The impact of mega-events on tourist arrivals

Johan Fourie[1] and Maria Santana-Gallego[2]

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[1] Department of Economics, Stellenbosch University. Corresponding author: Johan Fourie: johnf@sun.ac.za

[2] Department of Economics, La Laguna University,, Spain

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Johan Fourie*and Maria Santana-Gallego†

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Abstract

While a mega-event is scheduled at least once every year somewhere in the world, these events are rare occurrences for the host cities and countries. The benefits of such events seem lucrative; the very fact that many countries bid to host these events suggests that the benefits – be they tangible or intangible – more often than not outweigh the costs. Using a standard gravity model of bilateral tourism flows between 200 countries from 1995 to 2006, this paper measures a very direct benefit of such mega-events: the increase in tourist arrivals to the host country. Although ex ante expectations are that tourism numbers would increase significantly during such an event, a growing literature points to the careful appraisal of possible tourist displacement, i.e. 'regular' tourists that change their behaviour when a mega-event is held, either shifting their trip to a different time or different location. This may result in reduced tourism gain, or even loss. In general, results suggest that mega-events promote tourism but the gain is dependent on the type of mega-event, the participating countries, the host country's level of development, and whether the event is held during the peak- or off-season.

KEYWORDS: Mega-events, panel data, development, international tourism
JEL code: L83, F19

Acknowledgement 1 *FIFA World Cup^{TM} is a registered trademark of the Federation International de Football Association (FIFA)*

1 Introduction

Tourism is one of the leading growth sectors in international services trade. While many factors influence tourism growth, one of the more perceptible contributions – at least, in the public eye – comes from global events, or mega-events. Mega-events, according to Roche (2000), are 'large-scale cultural (including commercial and sporting) events, which have a dramatic character, mass popular appeal and international significance'. These events, such as the Olympic Games and FIFA World Cup, have not only attracted an increasingly global audience (Horne and Manzenreiter 2006), but also seem to have shaped world tourism patterns, highlighting new tourism destinations and creating 'lasting legacies' in the host cities or countries.

There is, however, little empirical proof of mega-events yielding cross-country tourism gains, as the existing literature usually evaluates only one event or, at most, one type of mega-event. This paper empirically measures across different mega-events the change in tourism arrivals for a country hosting a mega-event. We use a gravity specification standard in the trade literature to estimate the increases in tourism from hosting six different mega-sport event types, namely Summer and Winter Olympic Games, FIFA World Cup, Rugby World Cup, Cricket World Cup and British/Irish Lions tour over the period 1995-2006.

We test a number of hypotheses. We first estimate the more general hypothesis that a mega-event increases the number of tourists in the year of the event. Where this hypothesis is false, a

*Department of Economics, Stellenbosch University, South Africa: Correspoonding author: johanf@sun.ac.za
†Department of Economics, La LagumaUniversity, Spain.

strong case for displacement of tourists could be made. The effects are then disaggregated by type of mega-event to reveal if there is a systematic difference impact between the six mega-event types considered in the analysis. We test whether tourism from participating countries increases more than tourism from countries not participating in the mega-event. This hypothesis suggests whether hosting an event results in tourism creation or tourism diversion. We also distinguish between events held during the peak tourist season and off-season in order to search for possible evidence of differences in crowding-out given seasonal variation. We investigate the difference between mega-events hosted by OECD and non-OECD countries. This test is relevant because of the growing interest from developing countries to host mega-events, as in the case of China hosting the 2008 Olympic Games, South Africa the FIFA World Cup 2010 and Brazil the FIFA World Cup 2014 and the 2016 Olympic Games. One possible explanation for such interest is postulated by Rose and Spiegel (2009), suggesting that countries benefit from bidding for events even if they lose (the bid). In that sense, we also evaluate Rose and Spiegel's signal theory in the context of tourism (rather than trade-in-goods, as they do). Finally, while it is often said that mega-events create a 'lasting legacy', we attempt to quantify this by measuring the long-run impact on tourist arrivals, both before and after the event.

To that end, this paper is organized as follow: Section 2 discusses recent literature on mega-events and their impact. Data and methodology used to ascertain our results are presented in Section 3. Section 4 presents the results of the analysis and finally some conclusions are drawn in Section 5.

2 Mega-events and their impact on tourism

The appeal of hosting a mega-event, or more specifically a mega-sporting event, has grown significantly over the last two decades. Not only have the advent of professionalism in sport, combined with higher per capita income worldwide and improvements in broadcast technology, made mega-events a truly global experience (Horne and Manzenreiter 2006), but also countries and regions increasingly consider these events as possible lucrative opportunities encapsulating large potential tangible and intangible benefits for the host.

What has been less apparent is the size of these benefits. Although scholars have attempted to measure the economic gains that result from hosting a mega-event since the 1980s, it is in the most recent decade that the debate about the potential gains, both in terms of economic returns and intangible benefits (including various non-quantifiable advantages as broad as national pride, patriotism and country image), has intensified. Comparisons are fraught with difficulties; ex ante studies differ from ex post analyses while methodologies depend on data availability and the skills of the researcher (Kesenne 2005). However, the central problem remains similar across the spectrum: isolating the impact of one mega-event and determining its counterfactual. Put more plainly: Are the costs for infrastructure, stadia, security and marketing worth the gains from tourism, trade and tickets? And, if not directly, does the event spark – maybe indirectly – long-run economic development?

