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Exports and olympic games: Is there a signal effect?

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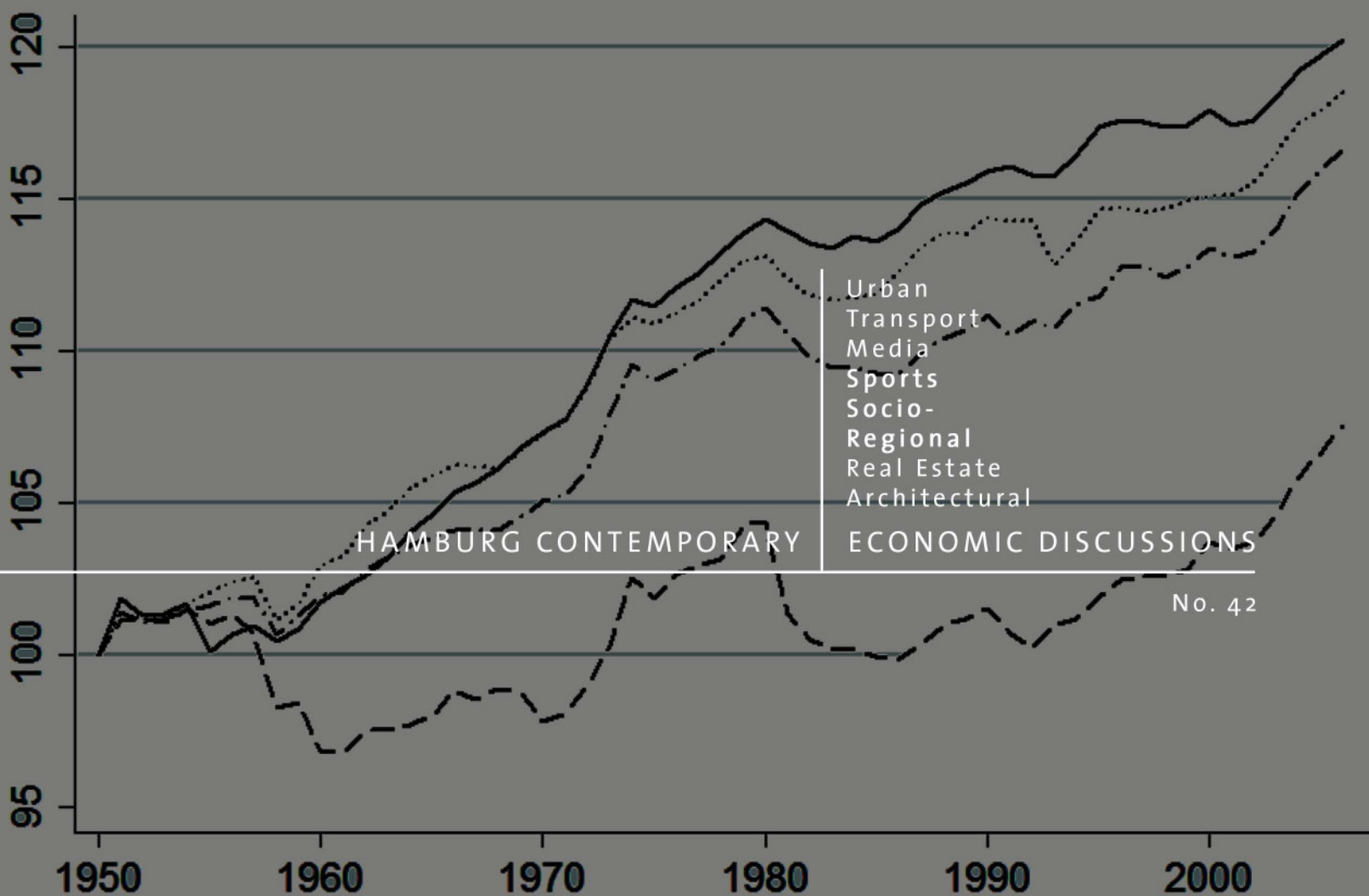
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EXPORTS AND OLYMPIC GAMES: IS THERE A SIGNAL EFFECT?



