Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Faculty of Business,
Economics and Social Sciences
Chair for Economic Policy

LEO DÖRR / ELIAS LEPPERT / WOLFGANG MAENNIG

OLYMPIC GAMES AND DEMOCRACY

Urban
Transport
Media
Sports
Socio-
Regional
Real Estate
Architectural

HAMBURG CONTEMPORARY ECONOMIC DISCUSSIONS

NO. 77

Hamburg Contemporary Economic Discussions
University of Hamburg
Faculty of Business, Economics and Social Sciences
Chair for Economic Policy
Von-Melle-Park 5
20146 Hamburg | Germany
Tel +49 40 42838-4622
https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/home.html
Editor: Wolfgang Maennig

Wolfgang Maennig
Universität Hamburg
Faculty of Business, Economics and Social Sciences
Chair for Economic Policy
Von-Melle-Park 5
20146 Hamburg | Germany
Tel +49 40 42838-4622
Wolfgang.Maennig@uni-hamburg.de

Leo Dörr
University of Hamburg
Faculty of Business, Economics and Social Sciences
Chair for Economic Policy
Von-Melle-Park 5
20146 Hamburg | Germany
Tel.: +49 40 42838-5569
Leo.Doerr@uni-hamburg.de

Elias Leppert
University of Hamburg
Faculty of Business, Economics and Social Sciences
Chair for Economic Policy
Von-Melle-Park 5
20146 Hamburg | Germany
Tel.: +49 40 42838-5297
Elias.Benedict.Leppert@uni-hamburg.de

Photo Cover: pixabay.com
Font: TheSans UHH by LucasFonts

Leo Dörr, Elias Leppert, Wolfgang Maennig

Olympic Games and Democracy

Abstract: We analyze whether the Olympic Games contribute to a process of democratization in the awarded country, as postulated in the cases of the 2008 and 2014 Olympics, controlling for endogeneity issues that may arise if the decision to award host status by the International Olympic Committee is affected by democratization in the bidding countries. Building on a broad-spectrum model of concepts and variables of democratization, we cannot reject the hypotheses that the Olympics have no effect on the democratization trajectories of host countries, neither positively nor negatively. We check for robustness of our results via a bundle of DiD and SCM methods and a number of alternative specifications. The one-off event of the Olympic Games, although they attract considerable international attention, does not seem to be able to lead to lasting changes in democratization.

Keywords: *Olympic Games, mega event, democracy*
JEL: *Z20, F59, C22*
Version: *July 2024*

1 Introduction

Beyond capturing the interest and enthusiasm of fans around the world, international sports events are discussed in the public square with respect to their socioeconomic and political dimensions; this is particularly the case when the host country has political structures that deviate from Western standards. Sports officials often argue that mega sports events, accompanied by increased international attention, may create incentives for more participation and stronger civil and human rights in the host countries. Such aspirations may be backed by the Olympic charter, in its first fundamental principle: “Olympism seeks to create a way of life based on [...] respect for internationally recognised human rights and universal fundamental ethical principles” (International Olympic Committee 2023).

For the 2008 Summer Games in China, the then-president of the International Olympic Committee (IOC) Jacques Rogge proposed that ”the Games are going to move ahead the agenda of the social and human rights as far as possible, the Games are going to be a force for good” amid controversy over freedom of speech and democracy (Reuters 2007). According to Rogge, during the bidding process, Chinese representatives had assured that “awarding the Games to China would advance the social agenda of China, including human rights” (Hersh 2008). Then-Director General of the Chinese General Administration of Sports Yuan Weimin stated, “In the next stage of our national development, we will continue to open ourselves wider to the outside world and carry out more reforms” (Associated Press 2001).

Note that there were concerns that IOC officials had not adequately inquired about democratic participation, safety, and self-determination (Selection Of Beijing Seen As Positive Step Toward Reform 2001; Hersh 2008). U.S. Representative Tom Lantos argued that “[t]his decision will allow the Chinese police state to bask in the reflected glory of the Olympic Games despite having one of the most abominable human rights records in the world” (Shipley 2001). Moreover, during the run-up to the Games and in the context of mounting protests in the face of Chinese actions in Tibet, great expectations

for the flourishing of Chinese democracy were disappointed: Rogge called on China to uphold their earlier commitment ("We definitely ask China to respect this moral engagement."), although Chinese officials such as foreign ministry spokeswoman Jiang Yu were less than receptive ("I believe IOC officials support the Beijing Olympics and adherence to the Olympic charter of not bringing in any irrelevant political factors. I hope IOC officials continue to adhere to principles of the Olympic charter," both quotes Hersh 2008).

Similar debates can be found in the case of the Olympic Games of 2014 in Sochi (Russia), where the treatment of construction workers and discriminatory anti-gay legislation put pressure on the IOC. IOC president Bach (2014) expressed hopes of a positive Olympic contribution: "This is the Olympic Message the athletes spread to the host country and to the whole world: [...] Yes, it is possible [...] to live together under one roof in harmony, with tolerance and without any form of discrimination for whatever reason. Yes, it is possible—even as competitors—to listen, to understand and to give an example for a peaceful society." Despite these hopes, earlier concerns about Russia as a host were later supported by reports of a Russian state-sponsored doping program (McLaren 2016) and the invasion of Crimea, which began on February 27th, four days after the end of the Games. Note that similar hopes also arose in the case of the FIFA World Cup in Russia in 2018 regarding worker protection and anti-discrimination (FIFA 2017) and Qatar in 2022 (FIFA Human Rights Advisory Board 2020).

The evidence on the potentially limited power of mega sports events is somewhat neglected. Scharpf et al. (2023) find evidence of increased repression in the local proximity of international media hotels during the run-up to the FIFA World Cup in Argentina in 1978. However, to the best of our knowledge, no studies on the effects of a mega sports event on democratization at the national level exist.

We provide the first empirical analysis of such effects by analyzing the Olympic Games. We draw on two branches of literature. First, for the identification of the determinants of democracy and democratization, a natural starting point is Barro (1999), who

identifies GDP per capita and average primary education as positive factors and the educational attainment gap between men and women and a dummy indicating major oil-exporting countries as negative factors. Acemoglu et al. (2008) argue that democracy and income have the same underlying factors, namely, longer-term interwoven development paths in politics and economics, but are not causally related. The impact of income on democracy may be path dependent and nonlinear: Cervellati et al. (2014) find positive effects for non-colonies and negative effects for former colonies, and Boix (2011) finds weaker effects with higher income levels. Concerning education, almost all authors confirm a positive effect (e.g., Glaeser et al. (2004), Castelló-Climent (2008)).[1] However, there are caveats: the effects are stronger in lower income countries (Apergis and Payne 2017), and a more equal distribution of education contributes to democracy (Castelló-Climent 2008). Ahmadov and Holstege (2023) find significant but small positive effects, particularly for primary and secondary but not tertiary education. Supporting Barro, Tsui (2011) finds a negative effect of oil discovery on democracy, and Aslaksen (2010) finds a negative effect of oil abundance. Ross (2015) provides a survey on contrasting views. In a broad-spectrum analysis of as many relevant factors as possible Teorell (2010), building on Hadenius and Teorell (2007), adds that a bundle of socioeconomic development variables, such as media availability and the degree of industrialization, economic crises, democratic neighboring countries, democratic regional organizations, and peaceful protests, are positively associated, whereas country size has negative effects.

Concerning the second branch of literature, cf. Firgo (2021), Wood and Meng (2021), and Fourie and Santana-Gallego (2011, 2022) find significant macroeconomic effects of the Olympic Games. The booster analyses of Hotchkiss et al.; Hotchkiss et al. (2003; 2015), Rose and Spiegel (2011), and Brückner and Pappa (2015), which may have received the most attention, suffer from combinations of sample selection bias, variable selection bias, and trend misspecifications (Maennig and Richter 2012; Langer et al. 2018;

[1] For a contrasting view, see Acemoglu et al. (2005).

Feddersen and Maennig 2013). Note that some studies also find negative economic impacts of mega sports events (Mitchell and Stewart 2015; Nitsch and Wendland 2017).

Chapter 2 surveys our data set and the empirical strategy. The results of a panel analysis of the effects of the Olympics on democracy are presented in Chapter 3 and Chapter 4 elaborates on the country-specific effects.

2 Data

To measure democracy, we use the indices produced by Varieties of Democracy (V-Dem, Coppedge et al. 2024), whose values range from 0 to 1 (with higher scores being associated with more democracy) and typically fall within the 0.1-0.8 range. Compared with other democracy indices such as those compiled by Freedom House and the Polity project, V-Dem is based on a larger number of independent coders and has more rigorous reliability validation and, furthermore, provides a more detailed scale (Coppedge et al. 2019). V-Dem scores the extent of democracies in five dimensions. These dimensions are intended to describe a) the responsiveness of the government to the will of the voters, b) the protection of individual rights from government overreach, c) the degree of political participation, d) the quality of public dialogue and its focus on the common good, and e) the equality in political rights and freedoms. We use the average of the five original indices as our main dependent variable. Generally, V-Dem data are highly granular in their component parts and final scoring.

For our estimation of the impact of the Olympics on democracy, we follow the abovementioned literature on the determinants of democracy, primarily Teorell (2010), and use the data on GDP, population, and years of schooling from the Penn World Table (PWT). For years of schooling, the PWT aggregates data from Barro and Lee (2013) as well as Cohen and Soto (2007), which have been updated in Cohen and Leker (2014). The national figures for GDP are converted to the log of per capita GDP. We also consider the attainment gap between men and women, measured as the difference between completed years of schooling. Following Teorell (2010) (who in turn follows Ross 2001),

we include variables for oil rents (share of GDP) and trade (share of GDP) as indicators for dependence on natural resources and trade, respectively, and furthermore include the share of nonagricultural economic activity as a measure of socioeconomic development following Teorell (2010) and the share of the population living in cities. The data for these four variables were obtained from the World Bank. Information on religious groups is taken from the National Religion Dataset compiled by the World Religion Project, and data on ethnic fractionalization (defined as the probability of two randomly selected citizens belonging to the same ethnic group) are taken from the Historical Index of Ethnic Fractionalization (HIEF) by Drazanova (2020), which expands the measurement first proposed by Alesina et al. (2003) to include more modern data. Religion has been a mainstay in the democratization literature since Barro (1999), and we follow Teorell (2010) in including ethnic fractionalization. Furthermore, we use contiguity data from Stinnett et al. (2002) to find the average democracy of each nations' neighbors and use that average to measure the potential impact of democratic diffusion, again following Teorell (2010). Descriptive statistics are given in Table 1.