Empirical results vary considerably across papers. Measuring only the economic returns to host the Summer Olympic Games, Preuss (2004; 2007) and Baade and Matheson (2003) show that the gains are ambiguous [see also Kasimati (2003)]. The benefits from hosting the FIFA World Cup are similarly doubtful (Szymanski 2002; Baade and Matheson 2004; Lee and Taylor 2005; Allmers and Maennig 2009). As the two largest mega-sport events on the planet and with a seemingly endless interest from countries in hosting these events, such results come as a surprise. 'Smaller' mega-events have received less attention. There are only a few recent articles, for example, reviewing the economic impact of the Winter Olympic Games (Rose and Spiegel 2009), Rugby World Cups (Jones 2001), Cricket World Cups and British/Irish Lions tours (Higham 2005) which are some of the mega-events analysed in this study.

Yet, hosting these events is not only about the direct monetary gains. If the interest in hosting

these events does not wane even in the face of negative financial returns, then surely some other positive, intangible gains must be at play. This view is purported by more recent work, mostly related to the two major global events, the Summer Olympics and FIFA World Cup (Maennig and Du Plessis 2007; Maennig and Porsche 2008).

While the costs and benefits (tangible and intangible) remain a source of debate, the focus has shifted recently towards those aspects of mega-events that are quantifiable, such as tourist behaviour (Solberg and Preuss 2006; Preuss 2007). Preuss (2007) argues that cost-benefit analyses or economic impact assessments on a macro-level relies too heavily on the assumptions to justify the outcomes and urges greater emphasis on a 'bottom-up' approach. This usually involves contingent evaluation through questionnaires and surveys, directly assessing the behaviour of individuals. While also costly, this approach has other disadvantages, including the main pitfall of 'top-down' studies, measuring the counterfactual. In that sense, our study attempts to bridge this problem by turning to a methodology now standard in the trade literature, the gravity model.

While the present paper is the first attempt to use the gravity model to assess the impact of mega-events on tourism, the approach of Rose and Spiegel (2009), who investigate the impact of hosting the Olympic Games on international trade flows, is followed. These authors find strong support that hosting a Summer Olympic Game increases trade flows significantly. Furthermore, they posit a theory of signalling, whereby countries that bid for a mega-event send a "policy signal that is followed by future liberalisation". The benefits of the mega-event is therefore not through the increase in event-related activities (tourists visiting to support their teams, for example) but through the signal a country sends by hosting (or being willing to host) the event. More revealing, they find a similar impact on trade for those countries that won the bid to host the Olympics and those that lost.

Measuring the behaviour of tourists from a comparative perspective also allows for an examination of tourism displacement or crowding-out (Matheson 2002; Solberg and Preuss 2006; Fourie, Siebrits et al. 2010). Whereas some tourists may be attracted to an event (event-specific tourists), some 'normal' tourists visiting the region frequently, may opt to shift their visit when a mega-event occurs. This could be for a variety of demand- or supply-side reasons, including escalating prices, supply constraints in terms of accommodation and transport, security concerns, or visitor preferences (Fourie, Siebrits et al. 2010). However, quantifying these crowding-out effects is troublesome as tourist behaviour is determined by many different country- and time-specific factors. A comparative analysis, therefore, which includes a number of mega-events over different years, may provide a more consistent evaluation of its size.

3 Data and Methodology

There are usually three different types of methodologies used to assess the impact of a mega-event on a country or region: input-output analysis, cost-benefit analysis, or computable general equilibrium modelling (CGE) (Andersson, Armbrecht et al. 2008). Since this paper concerns only the impact on tourist arrivals, we use a different methodology to estimate the growth in tourism when hosting a mega-event ceteris paribus. That is, a gravity equation model.

In fact, a similar methodology than the one adopted by Rose and Spiegel (2009) is applied in this paper. These authors measure the effect of hosting the Summer and Winter Olympics between 1950 and 2006 on trade flows. However, we employ a standard gravity model to measure the impact of mega-events on tourism (although we control for trade flows in our analysis). Moreover, where Rose and Spiegel (2009) only considered the Summer and Winter Olympics, we estimate the effects of six mega-sport events, namely Summer and Winter Olympic Games, FIFA World Cup, Cricket World Cup, Rugby World Cup and the Lions Tour. Thus, by using bilateral tourism flows between 200 countries from 1995 to 2006, we investigate whether tourism increases when hosting a mega-event. Eighteen mega-events are registered in the study (three each of those listed above, see Table A.1 in

the appendix).

Gravity models represent bilateral flows (in this case tourist arrivals) between two countries as a function of their respective economic size, measured in terms of GDP, GDP per capita or population, the distance between the two countries, and a host of other factors such as common border, language or colonial ties. Moreover, following Eilat and Einav (2004) bilateral trade is included as a proxy for the intensity of the economic relationship between country pairs.

