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Does Hosting a Mega-Event Bring Tangible Benefits in Tourism, Infrastructure Development, and GDP Growth?

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ABSTRACT

Does hosting a mega-event bring any tangible benefits for the country in terms of tourism, infrastructure development, and GDP growth? In order to test the hypothesis, I built an original international panel dataset on seven mega-events (Olympics and FIFA World Cups) spanning the period from 1992 to 2024 and supplemented it with a panel on the 10 German host cities of UEFA EURO 2024 containing 40 observations. In total, I did not manage to find a consistent relationship between the event and the dependent variables in my sample. Tourism did not follow one particular pattern either. No positive association was detected between the level of infrastructure investment and tourism performance. The two largest spenders in my sample, London 2012 and Rio 2016, had a moderate delayed pay-off and almost zero pay-off, correspondingly. At the same time, a lower-cost, privately-owned stadium model in Germany was associated with a record tourism year in most host cities. Finally, GDP seems to be hardly related to the events because of dominating macroeconomic factors. These findings indicate that the concept of the "mega-event dividend" should be reconsidered as the event itself, type of event, infrastructure financing mechanism and institutional capacity may play a more important role than hosting itself.

1. INTRODUCTION

Winning the rights to host the Olympic Games or the FIFA World Cup every four years is typically viewed by cities and respective governments as an economic opportunity. It usually triggers a number of economic impact assessments that forecast higher tourist numbers, infrastructure development, and GDP increase, but these expectations usually do not hold in reality. According to Flyvbjerg and Stewart (2012), every Summer Olympics since 1960 has experienced substantial budget overruns with an average real cost overrun reaching 179 percent. Baade and Matheson (2016) also point out the fact that the effects of hosting mega-events on GDP and employment are modest and can be even negative. Nevertheless, cities still strive to become hosts, and governments continue to finance such projects. This leaves an interesting question: are there any systematic biases in forecasting when bidding, or there are some hidden effects that cannot be adequately captured by the commonly applied measures of success?

For the purpose of this paper, I will adopt the definition of mega-event offered by Müller (2015) as one-time event that lasts a predetermined period of time, attracts large crowds, receives substantial media coverage, involves high costs and leads to significant changes in the built environment and the

population. In the context of this definition, the most obvious examples of mega-events are the Olympic Games and FIFA World Cup.

The three research questions that I am going to try to answer are: does hosting provide a lasting increase in international tourist arrivals or just a temporary boost? Is a higher level of public investment in infrastructure associated with a better tourism pay-off? Can changes in GDP be reasonably attributed to the event or they are just an artifact of the macroeconomic environment?

In order to answer these questions, I built an original dataset containing seven mega-events spread in 32 years and compared changes in independent variables prior to the event year, during the event year and in the two years after it. Also, I added a city-level dataset containing 10 German UEFA EURO 2024 host cities over four years from 2022 to 2025. This additional dataset is valuable as the ten cities hosted the same event in the same year, thus making it possible to conduct a comparison using city-level characteristics, especially public investment in infrastructure. Such a comparison is much more challenging in the context of various mega-events as they differ not only in terms of the event itself but in the majority of characteristics of host cities as well.

The paper is structured as follows. Section 2 reviews the existing literature. Section 3 describes my approach to building and analyzing datasets. Section 4 analyzes cross-case patterns of tourism, infrastructure and GDP. Section 5 analyzes the city-level panel on EURO 2024 in more details. Section 6 discusses limitations of my paper and Section 7 provides conclusions.

2. LITERATURE REVIEW

2.1 The Tourism Channel

One of the most commonly stated hypotheses in the literature on mega-events is that hosting can provide a long-lasting increase in international tourist arrivals (Baade & Matheson, 2016; Rose & Spiegel, 2011). This effect can be produced via two mechanisms. First, it can be achieved through a direct impact of hosting as some tourists will travel to the destination precisely because of the mega-event. Second, it can be produced via the showcase effect as the international media coverage will draw attention to the destination and stimulate future tourism visits (Rose & Spiegel, 2011). However, the validity of both of these mechanisms is not well-supported by empirical evidence.

In case of the direct effect, the challenge is that some potential tourists will be discouraged to visit the city due to the crowding-out effect. Some tourists who wanted to visit a destination during a mega-event will decide not to do it because of congestion, increased prices and inconvenience (ONS, 2013). I come back to this mechanism with my own data in Section 4.1.

In case of the showcase effect, the situation is also unclear. Giesecke and Madden (2007) apply the computable general equilibrium model to prove the absence of lasting tourism effect from the Sydney 2000 Olympic Games. The number of arrivals from Australia continued to move along the existing trend until 2002 when the September 11 attacks and the Bali bombing destroyed the tourist flows. The Barcelona experience looks quite different. Hotel overnight stays in the city almost doubled from 3.8 million in 1990 to 7.8 million in 2000 (Turisme de Barcelona, n.d.). This difference between Sydney

and Barcelona suggests that it is not just the event itself that plays the crucial role in generating tourism benefits, but urban renewal that made the city more attractive afterwards.

2.2 Infrastructure Investment and the White-Elephant Problem

The second reason why hosting is valuable is the infrastructure legacy, that is stadiums, transport infrastructure, athlete villages and urban regeneration initiatives that remain after the mega-event even if tourism and GDP do not grow. However, the literature on sports infrastructure is generally pessimistic regarding its economic effects. Baade and Matheson (2016) present several examples of stadiums underused after mega-events. One of the most famous white elephants was Cape Town Stadium built for the 2010 FIFA World Cup for the cost of about US$600 million and recording operating losses during many years after the event. The venues of Athens 2004 experienced the same problems. A good example in case of infrastructure legacy is provided by the UK as the venues built for the 2012 Olympics in London were constructed in the area of high deprivation, attracted private investments and became an example of successful urban renewal (Baade & Matheson, 2016).

Whether the amount invested in infrastructure is associated with better tourism outcomes in my own sample is examined in Section 4.2.

Germany 2024 also brings to attention another aspect that is less discussed in the literature: public versus private funding of event infrastructure. Seven out of ten UEFA EURO 2024 host cities (Munich, Dortmund, Leipzig, Cologne, Frankfurt, Gelsenkirchen and Düsseldorf) have zero public capital expenditure on event-related stadium works because of privately-owned stadiums. Three cities have material expenditures: Berlin (EUR 242 million, for the renovation of the stadium finished in 2004 for the 2006 World Cup), Stuttgart (EUR 139.5 million for the renovations in 2022-2024 to satisfy EURO 2024 requirements) and Hamburg (EUR 23.5 million for a EURO 2024-specific upgrade).