Table 1: Descriptive Statistics: Whole sample

	Mean	Std. deviation	Minimum	Maximum
V-Dem democracy index	.3335353	.255196	.0114	.8572
Log of per capita GDP (PPP)	8.707383	1.213181	5.499628	12.55511
Democracy of neighbors	.2671704	.2325238	0	.8421
No neighbors (binary)	.1277778	.3338546	0	1
Share of Muslims	.2566859	.3643284	0	1
Index of ethnic fractionalization	.4386208	.2712895	.001	.89
Years of schooling	5.881218	3.579703	0	15.802
Oil rents (% of GDP)	4.153148	10.39847	0	87.18431
Mineral rents (% of GDP)	.8656145	2.645031	0	39.66755
Trade (% of GDP)	73.3629	48.61978	.0209992	437.3267
Non-agriculture (% of GDP)	82.95996	14.77365	10.58549	99.96987
Urban population (% of total)	48.69876	24.35067	2.077	100
Log of population	8.888568	1.738094	3.69694	14.17583
Gap between male and female schooling	.8825133	.9811825	-2.294	4.517
Log of country size (km)	11.90148	2.090227	5.703783	16.61218
Share of Christians	.5143955	.3804276	0	.9951
Share of Jews	.0061319	.0642961	0	.8856
Share of Buddhists	.0459898	.1660251	0	.9669
Share of Hindus	.0244269	.104287	0	.8134
Share of non-religious	.0633595	.122281	0	.79
Share of religious (other)	.0993228	.159962	0	.8507963

3 Empirical strategy

To ensure that our estimates of the effect of the Olympics on democracy are not driven by omitted variable bias, we control for other determinants of democracy based on the literature which were described in the previous section. Specifically, our model is based on Teorell (2010), with added country-specific and yearly time fixed effects (which corresponds to one of his robustness tests). The dependent variable is the change in democracy measured by first differences of the V-Dem index, and we lag the independent variables to prevent distortions caused by reverse causality and to reduce serial correlation in the error terms.[2] Similarly to Teorell, we also include lagged levels of democracy as independent variables to help eliminate serial correlation in the error term and account for possible issues of reverse causality. The fixed effects help combat potential unobserved heterogeneity between countries and secular trends. The model used to explain changes in democracy is as follows:

$$\Delta D_{i,t} = \phi_{i,1} D_{i,t-1} + \phi_{i,2} D_{i,t-2} + \beta_i \vec{X}_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \qquad (1)$$

where $X_{i,t-1}$ is a matrix of the lagged independent variables, β_i is the respective vector of coefficients, α_i and γ_t are country and time fixed effects, respectively, and $\varepsilon_{i,t}$ is the error term. The standard errors are clustered at the country level to account for potential serial correlation in the error terms.

To estimate the effect of hosting the Olympic Games on changes in democracy, we make use of a difference-in-differences framework following Bertrand et al. (2004). The treatment we examine is a country hosting the Summer or Winter Olympics. In line with Rose and Spiegel (2011) and Brückner and Pappa (2015), we use non-host countries (assuming data availability) as the control group.[3]

[2] While the use of lagged dependent variables may introduce a Nickell 1981 bias, the panel should be long enough at $T = 24$ to reduce this to a tolerable level.

[3] For an overview of all host countries in our dataset, see Table B5 in the Appendix.

With respect to treatment duration, we follow Rose and Spiegel (2011), Brückner and Pappa (2015), Langer et al. (2018), and Maennig and Richter (2012) by including lags of ten years after hosting the Olympics. In line with these authors, we also add ten years of leads to test the main DiD assumption of (conditional) parallel trends. The inclusion of these leads and lags further mitigates variable selection bias. The leads are relevant since Olympic bids are usually decided seven years before the event itself in our period of analysis. Additionally, Olympic bids are often discussed in the applicant countries and prospective host cities even before the host election. Infrastructure projects are also sometimes initiated during this time, potentially inducing dialogue between the government and the population, protests, or changes in policing in anticipation of international press attention. As such, it is well possible for effects to occur even before the official start of the actual Games. Furthermore, it could also be possible that political changes such as greater political freedom or changing legislation as a result of shifting political attitudes in light of the Games do not immediately manifest. These delayed effects necessitate a large number of lags after treatment. Our working model to test for the potential effect of the Olympic Games on democracy is as follows:

$$\Delta D_{i,t} = \phi_{i,1} D_{i,t-1} + \phi_{i,2} D_{i,t-2} + \vec{\beta}_i X_{i,t-1} + \sum_{j=1}^{10} \eta_{i,j} 1(T = t + j) + \sum_{j=0}^{10} \theta_{i,j} 1(T = t - j) + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (2)$$

where T is the time of the treatment, i.e., the η_i code for the leads, and θ_i are the treatment effects.

4 Results

Baseline results

We start by replicating Teorell (2010) with his original data period (Table 2, Column 1) following Equation (1). Our results are broadly in line with those of Teorell. We find significant effects of past levels of democracy on current changes in democracy, combining to a joint effect of 0.1559−0.2790 = −0.1231, indicating that level shifts in democracy are typically followed by a reversion to the mean. As was found by Teorell,

we find a significantly positive impact of the level of democracy of neighboring countries.

In line with Teorell (2010) and Acemoglu et al. (2005, 2008), we find no significant effects of income per capita or education on democratization. We also find that religion does not have a significant effect on changes in democracy, again in line with Teorell (2010) but also Tsui (2011).[4] In a similar vein, our insignificant estimates for oil rents (measured as a percentage of GDP) are in line with the robustness analysis including the fixed effects of Teorell.

Overall, especially considering that we added fixed effects to the model of Teorell and used a different measure of democracy as our dependent variable, the results in Column 1 point toward the robustness of our findings.

Column 2 reports the results when the same specification is used but with an extended time period from 1972 to 2014. The dummy variable indicating whether a country has no land borders has a smaller and less significant effect for the longer period, but otherwise, the results are comparable.

Table 2: The determinants of democracy and the Olympic effect

VARIABLES	(1) 1972-2006	(2) 1972-2014	(3) 1972-2014
Lag of democracy	0.1600***	0.1636***	0.1635***
	(0.0423)	(0.0352)	(0.0354)
Second lag of democracy	-0.2830***	-0.2748***	-0.2749***
	(0.0356)	(0.0297)	(0.0299)
GDP per capita (ln)	-0.0076	-0.0046	-0.0046
	(0.0047)	(0.0036)	(0.0036)
Change of GDP per capita (ln)	0.0102	0.0083	0.0083
	(0.0109)	(0.0090)	(0.0090)
Democracy of neighbours	0.0574***	0.0465**	0.0467**
	(0.0215)	(0.0193)	(0.0194)

[4] The significant negative effects of the share of Muslims found by Barro (1999) tend to disappear when regional or country fixed effects are included (see the sections including additional controls in Barro 1999 and Teorell 2010). Notably, the share of religions in the population tends to be quite persistent, implying that the inclusion of country fixed effects results in relatively little statistically exploitable variation in the variables.

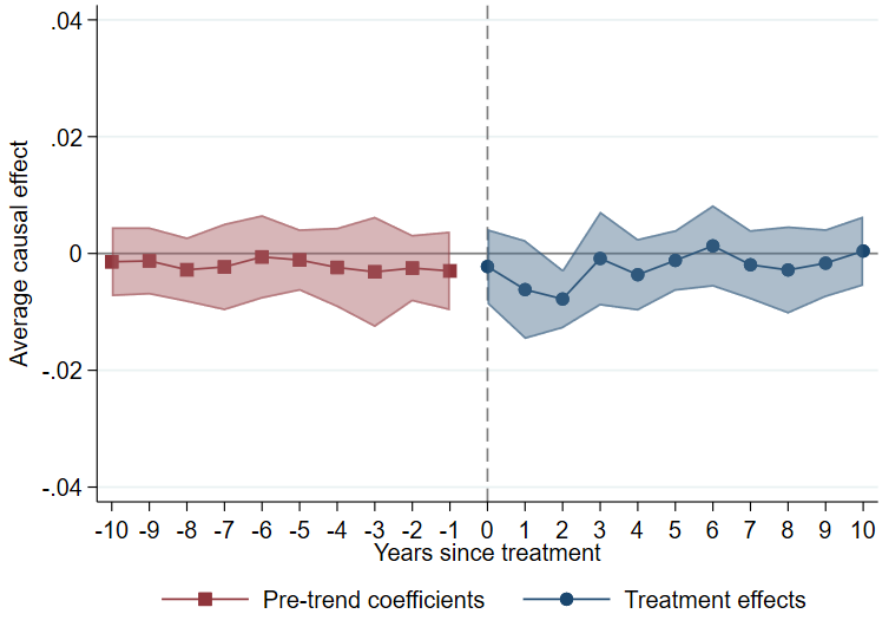
No land borders	0.0560	0.0352	0.0346
	(0.0437)	(0.0302)	(0.0301)
Share of Muslims	0.0608	0.0402	0.0404
	(0.0496)	(0.0334)	(0.0337)
Ethnic fractionalization	-0.1084	-0.0416	-0.0415
	(0.0829)	(0.0438)	(0.0442)
Years of schooling	-0.0024	0.0004	0.0005
	(0.0027)	(0.0018)	(0.0019)
Share of oil rents of GDP	0.0002	0.0001	0.0001
	(0.0002)	(0.0002)	(0.0002)
Share of mineral rents of GDP	0.0008	0.0002	0.0002
	(0.0008)	(0.0005)	(0.0005)
Share of trade of GDP	0.0000	0.0000	0.0000
	(0.0001)	(0.0000)	(0.0000)
Non-agricultural share of GDP	-0.0003	-0.0002	-0.0002
	(0.0003)	(0.0002)	(0.0002)
Share of population in cities	0.0002	-0.0001	-0.0001
	(0.0003)	(0.0002)	(0.0002)
Population (ln)	-0.0007	0.0007	0.0003
	(0.0125)	(0.0063)	(0.0064)
Male-female education gap	0.0018	0.0033*	0.0034*
	(0.0030)	(0.0020)	(0.0020)
Treatment			-0.0022
			(0.0033)
Year 1 after treatment			-0.0062
			(0.0043)
Year 2 after treatment			-0.0078***
			(0.0026)
Year 3 after treatment			-0.0009
			(0.0041)
Year 4 after treatment			-0.0036
			(0.0031)
Year 5 after treatment			-0.0012
			(0.0027)
Country-specific FEs	YES	YES	YES
Yearly FEs	YES	YES	YES
Observations	2,390	3,188	3,188
R-squared	0.2034	0.1873	0.1875

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses and clustered at the country level. In all specifications, a constant was estimated but not reported. All specifications contain a full set of year and country fixed effects. The baseline DiD specification in (3) contains ten lags and ten leads that were estimated but only partially reported here. For the full model, see Table B1 in the Appendix.