We estimate the following baseline model:

$$\begin{aligned} LnTou_{ijy} &= \beta_0 + \beta_1 LnTrade_{ijt} + \beta_2 LnGDPpc_{ijt} + \beta_3 LnPop_{ijt} + \beta_4 LnDist_{ij} \\ &+ \beta_5^L ang_{ij} + \beta_6 Border_{ij} + \beta_8 Colony_{ij} + \beta_9 CU_{ijt} + \eta^{'} E_{it} + \gamma_i + \delta_j + \lambda_t + u_{ijt} \end{aligned} \tag{1}$$

where Ln denotes natural logarithms, i indicates destination country, j origin country and t is time. Dependent variable *Tou* is the number of tourist arrivals to country$i$ from country j in year t; *Trade* denotes the real bilateral trade in goods, as the sum of exports and imports, between countries i and j; *GDPpc* is the product of real GDP in per capita terms of countries i and j, *Pop* denotes the product of population of both countries; *Dist* is the great circle distance between capital cities of countries i and j, *Lang* is a binary variable which is unity if the country of origin and the country of destination have a common language and zero otherwise; *Border* is a binary which is unity if the country of origin and the country of destination share a common land border and zero otherwise; *Colony* is a binary variable which is unity if there has ever exists a colonial relationship between countries in the pair and *CU* is a binary variable related to currency union which takes value 1 if both countries in the pair share a common currency, 0 otherwise.

E is a vector of dummy variables related to mega-events. This variable would be defined depending on which of the six hypotheses is tested. Finally, β_0 is the constant, γ_i refers to destination fixed-effects, δ_j are origin fixed-effects, λ_t are year fixed-effects and u_{ijt} is a well-behaved disturbance term.

Gravity equations can be estimated with different econometric methods. The most common of these, Ordinary Least Squares (OLS), assumes that the error term is uncorrelated with the explanatory variables. Only when neither cross-sectional nor temporal effects exist can we pool the data and run OLS. To avoid the inconsistent and inefficient estimates of OLS if unobserved heterogeneity exists, gravity equations can be estimated using fixed-effects (FE). The fixed-effect model is used when controlling for omitted variables that are constant over the period of time and vary across the unit. The FE approach, however, does not allow for estimating coefficients of time-invariant variables such as the distance, or the common border and language dummies. One way to circumvent this problem – and commonly used in the trade literature – is to include individual country fixed-effects for the importers and exporters of the gravity model and estimate by OLS (Mathias 1997; Kandogan 2008).

Despite its widespread empirical use, the gravity model was earlier criticized because it lacked theoretical foundations. Nowadays, it is certainly no longer true that the gravity model is without a theoretical basis. Anderson and Van Wincoop (2000) contribute to both the theoretical foundation and the empirical estimation of gravity equations. In particular, the authors developed a method that consistently and efficiently estimates a theoretical gravity equation by considering multilateral and bilateral trade resistance. Rose and Van Wincoop (2001) propose the inclusion of country fixed-effects as a way to approximate the multilateral resistances defined in the well-founded approach of Anderson and Van Wincoop. Moreover, Helpman *et al.* (2008) presents a theoretical framework to study bilateral trade flows across countries where importer and exporter fixed effects are included. In other words, the estimation of country specific effects is suitable not only from an econometric point of view, but also attending to the theoretical foundations of the gravity specification. Thus equation (1) is estimated by OLS and including γ_i, δ_j and λ_t as destination, origin and year fixed-effects respectively. Standard errors are clustered by country pairs.

The dataset includes 169 countries as tourist destination and 200 countries as origin of tourists. The list of countries used in the analysis is reported in Table A.2 in the appendix. Therefore, the

dataset covers 33,800 pairs of countries over the period 1995-2006. The source of annual international tourist arrivals by country of origin is the *United Nations World Tourism Organisation (UNWTO).* The trade variable is measured in millions of US$ and is obtained from *Direction of Trade* dataset of the *International Monetary Fund* and the *OECD Statistics.* GDP per capita and trade need to be converted to real terms by using US GDP deflator. GDP per capita, population and US GDP deflator were obtained from the *World Development Indicators* (2006) and the *UNCTAD Handbook of Statistics* (2008). Distance and dummy variables *Lang*, *Colony, and Border* were collected from the *Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)* dataset while *CU* were obtained from Andrew K. Rose's website and the *CIA Factbook.*

Finally, regarding to the event variables, the mega-sport events are obtained from their official websites (www.olympic.org/ for Summer and Winter Olympics, as well as candidates bidding for hosting the events; http://www.fifa.com/worldcup for FIFA World Cup, http://www.rugbyworldcup.com/ for Rugby World Cup; http://www.cricinfo.com for the Cricket World Cup and http://www.lionsrugby.com/ for the Lions tour).

As with any methodology, there are limitations with ours. By only considering the impact on tourism, we do not assess the net economic impact of the event. Although tourism is an essential component of the net benefits for these events, there are numerous other macro- and microeconomic benefits and costs at play which does not factor into our analysis.

4 Results

We firstly investigate whether mega-sporting events, on average, increase tourism flows in the same year of hosting the event. While this may seem obvious, the recent literature on mega-events and their impact on tourism have become more critical (and possibly pessimistic) in their assessment of the role in mega-events to generate new arrivals (Maennig 2008, Preuss 2009). To that end, *Event* variable is defined in equation (E1) as a binary variable which takes the value 1 if the destination country i hosted a mega-sporting event. This variable is then grouped according to the mega-event type and hence six dummy variables are defined to test whether the type of event matters. *SOG*, *WOG, FIFA, CWC, RWC* and *Lions* are binary variables which take the value 1 if the destination country hosts a Summer Olympic Game, a Winter Olympic Game, a FIFA World Cup, a Cricket World Cup, Rugby World Cup or a Lions Tour respectively.