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Exports and Olympic Games: Is there a Signal Effect?

Abstract: Rose & Spiegel (2011) find that Olympic Games host countries experience significant positive, lasting effects on exports. They interpret their results as an indication that countries use the hosting of such events to signal openness and competitiveness. We challenge these empirical findings on the grounds that a comparison of structurally different and non-matching groups of countries might suffer from a selection bias. We demonstrate that with an appropriate matching and treatment methodology, the significant Olympic effect disappears.

Keywords: Export, Olympic Games, International Trade, Treatment, Matching

JEL classification: F1, L83

Version: January 2012

Rose & Spiegel¹ (RS; 2011) find that Olympic Games host countries experience significant positive, lasting effects on exports. Their results do not only hold for the actual hosts but also for countries that unsuccessfully bid for the Olympic Games. RS interpret their results as an indication that countries use such events to signal openness and economic competitiveness (i.e., a “signal effect”).

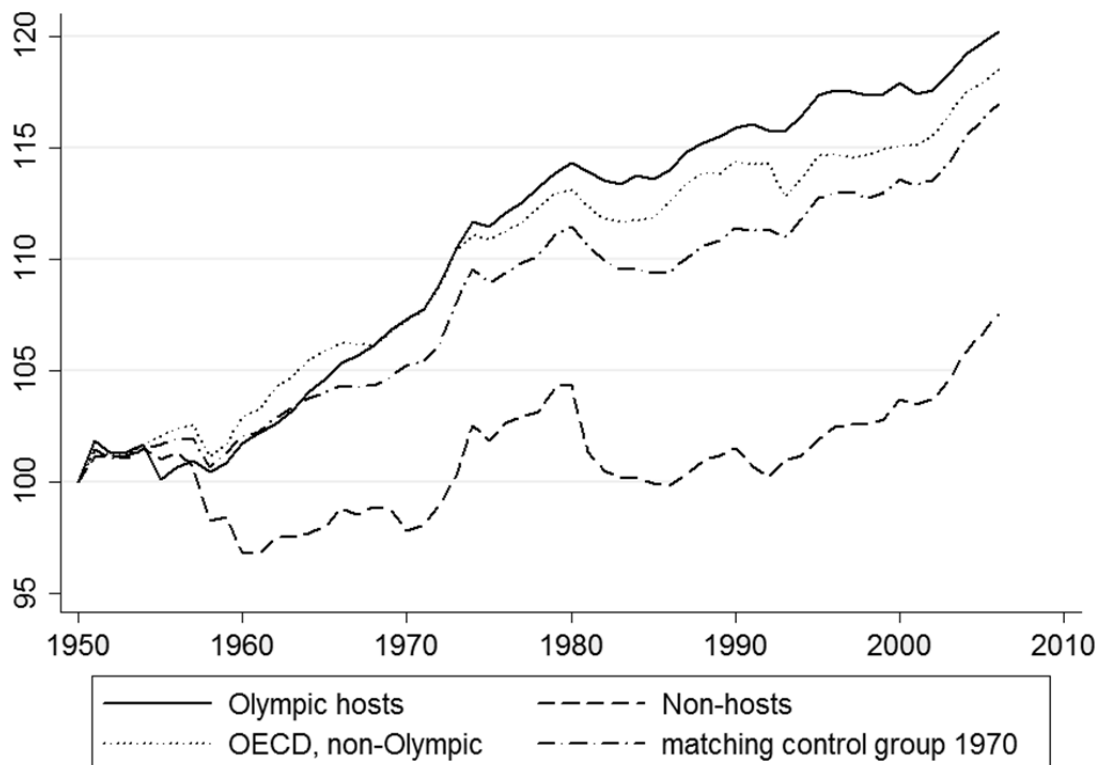
We challenge the empirical findings of RS because they compare Olympic nations such as the US, Japan, Germany, Canada, Italy, Spain, and Australia, which have been among the leading export nations for centuries, to all other nations. Their comparison of structurally different, non-matching groups might suffer from a selection bias. We demonstrate that with an appropriately applied matching and treatment methodology, the RS Olympic export effect disappears.