2.3 GDP Attribution and the Macro Dominance Problem

The third reason why hosting is beneficial is the accelerated GDP growth. However, there is a serious methodological challenge in establishing causality here as host selection is not random. Winning the rights to host implies that countries were already in favorable macroeconomic condition when they were bidding (Baade & Matheson, 2016). Feddersen and Maennig (2012) prove the absence of GDP effect around the 2006 FIFA World Cup in Germany. According to Matheson (2006), the forecasts made by event organizers are overstated as they measure tourists' expenditures as a completely new element of GDP ignoring the fact that some economic activity is being crowded out.

This methodological challenge is especially clear in the context of my data as international GDP is measured in current US dollars. Thus, the fluctuations in exchange rate can change the GDP value without changing the underlying economic reality. The GDP of Spain decreased from US$629 billion in 1992 to US$528 billion in 1994 not because Barcelona 1992 was unsuccessful, but partly because the peseta was devalued three times between 1992 and 1995 (World Bank, 2025). The GDP of Brazil dropped from US$2,456 billion in 2014 to US$1,796 billion in 2016 as the country was in recession and the real depreciated substantially rather than because of an Olympic effect (World Bank, 2025). The GDP of Qatar grew from US$176 billion in 2019 to US$236 billion in 2022 mainly because of the LNG

price surge caused by the Russian invasion of Ukraine (World Bank, 2025). In all of these cases, the macroeconomic effect is substantial enough to dominate the event effect in the GDP series. For this reason, I concentrate mainly on tourism effects and use city-level data when they are available.

3. DATA AND METHODOLOGY

3.1 Dataset Construction

The international sample contains seven mega-events: the 1992 Barcelona Summer Olympics, the 2008 Beijing Summer Olympics, the 2010 South Africa FIFA World Cup, the 2012 London Summer Olympics, the 2016 Rio de Janeiro Summer Olympics, the 2022 Qatar FIFA World Cup, and the 2024 Paris Summer Olympics. Every event is covered by three points in time: pre-event baseline in t-2 (or the closest available year depending on data needs), the event year t and a post-event observation in t+2. Paris 2024 does not have a post-event observation and thus is included in the sample description but not in the trajectory analysis. Table 1 contains the description of the international sample, while the full dataset and its sources are available in the supplementary Excel workbook.

Table 1

Event	Tourism pre (M)	Tourism event (M)	Tourism post (M)	Infrastructure (US$M, as reported)	Infrastructure (2015 US$M)	GDP event yr (US$bn)	Real GDP growth, event yr (%)
Barcelona 1992	34.3	39.6	43.2	9,700	9,700	629	0.9
Beijing 2008	49.9	53.0	55.7	6,800	6,800	4,594	9.7
South Africa 2010	7.01	8.07	9.19	3,900	≈4,200	417	3.0
London 2012	29.8	31.1	34.4	14,000	≈14,500	2,707	1.5
Rio 2016	6.43	6.60	6.62	13,100	≈12,900	1,796	-3.3
Qatar 2022	2.14	2.56	5.00	6,500	≈5,300	236	4.2
Paris 2024	n/a	100.0	not yet available	6,650 (EUR M)	≈5,400	3,162	1.2

International sample: tourism, infrastructure and GDP by eventNote. Tourism is country-level international arrivals in millions (UN Tourism, 2024; World Bank, 2025). Infrastructure values for 1992-2012 are sports-related costs in 2015 USD from the Oxford Olympics Study (Flyvbjerg & Stewart, 2016); Qatar and Paris values come from organizer reports and the Cour des comptes (2025) audit. GDP is nominal, current US$ (World Bank, 2025). The Paris post-event cell is empty because t+2 is 2026. The constant-price column expresses all values in 2015 US dollars: the South Africa, London, Rio and Qatar values are deflated from the price base of the original reports with the US CPI (BLS, 2025), and the Paris value is first converted from euros at the 2024 average exchange rate before deflating. Real GDP growth is the annual growth of GDP in constant local currency in the event year (World Bank, 2025).

For the international cases, tourism is measured by the number of international tourist arrivals in millions of people based on the data from UN World Tourism Organization and national statistical offices (Frontur/IET for Spain; UN Tourism and World Bank for the other cases). GDP is measured by nominal GDP in current US dollars taken from the World Bank World Development Indicators (World Bank, 2025). In addition to the nominal dollar series, I also use the real GDP growth rates in constant

local currency from the same database to cross-check every statement about the direction of GDP, since the nominal dollar values are affected by the exchange rates. Infrastructure is measured as the public capital expenditure on event-related infrastructure in millions of US dollars. For the period from 1992 to 2012, I use the Oxford Olympics Study (Flyvbjerg & Stewart, 2016) with costs adjusted to 2015 USD sports-related costs. For Qatar, Paris and the German cities, I use government reports, organizer audits, city reports and stadium authority records including the Cour des comptes (2025) audit of Paris. To make the spending amounts comparable across events that happened in different decades and in different countries, I express all the international infrastructure values also in constant 2015 US dollars. The values taken from Flyvbjerg and Stewart (2016) are already reported in 2015 prices, and I deflate the remaining values from the price base of their original source with the US consumer price index (BLS, 2025). The Paris figure is first converted from euros into dollars at the average exchange rate of 2024 and then deflated in the same way. The German city panel in Table 2 stays in nominal euros, because it is a within-country comparison over a short period, where the differences caused by inflation are small compared to the differences between the cities. This standardization is still approximate, because the spending of one event is usually spread over several years and because the price levels of the host countries differ from the US price level, and I return to this point in Section 6. I also measure the recognition of the event by the number of viewers in billions for the event year as provided by the organizers. The pre- and post-event cells for recognition are intentionally left empty as this variable is meaningful only for the event year.