<TABLE 1 HERE>

The results of the test for the first hypothesis are presented in column (1) of Table 1. Estimates show that, after controlling for the impact on trade which is economically and statistically significant and other factors standard to the gravity framework, the *Event* coefficient is 0.079 which suppose a predicted tourism increase of 8% in the same year of hosting a mega-event.

Predictably, not all mega-events would have the same impact on tourism. Column (2) of Table 1 presents the estimates of the impact of mega-sporting event disaggregated by the type of event. Four of the six mega-events have an economically and statistically positive impact on tourist arrivals, while the Rugby World Cup and the Winter Olympic Games have a negative impact on tourism, ceteris paribus. The latter finding is consistent with the results from Rose and Spiegel (2009) who also find no evidence of an increase in trade with hosting the Winter Olympic Games. The large negative coefficient for the Rugby World Cup is more difficult to explain, and requires a more disaggregated view.

To estimate the specific effect of each mega-event and their particularities across year and type of event, specific dummies for events are included in the model. So, three dummies for each type of event are defined according to the year that the event was held. The results of this analysis are presented in Table 2.

<TABLE 2 HERE>

Hosting the Summer Olympic Games would increase tourism arrivals, on average, by 15%, con-

trolling for other factors. Yet, this is brought into question when the three individual Summer Olympics are considered: The Atlanta Summer Games of 1996 seems to have had little influence on tourism arrivals to the USA, mostly because US tourism arrivals for a specific event are dwarfed by the size of the country. Again, consistent with the literature (Chappelet 2001), the Sydney Olympics seems to have been spectacularly successful, increasing tourism to Australia by an astonishing 43%, ceteris paribus. In contrast, the 2004 Summer Games in Athens, Greece brought about a significant decline in tourism of close to 30%. These rather disparate results may suggest that the timing of a mega-sports event and country-specific characteristics greatly influence its success – measured here in terms of tourist arrivals. We get back to this issue at a later stage.

Regarding the Winter Olympic Games, the Nagano Winter Olympic Games in 1998 and the 2002 Salt Lake City event appear to have a significantly negative impact on tourism while the Turin Winter Olympic Game had no effect on tourist arrivals. Again, this is consistent with the growing literature that the Winter Olympic Games add little in terms of tourism, at least for the larger economies (Teigland 1999; Deccio and Baloglu 2002).

The FIFA World Cup is widely believed to be the second largest mega-sport event on the planet. Yet the benefit of hosting the World Cup in terms of tourist arrivals is unconvincing. On the one hand, two of the three events showed positive increases in tourism numbers. 1998 France and 2002 South Korea and Japan imply a rise on tourism of 12 and 18% respectively. While this conflicts with the view of Allmers and Maennig (2009) for France, it concurs with the South Korea/Japan experience (Horne and Manzenreiter 2004; Lee and Taylor 2005). On the other hand, in contrast to the general consensus that view the 2006 World Cup in Germany as a success (Wyludda 2009), the event seems to have had no significant impact on tourism to the country during that year. This finding is consistent with the more recent literature (Maennig and Du Plessis 2007; Hagn and Maennig 2009). This result also supports the notion that while a mega-event may have numerous psychological and emotional benefits to the inhabitants of the host nation (as was the case in Germany, and in South Africa during the 1995 World Cup), the tangible benefits do not always materialise as expected.

The 1995 Rugby World Cup was hosted by South Africa immediately after the first democratic elections of 1994. Tourism numbers fluctuated precipitously after isolation from a low base, and the 'benefits' of the World Cup in terms of tourism may have been 'captured' by the increases in trade during this period. The United Kingdom hosted both the Cricket World Cup and the Rugby World Cup in 1999, thus precluding a separation between the two events. The dummy variable for the 1999 Cricket World Cup and 1999 Rugby World Cup is therefore the same. The 2003 Rugby World Cup in Australia is more surprising. One interpretation offered is that it is due to the large boost in tourism following the Summer Olympics in 2000 and, having satisfied the sport traveller, displacing 'normal' tourism, which suggests a lesson for countries not to 'overindulge' in mega-sporting events.

Finally, we also include the three British and Irish Lions rugby union tours during the time period. These events are slightly different, in that a country does not bid to host the event. Australia, New Zealand and South Africa receive the British and Irish Lions – a team made up of players from England, Ireland, Scotland and Wales – every four years on a rotational basis. The results show that two of the three tours yielded a large increase in the tourism of Australia (2001) and New Zealand (2005). While Australia might be as a result of the post-Olympic effect, the large coefficient for New Zealand suggests support for the existing notion of a strong impact on tourism from hosting the Lions (Higham 2005).

We next test whether the host country gain their new arrivals from countries participating in the mega-event. Intuitively, countries would attract supporters from those countries that participate in the event where promotional campaigns would also be more intense. To that end, two dummy variables are included in equation (E1): *Event Participant* which takes the value one if the country of origin participates in the event and *Event Non-Participant* which takes the value one if the country of origin does not participate in the event.

<TABLE 3 HERE>

As showed in column (1) in Table 3, when controlling for trade and other factors, there is a large gain in tourism from the countries participating in the event. Specifically, the coefficient of *Event Participant* variable is 0.2387 which implies an increase on predicted tourist arrivals to the host country of 24% while no differences for those not participating are found. This is an important result since it suggests that by hosting an event, tourism is generated mainly from the countries that participate in the event. While the Olympics would attract a large number of participating countries, this result may be important for those countries that consider staging a mega-event who wish to attract visitors from specific destinations.