To illustrate the structural differences between the subsamples, Figure 1 displays indices (1950 = 100) of the logarithms of real exports. The solid line depicts the average exports of the summer Olympics host countries, which clearly outper-

¹ We thank Andrew K. Rose for providing the data as well as the STATA do-file for the base case regressions.

forms the dashed line depicting the average exports of non-hosts.² The dotted line shows the average exports of the OECD member states of 2006, excluding Olympic hosts. Note that the export development of the founding members of the OECD (1961) does not significantly differ.³

Fig. 1 Indexed Real Log Exports.



Overall, it seems plausible that Olympic host countries are structurally different from the majority of the rest of the world. To overcome this problem, we employ the matching strategy of Rosenbaum & Rubin (1983) and estimate propensity scores, i.e. the probability of being part of a treatment group given a set of covariates. We use these estimations to systematically discriminate between Summer Olympic Games host countries (i.e., the treatment group) and non-host countries (i.e., the control group). Only countries that are otherwise structurally similar are

² As in RS, we focus our analysis on the Summer Olympic Games.

³ Details are available from the authors upon request.

included in the subsequent analysis. The covariates included in the propensity score estimation should affect both the outcome variable (i.e., exports) and participation in the treatment (i.e., Olympic hosts), and they should either be measured before the treatment or be time-invariant (Caliendo & Kopeinig, 2008, p. 38). Additionally, the explanatory power of the covariates cannot be too high; matching would not be possible if these covariates perfectly predicted the assignment into the treatment or the control group (Heckmann et al., 1997, p. 637). In our case, we aggregate the RS data to obtain a single export observation for each country i in year t . We estimate the propensity scores using the logs of both output and the population of the exporting country as covariates, fulfilling the balancing property (Becker & Ichino, 2002).⁴

We first estimate propensity scores for 1950; this is the first year of the RS sample, which ranges from 1950 to 2006. This is also before the competition dates of the first Olympic Games included in the RS investigation (Helsinki, 1952). Thus, no treatment effects should be incorporated. In the 1950 dataset, values for four Olympic hosts are missing (namely, USSR, Germany, Korea, and Greece), and the number of available non-host countries is 44. Nineteen countries fulfill our common support condition, including the eight Olympic host countries.⁵ We repeat the procedure for two further reference years, where data on more countries are available. For 1970, there are observations for all hosts except for the USSR. The non-host group includes 106 countries, and 34 countries fulfill the common support condition. For 2000, data on all hosts are available. In that year, the non-host

⁴ RS also apply a matching strategy to evaluate the robustness of their results; however, their log file indicates that their covariates are not balanced.

⁵ The common support region is [0.103; 0.946] for the 1950 subsample, [0.069; 0.953] for the 1970 subsample, and [0.056; 0.991] for the 2000 subsample.

group consists of 163 countries, while the common support condition is fulfilled by 37 countries.⁶

Apart from restricting our analysis to different subsamples of matching countries, we use the same investigation strategy as RS by employing an augmented version of the gravity model. Using RS's dataset of single observations for each country i 's exports to country j at each year t , we regress the logs of distance and output, an additional set of covariates, and an Olympic effect variable on the logarithms of exports of the country. The covariates include the log of the populations of both countries and a set of dummy variables that control, among other things, for common borders, common language, regional trade agreements, and common currency. The Olympic effect variable is a dummy variable that takes a value of one for the exporting country starting in the year it hosted the Olympic Games. For sensitivity analysis, we follow RS by alternatively estimating different combinations of year, dyadic and country-specific fixed effects, and country-specific linear time trends.