Column 3 of Table 2 reports the results of a Bertrand et al. (2004) baseline difference-in-differences (DiD) estimation corresponding to Equation (2). The newly added treatment variable is equal to one for hosts of the Summer or Winter Olympic Games during the year of the event. We follow Brückner and Pappa (2015) and Langer et al. (2018) and include ten years of lead (not reported in Table 2) and lags of ten years (partially reported

in Table 2). For a more accessible overview of the Olympic effect, we refer the reader to Figure 1, which presents the treatment effects estimated via Equation (2) and partially reported in Column (3) of Table 2 as an event study plot. These effects are mostly insignificant apart from the second lag, which is significantly negative, pointing to at least no significant effect in the direction of expressed hopes. Figure 1 also shows the ten leads of the treatment variable, which are all insignificant, meaning that we have no reason to reject the assumption of conditional parallel trends. These results are also reported in tabular form in Table B1 in the appendix.

Figure 1: DiD estimation of the Olympic effect from Equation (2), according to Bertrand et al. (2004)



Robustness

To evaluate the robustness of our results, we first considered potentially different effects of the Summer Olympics and Winter Olympics but did not find different results.[5]

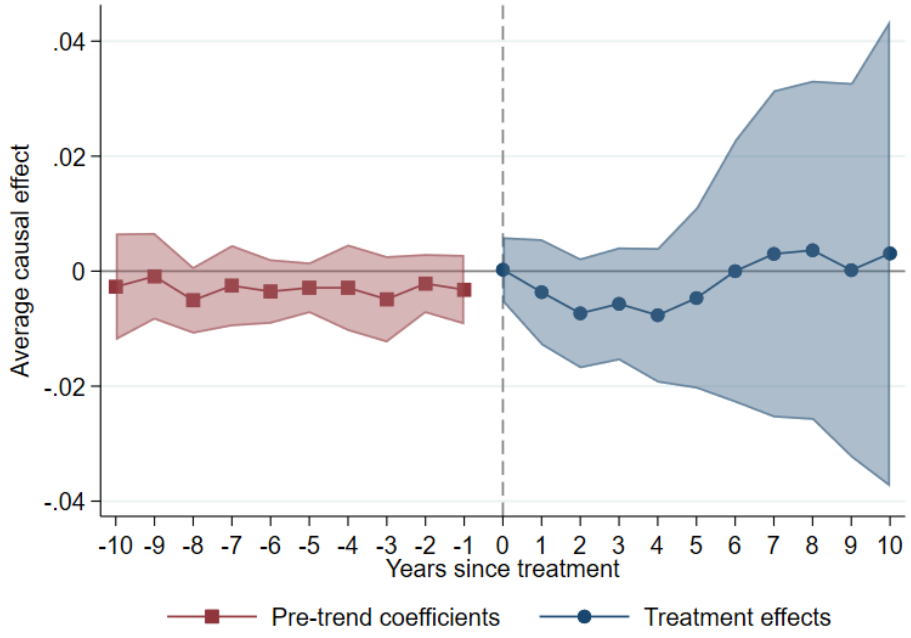
Second, we use more recent estimators that allow for heterogeneity in treatment effects. For example, during our period of observation, both Norway and the United States host the Olympics, but given the difference in population sizes between the two, a much larger proportion of Norway's population is directly affected by the event. Furthermore, different political systems and norms (e.g., Brazil versus Canada) that are not readily captured by our covariates also suggest that not all countries are equally affected. These features may be best accommodated by the estimator of de Chaisemartin and d'Haultfoeuille (2023, 2024), which we call the "DCDH estimator" hereafter. We use the same control variables as before and again consider a ten-year

[5] Details are available from the authors on request.

period each before and after treatment. Heterogeneous DiD models such as the DCDH estimate a separate set of OLS regressions for each average treatment effect and therefore do not report covariates or an R-squared, so we switch directly to an event study presentation.

The results of estimating Equation 2 with the framework suggested by de Chaisemartin and d'Haultfoeuille are illustrated in Figure 2. Again, the leads of the Olympics suggest (conditional) parallel trends, whereas the lags suggest no effect of the Olympics on the prevalence of democracy, with none of the point estimates being significantly different from zero.

Figure 2: DiD estimation of Equation (2) after DCDH



Third, there may be reasons for concern about the independence of our selected treatment. For example, prior to the dissolution of the Soviet Union and the end of the Cold War, mega sports events such as the Olympics were part of a systemic conflict between Western-aligned and Soviet-aligned states (Espy 1981; Sarantakes 2010). Consequently, applications and, as a result, hosting decisions may be considered

nonindependent of the level of democracy in the applicant countries. Thus, we exclude from this point onwards all the years before 1990 from our sample to limit our analysis to the years in which the Olympic Games can freely influence democracy without being steered in a particular direction by overt geopolitical conflicts. The results of estimating Equation (2) via DCDH for games after 1989 illustrated in Figure A1 in the Appendix again find no evidence of significant Olympic effects on democracy.

Fourth, up to this point, the control group consisted of all countries available with decent data coverage. This choice was motivated by other macro studies on Olympic effects (Rose and Spiegel 2011; Brückner and Pappa 2015). However, there is evidence of data selection bias when using an invalid control group (Langer et al. 2018; Maennig and Richter 2012). We therefore use propensity score matching (PSM, Rosenbaum and Rubin 1983) to define a control group of countries that are comparable to Olympic host countries. We match based on data from 1985 to avoid issues of matching being influenced by treatment or anticipation effects (although this leads to the exclusion of Russia and Germany due to a lack of relevant data) and requires countries to be located on the common support for the propensity score to be included. The variables used for matching are taken from our section on the determinants of democratization following advice from Caliendo and Kopeinig (2008). The results are reported in Figure A2 in the appendix. Again, there are no significant treatment effects in the ten-year window after hosting the Olympics, and pre-treatment placebos do not indicate a violation of conditionally parallel pre-trends.

Fifth, we conduct further robustness checks to ensure that our estimations are not affected by certain features of our Olympic treatment. Rose and Spiegel (2011) and Brückner and Pappa (2015) found significant and economically large announcement effects of the Olympic Games in terms of consumption, investment, and exports. Announcement effects could also occur in the area of democracy development: since successfully nominated countries are increasingly in the world's public eye from the moment of nomination, it could be argued that their governments will adjust their behavior both to not appear repressive to the wider world and to prevent anti-

government actions during a time of heightened scrutiny. As a result, we consider an alternative specification where the date of the host election at the respective IOC session is chosen as the treatment date. In addition, we specify a model in which the treated group consists of successful applicants rather than hosts.[6] The results for both specifications are reported in Figures A3 and A4 in the appendix. As before, the model outcomes remain broadly unchanged.

Finally, there may be concerns about pooling autocratic and democratic countries in the same treatment or control group. For example, pooling implicitly assumes that treatment effects are roughly the same between treated countries. Prior examinations of Olympic effects have mostly focused on economic impacts, where this is less of an issue than for democratic effects: we effectively assume that a potential Olympic effect on democracy would be the same in the U.S. and China and then compare these two countries to a control group containing vastly different political systems. As the vast majority of our treated countries are democratic countries, we exclude Russia and China from our treatment group to avoid confounding Olympic effects. As an alternative, we restrict the control group to members of the Organisation for Economic Co-operation and Development (OECD) based on the high rate of membership of our treatment group in the OECD and its commitment to upholding democratic standards to avoid unfair comparisons between treated and non-treated countries. The results of estimating Equation (2) via the DCDH estimator on the democratic sample are presented in Figure A5 in the Appendix. Again, the graph suggests neither potential violations of the parallel trend assumption nor any significant Olympic effect on changes in democracy.

Results for autocracies

Thus far, we have sought to estimate potential Olympic effects averaged over all host countries or for democratic countries exclusively. However, autocratic countries may be the most interesting subjects: There was little public argument about whether the UK

[6] For an overview of all applicants in our dataset, see Table B5 in the Appendix.

in 2012 or Japan in 2020 would become more democratic and respectful of civil rights in the wake of their Olympics, but for China in 2008 and Russia in 2014, this was at the heart of public debate. More recent concerns about sports washing, i.e., the instrumentalization of mega sports events to improve international attitudes toward the host country despite continued repression and human rights violations, are similarly centered on autocracies.

However, our preceding approach could face difficulties in establishing a suitable control group in the case of autocratic countries. Most democratic applicants are alike in their general socioeconomic development and interest in public relations by means of mega sports events and additionally share membership in international organizations such as the OECD, which uphold standards of governance and public participation. The autocratic states in our sample, Russia and China, exhibit far more idiosyncratic political and economic systems, which may lower the reliability of applicants as a control group.

We thus extend our approach by analyzing the cases of the Olympics of Russia in 2014 and China in 2008 via the synthetic control method (SCM) (Abadie 2021; Abadie et al. 2015, 2010), which simulates the subject of interest by calculating a weighted average of other subjects optimized to mimic the treated subject as closely as possible in terms of selected covariates and pre-treatment trends. The resulting synthetic control can then be used as a counterfactual where the event of interest did not take place. This approach is similar to classical DiD approaches, in which both attempt to find or create the best matching control group to isolate the effects of the examined treatment. The SCM approach has the advantage of identifying country-specific effects without large data needs, implying that we can estimate effects for Russia and China independently of each other.

While more robust than DiD, the SCM results are sensitive to their exact specification with respect to the pre-treatment matching period and the post-treatment prediction interval as well as with respect to their donor pool. In accordance with earlier studies,

we define the pre-treatment period using ten lags, although our pre-treatment fits expand past this period. We choose a prediction horizon of ten years, similar to the post-treatment window we selected for our previous DiD approach.

For China, we selected admissible countries for the donor pool based on geographical proximity, membership in free trade agreements, and intergovernmental organizations.[7] For Russia, we settled on a donor pool drawn from a wider base after a synthetic control based on former members of the Soviet Union failed to match democratic development in Russia before the 2014 Olympics. We further assume that the democracy level of neighboring countries in the donor pool is not affected by the Olympic Games in the treated country.

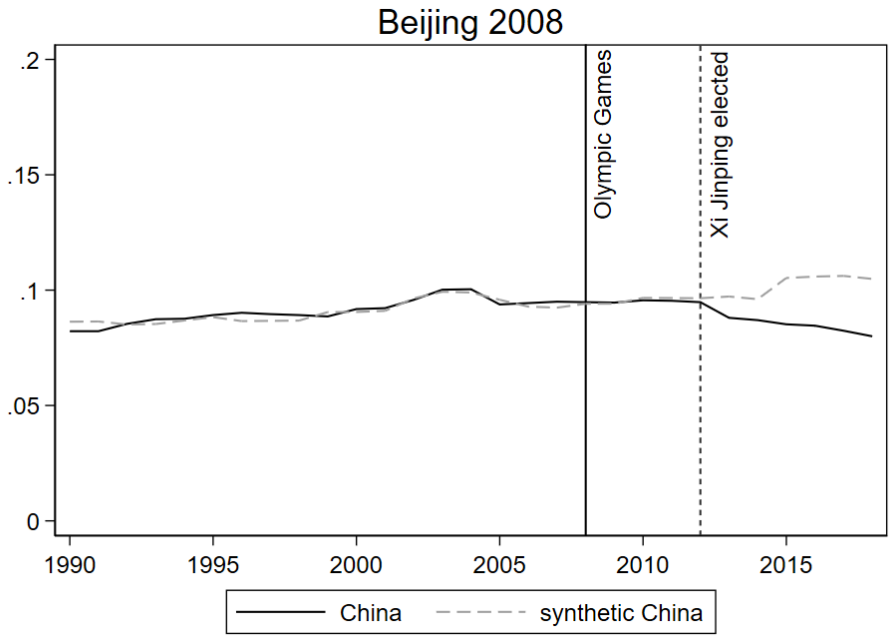
Figure 3 shows the SCM results for China in 2008 and Russia in 2014. The solid lines indicate the observed level of democracy, and the dashed lines represent the synthetic control. The vertical lines indicate the timing of both the Games and the later exogenous shocks.

