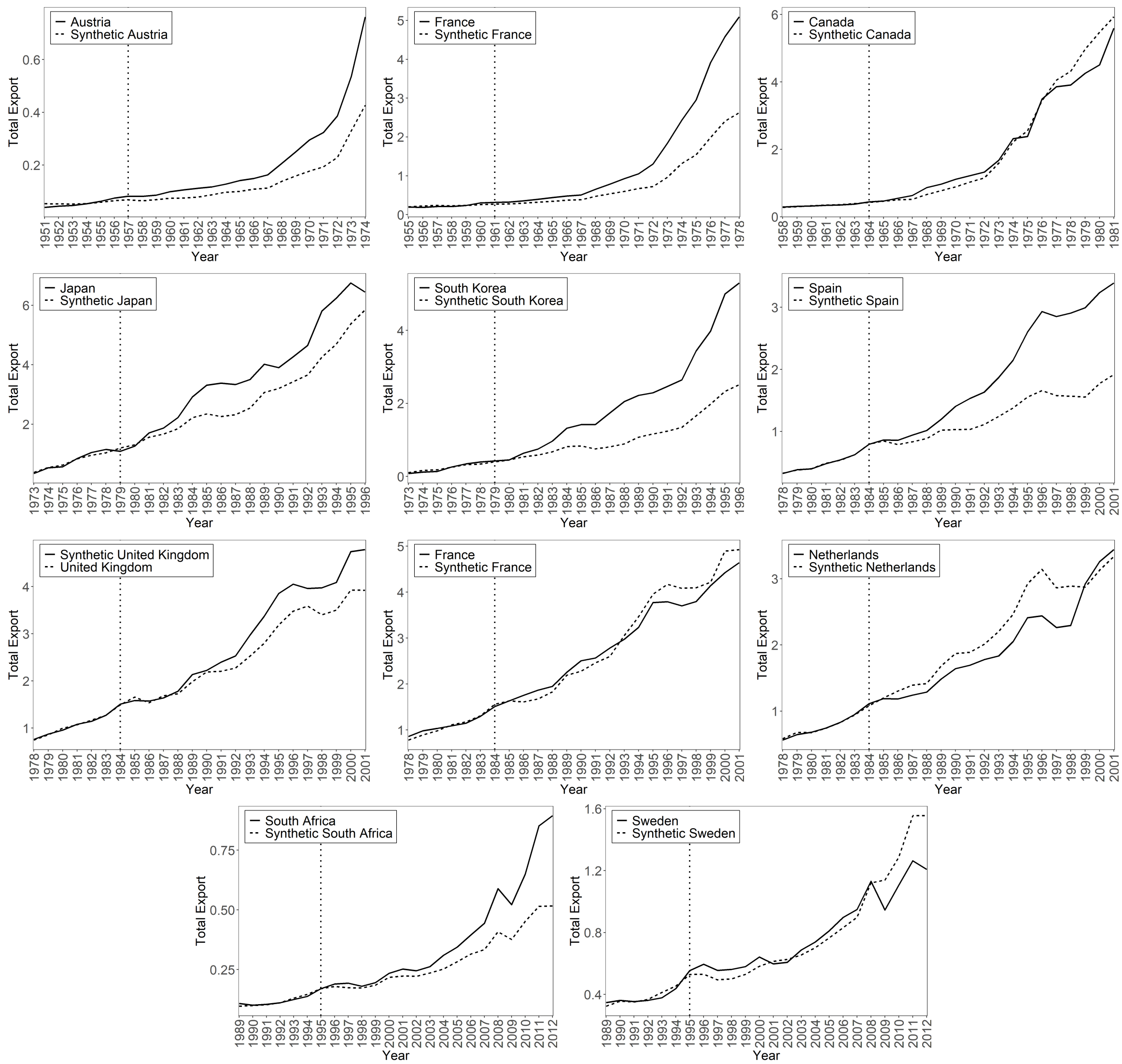
Donor	AUT-1964	FRA-1968	CAN-1972	KOR-1988	JPN-1988	ESP-1992	NLD-1992	FRA-1992	GBR-1992	ZAF-2004	SWE-2004
ARG				0.01						0.01	0.00
AUT	0.00			0.00	0.00					0.01	0.04
BDI				0.01						0.00	
BEL				0.02			0.78		0.73	0.01	0.20
BEN				0.01							0.00
NGA				0.01						0.01	
NIC		0.02		0.01						0.26	0.00
NLD	0.13	0.07	0.68		0.13						
NOR		0.02									
NZL	0.00	0.02		0.00	0.00					0.01	0.04
PAK		0.02		0.00						0.01	0.00
PER		0.02		0.01						0.01	0.00
PHL										0.01	0.00
POL				0.06						0.01	0.00
PRT				0.00						0.01	0.02
RWA				0.01						0.00	
SEN				0.01						0.01	
SGP				0.21					0.00	0.01	0.00
SLE				0.01						0.00	
SUR										0.01	0.00
SWE	0.00	0.03		0.01	0.00					0.01	
TCD				0.01						0.00	
TGO				0.01						0.00	
THA										0.01	0.00
TTO				0.00						0.02	0.00
TUR		0.02		0.00						0.01	0.00
TZA				0.01						0.00	
UGA										0.00	
URY		0.02		0.01						0.02	0.02
USA	0.40	0.05			0.40		0.06	0.17	0.25	0.00	0.01
ZAF				0.01							0.00
ZMB										0.01	0.00
ZWE										0.01	

