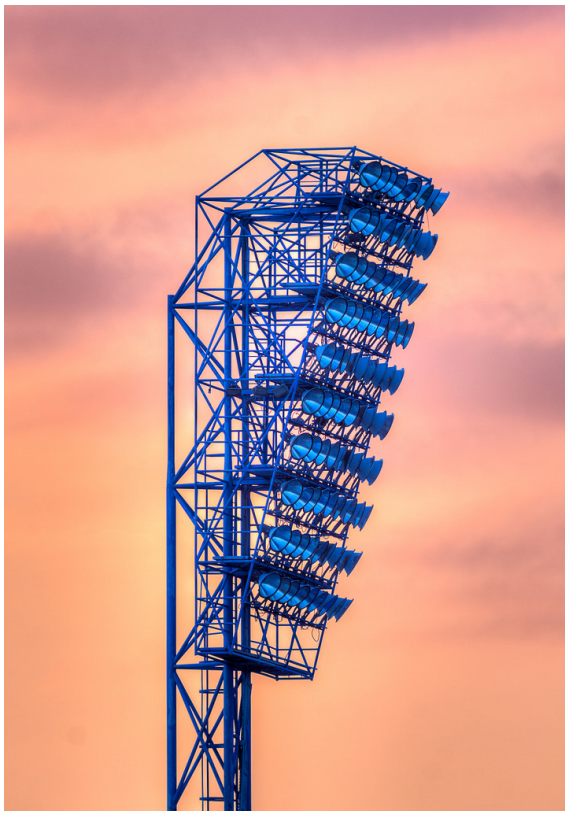

TO HOST OR NOT TO HOST

A Quantitative Analysis of the Impact of Mega Sport Events on Tourist Numbers

ABSTRACT

This research paper measures the impact factor of Mega Sport Event (MSE's) on the inward tourist flows of the hosting country. The theoretical background of MSE's are discussed, including reasons against and in favor of hosting. A theoretical and a statistical model are constructed based on the variables indicated in academic literature to contribute to a country's tourist numbers. A panel data analysis is conducted on a dataset with variables from UNWTO, UNCTAD, and the World Bank. The findings indicate that MSE's are a poor tool to attract tourists, and suggest tentatively that MSE's only attract tourists for countries with an already existing high tourist value offering.

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URBAN, PORT & TRANSPORT ECONOMICS

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Preface

My gratitude goes out to my thesis coordinators Alexander Otgaar and Jan-Jelle Witte for their continuous support and responsiveness. And to the University's Accounts Receivable Department, whose bi-monthly bank subtractions were the final inspiration to finish this thesis.

1. Introduction

Brazil hosted the FIFA World Cup in the summer of 2014. Considered to be 'the country of football', it has won the FIFA world cup for a record five times and is the only country to have qualified for every FIFA world cup to date.

One would have therefore expected that the population of Brazil would have been undividedly positive about hosting the 2014 FIFA World Cup edition. Instead, the prelude to the event was marked by public unrest, with large groups demonstrating against it on the streets of major cities like Sao Paolo and Rio de Janeiro.

The Guardian noted that the 'Our cup is on the streets' protests were aimed against corruption, police brutality, but above else against the high costs involved with the event – investments that, as the demonstrators argued, would be better spent on improving Brazil's social system, such as healthcare and education (Watts, 2014).

Indeed, the hosting of Mega Sport Events (MSE's) such as the FIFA Football World Cup involves enormous investments for the countries they are located in (Preuss, 2005). Why, then, do countries compete so heavily for the honor?

When looking at the previous two FIFA World Cups, one stumbles over an extensive pile of discussions and disagreement concerning the justifiability of the investment.

Academic literature has not withdrawn from this discussion on the economic and social justifiability of hosting MSE's. On the contrary, a lively debate is ongoing. This generally consists of the exploration of theoretical foundations underlying MSE's on the one hand, and of empirical measurement of their economic, commercial, and social returns on the other.