There are three baseline choices that need explanation. First, the pre-event baseline for South Africa 2010 is 2009 rather than 2008 because Statistics South Africa changed their tourist definition between these years. The 2008 figure includes day visitors that are not included in the 2009 and 2010 figures, and therefore the 2008 figure cannot be compared with others (Statistics South Africa, 2012). Second, the pre-event baseline for Qatar is 2019 as the figures for 2020 and 2021 are severely impacted by COVID-19 and therefore do not serve as a useful baseline. Third, the pre-event baseline for Brazil is 2014 that also happens to be the year when Brazil hosted the FIFA World Cup. This makes the pre-event to event comparison biased towards zero and may make the event-to-post comparison look stronger than it actually is. I will return to this problem in Section 6.

The city-level dataset covers all 10 German host cities of UEFA EURO 2024 in four calendar years: 2022, 2023, 2024 and 2025. This yields the target of 40 city-year observations, but only 33 of them were available at the moment of writing this paper. The missing cells, especially for Gelsenkirchen and the 2025 releases, are highlighted in Table 2. For the German cities, tourism is measured by the number of overnight stays in registered accommodation establishments with ten or more beds. This measure differs from the country-level international arrivals used in the international sample, so the two datasets cannot be compared directly. The German figures come from the relevant official state statistical offices: the Amt für Statistik Berlin-Brandenburg (2025) for Berlin, Statistikamt Nord (2026) for Hamburg, IT.NRW (2025) for the five cities in North Rhine-Westphalia, München Tourismus and the Bayerisches Landesamt für Statistik (2025) for Munich, the Statistisches Landesamt Sachsen (2025) for Leipzig, and the Statistisches Landesamt Baden-Württemberg (2026) for Stuttgart. The GDP of Berlin and Hamburg is measured at the city-state level by using the Volkswirtschaftlichen Gesamtrechnungen

der Länder (VGRdL, 2025) where the GDP of the Land is also the GDP of the city. For other cities, the city-level GDP for 2024 is not yet available as VGRdL provides city-level data with two-year lag, so I use Bundesland-level GDP as a proxy. Infrastructure is measured by the public capital investment in EURO 2024 attributable to each city and verified with the help of city reports, stadium authority records and UEFA documentation.

Table 2

City	2022 (M)	2023 (M)	2024 (M)	2025 (M)	Public spend (EUR M)
Berlin	26.5	29.6	30.6	29.4	242
Hamburg	14.7	15.9	16.2	16.5	23.5
Munich	16.5 a	18.6	19.7	19.7	0
Frankfurt	8.6 a	10.35	11.14	n.p.	0
Cologne	5.6	6.6	7.09	7.22	0
Düsseldorf	4.3	5.4	5.55	n.p.	0
Stuttgart	3.3	4.06	4.66 a	4.53	139.5
Leipzig	3.37	3.83	3.8	3.7	0
Dortmund	n.p.	1.50 a	1.58	n.p.	0
Gelsenkirchen	n.p.	n.p.	0.31 b	n.p.	0

German EURO 2024 panel: overnight stays and public stadium investmentNote. Overnight stays in millions, from the state statistical offices listed in the text. n.p. = not yet published in an accessible annual release at the time of writing. a = derived from an officially published growth rate or level statement (Munich 2022 from the city's statement that stays reached about 90 percent of the 2019 level of 18.3 million; Frankfurt 2022 from the officially stated +20 percent growth to the 2023 level; Stuttgart 2024 from the official 2025 balance of 4.53 million at -2.7 percent; Dortmund 2023 from the official +5.7 percent growth to the 2024 level). b = latest published annual value (2021, IT.NRW); the exact 2024 value sits in the IT.NRW regional database. The 2025 values are first estimates.

3.2 Analytical Approach

My main analytical technique is structured case comparison combined with within-case before-and-after comparison. For each international event, I measure two tourism growth rates: change from the pre-event baseline to the event year, and change from the event year to the post-event observation. The combination of the two helps to characterize the tourism trajectory. High growth rate before the event year followed by decline points to spike effect. Low event-year growth rate followed by higher post-event growth rate points to the legacy effect. If high growth rate persists after the event year, the pattern is classified as uplift effect.

For the UEFA EURO 2024, I use the difference between the 10 German cities. Since all ten cities hosted the same event in the same year, the event itself and the macroeconomic environment are kept relatively constant. Therefore, it becomes possible to examine the difference in the characteristics of cities, such as tourism level, number of matches hosted and public investment in infrastructure. This makes the comparison of the German cities more compelling than the comparison of the international events, where a lot of factors are changing at the same time.

I do not estimate a regression in this paper for two main reasons. First, the international sample consists of only seven events that is insufficient to obtain reliable coefficient estimates even in a bivariate model.

Second, GDP is measured in current US dollars and therefore is sensitive to fluctuations in exchange rates. Thus, a regression of GDP growth on event-year indicators would capture the impact of currency depreciation rather than the effect of the event. This sensitivity is a problem for the qualitative comparison as well, and for this reason every statement about GDP in Section 4.3 is checked against the real growth rates in constant local currency and not against the dollar values alone. I utilize a qualitative comparative research design and prove the arguments with the results obtained from the dataset. The only statistic that I report is a descriptive Spearman rank correlation between the standardized infrastructure spending and the post-event tourism growth of the six completed events, and I use it as a simple summary of the ranking rather than as an inferential test.

4. CROSS-CASE RESULTS

4.1 Tourism: Three Patterns, Not One

One of the main findings in this paper is that the commonly accepted "boost versus no boost" characterization of mega-events' impacts on tourism is too crude. The dataset shows at least three different trajectories of event tourism with various implications for policy and evaluation practices. Figures 1 presents the tourism trajectories of the events indexed such that the pre-event period is equal to 100, and Figure 2 shows the two growth periods of each trajectory separately.

