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JOHAN FOURIE AND MARÍA SANTANA-GALLEGO

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JOHAN FOURIE
DEPARTMENT OF ECONOMICS
UNIVERSITY OF STELLENBOSCH
PRIVATE BAG X1, 7602
MATIELAND, SOUTH AFRICA
E-MAIL: JOHANF@SUN.AC.ZA

MARÍA SANTANA-GALLEGO
DEPARTMENT OF ECONOMICS
LA LAGUNA UNIVERSITY
SPAIN

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ABSTRACT

While a mega-sport 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. In general, results suggest that mega-events promote tourism but the gain varies depending 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 season or off season.

Keywords: Sport mega-events; tourism; World Cup; Olympic Games; trade
JEL codes: L83, F19

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I. 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 so-called 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.

In the empirical analysis we test six different hypotheses. First, we analyse the more general hypothesis that a mega-event increases the number of tourists in the year of the event. Where this hypothesis is rejected, a strong case for displacement of tourists could be made. Second, the effects are disaggregated by type of mega-event to reveal if there is a systematic difference in impact between the six mega-event types considered in the analysis. Third, we test whether tourist arrivals from participating countries increase more than arrivals from countries not participating in the mega-event. This hypothesis suggests whether hosting an event results in tourism creation or tourism diversion. Fourth, 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 the 2008 Beijing Olympic Games, the FIFA World Cup 2010 South Africa, the FIFA World Cup 2014 Brazil and the 2016 Rio de Janeiro Olympic Games. Fifth, while it is often said that mega-events create a so-called lasting legacy, we attempt to quantify this by measuring the long-run impact on tourist arrivals, both before and after the event and finally we also distinguish between events held during the peak tourist season and off-peak season in order to search for possible evidence of differences in crowding-out given seasonal variation.

To that end, this paper is organized as follows: 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.

II. Mega-sport events and their impact on tourism

The appeal of hosting a mega-event, or more specifically a mega-sports event, has grown significantly over the last two decades. Not only has 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 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 (Fourie and Spronk 2010) and British/Irish Lions rugby tours (Higham 2005; Fourie and Spronk 2010) 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 rely 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 for the view 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 and Spronk 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, *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.

III. 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 and Lundberg 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.

Traditionally, gravity models have been applied to explain country-pair flows, such as international trade (Armstrong, 2007 and Fratianni, 2007 provide two recent surveys on the broad use of gravity models on trade), foreign direct investment (Eichengreen and Tong, 2007; Bergstrand and Egger, 2007; Head and Ries, 2008) or migrations (Karemera *et al*., 2000; Gallardo *et al*., 2006). Indeed, under the assumption of tourism as a particular class of trade, a gravity equation can be used to study the main determinants of its volume. Durbarry (2000), Gil-Pareja, Llorca and Martínez-Serrano (2006, 2007) and Santana-Gallego, Ledesma-Rodríguez and Pérez Rodríguez (2010) have successfully applied gravity equations to explain international tourism flows.

In the present analysis, a similar methodology as the one adopted by Rose and Spiegel (2009) is used. These authors measure the effect of hosting the Summer and Winter Olympics between 1950 and 2006 on trade flows. Building on Rose and Spiegel (2009), we employ a standard gravity model to measure the impact of mega-events on tourism, but, whereas 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 Rugby Tour. Thus, by using bilateral tourism flows between 200 countries from 1995 to 2006, we investigate whether tourist arrivals increase when hosting a mega-event. For that purpose, eighteen mega-events are registered in the study (three of 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 set of other factors such as common border, common language, common currency 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 therefore estimate the following baseline model:

$$\begin{aligned} LnTou_{ijt} &= \beta_0 + \beta_1 LnTrade_{ijt} + \beta_2 LnGDPpc_{ijt} + \beta_3 LnDist_{ij} + \beta_4 Lang_{ij} \\ &+ \beta_5 Border_{ij} + \beta_6 Colony_{ij} + \beta_7 CU_{ijt} + \eta' E_{it} + \gamma_i + \delta_j + \lambda_t + u_{ijt} \end{aligned} \quad (1)$$

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*; $GDPpc_{ij}$ is the product of real GDP in per capita terms of countries *i* and *j*; *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 existed 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) present 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 are

converted to real terms by using the US GDP deflator. GDP per capita and the 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 from candidates bidding to host 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 are not factored into our analysis. However, this raises questions beyond the scope of our analysis. Our main purpose here is to quantify the benefit of hosting a mega-events derived from the increase in tourist arrivals.