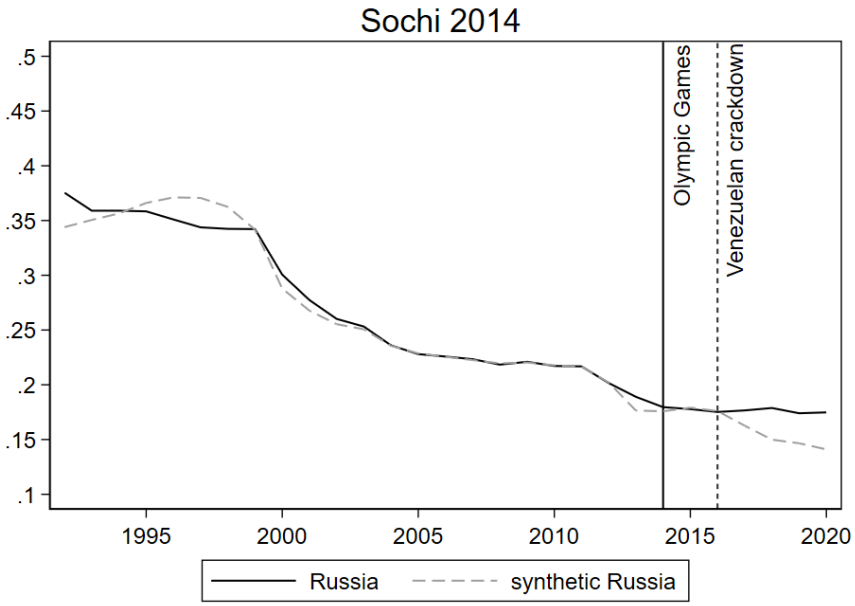
Both the adherence to parallel trends before treatment and the effect of the Olympic games on democracy are clearly observable. Immediately after treatment, there is no deviation of the treated country from its synthetic control, indicating that there is no Olympic effect. We acknowledge the notable deviations of the observed data from the synthetic control in Figure 3. Following Abadie and Gardeazabal (2003), such exogenous shocks to the dependent variable do not affect model performance as long as they are sufficiently distant from and unrelated to the treatment. In the underlying case, we consider both requirements to be fulfilled. Both shocks are sufficiently far removed from the respective Olympic games that we can rule out correlation and can be explained by corresponding events: Chinese democracy falls below its control following the appointment of Xi Jinping as the General Secretary of the Chinese Communist Party and his subsequent “anti-corruption campaign” and other centralizing reforms. Russian

[7] For detailed information on the Chinese donor pool, see Table B2 in the Appendix.

democracy rose above its synthetic control following a shock to a key member of the relevant donor pool: the Venezuelan government delayed and ultimately permanently suspended a recall referendum with broad popular support targeting President Nicolas Maduro in 2016. This incident and a broad economic crisis prompted further protests and government crackdowns such as the National Assembly being stripped of its power.

Figure 3: SCM estimation of country-specific Olympic effects for Russia and China





SCM is not regression-based, does not provide estimates of standard errors, and thus does not allow for hypothesis tests, which makes falsification of the model difficult. As a result, the SCM relies heavily on robustness checks. Abadie and L'Hour (2021) propose two main robustness checks for SCM approaches, namely, in-space and in-time placebo tests. In-space placebos aim to show that the deviation of synthetic controls from observed data is unique for all countries in the donor pool and therefore not random.[8] In the present case, no model revealed a notable post-treatment effect, meaning that in-space placebo tests would not be conclusive. We conduct the in-time placebo test by resetting the year of treatment to one year before the respective country was awarded hosting rights or the Olympic Games. The results are reported in Figure A5. In the case of China, the results remain broadly the same, with only slight deterioration in fit as predictor parameters exit the ten-year prediction interval. In the Russian case, the model

[8] We also examine the efficacy of our SCM models compared to single country DiD approaches with a single treated unit. We find that all synthetic controls match pre-treatment characteristics of the treated country more closely than the donor pool. Considering that the donor pool would be used as the control group in a DiD approach, we posit that the SCM approach is more appropriate in this application. The results are given in Table B3 and B4 in the Appendix alongside with more detailed information on the composition of the synthetic controls of our autocratic countries.

fit declines noticeably. While unfortunate, this is not entirely unexpected due to the difficulty of finding a suitable donor pool that would achieve pre-treatment fit, Russia's donor pool is not restricted; this means that selecting a different time for treatment causes the newly modeled synthetic control to differ much more from the original analysis than it does in the other examples, leading to larger deviations.

5 Conclusion

We first test whether the Olympic Games contribute to the democratic development of host countries. By analyzing data on Olympic games between 1972 and 2014, we first establish the reliability of our data by reproducing the results of Teorell (2010) with our newly collected dataset. Focusing mostly on the period between 1990 and 2014 and utilizing multiple approaches, including the state-of-the-art policy evaluation methods of heterogeneity-robust differences-in-differences as well as individual country analysis based on the synthetic control method, we do not find significant evidence of the effects of the Olympic Games on democracy, neither in democratic nor autocratic states. After multiple robustness tests, we posit that these results are robust to heterogeneous treatment effects, different control group selections, and specifications of the treatment window.

There are caveats to keep in mind with respect to our results. First, our scope is limited to the period of 1990-2014. Second, our analysis happens at a relatively aggregated level of yearly values of overall democracy, meaning that we may overlook smaller scale effects such as the ebb and flows in repression or broad changes in public opinion that are not reflected in legislation.

Our results highlight opportunities for future research. If the Olympics do not produce significant effects on economic growth, as suggested by the majority of the economic literature, nor on democratization according to our analysis, the question of their actual effect still remains. Presenting a positive public image to global audiences may be relevant, as (at least in democracies) popular opinion drives policy, including foreign

policy. Finally, while we consider a decade-long post-treatment window, effects could manifest after that period, especially if we consider that democratization need not be a steady process.

Publication bibliography

Abadie, Alberto (2021): Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects. In *Journal of Economic Literature* 59 (2), pp. 391–425. DOI: 10.1257/jel.20191450.

Abadie, Alberto; Diamond, Alexis; Hainmueller, Jens (2010): Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program. In *Journal of the American Statistical Association* 105 (490), pp. 493–505. DOI: 10.1198/jasa.2009.ap08746.

Abadie, Alberto; Diamond, Alexis; Hainmueller, Jens (2015): Comparative Politics and the Synthetic Control Method. In *American Journal of Political Science* 59 (2), pp. 495–510. DOI: 10.1111/ajps.12116.

Abadie, Alberto; Gardeazabal, Javier (2003): The Economic Costs of Conflict: A Case Study of the Basque Country. In *The American Economic Review* Vol. 93, (No 1), pp. 113–132.

Abadie, Alberto; L'Hour, Jérémy (2021): A Penalized Synthetic Control Estimator for Disaggregated Data. In *Journal of the American Statistical Association* 116 (536), pp. 1817–1834. DOI: 10.1080/01621459.2021.1971535.

Acemoglu, Daron; Johnson, Simon; Robinson, James Alan; Yared, Pierre (2005): From education to democracy? In *American Economic Review* 95 (2), pp. 44–49.

Acemoglu, Daron; Johnson, Simon; Robinson, James Alan; Yared, Pierre (2008): Income and democracy. In *American Economic Review* 98 (3), pp. 808–842.

Ahmadov, Anar; Holstege, Floris (2023): Does schooling promote democracy? A meta-analysis. In *Democratization* 30 (1), pp. 57–77. DOI: 10.1080/13510347.2022.2109016.

Alesina, Alberto; Devleeschauwer, Arnaud; Easterly, William; Kurlat, Sergio; Wacziarg, Romain (2003): Fractionalization. In *J Econ Growth* 8 (2), pp. 155–194. DOI: 10.1023/A:1024471506938.

Apergis, Nicholas; Payne, James E. (2017): From education to democracy: evidence from long-run time-varying estimates. In *Int Rev Econ* 64 (4), pp. 313–325. DOI: 10.1007/s12232-017-0273-8.

Aslaksen, Silje (2010): Oil and democracy: More than a cross-country correlation? In *Journal of Peace Research* 47 (4), pp. 421–431. DOI: 10.1177/0022343310368348.

Associated Press (2001): IOC believes Games will open up China. In *ESPN*, 2001. Available online at https://www.espn.com/oly/news/2001/0713/1225704.html.

Bach, Thomas (2014): Speech on the occasion of Opening Ceremony Sochi 2014 Olympic Winter Games. International Olympic Committee, 2014. Available online at https://stillmed.olympic.org/Documents/Games_Sochi_2014/Speech_Games_Opening_IOC_President.pdf.

Barro, Robert J. (1999): Determinants of Democracy. In *Journal of Political Economy* 107 (S6), S158-S183. DOI: 10.1086/250107.

Barro, Robert J.; Lee, Jong Wha (2013): A new data set of educational attainment in the world, 1950–2010. In *Journal of Development Economics* 104, pp. 184–198. DOI: 10.1016/j.jdeveco.2012.10.001.

Bertrand, Marianne; Duflo, Esther; Mullainathan, Sendhil (2004): How much should we trust differences-in-differences estimates? In *The Quarterly journal of economics* (119.1), pp. 249–275.

Boix, Carles (2011): Democracy, Development, and the International System. In *Am Polit Sci Rev* 105 (4), pp. 809–828. DOI: 10.1017/S0003055411000402.

Brückner, Markus; Pappa, Evi (2015): News Shocks in the Data: Olympic Games and Their Macroeconomic Effects. In *J of Money Credit Banking* 47 (7), pp. 1339–1367. DOI: 10.1111/jmcb.12247.

Caliendo, Marco; Kopeinig, Sabine (2008): Some practical guidance for the implementation of Propensity Score Matching. In *Journal of Economic Surveys* 22 (1), pp. 31–72. DOI: 10.1111/j.1467-6419.2007.00527.x.

Castelló-Climent, A. (2008): On the distribution of education and democracy. In *Journal of Development Economics* 87 (2), pp. 179–190.