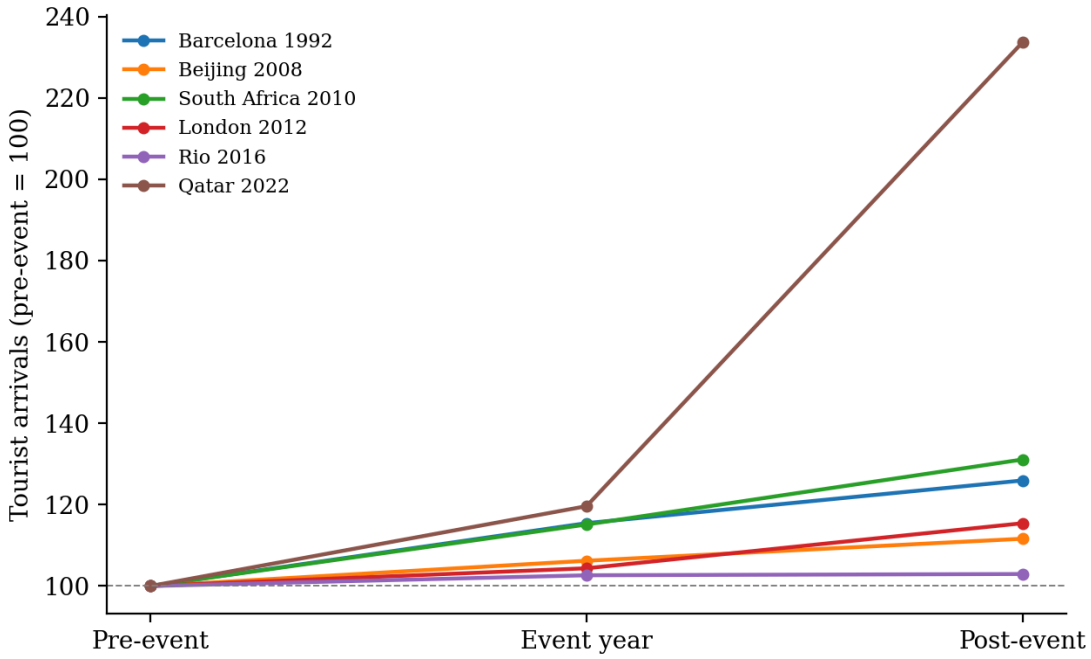


Figure 1. Tourism trajectories of the six completed international events, indexed to the pre-event baseline (= 100). The three patterns described in the text are visible: London dips below trend into the event year and then jumps; Rio stays flat; Qatar and South Africa keep rising after the event. Data from the dataset in Table 1.

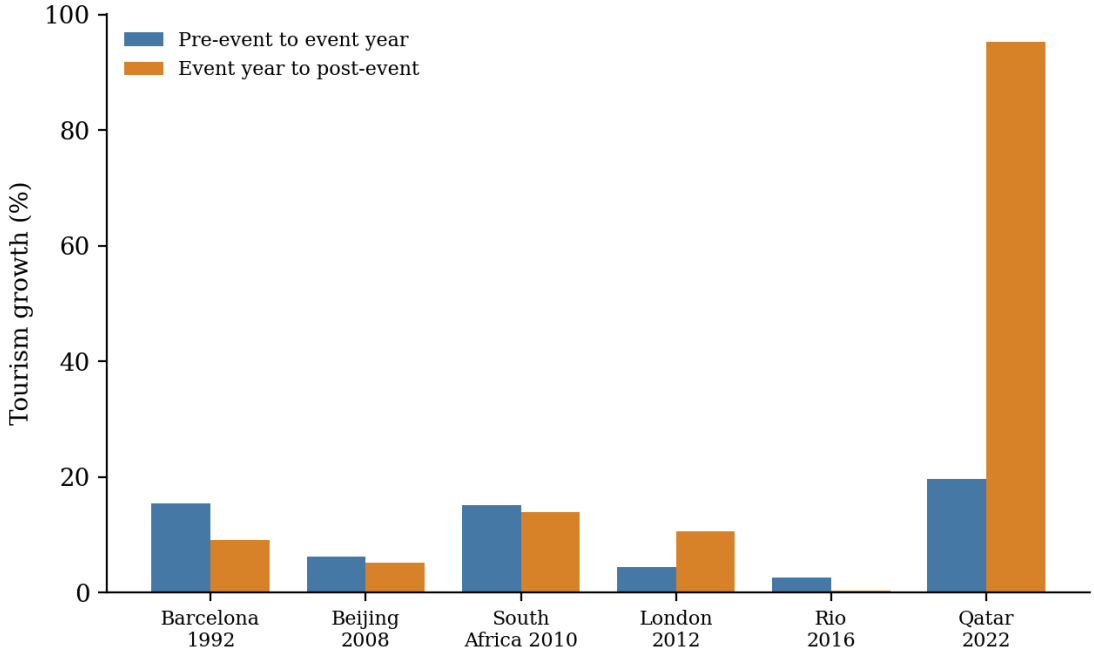


Figure 2. Tourism growth before and after the event year, by event. Qatar's post-event bar reflects growth from 2.56 million to 5.0 million arrivals; the small base matters for the interpretation. Author's calculations from Table 1.

The first type of a pattern is a spike followed by decline, which is evident in the Berlin case. The number of overnight stays in Germany increased from 26.5 million in 2022 to 29.6 million in 2023 and rose to 30.6 million in the event year 2024, a 15.5 percent increase relative to the 2022 baseline (Amt für Statistik Berlin-Brandenburg, 2025). The first estimate for 2025 indicates the number of overnight stays declining to 29.4 million, a 3.9 percent decline relative to the 2024 peak. The 2025 figure is greater than the 2022 baseline, hence the presence of a certain net gain, but the 2024 figure of 30.6 million clearly indicates a peak rather than a new equilibrium level of tourism. The latter becomes obvious only in the panel data.

The second pattern is crowding-out followed by a delayed legacy, which is particularly clear in the case of the United Kingdom. UK inbound visits increased from 29.8 million in 2010 to 31.1 million in 2012, a 4.4 percent increase over two years. This growth was lower than the trend implied by the 2006-2010 growth rate (ONS, 2013). The ONS attributed this decline to the regular tourists avoiding London in the time of the Olympics due to the high prices and congestion. The effect emerged later: the number of arrivals rose to 34.4 million in 2014, a 10.6 percent growth relative to the event year and 15.4 percent increase relative to the 2010 baseline (ONS, 2015). Here, we see that the tourism effect was present, although delayed. This is important to know when choosing the evaluation period because the one-year post-event period would fail to detect the legacy. This pattern also fits the crowding-out mechanism that was discussed in Section 2.1, since the benefit from tourism appeared later, when the negative effects of hosting faded away.