Note: The table reports the synthetic control donor weights. The first column indicates the donor country. The other columns indicate the host or bidder countries. The country abbreviations correspond to the ISO 3166-1 Alpha-3 codes. The list of countries with the corresponding ISO codes can be found here: https://en.wikipedia.org/wiki/List_of_ISO_3166_country_codes.

C Robustness Checks

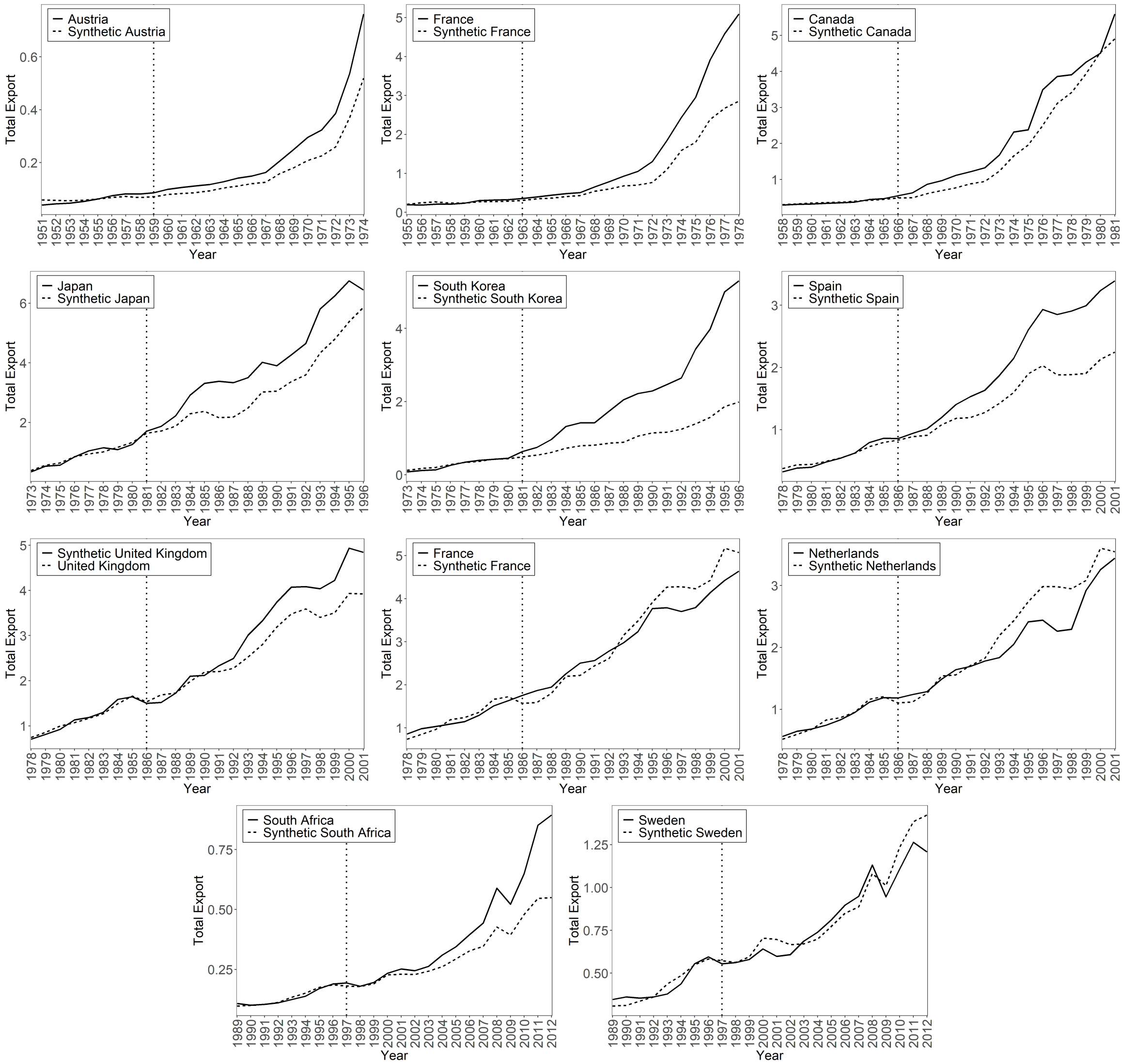
For comparison, Table C.1 shows the size of the Olympic effect for the baseline analysis with four different predictors and for the robustness check where only single predictor, total exports, is used. Graphs depicting the trends of the country and their respective synthetic control are below.