Cervellati, Matteo; Jung, Florian; Sunde, Uwe; Vischer, Thomas (2014): Income and Democracy: Comment. In *American Economic Review* 104 (2), pp. 707–719.

Cohen, Daniel; Leker, Laura (2014): Health and Education: Another Look with the Proper Data. In *CEPR Discussion Paper* DP9940. Available online at https://ssrn.com/abstract=2444963.

Cohen, Daniel; Soto, Marcelo (2007): Growth and human capital: good data, good results. In *J Econ Growth* 12 (1), pp. 51–76. DOI: 10.1007/s10887-007-9011-5.

Coppedge, Michael; Gerring, John; Knutsen, Carl Henrik; Krusell, Joshua; Medzihorsky, Juraj; Pernes, Josefine et al. (2019): The Methodology of "Varieties of Democracy" (V-Dem). In *Bulletin of Sociological Methodology* (143(1)), pp. 107–133. DOI: 10.1177/0759106319854989.

de Chaisemartin, Clément; D'Haultfoeuille, Xavier (2023): Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: A survey. In *The Econometrics Journal* (26.3), C1-C30.

de Chaisemartin, Clément; D'Haultfoeuille, Xavier (2024): Difference-in-differences estimators of intertemporal treatment effects. In *Review of Economics and Statistics*, pp. 1–45.

Drazanova, Lenka (2020): Introducing the Historical Index of Ethnic Fractionalization (HIEF) Dataset: Accounting for Longitudinal Changes in Ethnic Diversity. In *Journal of Open Humanities Data* 6, Article 6. DOI: 10.5334/johd.16.

Espy, Richard (1981): The politics of the Olympic Games: with an epilogue, 1976-1980: Univ of California Press.

Feddersen, Arne; Maennig, Wolfgang (2013): MEGA-EVENTS AND SECTORAL EMPLOYMENT: THE CASE OF THE 1996 OLYMPIC GAMES. In *Contemporary Economic Policy* 31 (3), pp. 580–603. DOI: 10.1111/j.1465-7287.2012.00327.x.

FIFA (2017): FIFA activity update on human rights. FIFA. Available online at https://digitalhub.fifa.com/m/374ed18bc52dbef4/original/ah5ghjuqbc6nzdbtpxhy-pdf.pdf, checked on 7/3/2024.

FIFA Human Rights Advisory Board (2020): Fourth Report by the FIFA Human Rights Advisory Board. FIFA. Available online at https://digitalhub.fifa.com/m/25237da419e1f62f/original/pyume2cahuue2szxgjwq-pdf.pdf, checked on 7/3/2024.

Firgo, Matthias (2021): The causal economic effects of Olympic Games on host regions. In *Regional Science and Urban Economics* 88, p. 103673. DOI: 10.1016/j.regsciurbeco.2021.103673.

Fourie, Johan; Santana-Gallego, María (2011): The impact of mega-sport events on tourist arrivals. In *Tourism Management* 32 (6), pp. 1364–1370. DOI: 10.1016/j.tourman.2011.01.011.

Fourie, Johan; Santana-Gallego, María (2022): Mega-sport events and inbound tourism: New data, methods and evidence. In *Tourism Management Perspectives* 43, p. 101002. DOI: 10.1016/j.tmp.2022.101002.

Glaeser, Edward L.; La Porta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei (2004): Do Institutions Cause Growth? In *Journal of Economic Growth* 9 (3), pp. 271–303. DOI: 10.1023/B:JOEG.0000038933.16398.ed.

Hadenius, Axel; Teorell, Jan (2007): PATHWAYS FROM AUTHORITARIANISM. In *Journal of Democracy* (143).

Hersh, Philip (2008): Rogge stands tall. In *Chicago Tribune*, 2008. Available online at https://www.chicagotribune.com/2008/04/11/rogge-stands-tall/.

Hotchkiss, Julie L.; Moore, Robert E.; Rios-Avila, Fernando (2015): Reevaluation of the Employment Impact of the 1996 Summer Olympic Games. In *Southern Economic Journal* 81 (3), pp. 619–632. DOI: 10.4284/0038-4038-2013.063.

Hotchkiss, Julie L.; Moore, Robert E.; Zobay, Stephanie M. (2003): Impact of the 1996 Summer Olympic Games on Employment and Wages in Georgia. In *Southern Economic Journal* 69 (3), pp. 691–704. DOI: 10.1002/j.2325-8012.2003.tb00521.x.

International Olympic Committee (2023): Olympic Charter. Source: https://stillmed.olympics.com/media/Document Library/OlympicOrg/General/EN-Olympic-Charter.pdf.

Langer, Viktoria C. E.; Maennig, Wolfgang; Richter, Felix (2018): The Olympic Games as a News Shock. In *Journal of Sports Economics* 19 (6), pp. 884–906. DOI: 10.1177/1527002517690788.

Maennig, Wolfgang; Richter, Felix (2012): Exports and Olympic Games: Is there a Signal Effect? In *Journal of Sports Economics* 13 (6), pp. 635–641. DOI: 10.1177/1527002512454663.

McLaren, Richard H. (2016): Independent Person WADA investigarion of Sochi allegations. Available online at https://www.wada-ama.org/sites/default/files/resources/files/20160718_ip_report_newfinal.pdf, checked on 7/3/2024.

Michael Coppedge et al. (2024): V-Dem Dataset v14.

Mitchell, Heather; Stewart, Mark Fergusson (2015): What should you pay to host a party? An economic analysis of hosting sports mega-events. In *Applied Economics* 47 (15), pp. 1550–1561. DOI: 10.1080/00036846.2014.1000522.

Nickell, Stephen (1981): Biases in Dynamic Models with Fixed Effects. In *Econometrica* 49 (6), p. 1417. DOI: 10.2307/1911408.

Nitsch, Volker; Wendland, Nicolai (2017): The IOC's midas touch: Summer Olympics and city growth. In *Urban Studies* 54 (4), pp. 971–983. DOI: 10.1177/0042098015623719.

Reuters (2007): The story. In *CNN*, 2007. Available online at https://edition.cnn.com/2007/SPORT/08/06/olympics.rogge.reut/other1.html.

Rose, Andrew K.; Spiegel, Mark M. (2011): The Olympic Effect. In *The Economic Journal* 121 (553), pp. 652–677. DOI: 10.1111/j.1468-0297.2010.02407.x.

Rosenbaum, Paul R.; Rubin, Donald (1983): The central role of the propensity score in observational studies for causal effects. In *Biometrika* 70 (1), pp. 41–55. DOI: 10.1093/biomet/70.1.41.

Ross, Michael L. (2001): Does Oil Hinder Democracy? In *World Pol.* 53 (3), pp. 325–361. DOI: 10.1353/wp.2001.0011.

Ross, Michael L. (2015): What Have We Learned about the Resource Curse? In *Annu. Rev. Polit. Sci.* 18 (1), pp. 239–259. DOI: 10.1146/annurev-polisci-052213-040359.

Sarantakes, Nicholas Evan (2010): Dropping the torch: Jimmy Carter, the Olympic boycott, and the Cold War: Cambridge University Press.

Scharpf, Adam; Gläßel, Christian; Edwards, Pearce (2023): International Sports Events and Repression in Autocracies: Evidence from the 1978 FIFA World Cup. In *Am Polit Sci Rev* 117 (3), pp. 909–926. DOI: 10.1017/S0003055422000958.

Selection Of Beijing Seen As Positive Step Toward Reform (2001). In *Sports Business Journal*, 2001. Available online at https://www.sportsbusinessjournal.com/Daily/Issues/2001/07/16/Olympics/Selection-Of-Beijing-Seen-As-Positive-Step-Toward-Reform.aspx.

Shipley, Amy (2001): Beijing Is Awarded Summer Olympics. In *Washington Post*, 2001. Available online at https://www.washingtonpost.com/archive/politics/2001/07/14/beijing-is-awarded-summer-olympics/c5c74b57-0925-456a-b2ee-ab2969661339/.

Stinnett, Douglas M.; Tir, Jaroslav; Diehl, Paul F.; Schafer, Philip; Gochman, Charles (2002): The Correlates of War (Cow) Project Direct Contiguity Data, Version 3.0. In *Conflict Management and Peace Science* 19 (2), pp. 59–67. DOI: 10.1177/073889420201900203.

Teorell, Jan (2010): Determinants of Democratization: Explaining Regime Change in the World, 1972-2006. Cambridge: Cambridge University Press.

Tsui, Kevin K. (2011): More Oil, Less Democracy: Evidence from Worldwide Crude Oil Discoveries. In *The Economic Journal* 121 (551), pp. 89–115. DOI: 10.1111/j.1468-0297.2009.02327.x.

Wood, Jeremy; Meng, Samuel (2021): The economic impacts of the 2018 Winter Olympics. In *Tourism Economics* 27 (7), pp. 1303–1322. DOI: 10.1177/1354816620921577.

Appendix A: Figures

Figure A1: DiD estimation after DCDH on years from 1989 onwards

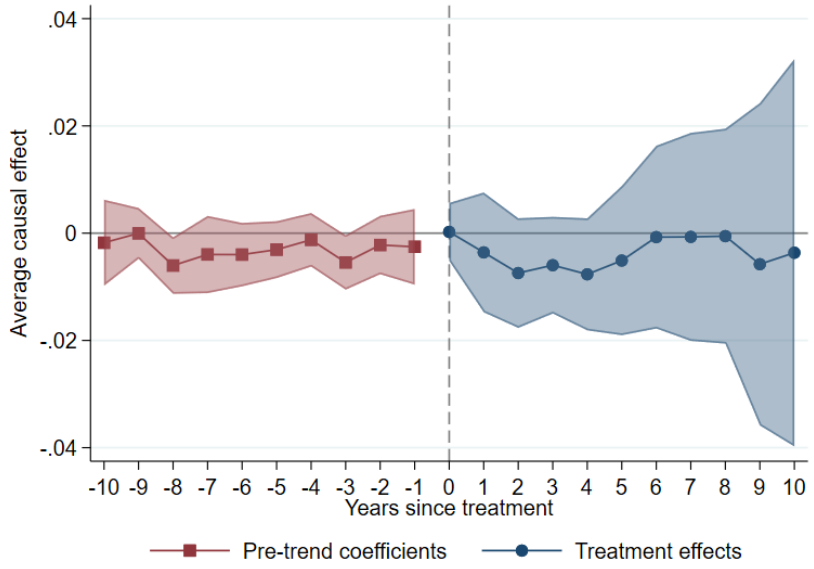


Figure A2: DiD estimation after DCDH with matched treated and control groups

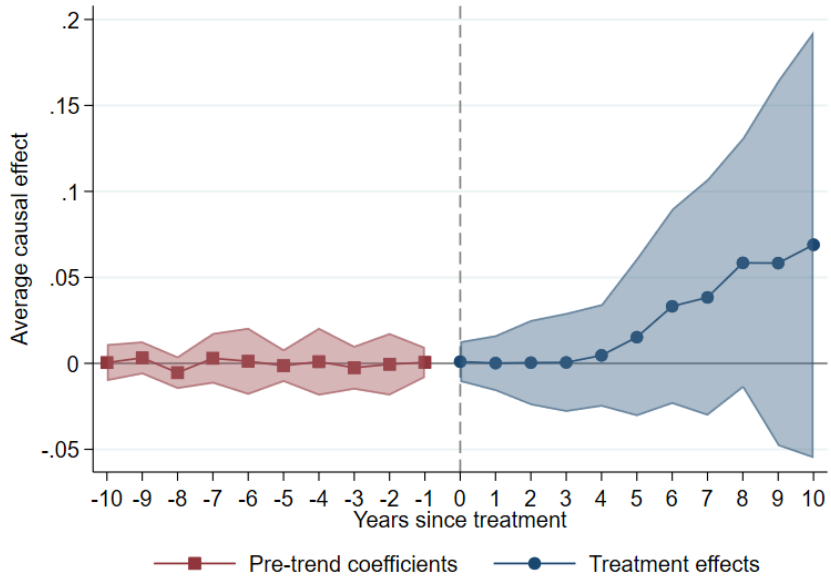


Figure A3: DiD estimation after DCDH, treatment timing backdated to successful application