The third pattern is a sustained post-event increase, which can be observed in both South Africa and Qatar cases, although the reasons behind might be different. The number of international arrivals in South Africa increased from 7.01 million to 8.07 million between 2009 and 2010 and further increased to 9.19 million in 2012, a 13.9 percent increase (Statistics South Africa, 2012). This case is similar to the spike followed by a decline, although the post-event period here seems to represent the beginning of the sustained growth period. The increase in the Qatar case is even more spectacular in percentage terms. The number of arrivals increased from 2.14 million in 2019 to 2.56 million in 2022 and to 5.0 million in 2024, a more than twofold increase relative to the pre-COVID-19 baseline (Qatar Tourism, 2024). However, it is hard to attribute this increase to the World Cup effect because Qatar was experiencing a much bigger national transformation project involving more than US$200 billion of investment, 2023 AFC Asian Cup, and a Formula 1 Grand Prix.

All the remaining cases lie somewhere in-between these patterns. Spain experienced steady increases in arrivals from 34.3 million in 1990 to 39.6 million in 1992 and further to 43.2 million in 1994, which seems to indicate the presence of legacy (UN Tourism, 2024). The methodological changes in the Spanish frontier statistics in 1995 suggest that these figures should be interpreted only directionally. China experienced steady increases in its national arrivals from 49.9 million in 2006 to 53.0 million in 2008 and further to 55.7 million in 2010 (World Bank, 2025). However, this increase occurred in the time of rapid tourism growth in China and, hence, cannot be attributed to the Olympic Games. The foreign arrivals in Beijing itself actually decreased during the Olympic year due to the tighter visa and security restrictions. This case reveals what I call the "Beijing paradox" because the national arrivals increased while arrivals in the host city declined. It is an illustration of how unreliable are the national-level tourist data when the event itself is hosted in only one city.

The clearest negative case in the sample is Brazil. Its international arrivals stayed almost unchanged between 2014 and 2018, increasing from 6.43 million to 6.62 million, a total 2.9 percent growth over four years, despite more than US$13.1 billion in infrastructure spending (Embratur, 2019; Flyvbjerg & Stewart, 2016). This is the worst pay-off relative to infrastructure spending in the sample.

4.2 Infrastructure: Spend Versus Pay-Off

There is no positive relationship between the infrastructure investment and tourism gains in the data. Figure 3 compares the event-related public infrastructure spending, expressed in constant 2015 US dollars, with the post-event tourism growth.

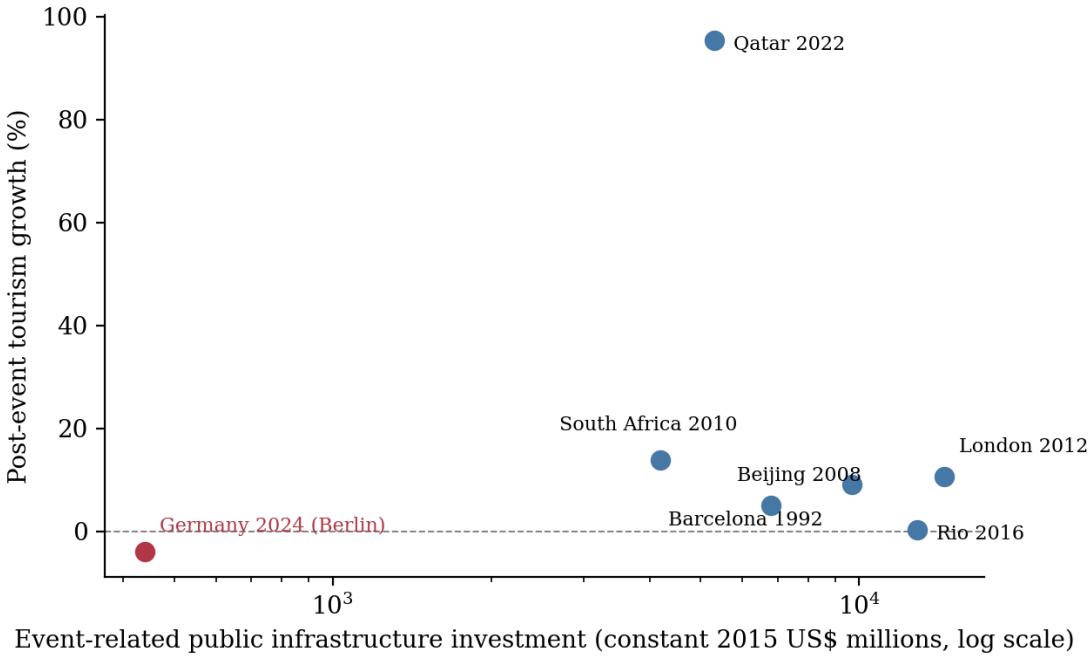


Figure 3. Event-related public infrastructure investment in constant 2015 US dollars (log scale) against post-event tourism growth. There is no positive relationship: the two highest spenders (London, Rio) sit at opposite ends of the outcome range, and the highest-growth case (Qatar) is a mid-range spender. The Germany point uses the total public stadium spending of the ten cities, converted to approximately US$440 million in 2015 prices, and Berlin's post-event change. Author's calculations from Tables 1 and 2.

The two biggest spenders, London (US$14 billion) and Rio (US$13.1 billion) (Flyvbjerg & Stewart, 2016; National Audit Office, 2012), have very different outcomes: London has the second-highest post-event tourism growth, while Rio has the lowest. The German case of EURO 2024 involved only EUR 385 million of public spending on stadiums in ten cities, but eight out of ten cities experienced record tourism years in 2024. Qatar spent US$6.5 billion in its World Cup-related projects, which is related to the highest post-event tourism growth rate, but, as noted above, this increase cannot be separated from the much bigger transformation happening in Qatar. These examples, taken altogether, do not suggest that the more infrastructure one spends, the better post-event tourism gains one receives.

To give this comparison a single descriptive number, I calculate the Spearman rank correlation between the infrastructure spending in constant 2015 US dollars and the post-event tourism growth for the six completed events. The coefficient is -0.54, which means that the events that spent more tend to rank lower on the post-event tourism growth in this sample. I do not treat this value as an inferential result. With six observations the coefficient would need to reach 0.886 in absolute value to be significant at the five percent level, and a single unusual observation such as Qatar can move it substantially. What the number summarizes is only that the association between spending and tourism pay-off in this sample is not positive.