Together with targeting new destinations, developing countries are increasingly bidding and hosting mega-events as a strategy to improve growth and development initiatives. While such strategies has been roundly criticised (Matheson and Baade 2004), developing countries have over the last few years won the rights to host major mega-events, including the 2008 Summer Olympics (China), 2010 FIFA World Cup (South Africa), the 2014 FIFA World Cup (Brazil) and the 2016 Summer Olympic Games (also Brazil). We therefore measure the difference in impact between mega-events held in OECD and non-OECD countries. Two dummy variables are included in regression (E1), *Event OECD* which is unity if the host country is a member of the OECD and *Event Non-OECD* which is unity if the host country is not one of the 30 members of the OECD. The results are presented in column (2) in Table 3. While both coefficients are positive and significant, the results suggest that there is a sizeable difference between developed and developing countries. Considering the increase in tourism, non-OECD countries perform better (15%) than the OECD countries (9%), ceteris paribus. At the cost-benefit level, there are often stark differences between hosting mega-events in developed and developing countries (Matheson and Baade 2004; Lakshman 2008). Yet, the pervasiveness of mega-sport events in developing countries in recent times is supported by our results of a higher-than-average increase in tourist arrivals for developing countries.

<TABLE 4 HERE>

To test Rose and Spiegel's (2009) hypothesis described earlier, we estimate the impact of countries that have bid for three mega-events types – the Summer and Winter Olympic Games and the FIFA World Cup. A dummy is included for the same year when the host country was selected, and the three consecutive years following this decision. We include all the countries that submitted an official bid document. The results are reported in Table 4, column (1). We find little evidence of a signal effect through tourism arrivals. Both the bid winners and losers seem to perform equally weak in the same year and the three year immediately following the bid, which would have been the strongest validation of the Rose and Spiegel hypothesis. Table 5, column (1) reports the more disaggregated results by type of event. Again, the results are extremely varied, with no discernable trend.[1] There seems to be little evidence of an increase in tourism for those countries that lose the bid, even given the large outlier of Mexico in 1995, which could be explained with Mexico's entry into NAFTA. In all, it is not clear that countries gain from just bidding (and losing) for mega-events. Moreover, there are no discernable gains for the winners in the years immediately following the bid.

<TABLE 5 HERE>

Often labelled as the most important benefit of hosting major sporting events, the lasting 'legacy' that the event creates, refers to many aspects of the event, including the sport and transport infrastructure legacy, the urban regeneration legacy and the nation building or patriotism legacy. Yet, the long-run impact on tourism (including country brand and other tourism related marketing) is often cited as a key consideration when countries bid to host mega-events. Table 6 and Table 7 is an attempt to quantify the tourism legacies of the 18 events in our study. Table 6 shows the increases in tourism for the event held in year t, as well as the three years before and three years after the event.

<TABLE 6 HERE>

[1] The date next to the event in Table 5 refers to the year the bid was awarded to the host nation. The difference between the events and the bid election is roughly 7 to 8 years, depending on the event type. Table A.3 in the appendix present the countries that won and lost bids for hosting a events included in the analysis.

We find that, consistent with our earlier estimates, there are significant gains during the same year that the event is held. This should include event-specific tourists that visit the country during the event, as well as non-event tourists that shift their behaviour to a different time (but in the same year). Noteworthy, though, is that there seems to be little gains in the three years immediately following an event – two of the three reveal negative coefficients, while all three years are not statistically different from zero. The results do, however, reveal that tourism tends to increase dramatically as the event draws near: predicted tourism is 4 per cent higher three years before the event, 7 per cent two years before the event and 16 per cent one year prior to the event, ceteris paribus. As far as we know, this is the first cross-country, empirical estimate of pre-event tourism growth and paves the way for future research. The strong growth ex ante may also explain the relatively weak performance of the ex post years, as event-specific growth is already from a high base.

<TABLE 7 HERE>

Table 7 reports the same results now sorted by type of event. Each event includes a combined estimate of seven years (three years prior, three years post and the event year). The Summer Olympic Games, FIFA World Cup, Cricket World Cup and Lions Tour all reveal positive gains in terms of tourism numbers, while the Rugby World Cup show no difference from zero and the Winter Olympic Games show a decline in tourism numbers across all the years. These results are strongly correlated with our initial results of tourism performance in the same year of the event, and also consistent with the literature. It further suggests that 'legacies' materialise even before the event is held.

Our final hypothesis returns to identifying the size of possible crowding out. The marked differences between and within different event types suggest an important role for event-specific characteristics. One such (quantifiable) characteristic is seasonality. We therefore test the difference between events hosted during peak-season and those hosted during the off-season. To construct a binary dummy, we assume Summer to be peak-season while Spring, Autumn and Winter are regarded as off-seasons. Table 8 reports the results.

<TABLE 8 HERE>

The two coefficients in column (1) spell out the clear difference between hosting a mega-event during the peak tourist season and hosting it during the off-season. We find that a mega-event during the peak season reduce the counterfactual by 6%, while an event held during the off-season increase predicted tourism by 16%. Both are statistically significant. Table 9 further shows that these results are consistent across mega-events. The Summer Olympic Games, FIFA World Cup and Cricket World Cup draw more tourists during an off-season than during the peak season. The Lions tour is only held during the off-season which may be one reason for its consistently large impact on tourism. The Winter Olympic Games is specifically a winter event and is therefore held only during the off-season as defined here. However, because cities hosting the Winter Olympics often draw their major tourist market during the winter months to enjoy winter sports such as skiing, peak- and off-season is a misnomer in this case. For this reason, the Winter Olympic Games is excluded from Table 8.