IV. Results

We firstly investigate the more general hypothesis whether mega-sporting events increase tourist arrivals 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 of mega-events in generating new arrivals (Maennig 2008, Preuss 2009). To that end, *Event* variable is defined in equation (1) as a binary variable which takes the value 1 if the destination country *i* hosted a mega-sporting event.

<TABLE 1 HERE>

The results of the test for the first hypothesis are presented in column (1) of Table 1. Before we discuss the coefficients of greatest interest to us, we briefly discuss the other determinants of tourist arrivals. The R^2 reports that the model explains a satisfactorily high 83% of the variation in international tourism. The coefficient of trade is statistically significant and has a positive sign, indicating that trade promotes tourism. The product of logarithm GDP per capita is significant as expected, implying that the richer countries are, the higher the international tourism movement between them will be. The distance has the expected negative sign, showing that *ceteris paribus*, tourists prefer closer destinations. As for the dummy variables, sharing a common language reveals a positive effect, indicating that a different language behaves as a barrier for tourism. The *Border* variable is significant and positive which

implies that tourism flows are greater between contiguous countries and finally, the coefficient of *Colony* is positive, suggesting that tourism increases whether one country ever colonized the other or vice versa.

Our variable of interest, *Event*, is statistically significant and yields a coefficient of 0.073 Since, the dependent variable is expressed in logs, the way to obtain the elasticity of the Event dummy variables is by applying an exponential, in this case: exp(0. 073)-1=0.076. This result implies that by hosting a mega-sport event countries would increase their tourist arrivals by 7.6%.

Predictably, not all mega-events would have the same impact on tourism. The *Event* variable is therefore disaggregated in the second regression according to the mega-event type to test the second hypothesis 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 Rugby Tour, respectively. These results are presented in Column (2) of Table 1. 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, suffice to say that an overlapping dummy variable in the 1999 Rugby and Cricket World Cup in England, the lack of comparable South African tourism data in 1995, and the high level of existing tourism demand in the three host countries (South Africa, England and Australia) may all influence the size of the coefficient downward. But even given this adjustment, there is little evidence to suggest that Rugby World Cup tournaments *increase* tourism, *ceteris paribus*.

We next test whether the host country gains the estimated new arrivals from countries that participate in the mega-event. Intuitively, countries would attract supporters from those countries that participate in the event, and where promotional campaigns would also be more intense. To test the third hypothesis, two dummy variables are included in equation (1): *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 2 HERE>

As shown in column (1) of Table 2, 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 0.1097, which implies an increase on tourist arrivals to the host country of 11.6%, while *Event Non-Participant* appears to be not statistically significant. This is an important result since it suggests that by hosting an event, tourism generated comes 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 and 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 boost development initiatives. While such strategies have been roundly criticized (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), the 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.

To test for the fourth hypothesis, two dummy variables are included in regression (1), *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) of Table 2. 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 (18%) than the OECD countries (3%), *ceteris paribus*. Our results therefore has important implications for projections of tourist arrivals to developing vis-à-vis developed host nations, where stark differences at the cost-benefit level are often to be found (Matheson and Baade 2004; Lakshman 2008).

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-sport events. The fifth hypothesis is an attempt to quantify the tourism legacies of the mega-sport events in our study. To that end, six dummy variables, the three years before and three years after the event , in addition to the contemporary event variable, are included in the first regression in Table 3.

<TABLE 3 HERE>

We find that, consistent with our earlier estimates, there are significant gains (10%) 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 11% higher three years before the event, 10% two years before the event and 19% 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.