However, the German case of the cities hosting EURO 2024 provides a deeper insight into this finding. Among the ten cities, only three cities, namely Berlin (EUR 242 million), Stuttgart (EUR 139.5 million) and Hamburg (EUR 23.5 million), experienced public spending on stadiums. The rest seven cities had no public capital expenditure on the 2024 stadium projects. Despite the absence of any public investment on stadiums, Munich, where there was no public stadium spending on EURO 2024 due to the private ownership of Allianz Arena, recorded the highest number of overnight stays (19.7 million) among ten cities in 2024 (München Tourismus, 2025). Frankfurt also made no investments in public stadiums but still managed to have a record tourism year in 2024 (11.14 million overnight stays). Hence, the cities with private stadiums did at least as well as the cities with public investments in 2024. However, this does not establish a causal relationship because Munich already had the largest tourism base in Germany and Frankfurt had a powerful business tourism sector.

Therefore, the results on this question are not conclusive: I do not find any evidence of a positive association between higher public infrastructure spending and better tourism performance in this sample, and the descriptive rank correlation reported above is even negative. This finding is consistent with Flyvbjerg and Stewart's (2016) argument about Olympic cost overruns being usually not compensated with the higher post-event economic performance.

4.3 GDP: The Macro Dominance Problem

The GDP trajectories in the dataset are much more driven by the macroeconomic factors rather than by the events themselves. Three cases reveal this fact very clearly, and in all three cases, a simple before-and-after comparison will lead to the wrong conclusions.

In Spain, nominal dollar GDP decreased from US$629 billion in 1992 to US$528.5 billion in 1994, a 16 percent drop, despite the successful event in Barcelona (World Bank, 2025). Most of this decline is explained by three successive devaluations of peseta against the dollar between 1992 and 1995, which resulted in the dollar value of Spanish output dropping without actual reduction in real GDP. Thus, the simple analysis of nominal dollar GDP would erroneously interpret Barcelona 1992 as a negative economic effect. The real growth rates confirm this reading: in constant local currency, the Spanish economy grew by 0.9 percent in 1992 and contracted by about 1 percent in the recession of 1993 (World Bank, 2025), which is nothing close to the 16 percent drop that the dollar series suggests.

The GDP in Brazil dropped from US$2,456 billion in 2014 to US$1,796 billion in 2016, a 26.9 percent decrease. This happened because Brazil entered a recession in 2015 and the real depreciated against the dollar (World Bank, 2025). There is no reasonable basis for treating this sharp decline as a consequence of the Olympics. The real series shows the actual size of the crisis: Brazilian GDP fell by 3.6 percent in 2015 and by 3.3 percent in 2016 in constant local currency (World Bank, 2025), so the recession was deep, but it was still much smaller than the 26.9 percent collapse of the dollar value.

This is an opposite example of Qatar. GDP grew from US$176 billion in 2019 to US$236 billion in 2022 – an increase of 34%. However, the same period saw a major LNG price increase following Russia's invasion of Ukraine (World Bank, 2025). It is thus misleading to assume that the growth was caused by the World Cup. In real terms, the economy of Qatar grew by 4.2 percent in 2022 (World

Bank, 2025), so most of the 34 percent increase of the dollar value reflects the higher prices of the energy exports rather than an expansion of production.

In the case of Berlin, this comparison is more straightforward, since its GDP is measured in euros and is not affected by the fluctuations of the dollar exchange rate. Berlin's nominal GDP increased from EUR 178.9 billion in 2022 to EUR 193.2 billion in 2023 and EUR 207.1 billion in 2024 – a trend similar to the rest of Germany's (VGRdL, 2025). This is similar to the finding by Feddersen & Maennig (2012) regarding the 2006 World Cup in terms of the event not leading to GDP increase, but rather shifting economic activity from other places to hospitality and retail.

However, it is essential to note a methodological problem here. The GDP should be measured in local currency with the consideration of country fixed effects and time trends. Otherwise, the comparison of raw dollar GDP figures would tell much more about the movement of the exchange rates than about the economic effect of the event. Table 1 therefore reports the real GDP growth rate of the event year next to the nominal dollar values, so that the reader can separate the currency movements from the actual growth.

5. THE EURO 2024 CITY PANEL

5.1 Setting and Design

What the international comparison lacks, but the EURO 2024 city panel has, is the event holding constant. The ten cities participating in the tournament represent the same country, same year and variable city-level characteristics. The ten cities were Berlin, Hamburg, Munich, Dortmund, Leipzig, Stuttgart, Gelsenkirchen, Cologne, Frankfurt and Düsseldorf. The cities hosted 4-7 matches each, Berlin hosting the final match. The period of interest is 2022 (t-2), 2023 (t-1), 2024 (event year) and 2025 (t+1). Out of 40 city-year observations, 33 are observed from official releases when the analysis is carried out. All ten are measured under the same definition of tourism – overnight stays in accommodation establishments with ten or more beds.

The most interesting aspect of the panel is the variation in financing of the stadiums. There are seven stadiums in the sample owned privately, which allows for observing zero public infrastructure spending. Berlin, Stuttgart and Hamburg have spent EUR 242 million, EUR 139.5 million and EUR 23.5 million respectively. This allows for the comparison of privately and publicly financed hosting in the context of the same tournament.

5.2 Event-Year Tourism: Scale and Record Performance

2024 was the best tourism year for most of the cities hosting the EURO 2024. Munich received 19.7 million overnight stays, making it the highest for the host cities and a record for the city (München Tourismus, 2025). Frankfurt received 11.14 million, Düsseldorf – 5.55 million, Stuttgart – 4.66 million, Cologne – 7.09 million and Leipzig – 3.8 million – all being record highs (IT.NRW, 2025; Statistisches Landesamt Sachsen, 2025; Statistisches Landesamt Baden-Württemberg, 2026). Even Hamburg managed 16.2 million overnight stays, setting a new record (Statistikamt Nord, 2026). Figure 4 shows ten cities and their financing models. While the record-breaking tourism year in eight out of ten cities

should not automatically be considered the consequence of EURO 2024 due to post-COVID recovery also having significant part in this.