Figure C.1: Robustness I: two-year backdating of treatment



Note: The figures show the synthetic control results for all countries in the sample where the treatment year is moved back by 2 time periods. From left to right, starting in the top left corner (country, Olympics year): Austria (1964), France (1968), Canada (1972), South Korea (1988), Japan (1988), Spain (1992), Netherlands (1992), France (1992), United Kingdom (1992), South Africa (2004), Sweden (2004). The bold line is the treated unit; the dashed line is the synthetic control unit.

Figure C.2: Robustness II: single predictor specification



Note: The figures show the synthetic control results for all countries in the sample, using a single predictor. From left to right, starting in the top left corner (country, Olympics year): Austria (1964), France (1968), Canada (1972), South Korea (1988), Japan (1988), Spain (1992), Netherlands (1992), France (1992), United Kingdom (1992), South Africa (2004), Sweden (2004). The bold line is the treated unit; the dashed line is the synthetic control unit.

Table C.1: Summary of the results

Country	Host/bid	Olympics year	Treatment year	Olympic effect - baseline	Olympic effect - one-predictor	Olympic effect - two-year backdate
Austria	bid	1964	1959	0.38	0.38	0.51
France	bid	1968	1963	0.77	0.69	0.84
Canada	bid	1972	1966	0.11	0.77	0.21
South Korea	host	1988	1981	1.22	1.27	1.23
Japan	bid	1988	1981	0.45	0.48	0.46
Spain	host	1992	1986	0.59	0.44	0.64
Netherlands	bid	1992	1986	-0.20	-0.13	-0.27
France	bid	1992	1986	-0.05	0	0
UK	bid	1992	1986	-0.19	-0.15	-0.19
South Africa	bid	2004	1997	0.16	0.17	0.22
Sweden	bid	2004	1997	-0.09	-0.01	0.07

Note: The table summarizes the results of several synthetic control method applications. 'Olympic effect' (baseline) column shows the standardized Olympic effect, which is the 10-year sum of the gap between the exports of the 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. The next two columns show the one-predictor and in-time placebo results, calculated in the same manner as described above.

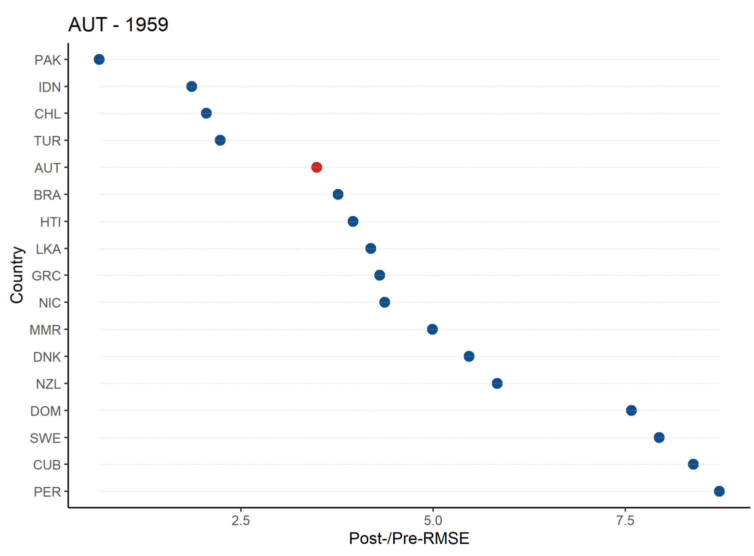
D Placebo In-place Tests

For each treated country, we permutate the treatment over all donor pool units that have a pre-RMSE (residual mean squared error in the pre-treatment period) smaller than the twice as the pre-RMSE of the treated unit. We report the resulting placebo Olympic effects in the figures below.