While the theoretical debate has a comprehensive approach, the empirical studies are dominated by case studies of separate events (e.g. Hede, 2005; Graton et al, 2000; Kang & Perdue, 1994; Lee & Taylor, 2005). This case-study approach is understandable when one considers the immense amount of data that needs to be collected to measure the effects of such events (Ritchie, 1984).

Measuring their impact is a "complex and practically difficult task" (Ritchie, 1984, p.5). He points out that while the measurement of

economic impacts is simple on a conceptual level, the difficulty lies in the actual collection of required information, due to the conditions under which this happens and the many different sources.

On the other hand, the assessment of impact on tourism and commerce runs into difficulties on a methodological level, as it requires the observation of awareness in a wide number of countries over a long period of time (Ritchie, 1984). This explains the dominance of case studies in empirical research on the impact of MSE's, where the collection of data is limited by geographical scope.

These studies should be credited for the deep insights they provide into their respective cases. However, as is a general problem with case studies, they fall short in generalizability. This is compounded by the fact that the wide number of case studies have produced widely varying results. This lack of generalizability forms an 'untested' gap between the theoretically and empirically oriented literature. Furthermore, it poses a problem for policymakers, who in the current situation lack adequate tools to base their decisions on.

This paper aims to provide such a tool by producing an empirical research with generalizable conclusions. Instead of looking at many factors of one specific event, as is done in the case studies, this paper considers many different cases of MSE's and takes one specific and highly relevant metric as a measure for success. This metric is tourist arrivals, and the goal of the study is to assess whether and how these are affected by the hosting of MSE's.

With this approach we aim to answer the main research question:

- *To what extent can Mega Sport Events impact a country's tourism flows?*

To answer this, we conduct a panel data analysis on a unique dataset. This dataset includes data on tourism flows and various influencing factors of a collection of hosting and non-hosting countries over a 19-year period.

In the literature many factors are claimed to be – or not to be – affected by the hosting of MSE's. Therefore, it should be made clear from the start that the results of this research paper will not provide a complete picture. However, they should give insight into the actual capability of a MSE to impact the tourism flows of the host countries, the metric often quoted as most critical for hosting regions to benefit economically (Burgan &

Mules, 1992; Crompton et at, 2001; Chalip, 2002; Gelan, 2003 Preuss, 2005).

Before the analysis, one should have an understanding of the concept of a MSE and its position within contemporary 'place marketing'. Section 2, 3, 4, and 5 of this paper cover existing literature on the topic, discussing the position of MSE's inside the concept of place marketing and the commonly quoted benefits for hosting one. More specifically, it covers the questions:

- *How can we explain the growing attention for Mega Sport Events?*

- *What is a Mega Sport Event?*

- *Why would a nation or city want to host a Mega Sport Event?*

This section continues by reviewing academic criticism on the phenomenon of MSE's and their proclaimed benefits, followed by a discussion of factors that could play a mediating role in the 'success' of an event. More specifically, we discuss:

- *What are the critiques on the hosting of Mega Sport Events?*

- *What factors could influence the 'success' level of Mega Sport Events on tourism flows?*

Finally, we zoom in on tourism flows and their nature in respect to tourism and mega (sport) events. We discuss in section 6:

- *What factors influence the tourism flows of nations?*

From this we build our theoretical and statistical models. The theoretical sections serve as a foundation to tackle the main research question, which we will answer through a quantitative analysis:

- *What is the influence of MSE's on tourist flows during the event, pre-event, and post-event periods?*

In section 7 we build the theoretical and statistical models. In section 8 we discuss the data in our compiled data set, after which we discuss the methodology of our quantitative analysis in section 9. The results are further discussed in section 10 with the aim of providing actionable

policy recommendations, followed by a section on the limitations of this research and proposals for further research.

2. How can We Explain the Growing Attention for Mega Sport Events?

The growing attention for MSE's can be understood as part of the equally growing concept of place marketing, which is rooted in the dynamics of several global developments. In this first section we discuss the concept of place marketing, which the hosting of MSE's is considered to be a tool of. As the name suggest, this type of marketing is aimed at pushing forward a certain image of a geographical location.