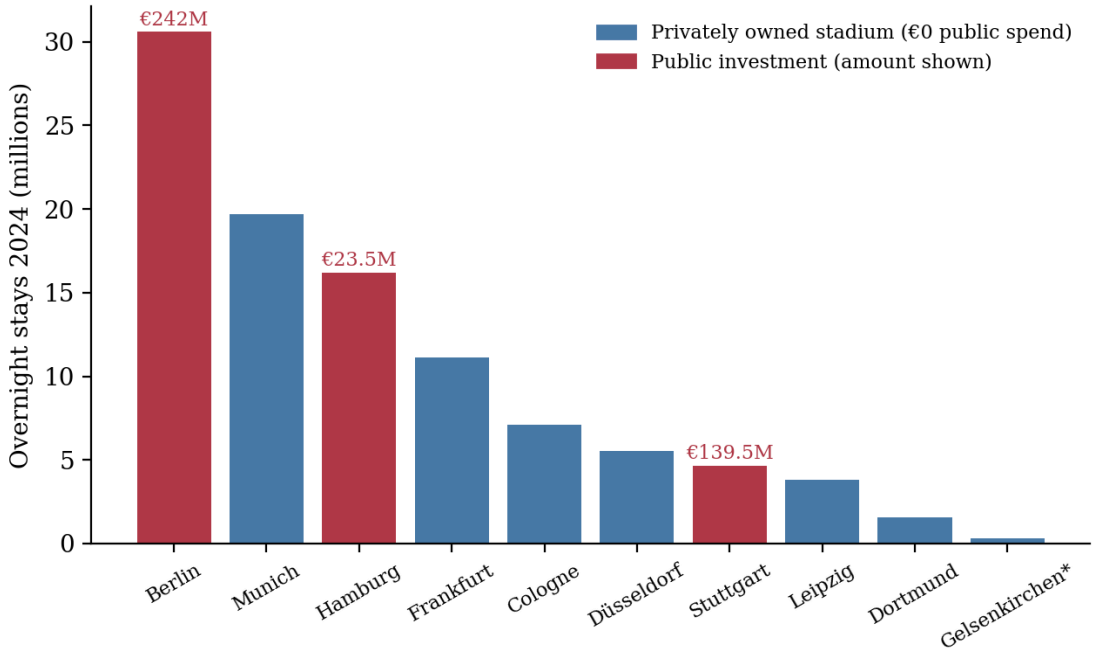


*Figure 4. Overnight stays in 2024 for the ten EURO 2024 host cities, colored by stadium financing model. The three public-investment cities (red) do not outperform the seven private-stadium cities (blue). *Gelsenkirchen shows the latest published value (2021). Data from Table 2.*

One of the problems in this panel is the separation of the effects of EURO 2024 from the post-COVID recovery of the tourism industry. This is well illustrated in the case of Berlin, where overnight stays increased from 26.5 million in 2022 to 29.6 million in 2023 (+11.7%), with further increase to 30.6 million in 2024, another +3.4% over this trend. However, the 2025 figure dropped to 29.4 million, lower than 2023. This shows that at least part of the increase in 2024 year was temporary and the net change from 2022 remains positive, but 30.6 million cannot be considered the level of Berlin's tourism anymore.

5.3 The Spike-and-Fade Versus Sustained Growth Contrast

Probably one of the most striking differences in the panel is the performance of Berlin and Hamburg in 2025, which falls right after the event. Berlin dropped from 30.6 million overnight stays in 2024 to 29.4 million in 2025, a drop of 3.9%. In comparison, Hamburg increased from about 16.2 million to 16.5 million (+1.9%) (Statistikamt Nord, 2026). Two city-states have hosted the same tournament under the same macroeconomic circumstances. Moreover, both have the comparable level of administration and both have invested in infrastructure equally poorly.

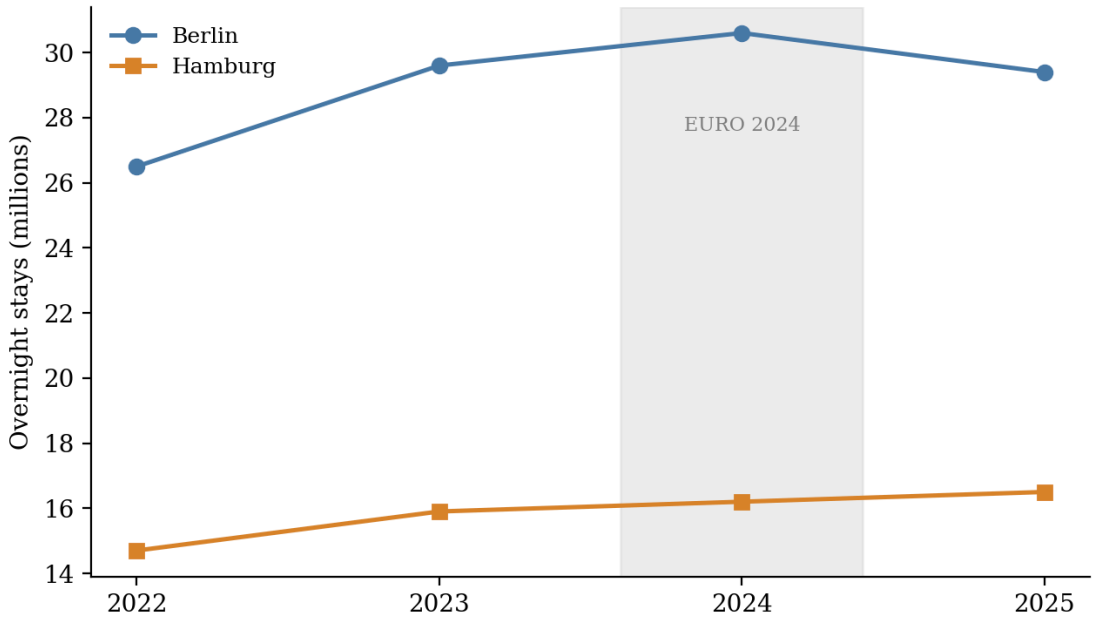


Figure 5. Overnight stays in Berlin and Hamburg, 2022-2025. Berlin peaks in the event year and pulls back; Hamburg keeps growing through 2025. The 2025 values are first estimates. Data from Table 2.

Probably, the key difference lies in the type of visitors of the cities. Berlin is a well-developed leisure tourism destination due to its nightlife, cultural events and relatively cheap accommodation options, thus it may react to the temporary excitement caused by a major event quite strongly. On the other hand, Hamburg has higher business and port tourism share, which is less likely to be affected by the events. In this sense, Berlin's spike and decline may show the temporary rise of leisure tourists, while Hamburg's continued growth can be attributed to the expansion of tourist base supported, but not generated by the event. This is the hypothesis yet to be proved with the more detailed data on visitor composition.