The country abbreviations correspond to the ISO 3166-1 Alpha-3 codes. The list of countries with the corresponding ISO codes can be found here: https://en.wikipedia.org/wiki/List_of_ISO_3166_country_codes.

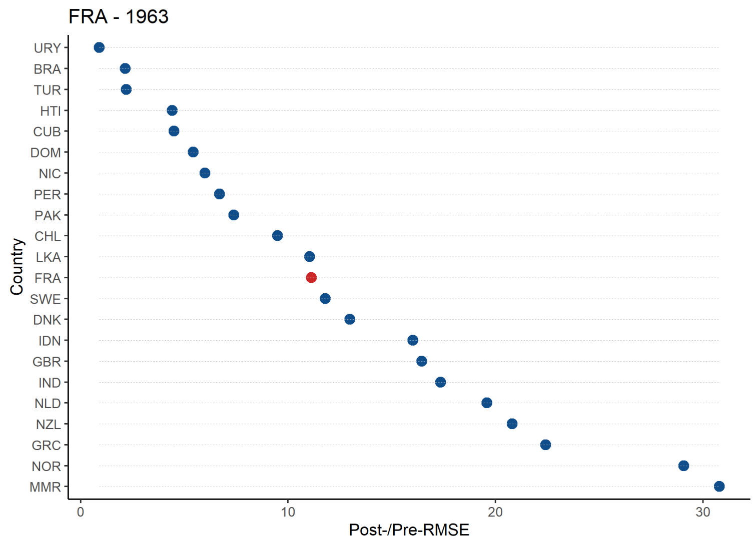
The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.1



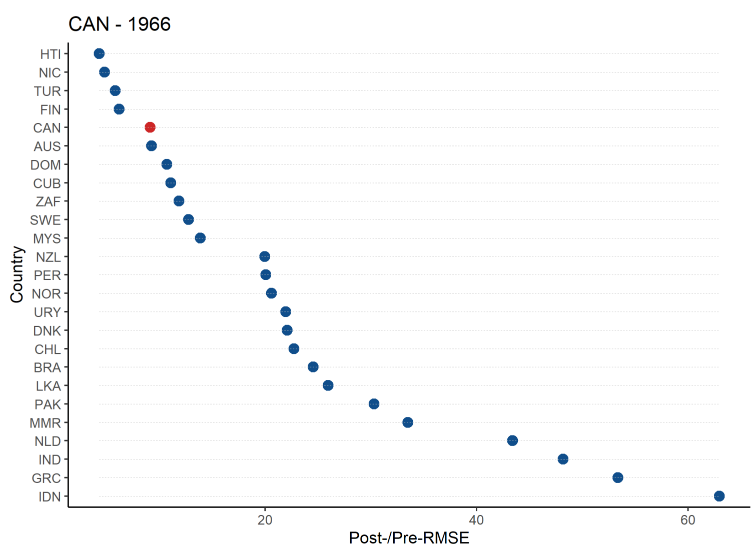
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.2



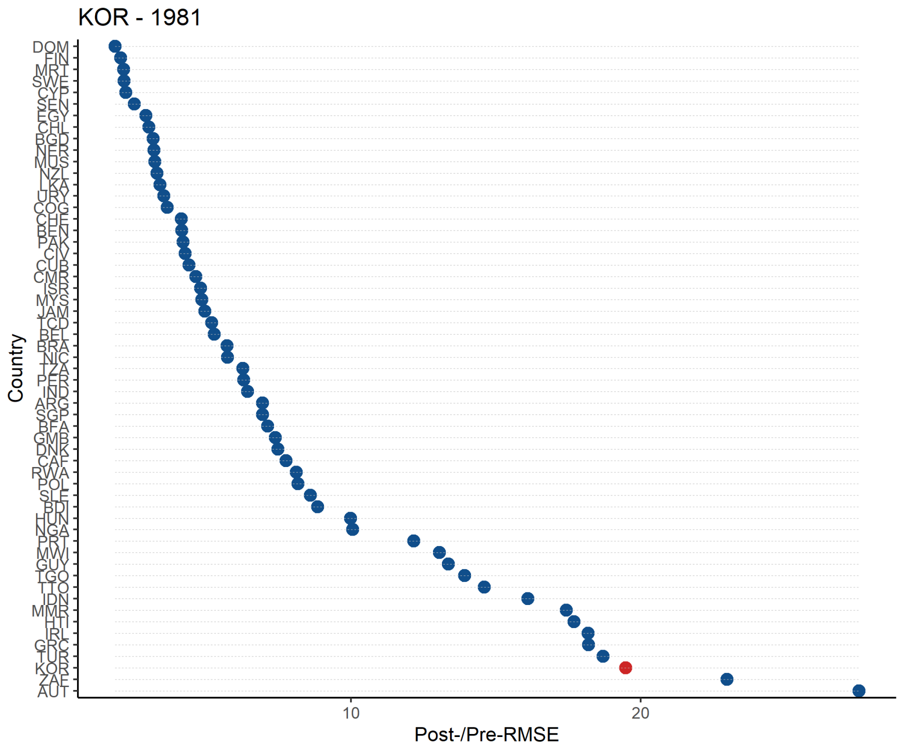
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.3