Before elaborating on how MSE's fit in the concept of place marketing and settling on a definition for either of the two, one should first gain an understanding of the fundamental developments and trends that underlie the increased attention given to these concepts in academic literature — and outside, in the real world. Braun (2008) provides an overview of exactly this. Although his analysis is primarily concerned with urban tourism and city marketing, many of the fundamental developments and the resulting (inter)national trends are applicable to place marketing and country level analysis as well.

2.1. Fundamental Developments and Trends

Braun (2008) identifies six fundamental developments that are behind a number of trends, which again produce changes in the behavior of actors on an urban level. These fundamental developments and trends are interdependent, yet by explicitly discussing them one gains a better understanding of the growing importance of place marketing and MSE's.

The first development is 'globalization', the "worldwide movement toward economic, financial, trade, and communications integration" (Business Dictionary Website, 2015). Robertson (1992) notes that this term has been increasingly used in academic literature since the 1980s, and that it covers the compression and intensification of the world.

The second fundamental development identified by Braun (2008) is the advancement in Information and Communication technology. The world is in an accelerating process of interconnectivity, the effects of which can be experienced by anyone with an internet connection. Castells (1999) argued that new technologies in information and communication (ICT) are the sources of renewed productivity, organizational shapes, and globalization in today's capitalistic era. The advancements in ICT and of globalization are heavily intertwined; one cannot be explained without the other.

Thirdly, Braun (2008) presents 'political developments' as a third fundamental development, with examples such as Europe's ongoing integration process and the NAFTA and GATT negotiations. These political developments can also be regarded as symptoms of globalization.

The threat of terrorism is mentioned as a fourth fundamental development. Events such as the 2001 attack on the World Trade Centre, the following wars in Afghanistan and Iraq, as well as more recent developments such as the Arabic Spring and Islamic State movement in the Middle East have a real impact on the (travel) behavior of large groups of people.

Fifthly, Braun (2008) focuses on the economic power shift from the West to South East Asia, and especially to China (World Bank, 2005). This global redistribution of wealth has an impact on, among others, the products and services that people spend their money on around the world – for example the consumption of luxury products like tourism.

Braun (2008) also mentions the power of mass media in the shaping of the public's views and attitudes, which strongly influences its choices. The increasing prominence of mass media has been facilitated by advancements in ICT. Large groups of people around the world spend a great part of their wakeful hours behind computer screens. This allows them to receive updates about worldly developments as they occur, instead of reading about them in the morning newspapers, as was the dominant mode not too long ago.

Braun (2008) identifies the developments in transport as the final fundamental development. The costs of crossing large distances have dropped dramatically over the past decades due to advancements in technology but also due to market liberalization, which resulted for example in high speed train networks and low cost airlines.

Together, these fundamental developments are at the root of the following trends, the relevant ones of which we will expand on:

(i) A continuous integration of markets, (ii) the enlargement of export markets of international companies, (iii) the concentration of (inter)national command and control functions in major conurbations, (iii) greater mobility of people, goods and capital (leading to more competition among cities in attracting and maintaining these), (iv) the movement towards a 'knowledge economy' in Western cities, and (v) the

rise of the ‘experience economy’ (Braun, 2008). Again, these resulting trends are interdependent.

Especially important for the increasingly prominent role of ‘place marketing’ is the greater mobility of people and companies. The options for settlement have widely increased for these two groups, as have the leisure travel options for individuals. Since the presence of (talented) people and (profitable) companies are often considered as the cornerstones of economic growth for cities and countries alike (Florida et al, 2008), this increase in mobility has led to a surge in competition within these respective groups. Furthermore, the jump in available options has increased the reliance on information to make accurate decisions (Braun, 2008).

The greater mobility explains the higher competition between cities and between countries, as well as the increased reliance on information to make accurate decisions. Together they can explain the rise of ‘place marketing’, with countries and cities competing among each other to communicate a favorable image of their location to their ‘target customers’.