5.4 The Private-Stadium Finding

The most important finding of this panel is the lack of association between public infrastructure spending and tourism performance. The three cities that spent the money on public stadium construction (Berlin, Stuttgart and Hamburg) did not outperform the seven that did not spend anything (Munich, Frankfurt, Cologne, Düsseldorf, Dortmund, Leipzig and Gelsenkirchen). Munich recorded the highest tourism total in the panel with zero public infrastructure investment. Similarly, Frankfurt and Cologne also showed the record tourism numbers despite having zero public infrastructure investment. Dortmund also did quite well despite the zero public stadium spending, registering 1.58 million overnight stays, which is record high for a relatively small city (IT.NRW, 2025).

The case of Germany shows that privately financed sports infrastructure, accompanied by developed hospitality sector and proper transport connections, can deliver results that are comparable to, and even exceed those of publicly financed infrastructure. Additionally, this financing model is less susceptible to

the white elephant problem – seven of ten stadiums built for EURO 2024 in Germany will keep generating profits for their owners regardless of major events they host. This should be contrasted with the case of Cape Town Stadium. The stadium was built for the 2010 World Cup using public budget of about US$600 million and required public subsidies from 2011 (Baade & Matheson, 2016).

6. LIMITATIONS

There are several methodological problems in the results presented here. First of all, the sample of seven countries hosting the international events is too small for running regression analysis and the case comparison approach cannot control for all the differences between countries including the level of development, tourism base, political environment and pre-bidding forecasts. Thus, the findings presented here should be considered more as hints than as causation.

In addition, the events in the sample do not attract the same audiences. A European Championship in Germany is visited mostly by Europeans, who can arrive by car or by train at a relatively low cost, while the tournaments in Rio de Janeiro or in Qatar require long-haul flights for the majority of their potential visitors. The differences in the tourism outcomes between the events therefore reflect not only the effects of the events themselves but also how accessible the host is for its main audience, and this is one more reason to treat the cross-event comparisons as suggestive. A similar caution applies to the standardization of the infrastructure spending: the conversion to constant 2015 US dollars corrects for the US inflation, but it cannot correct for the differences in construction costs and price levels between the host countries, and it cannot fully reflect the fact that the spending of one event is spread over several years.

Secondly, the international GDP figures are measured in current dollar values, which means that the movements in exchange rates have very substantial effect on the result. The devaluation of peseta in Spain, the real depreciation in Brazil and the LNG price increases in Qatar show how unrelated macroeconomic events can have larger effect on GDP than any plausible contribution of the event itself. The fixed effects panel with the estimation of real growth rates and currency controls would provide the better estimation of the effect, but the sample is too small for that approach. The real growth rates that were added to Table 1 and Section 4.3 soften this problem, but they do not remove it completely, because the qualitative comparison of the dollar levels across the countries remains fragile.

Thirdly, the baseline for the Brazilian GDP is problematic since the country has hosted the FIFA World Cup in the same year. The number of 6.43 million arrivals in 2014 was probably already inflated due to the event tourism, so the comparison with the 6.60 million in 2016, when the Olympics took place, looks quite insignificant, despite the fact that both years may be above the underlying tourism trend. As a result, excluding Brazil from the regression estimating the effect of the event year on the tourism numbers seems reasonable.

Fourthly, the post-event tourism growth in Qatar is too confounded to attribute confidently to the World Cup in the context of the available data. The World Cup was part of the national transformation program worth more than US$200 billion, which included several other major events. This makes the construction of a convincing counterfactual scenario almost impossible.

Finally, some of the German data are preliminary. The figures for 2025 are the first estimates and may be changed, while the tourism figure for Hamburg in 2024 is an estimated value based on its 2025 release and not the published annual figure. The figure for Gelsenkirchen is also an annual figure for 2021, the last available figure. Thus, these figures should be updated when released officially.

7. CONCLUSION

This paper raised three questions regarding the mega-events: do they create lasting tourism growth, is higher infrastructure spending associated with better tourism outcomes and can GDP growth be attributed to the events themselves. Using the dataset of seven international events and the German city panel, the answers seem to be threefold: sometimes and often only temporarily, no positive association and rarely or never.

For the tourism, the data shows the three main patterns – spike and fade, crowding-out followed by a delayed legacy and the sustained uplift. A simple "boost or no boost" classification fails to cover the differences. Berlin in 2024-2025 shows the spike-and-fade pattern, London in 2012-2014 shows the delayed legacy that could be overlooked with a short evaluation period and South Africa in 2010-2012 shows the sustained uplift. The differences in the patterns matter, as they show that the evaluation period can have substantial effect on the outcome of the impact study and that the host city should expect the peak of event-year tourism to fade away after the event.

For the infrastructure, no positive association between the amount of public investments and the tourism outcome has been found in the sample, and the descriptive rank correlation is even negative. While Germany's model of private stadiums with zero public capital expenditures in seven out of ten host cities worked well in 2024 and Rio de Janeiro saw almost no tourism growth despite the investments of US$13.1 billion over four years. This does not mean that infrastructure investments are wasteful, but rather that financing model, usefulness of the asset and management potential play larger role than its total cost.

For the GDP, the main takeaway is the importance of macroeconomic factors – exchange rate movements, commodity prices, business cycle etc. that are capable of moving the indicator much more substantially than any plausible effect of the event. The case of Berlin is a good illustration of this, where the euro-denominated GDP of the city followed the overall German trend during the EURO 2024 period and showed no substantial acceleration in the event year. This means that the nominal dollar GDP is not a reliable metric to measure economic effects of a mega-event without controlling currency movements and fixed effects.

In general, the findings of this paper show that if there is a "mega-event dividend", it is more likely to occur in cities that combine the event into a larger transformation, like Barcelona did, use private financing to avoid the white elephant issue, like in Germany and are evaluated for a longer period than just the year of the event. The least evidences for the existence of the dividend come from cases of heavy infrastructure spending, economic instability of the host and analysis of the nominal dollar GDP.

DATA AVAILABILITY

The full dataset used in this paper, including all sources, growth-rate formulas and methodological notes, is provided as a supplementary Excel workbook (Arel_Dataset_final.xlsx). All figures in this paper are generated directly from that workbook.

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