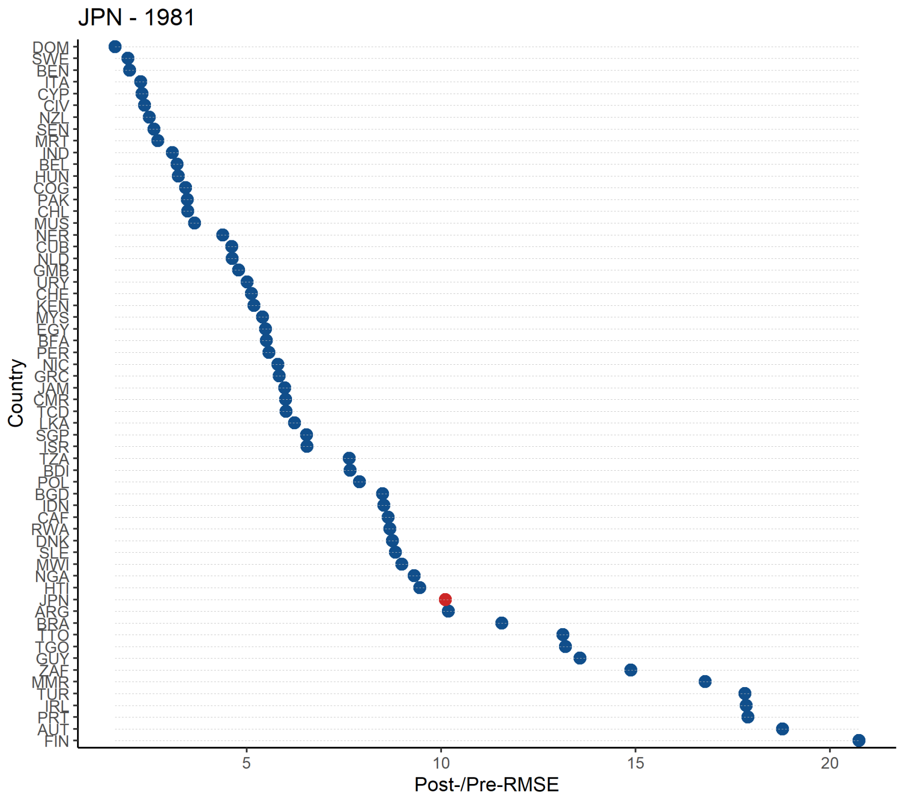
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.4



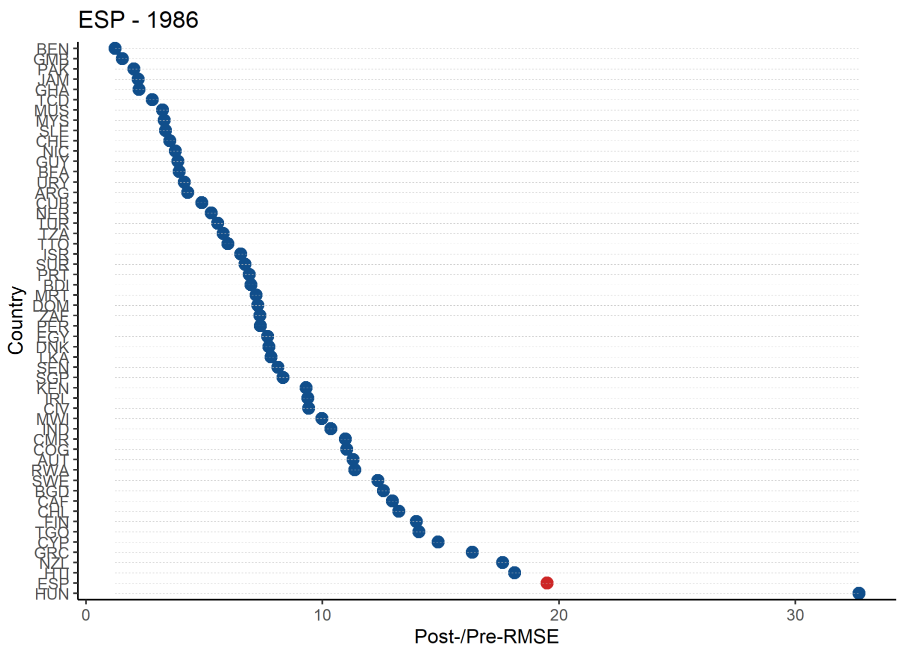
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.5