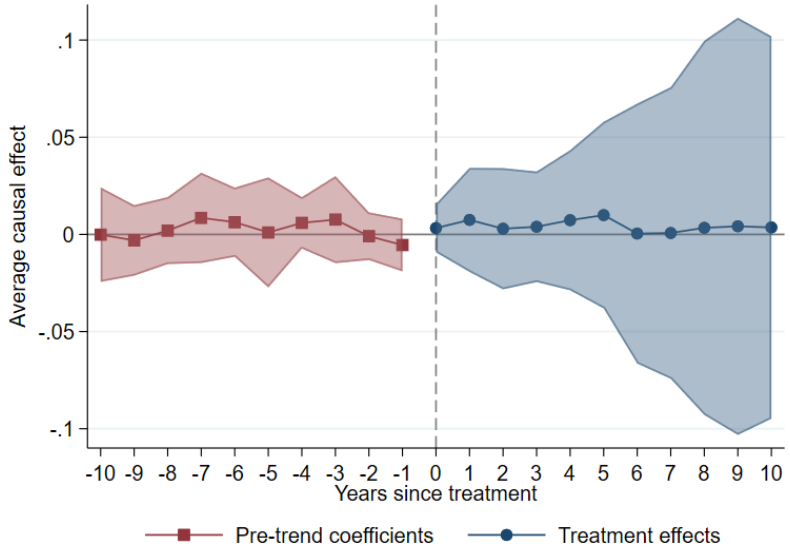


Figure A4: DiD estimation after DCDH, successful applicants instead of hosts as treatment group

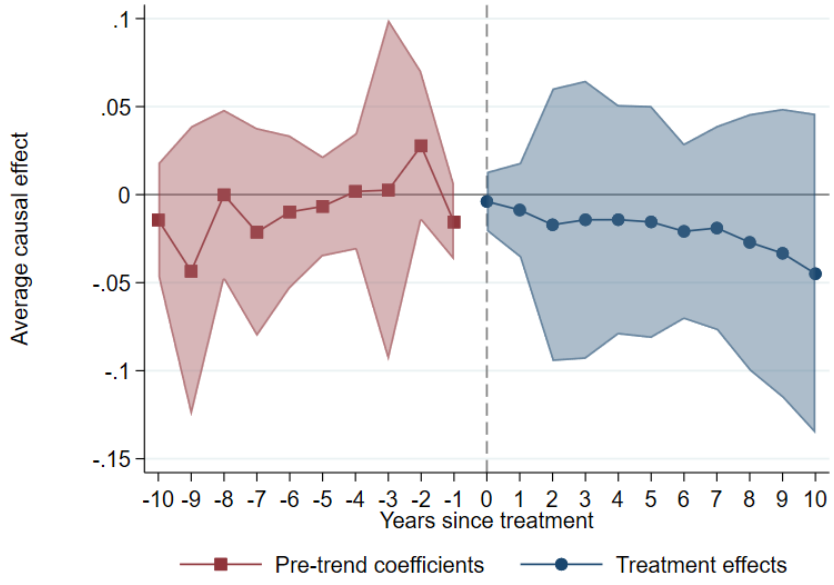


Figure A5: DiD estimation after DCDH, for democratic treatment- and control group

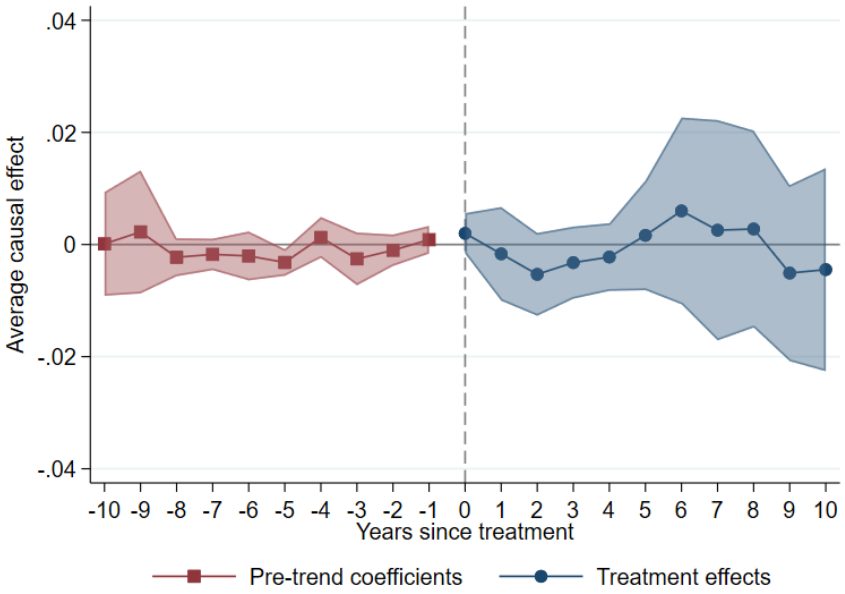
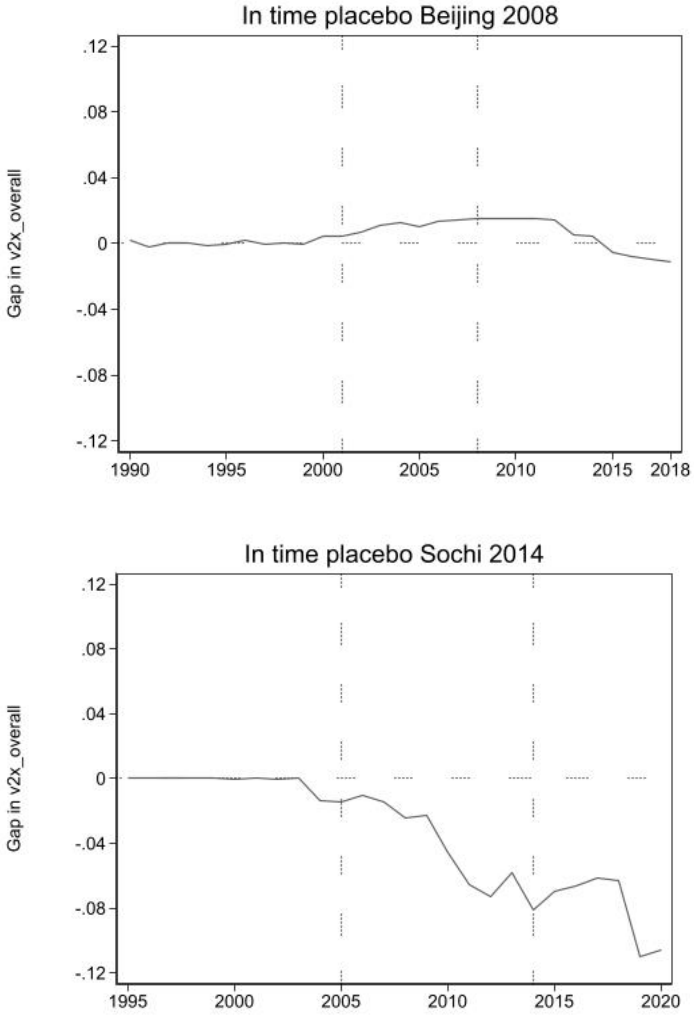


Figure A6: SCM Robustness: In time placebo für Russia and China



Appendix B: Tables

Table B1: Determinants of democracy and Olympic effect, full table

VARIABLES	(1) 1972-2006	(2) 1972-2014	(3) 1972-2014
Year 10 before treatment			-0.0014
			(0.0030)
Year 9 before treatment			-0.0013
			(0.0029)
Year 8 before treatment			-0.0028
			(0.0028)
Year 7 before treatment			-0.0023
			(0.0038)
Year 6 before treatment			-0.0006
			(0.0037)
Year 5 before treatment			-0.0011
			(0.0027)
Year 4 before treatment			-0.0024
			(0.0035)
Year 3 before treatment			-0.0031
			(0.0048)
Year 2 before treatment			-0.0025
			(0.0029)
Year 1 before treatment			-0.0030
			(0.0035)
Treatment			-0.0022
			(0.0033)
Year 1 after treatment			-0.0062
			(0.0043)
Year 2 after treatment			-0.0078***
			(0.0026)
Year 3 after treatment			-0.0009
			(0.0041)
Year 4 after treatment			-0.0036
			(0.0031)
Year 5 after treatment			-0.0012
			(0.0027)
Year 6 after treatment			0.0013
			(0.0036)
Year 7 after treatment			-0.0019
			(0.0030)
Year 8 after treatment			-0.0028
			(0.0038)
Year 9 after treatment			-0.0017