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. While we recognise that summer may not always be peak season, tourism trends for the countries included in our analysis seem to support this notion. Table 4 reports the results.

<TABLE 4 HERE>

The *Peak Season* and *Off Season* coefficients in Table 4 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 reduces the counterfactual by 6%, while an event held during the off-season increases predicted tourism by 16%. Tourism displacement, or crowding-out, seems to be much higher when an event is scheduled for peak-season (summer) rather than during other months. Thus, local mega-event organisers must be cognisant of the important effects of seasonality on tourism when submitting a bid.

V. Conclusions

The objective of this paper is to study the effect of mega-sport 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 increases 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.

Moreover, our results reveal significant increases in pre-event tourism, which may explain the lacklustre performance of post-event dummies. 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 attract 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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Appendix

Table 1: Effect of mega-event on tourist arrivals:
Hosting a sporting mega-event

	(1)		(2)	
Variables	coef	t	coef	t
constant	11.4596	0.01	14.6453	36.42
Log of Trade	0.0656	20.51	0.0656	20.51
Log of GDPpc	0.3284	15.21	0.3290	15.23
Log of Dist	-1.5060	-68.45	-1.5060	-68.45
Language	1.1551	10.55	1.1551	10.55
border	1.0713	23.19	1.0713	23.19
Colony	0.9727	8.79	0.9727	8.79
CU	0.1874	1.67	0.1870	1.67
Event	0.0730	5.92	-	-
SOG	-	-	0.1525	4.74
WOG	-	-	-0.0542	-2.64
FIFA	-	-	0.1005	3.80
RWC	-	-	-0.1282	-3.49
CWC	-	-	0.1692	4.99
Lions	-	-	0.1522	4.85
N	92617		92617	
F	210.68	0.0000	208.27	0.0000
R	0.8336		0.8336	

Table 2: Effect of mega-event on tourist arrivals:
Participating partners/OECD host

	(1)		(2)	
Variables	coef	t	coef	t
constant	14.6487	36.43	14.6542	36.44
Log of Trade	0.0656	20.51	0.0656	20.51
Log of GDPpc	0.3285	15.21	0.3282	15.20
Log of Dist	-1.5060	-68.45	-1.5060	-68.45
Language	1.1549	10.55	1.1551	10.55
border	1.0711	23.19	1.0713	23.19
Colony	0.9724	8.79	0.9727	8.79
CU	0.1868	1.67	0.1877	1.68
Event participant	0.1097	3.83	-	-
Event non-participant	-0.0047	-0.17	-	-
Event OECD	-	-	0.0293	1.97
Event non-OECD	-	-	0.1656	4.28
N	92617		92617	
F	210.27	0.0000	210.28	0.0000
R	0.8336		0.8336	

Table 3: Effect of mega-event on tourist arrivals: Event legacy effects

	-1	
	coef	t
constant	14.6764	36.49
Log of Trade	0.0656	20.52
Log of GDPpc	0.3266	15.13
Log of Dist	-1.5060	-68.45
Language	1.1551	10.55
border	1.0714	23.19
Colony	0.9731	8.79
CU	0.1818	1.62
Event (t)	0.0951	5.67
Event (t+1)	0.0176	0.96
Event (t+2)	-0.0285	-1.34
Event (t+3)	-0.0079	-0.36
Event (t-1)	0.1710	9.03
Event (t-2)	0.0975	4.83
Event (t-3)	0.1031	5.18
N	92617	
F	208.26	0.0000
R	0.8337	

Table 4: Effect of mega-event 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
Event Peak season	-0.0622	-2.51
Event Off season	0.1628	7.44
N	92617	
F	209.53	0.0000
R	0.8336	

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.	Palau	Ukraine
Comoros	Iraq	Panama	United Arab Emirates
Congo	Ireland	Papua New Guinea	United Kingdom
Costa Rica	Israel	Paraguay	United Rep. of Tanzania
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
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