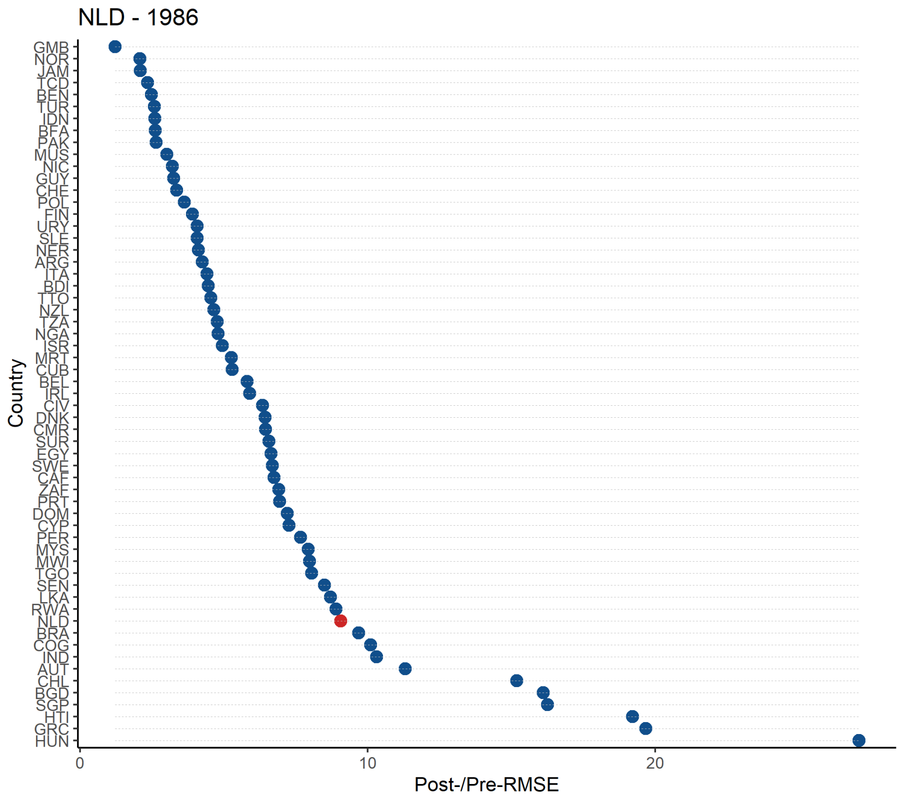
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.6



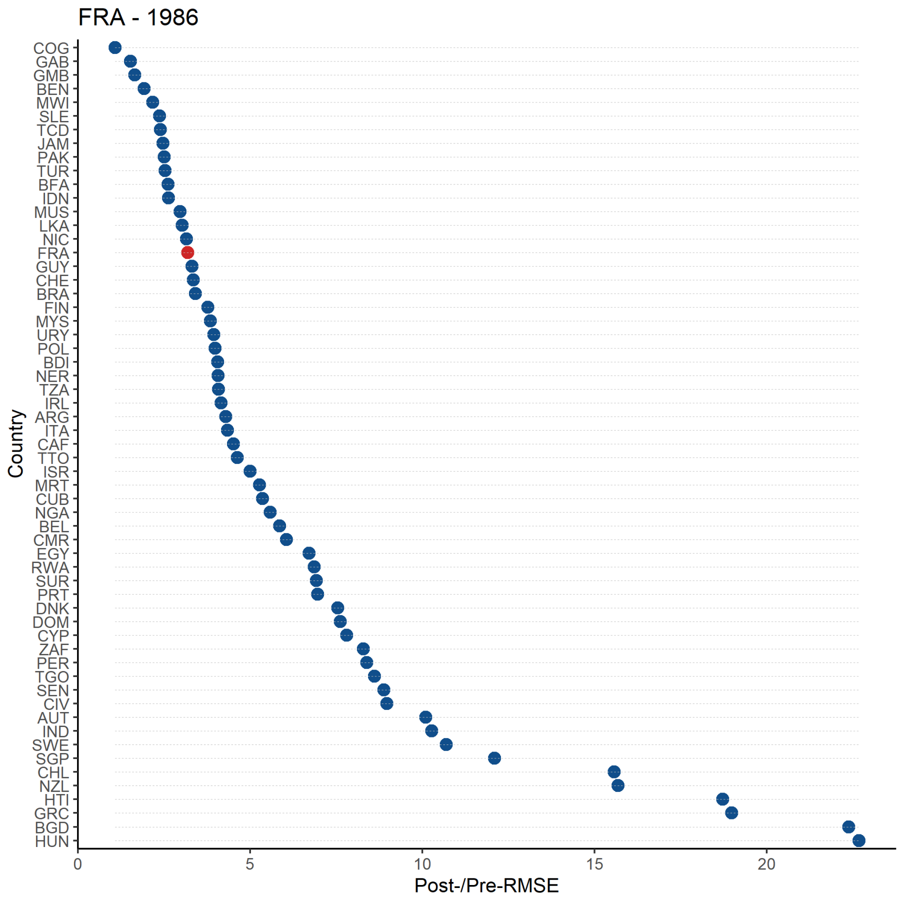
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.7