			(0.0030)
Year 10 after treatment			0.0004
			(0.0030)
Lag of democracy	0.1600***	0.1636***	0.1635***
	(0.0423)	(0.0352)	(0.0354)
Second lag of democracy	-0.2830***	-0.2748***	-0.2749***
	(0.0356)	(0.0297)	(0.0299)
GDP per capita (ln)	-0.0076	-0.0046	-0.0046
	(0.0047)	(0.0036)	(0.0036)
Change of GDP per capita (ln)	0.0102	0.0083	0.0083
	(0.0109)	(0.0090)	(0.0090)
Democracy of neighbors	0.0574***	0.0465**	0.0467**
	(0.0215)	(0.0193)	(0.0194)
No land borders	0.0560	0.0352	0.0346
	(0.0437)	(0.0302)	(0.0301)
Share of Muslims	0.0608	0.0402	0.0404
	(0.0496)	(0.0334)	(0.0337)
Ethnic fractionalization	-0.1084	-0.0416	-0.0415
	(0.0829)	(0.0438)	(0.0442)
Years of schooling	-0.0024	0.0004	0.0005
	(0.0027)	(0.0018)	(0.0019)
Share of oil rents of GDP	0.0002	0.0001	0.0001
	(0.0002)	(0.0002)	(0.0002)
Share of mineral rents of GDP	0.0008	0.0002	0.0002
	(0.0008)	(0.0005)	(0.0005)
Share of trade of GDP	0.0000	0.0000	0.0000
	(0.0001)	(0.0000)	(0.0000)
Non-agricultural share of GDP	-0.0003	-0.0002	-0.0002
	(0.0003)	(0.0002)	(0.0002)
Share of population in cities	0.0002	-0.0001	-0.0001
	(0.0003)	(0.0002)	(0.0002)
Population (ln)	-0.0007	0.0007	0.0003
	(0.0125)	(0.0063)	(0.0064)
Male-female education gap	0.0018	0.0033*	0.0034*
	(0.0030)	(0.0020)	(0.0020)
Share of Christians	-0.0280	-0.0123	-0.0125
	(0.0340)	(0.0193)	(0.0196)
Share of Jews	-0.2413	-0.0049	-0.0075
	(0.3155)	(0.1106)	(0.1124)
Share of Buddhists	-0.0005	0.0105	0.0118
	(0.0245)	(0.0207)	(0.0209)
Share of Hindus	-0.0191	0.0840**	0.0848**
	(0.0610)	(0.0408)	(0.0411)
Share of non-religious	-0.0556**	-0.0365**	-0.0372*
	(0.0234)	(0.0183)	(0.0189)
Share of other religions	0.0046	0.0134*	0.0141*
	(0.0217)	(0.0079)	(0.0076)

Country-specific FEs	YES	YES	YES
Yearly FEs	YES	YES	YES
Observations	2,390	3,188	3,188
R-squared	0.2034	0.1873	0.1875

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table B2: Donor Pool SCM China

Country	Name in dataset	geographical	Data coverage	(informal) association
Indonesia	Indonesia	Southeast Asia	1960-2021	ASEAN , (Tiger state)
Cambodia	Cambodia	Southeast Asia	1960-2021	ASEAN
Lao	Lao PDR	Southeast Asia	1960-2021	ASEAN
Malaysia	Malaysia	Southeast Asia	1960-2021	ASEAN, (Tiger state)
Myanmar	Myanmar	Southeast Asia	1960-2021	ASEAN
Phillipines	Philippines	Southeast Asia	1960-2021	ASEAN, (Tiger state)
Singapoure	Singapore	Southeast Asia	1960-2021	ASEAN, Tiger state
Thailand	Thailand	Southeast Asia	1960-2021	ASEAN ,(Tiger state)
Vietnam	Vietnam	Southeast Asia	1960-2021	ASEAN
Japan	Japan	East Asia	1960-2021	OECD
South Korea	Korea, Rep.	East Asia	1960-2021	Tiger state
North Korea	Korea, Dem. People's Rep.	East asia	1960-2021	
Mongolia	Mongolia	East asia	1960-2021	
Hong Kong	Hong Kong SAR, China	East asia	NA	Tiger state
Taiwan	NA	East asia	NA	Tiger state
Bangladesh	Bangladesh	South Asia	1971-2021	SAARC
Bhutan	Bhutan	South Asia	1960-2021	SAARC
India	India	South Asia	1960-2021	SAARC
Nepal	Nepal	South Asia	1960-2021	SAARC
Pakistan	Pakistan	South Asia	1960-2021	SAARC, ECO
Sri Lanka	Sri Lanka	South Asia	1960-2021	SAARC
Afghanistan	Afghanistan	Central Asia	1960-2021	SAARC, ECO
Azerbaijan	Azerbaijan	Central Asia	1990-2021	ECO, former SU

Iran	Iran, Islamic Rep.	Central Asia	1960-2021	ECO
Kazakhstan	Kazakhstan	Central Asia	1990-2021	ECO, former SU
Kyrgyztan	Kyrgyz Republic	Central Asia	1990-2021	ECO, former SU
Tajikistan	Tajikistan	Central Asia	1990-2021	ECO, former SU
Turkey	Turkiye	Central Asia	1960-2021	ECO
Turkmenistan	Turkmenistan	Central Asia	1990-2021	ECO, former SU
Uzbekistan	Uzbekistan	Central Asia	1990-2021	ECO, former SU
Russia	Russian Federation	Central Asia	1985-2021	former SU

Table B3: Specifics: Beijing '08

Donor Pool	excluded	Composition	Predictor	Treated	Synthetic	Average Donor pool
See Table B2	Russia	0.6 % Afghanistan	lag 1	.0906	.0902292	.310324
	Myanmar	2.5 % Indonesia	lag 2	.0903625	.0900655	.3105915
	Uzbekistan	7.5 % Sri Lanka	lag 3	.0901333	.089681	.3106411
	Turkmenistan	6 % Pakistan	lag 4	.0894	.0890169	.3105373
	Tajikistan	83.1 % North Korea	lag 5	.0885692	.0882253	.3103734
	Kyrgyztan	0.2 % Thailand	lag 6	.0879667	.0875402	.3102322
	Kazakhstan	0.2 % Turkey	lag 7	.0875818	.0872233	.309896
	Azerbaijan		lag 8	.08716	.0868916	.3095254
			lag 9	.087	.0864899	.3088565
			lag 10	.086725	.0864516	.3074339

Table B4: Specifics: Sochi '14

Donor Pool	excluded	Composition	Predictor	Treated	Synthetic	Average Donor pool
Global	China	2.2 % Bangladesh	lag 1	.2814667	.2815883	.4116519
		32.5% Eritrea	lag 2	.28546	.2855639	.4116058
		7.9% Haiti	lag 3	.2890737	.2891957	.4113548
		4.5% Sri Lanka	lag 4	.2930667	.2931678	.4110123
		0.7% Moldova	lag 5	.2973059	.2974501	.4105746
		6.8% Mali	lag 6	.3022375	.3023179	.4099888
		1.4% Myanmar	lag 7	.3074933	.3076363	.4092779
		2% Turkey	lag 8	.3133286	.3134963	.408429
		42.1% Venezuela	lag 9	.3198923	.320024	.4074725
			lag 10	.3268833	.3270567	.4060825

Table B5: Hosts and applicants for the Olympic games in our dataset

Year	Summer or Winter	Host country	Applicants	Election date
1972	Summer	Germany	Spain, Canada, USA	25/4/1966
1972	Winter	Japan	Canada, Finland, USA	25/4/1966
1976	Summer	Canada	USSR, USA	12/5/1970
1976	Winter	USA	Switzerland, Finland, Canada	12/5/1970
1980	Summer	USSR	USA	13/10/1974
1980	Winter	USA	-	13/10/1974
1984	Summer	USA	-	18/5/1978
1984	Winter	Yugoslavia	Japan, Sweden	18/5/1978
1988	Summer	South Korea	Japan	30/9/1981
1988	Winter	Canada	Sweden, Italy	30/9/1981
1992	Summer	Spain	France, Yugoslavia, Australia, United Kingdom, Netherlands	17/10/1986
1992	Winter	France	Bulgaria, Sweden, Norway, Italy, USA	17/10/1986
1994	Winter	Norway	Sweden, USA, Bulgaria	15/9/1988
1996	Summer	USA	Greece, Canada, Astralia, United Kingdom, Yugoslavia	18/9/1990
1998	Winter	Japan	USA, Sweden, Spain, Italy	15/6/1991
2000	Summer	Australia	China, United Kingdom, Germany, Turkey	23/9/1993
2002	Winter	USA	Sweden, Switzerland, Canada	16/6/1995
2004	Summer	Greece	Italy, South Africa, Sweden, Argentina	5/9/1997
2006	Winter	Italy	Switzerland	19/6/1999
2008	Summer	China	Canada, France, Turkey, Japan	13/7/2001
2010	Winter	Canada	South Korea, Austria	2/7/2003

2012	Summer	United Kingdom	France, Spain, USA, Russia	6/7/2005
2014	Winter	Russia	South Korea, Austria	4/7/2007
2016	Summer	Brazil	Spain, Japan, USA	2/10/2009
2018	Winter	South Korea	Germany, France	6/7/2011
2020	Summer	Japan	Turkey, Spain	7/9/2013
2022	Winter	China	Kazakhstan	31/7/2015
2024	Summer	France	-	13/9/2017

Hamburg Contemporary Economic Discussions

(Download: https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/research/hceds.html)

77 DÖRR, L., LEPPERT E., MAENNIG W.: Olympic games and Democracy, 2024.

76 DÖRR, L.: Aid and growth: Asymmetric effects?, 2024.

75 CREUTZBURG, C. / MAENNIG, W. / MUELLER, S. Q.: From bias to bliss: Racial preferences and worker productivity in tennis, 2024.

74 MAENNIG, W. / WILHELM, S.: Crime Prevention Effects of Data Retention Policies, 2023.

73 MAENNIG, W.: Centralization in national high-performance sports systems: Reasons, processes, dimensions, characteristics, and open questions, 2023.

72 MAENNIG, W. / WILHELM, S.: News and noise in crime politics: The role of announcements and risk attitudes, 2022.

71 MAENNIG, W.: Auch in Peking 2022: Relativ schwache Medaillenausbeute der SportsoldatInnen, 2022.

70 MAENNIG, W. / MUELLER, S. Q.: Heterogeneous consumer preferences for product quality and uncertainty, 2021.

69 MAENNIG, W. / MUELLER, S. Q.: Consumer and employer discrimination in professional sports markets – New evidence from Major League Baseball, 2021.

68 ECKERT, A. / MAENNIG, W.: Pharma-Innovationen: Überragende Position der USA und Schwächen der deutschen universitären und außeruniversitären Forschung, 2021.

67 MUELLER, S. Q. / RING, P. / FISCHER, M.: Excited and aroused: The predictive importance of simple choice process metrics, 2020.

66 MUELLER, S. Q. / RING, P. / SCHMIDT, M.: Forecasting economic decisions under risk: The predictive importance of choice-process data, 2019.

65 MUELLER, S. Q.: Pre- and within-season attendance forecasting in Major League Baseball: A random forest approach, 2018.

64 KRUSE, F. K. / MAENNIG, W.: Suspension by choice – determinants and asymmetries, 2018.

63 GROTHE, H. / MAENNIG, W.: A 100-million-dollar fine for Russia's doping policy? A billion-dollar penalty would be more correct! Millionenstrafe für Russlands Doping-Politik? Eine Milliarden-Strafe wäre richtiger! 2017.

Hamburg Contemporary Economic Discussions

(Download: https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/research/hceds.html)

62 MAENNIG, W., / SATTARHOFF, C. / STAHLECKER, P.: Interpretation und mögliche Ursachen statistisch insignikanter Testergebnisse - eine Fallstudie zu den Beschäftigungseffekten der Fußball-Weltmeisterschaft 2006, 2017.