<TABLE 9 HERE>

Tourism displacement, or crowding-out, seems to be much higher when an event is scheduled for peak-season (summer) rather than during other months. This may explain the widely disparate results found even within the same type of event, such as the large predicted increase in tourism to Australia for the 2000 Olympic Games held during the off-season versus the large decline in tourism to Greece for the 2004 Olympic Games held during their peak season. Local mega-event organisers must be cognitive of the important effects of seasonality on tourism when submitting a bid.

5 Conclusions

The objective of this paper is to study the effect of mega-sporting events on tourist arrivals. To that end, we test a number of hypotheses. The main hypothesis that mega-events increase the number of tourists in the year of the event could not be rejected. We find that, on average, mega-sporting events increase predicted tourism by roughly 8% in the same year. There is however large disparities between the types of event; the Summer Olympics, FIFA World Cup and to a lesser extent the Cricket World Cup and Lions Tour all seem to have a significant positive impact on tourism, while the Winter Olympics and the Rugby World Cup do not. This may be due to tourism displacement, but is probably more the result of the smaller nature of these events and because the events analysed here were held in countries with an already strong tourism demand.

An important conclusion of this paper is that tourism from participating countries increase more than tourists from countries not participating in the mega-event. While this is not surprising, it holds important implications for countries that consider bidding for a mega-event. Events held in non-event OECD countries increase predicted tourism more than those held in non-OECD countries, which provides some support for the growing interest from developing countries to host mega-events. We also find no evidence to support Rose and Spiegel's signal theory that countries bidding for events and lose perform similarly to those that win. Our results reveal significant increases in pre-event tourism, which may explain the lacklustre performance of post-event dummies. These legacy effects are especially large for the two major mega-events, the Summer Olympic Games and the FIFA World Cup. Finally, the size of tourism crowding-out may depend on the season in which the event is hosted. Events held during peak-season, on average, tend to show a decline in predicted tourism, while events held during the off-season attracts significantly higher numbers than what is predicted.

While these results point to many further directions for research, a few cautious policy conclusions may suffice. From a tourism perspective, hosting a mega-event is beneficial, even in the face of the growing scepticism of tourism crowding-out. Yet, it is not necessarily the more expensive events that yield the most benefits: the size and development level of the host country, the type and, importantly, timing (seasonality) of the mega-event, and the countries participating in the event all impact on the 'success' of these events, measured in terms of tourist arrivals.

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List of Tables

Table 1: Mega-event's effect on tourist arrivals: Baseline estimates

	(1)		(2)	
Variables	coef	t	coef	t
constant	10.2055	2.66	10.0380	2.62
Log of Trade	0.0656	20.49	0.0656	20.49
Log of GDPpc	0.3356	15.39	0.3364	15.42
Log of Pop	0.1329	1.16	0.1377	1.20
Log of Dist	-1.5060	-68.45	-1.5060	-68.45
Language	1.0715	23.19	1.0716	23.19
border	1.1551	10.55	1.1550	10.55
Colony	0.9725	8.79	0.9725	8.79
CU	0.1894	1.69	0.1891	1.69
Event	0.0790	5.86	-	-
SOG	-	-	0.1546	4.81
WOG	-	-	-0.0546	-2.66
FIFA	-	-	0.1048	3.97
RWC	-	-	-0.0912	-2.56
CWC	-	-	0.1469	4.52
Lions	-	-	0.1521	4.85
N	92617		92617	
F	210.17		207.71	
R	0.8336		0.8336	

Table 2: Mega-event's effect on tourist arrivals:
Year-events dummies

	(1)	
Variables	coef	t
constant	10.0297	2.61
Log of Trade	0.0656	20.49
Log of GDPpc	0.3375	15.46
Log of Pop	0.1375	1.19
Log of Dist	-1.5059	-68.44
Language	1.0716	23.19
border	1.1550	10.55
Colony	0.9725	8.79
CU	0.1907	1.70
SOG96	-0.0114	-0.31
SOG00	0.4340	9.17
SOG04	-0.2994	-2.50
WOG98	-0.1036	-4.20
WOG02	-0.0868	-3.84
WOG06	0.0726	0.93
FIFA02	0.1137	1.92
FIFA98	0.1683	5.81
FIFA06	-0.0457	-0.70
CWC96	0.3300	3.28
CWC99	0.0647	1.94
CWC03	0.0846	2.63
RWC95	(dropped)	
RWC99	0.0647	1.94
RWC03	-0.1092	-2.47
Lion97	(dropped)	
Lion01	0.1494	3.61
Lion05	0.2032	4.05
N	92617	
F	204.34	
R	0.8337	

Table 3: Mega-event's effect on tourist arrivals:
Participating partners/OECD host