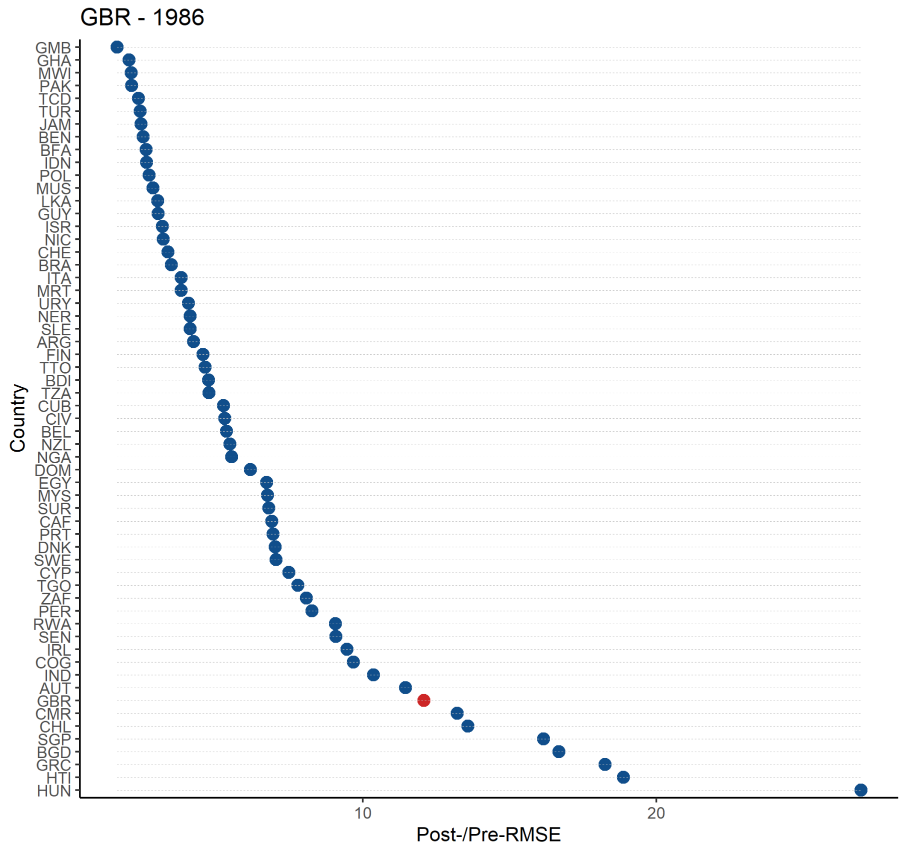
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.8