⁶ Hosts fulfilling the common support, $t=1950$: Australia, Canada, Finland, Italy, Japan, Mexico, Spain, and the United States. Non-hosts fulfilling the common support, $t=1950$: Austria, Brazil, Denmark, France, India, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom. | Additional hosts fulfilling the common support, $t=1970$ (compared to $t=1950$): Germany, Greece and Korea. | Additional non-hosts fulfilling the common support, $t=1970$ (compared to $t=1950$): Argentina, Chile, Colombia, Hungary, Indonesia, Peru, Philippines, Poland, Portugal, Saudi Arabia, Turkey, and Venezuela. | Additional hosts fulfilling the common support, $t=2000$ (compared to $t=1950$): Germany, Greece, Korea, and Russia. | Additional non-hosts fulfilling the common support, $t=2000$ (compared to $t=1950$): Argentina, Belgium, China, Hong Kong, Indonesia, Ireland, Israel, Malaysia, Poland, Portugal, Saudi Arabia, South Africa, Singapore, Thailand, and the United Arab Emirates.

Tab. 1 The Olympic Effect, Diverging Control Groups and Methods

| Specification: | a | b | c | d | e | f | g |
|-----------------------------|-------------------|------------------|------------------|------------------|------------------|------------------------------|------------------|
| 1. Rose Spiegel (2011) | 0.33** (0.04) | 0.24** (0.03) | 0.30** (0.04) | 0.19** (0.04) | 0.16** (0.04) | 0.34** (0.03) | 0.35** (0.04) |
| 2. Common Support t = 1950 | -0.20** (0.04) | -0.01 (0.04) | 0.01 (0.04) | 0.15** (0.05) | 0.07 (0.04) | -0.19 [°] (0.04) | 0.01 (0.04) |
| 3. Common Support t = 1970 | 0.01 (0.04) | -0.02 (0.03) | 0.01 (0.04) | 0.10* (0.04) | 0.04 (0.04) | 0.04 (0.03) | 0.03 (0.04) |
| 4. Common Support t = 2000 | -0.07 (0.04) | 0 (0.03) | 0.01 (0.04) | 0.11** (0.04) | 0.01 (0.04) | -0.03 (0.03) | 0.02 (0.04) |
| 5. OECD 2006 | -0.03 (0.04) | -0.08* (0.04) | -0.05 (0.04) | 0.06 (0.04) | -0.04 (0.04) | 0 (0.04) | -0.06 (0.04) |
| Year Effects | X | X | X | X | X | X | |
| Dyadic Fixed Effects | | X | | | | | |
| Exporter Fixed Effects | | | X | | | | X |
| Importer Fixed Effects | | | X | | X | | |
| Exporter*Time Fixed Effects | | | | X | X | | |
| Importer*Time Fixed Effects | | | | | | X | X |

Notes: Significance: * (**) at 0.05 (0.01)

Robust standard errors are in parentheses.

[°] Highly singular variance matrix. No standard deviations available.

Table 1 reports the regression results for the Olympic effect coefficient if we restrict the RS method to the countries that fulfill the common support condition in 1950 (row #2), 1970 (row #3), and 2000 (row #4). For ease of comparison, row #1 displays the RS results, which we were able to replicate. With the single exception of specification d (i.e., fixed-year effects and country-specific exporter trends), no significant positive effects are measurable in the different subsamples. For the sample restricted to those countries on the common support in t=1950 and the specifications (a) and (f), even significant negative effects can be found. If the analysis is restricted to those countries on the common support in t= 1970 (row #3) and t=2000 (row #4), where the data is the most complete, the majority of the effects is insignificant and around zero, with coefficients often below one standard deviation. Specification (d) is again an exception.

For readers who mistrust complex data selection methods as treatment and matching procedures, we alternatively compare the Olympic OECD countries with

the non-Olympic OECD countries, which can be reasonably assumed to be structurally alike. Again, no significant, positive effects on exports are found (row #5).

As mentioned above, RS find that their results do not only hold for actual hosts but also for countries that unsuccessfully bid for Olympic Games, leading them to the interpretation that countries use the Games (and similar events) to signal openness and increasing economic competitiveness (“signal effect”).⁷ However, when controlling for the structural (dis)similarities of countries, there is hardly any evidence for such an effect.

⁷ We tested for bidding countries as well and did not find any systematic significant, positive effects. Details are available from the authors on request.

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