	(1)		(2)	
Variables	coef	t	coef	t
constant	-0.0076	0.00	0.0192	0.01
Log of Trade	0.0915	51.54	0.0914	51.52
Log of GDPpc	0.1301	7.61	0.1298	7.58
Log of Pop	0.4442	9.00	0.4435	8.99
Log of Dist	-1.4479	-188.55	-1.4480	-188.56
Language	1.0047	63.37	1.0050	63.39
border	1.1755	43.84	1.1759	43.85
Colony	0.9584	28.97	0.9596	29.01
CU	0.0780	1.82	0.0803	1.87
Event participant	0.2387	4.07		
Event non-participant	-0.0195	-0.36		
Event OECD			0.0925	1.99
Event non-OECD			0.1471	1.65
N	80180		80180	
F	1075.26		1075.12	
R	0.832		0.832	

Table 4: Mega-event's effect on tourist arrivals: Bid winners and losers

	(1)	
	coef	t
constant	5.8062	1.82
Log of Trade	0.0655	20.46
Log of GDPpc	0.3370	15.37
Log of Pop	0.1466	1.27
Log of Dist	-1.5060	-68.45
Language	1.0717	23.20
border	1.1552	10.55
Colony	0.9720	8.79
CU	0.1831	1.63
Bid won (t)	-0.0931	-4.95
Bid won (t+1)	0.0055	0.38
Bid won (t+2)	0.0022	0.14
Bid won (t+3)	0.1335	6.55
Bid lost (t)	-0.0221	-1.53
Bid lost (t+1)	0.0192	1.84
Bid lost (t+2)	0.0663	4.93
Bid lost (t+3)	0.0022	0.14
N	92617	
F	207.46	0.0000
R	0.8337	

Table 5: Mega-event's effect on tourist arrivals: Bid winners and losers per type of event

	(1)	
	coef	t
constant	6.6044	2.05
Log of Trade	0.0656	20.46
Log of GDPpc	0.3406	15.52
Log of Pop	0.1158	1.00
Log of Dist	-1.5053	-68.40
Language	1.0721	23.21
border	1.1546	10.54
Colony	0.9710	8.78
CU	0.1927	1.71
Bid won SOG97	0.1712	1.63
Bid won SOG01	0.1982	5.85
Bid won SOG05	-0.0956	-1.57
Bid won WOG95	0.1101	2.98
Bid won WOG99	0.0133	0.28
Bid won WOG03	-0.3421	-9.22
Bid won FIFA96	-0.1568	-5.60
Bid won FIFA00	-0.0192	-0.29
Bid won FIFA04	-0.2448	-4.19
Bid lost SOG97	-0.0537	-1.64
Bid lost SOG01	0.0491	1.83
Bid lost SOG05	-0.2734	-8.56
Bid lost WOG95	0.2910	2.62
Bid lost WOG99	0.3657	5.17
Bid lost WOG03	-0.0814	-1.69
Bid lost FIFA95	0.6237	2.29
Bid lost FIFA99	0.0093	0.29
Bid lost FIFA03	-0.0420	-0.63
N	92617	
F	202.72	0.0000
R	0.8338	

Table 6: Mega-event's effect on tourist arrivals: Event legacy effects

	(1)	
	coef	t
constant	6.2010	1.94
Log of Trade	0.0656	20.49
Log of GDPpc	0.3330	15.26
Log of Pop	0.1347	1.17
Log of Dist	-1.5060	-68.45
Language	1.0716	23.19
border	1.1550	10.55
Colony	0.9727	8.79
CU	0.1840	1.64
Event (t)	0.1323	7.90
Event (t+1)	-0.0008	-0.05
Event (t+2)	-0.0034	-0.21
Event (t+3)	0.0212	1.25
Event (t-1)	0.1603	8.92
Event (t-2)	0.0738	4.16
Event (t-3)	0.0421	2.55
N	92617	
F	207.46	0.0000
R	0.8337	

Table 7: Mega-event's effect on tourist arrivals:
Event legacy effects per type of event

	(1)	
	coef	t
constant	5.7111	1.79
Log of Trade	0.0656	20.49
Log of GDPpc	0.3363	15.41
Log of Pop	0.1508	1.31
Log of Dist	-1.5060	-68.44
Language	1.0715	23.19
border	1.1550	10.55
Colony	0.9724	8.79
CU	0.1895	1.69
SOG	0.0713	2.20
WOG	-0.0569	-2.51
FIFA	0.0771	3.36
RWC	-0.0400	-0.96
CWC	0.0953	2.22
LIONS	0.0823	3.16
N	92617	
F	207.37	0.0000
R	0.8336	

Table 8: Mega-event's effect on tourist arrivals: Seasonal variation

	coef	t
constant	6.3543	1.99
Log of Trade	0.0656	20.49
Log of GDPpc	0.3354	15.38
Log of Pop	0.1273	1.11
Log of Dist	-1.5059	-68.45
Language	1.0714	23.19
border	1.1551	10.55
Colony	0.9725	8.79
CU	0.1906	1.70
Peak season	-0.0622	-2.51
Off season	0.1628	7.44
N	92617	
F	209.53	0.0000
R	0.8336	

Table 9: Mega-event's effect on tourist arrivals: Seasonal variation per type of event