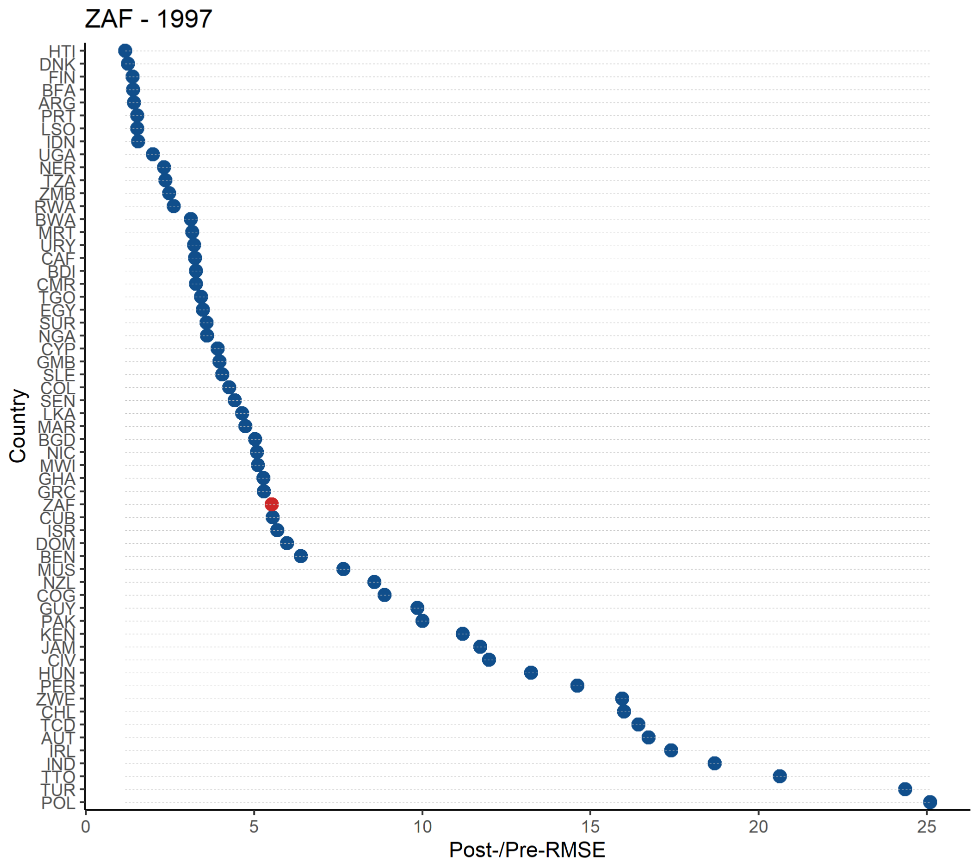
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.9



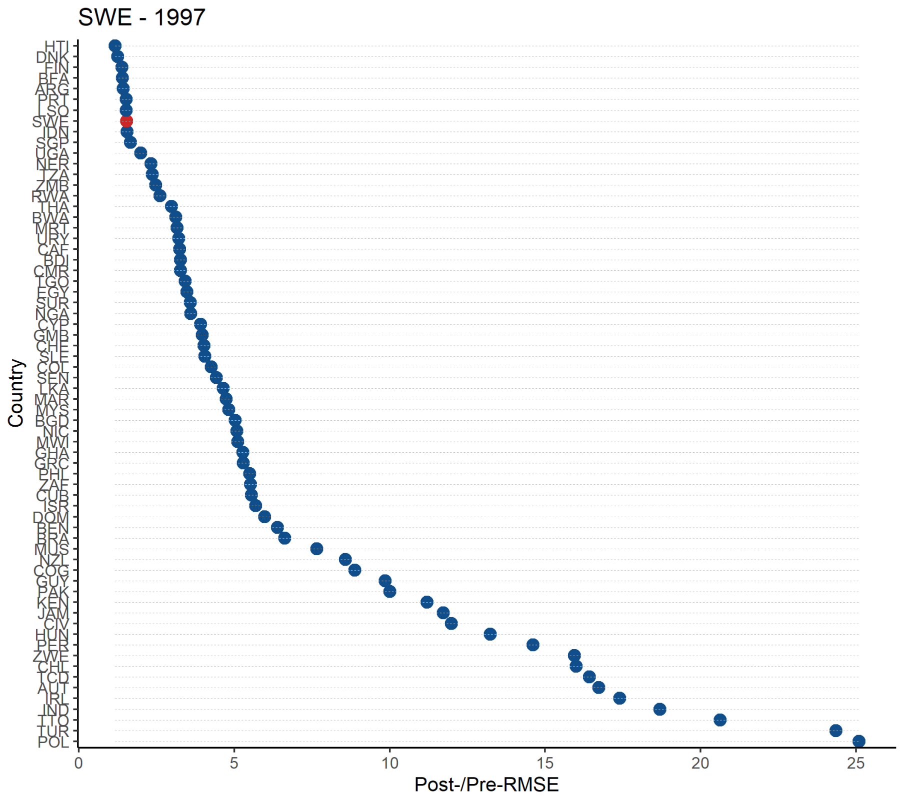
Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.10



Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.

Figure D.11



Note: The plot shows the ratio of post-RMSE (residual mean squared error in the post-treatment period) to the pre-RMSE for the treated unit and donor pool units. Actual treated unit is plotted in red, donor pool units are plotted in blue. The country abbreviations in Y-axis correspond to the ISO 3166-1 Alpha-3 codes. The years that are next to the ISO codes are the treatment years.