61 KRUSE, F. K. / MAENNIG, W.: The future development of world records, 2017.

60 MAENNIG, W.: Governance in Sports Organizations, 2017.

59 AHLFELDT, G. M. / MAENNIG, W. / FELIX J. RICHTER: Zoning in reunified Berlin, 2017.

58 MAENNIG, W.: Major Sports Events: Economic Impact, 2017.

57 MAENNIG, W.: Public Referenda and Public Opinion on Olympic Games, 2017.

56 MAENNIG, W. / WELLBROCK, C.: Rio 2016: Sozioökonomische Projektion des Olympischen Medaillenrankings, 2016.

55 MAENNIG, W. / VIERHAUS, C.: Which countries bid for the Olympic Games? Economic, political, and social factors and chances of winning, 2016.

54 AHLFELDT, G. M. / MAENNIG, W. / STEENBECK, M.: Après nous le déluge? Direct democracy and intergenerational conflicts in aging societies, 2016.

53 LANGER, V. C. E.: Good news about news shocks, 2015.

52 LANGER, V. C. E. / MAENNIG, W. / RICHTER, F. J.: News Shocks in the Data: Olympic Games and their Macroeconomic Effects – Reply, 2015.

51 MAENNIG, W.: Ensuring Good Governance and Preventing Corruption in the Planning of Major Sporting Events – Open Issues, 2015.

50 MAENNIG, W. / VIERHAUS, C.: Who Wins Olympic Bids? 2015 (3rd version).

49 AHLFELDT, G. M. / MAENNIG, W. / RICHTER, F.: Urban Renewal after the Berlin Wall, 2013.

48 BRANDT, S. / MAENNIG, W. / RICHTER, F.: Do Places of Worship Affect Housing Prices? Evidence from Germany, 2013.

47 ARAGÃO, T. / MAENNIG, W.: Mega Sporting Events, Real Estate, and Urban Social Economics – The Case of Brazil 2014/2016, 2013.

46 MAENNIG, W. / STEENBECK, M. / WILHELM, M.: Rhythms and Cycles in Happiness, 2013.

Hamburg Contemporary Economic Discussions

(Download: https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/research/hceds.html)

45 RICHTER, F. / STEENBECK, M. / WILHELM, M.: The Fukushima Accident and Policy Implications: Notes on Public Perception in Germany, 2014 (2nd version).

44 MAENNIG, W.: London 2012 – das Ende des Mythos vom erfolgreichen Sportsoldaten, 2012.

43 MAENNIG, W. / WELLBROCK, C.: London 2012 – Medal Projection – Medaillenvorausberechnung, 2012.

42 MAENNIG, W. / RICHTER, F.: Exports and Olympic Games: Is there a Signal Effect? 2012.

41 MAENNIG, W. / WILHELM, M.: Becoming (Un)employed and Life Satisfaction: Asymmetric Effects and Potential Omitted Variable Bias in Empirical Happiness Studies, 2011.

40 MAENNIG, W.: Monument Protection and Zoning in Germany: Regulations and Public Support from an International Perspective, 2011.

39 BRANDT, S. / MAENNIG, W.: Perceived Externalities of Cell Phone Base Stations – The Case of Property Prices in Hamburg, Germany, 2011.

38 MAENNIG, W. / STOBERNACK, M.: Do Men Slow Down Faster than Women? 2010.

37 DU PLESSIS, S. A. / MAENNIG, W.: The 2010 World Cup High-frequency Data Economics: Effects on International Awareness and (Self-defeating) Tourism, 2010.

36 BISCHOFF, O.: Explaining Regional Variation in Equilibrium Real Estate Prices and Income, 2010.

35 FEDDERSEN, A. / MAENNIG, W.: Mega-Events and Sectoral Employment: The Case of the 1996 Olympic Games, 2010.

34 FISCHER, J.A.V. / SOUSA-POZA, A.: The Impact of Institutions on Firms Rejuvenation Policies: Early Retirement with Severance Pay versus Simple Lay-Off. A Cross-European Analysis, 2010.

33 FEDDERSEN, A. / MAENNIG, W.: Sectoral Labor Market Effects of the 2006 FIFA World Cup, 2010.

32 AHLFELDT, G.: Blessing or Curse? Appreciation, Amenities, and Resistance

around the Berlin "Mediaspree", 2010.

31 FALCH, T. / FISCHER, J.A.V.: Public Sector Decentralization and School Performance: International Evidence, 2010.

30 AHLFELDT, G. / MAENNIG, W. / ÖLSCHLÄGER, M.: Lifestyles and Preferences for (Public) Goods: Professional Football in Munich, 2009.

29 FEDDERSEN, A. / JACOBSEN, S. / MAENNIG, W.: Sports Heroes and Mass Sports Participation – The (Double) Paradox of the "German Tennis Boom", 2009.

28 AHLFELDT, G. / MAENNIG, W. / OSTERHEIDER, T.: Regional and Sectoral Effects of a Common Monetary Policy: Evidence from Euro Referenda in Denmark and Sweden, 2009.

27 BJØRNSKOV, C. / DREHER, A. / FISCHER, J.A.V. / SCHNELLENBACH, J.: On the Relation Between Income Inequality and Happiness: Do Fairness Perceptions Matter? 2009.

26 AHLFELDT, G. / MAENNIG, W.: Impact of Non-Smoking Ordinances on Hospitality Revenues: The Case of Germany, 2009.

25 FEDDERSEN, A. / MAENNIG, W.: Wage and Employment Effects of the Olympic Games in Atlanta 1996 Reconsidered, 2009.

24 AHLFELDT, G. / FRANKE, B. / MAENNIG, W.: Terrorism and the Regional and Religious Risk Perception of Foreigners: The Case of German Tourists, 2009.

23 AHLFELDT, G. / WENDLAND, N.: Fifty Years of Urban Accessibility: The Impact of Urban Railway Network on the Land Gradient in Industrializing Berlin, 2008.

22 AHLFELDT, G. / FEDDERSEN, A.: Determinants of Spatial Weights in Spatial Wage Equations: A Sensitivity Analysis, 2008.

21 MAENNIG, W. / ALLMERS, S.: South Africa 2010: Economic Scope and Limits, 2008.

20 MAENNIG, W. / WELLBROCK, C.-M.: Sozio-ökonomische Schätzungen Olympischer Medaillengewinne: Analyse-, Prognose- und Benchmark-möglichkeiten, 2008.

Hamburg Contemporary Economic Discussions

(Download: https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/research/hceds.html)

19 AHLFELDT, G.: The Train has Left the Station: Real Estate Price Effects of Mainline Realignment in Berlin, 2008.

18 MAENNIG, W. / PORSCHE, M.: The Feel-good Effect at Mega Sport Events – Recommendations for Public and Private Administration Informed by the Experience of the FIFA World Cup 2006, 2008.

17 AHLFELDT, G. / MAENNIG, W.: Monumental Protection: Internal and External Price Effects, 2008.

16 FEDDERSEN, A. / GRÖTZINGER, A. / MAENNIG, W.: New Stadia and Regional Economic Development – Evidence from FIFA World Cup 2006 Stadia, 2008.

15 AHLFELDT, G. / FEDDERSEN, A.: Geography of a Sports Metropolis, 2007.

14 FEDDERSEN, A. / MAENNIG, W.: Arenas vs. Multifunctional Stadia – Which Do Spectators Prefer? 2007.

13 AHLFELDT, G.: A New Central Station for a Unified City: Predicting Impact on Property Prices for Urban Railway Network Extension, 2007.

12 AHLFELDT, G.: If Alonso was Right: Accessibility as Determinant for Attractiveness of Urban Location, 2007.

11 AHLFELDT, G., MAENNIG, W.: Assessing External Effects of City Airports: Land Values in Berlin, 2007.

10 MAENNIG, W.: One Year Later: A Re-Appraisal of the Economics of the 2006 Soccer World Cup, 2007.

09 HAGN, F. / MAENNIG, W.: Employment Effects of the World Cup 1974 in Germany.

08 HAGN, F. / MAENNIG W.: Labour Market Effects of the 2006 Soccer World Cup in Germany, 2007.

07 JASMAND, S. / MAENNIG, W.: Regional Income and Employment Effects of the 1972 Munich Olympic Summer Games, 2007.

06 DUST, L. / MAENNIG, W.: Shrinking and Growing Metropolitan Areas – Asymmetric Real Estate Price Reactions? The Case of German Single-family Houses, 2007.

05 HEYNE, M. / MAENNIG, W. / SUESSMUTH, B.: Mega-sporting Events as

Experience Goods, 2007.

04 DU PLESSIS, S. / MAENNIG, W.: World Cup 2010: South African Economic Perspectives and Policy Challenges Informed by the Experience of Germany 2006, 2007.

03 AHLFELDT, G. / MAENNIG, W.: The Impact of Sports Arenas on Land Values: Evidence from Berlin, 2007.

02 FEDDERSEN, A. / MAENNIG, W. / ZIMMERMANN, P.: How to Win the Olympic Games – The Empirics of Key Success Factors of Olympic Bids, 2007.

01 AHLFELDT, G. / MAENNIG, W.: The Role of Architecture on Urban Revitalization: The Case of "Olympic Arenas" in Berlin-Prenzlauer Berg, 2007.

04/2006 MAENNIG, W. / SCHWARTHOFF, F.: Stadium Architecture and Regional Economic Development: International Experience and the Plans of Durban, October 2006.

03/2006 FEDDERSEN, A. / VÖPEL, H.: Staatliche Hilfen für Profifußballclubs in finanziellen Notlagen? – Die Kommunen im Konflikt zwischen Imageeffekten und Moral-Hazard-Problemen, September 2006.

02/2006 FEDDERSEN, A.: Measuring Between-season Competitive Balance with Markov Chains, July 2006.

01/2006 FEDDERSEN, A.: Economic Consequences of the UEFA Champions League for National Championships – The Case of Germany, May 2006.

04/2005 BUETTNER, N. / MAENNIG, W. / MENSSEN, M.: Zur Ableitung einfacher Multiplikatoren für die Planung von Infrastrukturkosten anhand der Aufwendungen für Sportstätten – eine Untersuchung anhand der Fußball-WM 2006, May 2005.

03/2005 SIEVERS, T.: A Vector-based Approach to Modeling Knowledge in Economics, February 2005.

02/2005 SIEVERS, T.: Information-driven Clustering – An Alternative to the Knowledge Spillover Story, February 2005.

Hamburg Contemporary Economic Discussions

(Download: https://www.wiso.uni-hamburg.de/en/fachbereich-vwl/professuren/maennig/research/hceds.html)

01/2005 FEDDERSEN, A. / MAENNIG, W.: Trends in Competitive Balance: Is there Evidence for Growing Imbalance in Professional Sport Leagues? January 2005.

Hamburg

Contemporary Economic Discussions

HCED NO. 77