	(1)	
	coef	t
constant	6.0507	1.90
Log of Trade	0.0656	20.49
Log of GDPpc	0.3370	15.45
Log of Pop	0.1376	1.20
Log of Dist	-1.5058	-68.44
Language	1.0716	23.19
border	1.1550	10.55
Colony	0.9724	8.79
CU	0.1901	1.70
SOG (off)	0.4360	9.33
SOG (peak)	-0.0650	-1.69
WOG (off)	-0.0622	-3.07
FIFA (off)	0.2177	8.76
FIFA (peak)	0.0091	0.20
RWC (off)	-0.1072	-2.42
RWC (peak)	-0.0197	-0.42
CWC (off)	0.3275	3.26
CWC (peak)	0.0840	2.61
LIONS (off)	0.1709	5.37
N	92617	
F	205.7	0.0000
R	0.8337	

Appendix

Table A.1: Mega-sport events included in the analysis, 1995-2006

Year	Summer Olympic Games (SOG)	Winter Olympic Games (WOG)	FIFA World Cup (FIFA)	Rugby World Cup (RWC)	Cricket World Cup (CWC)	Lions Tour (Lion)
1995				South Africa		
1996	USA				India/ Pakistan/ Sri Lanka	
1997						South Africa
1998		Japan	France			
1999				United Kingdom	United Kingdom	
2000	Australia					
2001						Australia
2002		USA	South Korea/ Japan			
2003				France	South Africa	
2004	Greece					
2005						New Zealand
2006		Italy	Germany			

Table A.2:Other countries included in the analysis, 1995-2006

Afghanistan, I.S. of	Dominica	Kuwait	Réunion
Albania	Dominican Rep.	Kyrgyz Rep.	Saint Helena
Algeria	Ecuador	Lao, P. D. Rep.	Saint Kitts and Nevis
Angola	Egypt	Latvia	Saint Lucia
Antigua & Barbuda	El Salvador	Lebanon	Saint Pierre & Miquelon
Argentina	Equatorial Guinea	Lesotho	Saint Vincent and the Grenadines
Armenia	Eritrea	Liberia	Samoa
Aruba	Estonia	Libya	Saudi Arabia
Australia	Ethiopia	Lithuania	Senegal
Austria	Falkland Islands	Luembourg	Serbia and Montenegro
Azerbaijan	Feroe Islands	Macao	Seychelles
Bahamas, The	Fiji	Madagascar	Sierra Leone
Bahrain	Finland	Malawi	Singapore
Bangladesh	France,	Malaysia	Slovak Rep.
Barbados	French Guiana	Maldives	Slovenia
Belarus	French Polynesia	Mali	Solomon Islands
Belgium	Gabon	Malta	Somalia
Belize	Gambia, The	Martinique	South Africa
Benin	Georgia	Mauritania	Spain
Bermuda	Germany	Mauritius	Sri Lanka
Bhutan	Ghana	Mexico	Sudan
Bolivia	Gibraltar	Mongolia	Suriname
Bosnia and Herzegovina	Greece	Morocco	Swaziland
Botswana	Greenland	Mozambique	Sweden
Brazil	Grenada	Namibia	Switzerland
Brunei Darussalam	Guadeloupe	Nauru	Syrian Arab Rep.
Bulgaria	Guatemala	Nepal	São Tomé & Príncipe
Burkina Faso	Guinea	Netherlands	TFYR of Macedonia
Burundi	Guinea-Bissau	Netherlands Antilles	Tajikistan
Cambodia	Guyana	New Caledonia	Thailand
Cameroon	Haiti	New Zealand	Togo
Canada	Honduras	Nicaragua	Tonga
Cape Verde	Hong Kong	Niger	Trinidad and Tobago
Central African Rep.	Hungary	Nigeria	Tunisia
Chad	Iceland	Norway	Turkey
Chile	India	Oman	Turkmenistan
China	Indonesia	Pakistan	Uganda
Colombia	Iran, Islamic Rep. of	Palau	Ukraine
Comoros	Iraq	Panama	United Arab Emirates
Congo	Ireland	Papua New Guinea	United Kingdom
Costa Rica	Israel	Paraguay	United Rep. of TanzaniaTanzania
Cote d'Ivoire	Italy	Peru	United States
Croatia	Jamaica	Philippines	Uruguay
Cuba	Japan	Poland	Uzbekistan
Cyprus	Jordan	Portugal	Vanuatu
Czech Rep.	Kazakhstan	Qatar	Venezuela, República Bolivariana de
Czechoslovakia	Kenya	Rep. of Moldova	Vietnam
Democratic Rep. of Congo	Kiribati	Romania	Yemen, Rep. of
Denmark	Korea, dem	Russia	Zambia
Djibouti	Korea, rep of	Rwanda	Zimbabwe

Table A.3: Won and lost mega-sport event's bid

Year	Summer Olympic Games (SOG)	Winter Olympic Games (WOG)	FIFA World Cup (FIFA)
1995		United States (won) Sweden (lost) Switzerland (lost) Canada (lost)	
1996			South Korea (won) Japan (won) Mexico (lost)
1997	Greece (won) Italy (lost) South Africa (lost) Sweden (lost) Argentina (lost		
1998			
1999		Italy (won) Switzerland (lost)	
2000			Brazil (lost) England (lost) Germany (won) South Africa (lost) Morocco (lost)
2001	China (won) Canada (lost) France (lost) Turkey (lost) Japan (lost)		
2002			
2003		Canada (won) South Korea (lost) Austria (lost)	
2004			Egypt (lost) Morocco (lost) South Africa (won)
2005	Great Britain (won) France (lost) Spain (lost) United States (lost) Russia (lost)		
2006			