The ‘customers’ of a place are generally categorized into ‘residents’, ‘companies’ and ‘visitors’ (Van den Berg et al, 1990; Ashworth & Voogd, 1990), although another category of ‘investors’ is added to that on occasion as well (Van den Berg and Braun, 1999; Braun et al, 2003). This paper is concerned with the measurement of the ‘visitor’ customer, yet one should keep the customers in mind as well. As we will discuss later, besides attracting visitors, the arguments for hosting MSE’s also focus on the other ‘place customers’. We shall also see that the interests of these various customers can be in conflict, which results in problems for resource allocations of the scale required for the hosting of major events.

Not only have the abovementioned developments and trends resulted in intensified competition among existing traditional tourism destinations, the low cost airlines and the role of the internet in decision making have made it easier for ‘non-touristic’ places to grow in this industry (Dunne et al, 2010).

Having explained the developments and trends that led to the advancement of ‘place marketing’ in policy making and literature alike, we will now settle on a definition to be used throughout the rest of this paper.

2.2. Defining Place Marketing

As mentioned earlier, even though Braun's (2008) analysis was primarily conducted on an urban geographical level, the developments and trends he brings forwards can be applied to the broader 'place marketing' as well. There is, however, no consensus within the literature about the definition of 'place marketing'.

Besides 'place marketing' (Ashworth & Voogd (1990), Kotler et al. (1993;1999)) and 'city marketing' (Van den Berg, Klaassen and Van der Meer (1990), Van Gent (1984), Borchert and Buursink (1987), Buursink (1991), Paddison (1993) and Kriekaard (1994)), other terms used for similar concepts include 'place selling' (Burgess, 1982; Ward 1998), 'place promotion' (Gold and Ward, 1994), 'locational marketing', 'city branding' (Hankinson, 2001), 'regional marketing' (Van 't Verlaat (1997)), 'urban marketing' (Corsico and Ave (1994)), 'destination marketing' (Gartrell (1988), Goodall and Ashworth (1990)), and 'geographical marketing' (Meester and Pellenbarg, 2001).

Of these, place marketing and city marketing are the most common (Braun, 2008), with city marketing being more specific to the marketing of urban entities and place marketing applying to the marketing of a broader array of geographical scopes. Braun (2008) describes place marketing as a family term that covers the marketing from neighborhoods until states and countries.

What term should be chosen thus depends on the geographical scope of the analysis. Sport events are used across such scopes to promote places, yet this research paper focuses on MSE's. The magnitude of investment required for such events is so high that its hosting decision must be made at the state level – with the spread of its benefits approaching the same level. Because of this, the term used throughout this paper will be 'place marketing', as the measured effects are thought to take place on a level closer to that of a nation than that of a city or region.

The most prominent user of the term 'place marketing' is certainly Kotler (2002). He provides a broad definition of place marketing, as "designing a place to satisfy the needs of its target markets. It succeeds when citizens and businesses are pleased with their community, and the expectations of visitors and investors are met" (Kotler et al 2002, p.183). This definition of place marketing will be used for this paper.

Distinguishing what does and does not fall within the realm of place marketing is not straightforward. As one can imagine, the spectrum of

possibilities to 'design a place to satisfy the needs of its target markets' is wide. Kotler (1999) describes four 'products' that a place can offer its 'customers'. A place offers (i) a character (architectural and design qualities), (ii) a fixed environment (infrastructure and natural environment, (iii) public services (e.g. safety and cleaning services), and (iv) entertainment (e.g. leisure facilities and events). Whatever tools are used for purposeful management of these 'place products' to 'satisfy the needs of the target market' can be regarded as tools for place marketing. The different products of a place are obviously not equal in how easily they can be tweaked for the purpose of marketing.

'Place as a character' and 'fixed environment' products are arguable less easy to control than 'service' or 'entertainment' products. Therefore, practices typically described as 'place marketing' tend to fall within the latter two areas. The short and long term success of such easier 'products' will however conceivably depend on the perceived quality of less manageable products – such as character and fixed environment.

The hosting of a MSE clearly falls within the entertainment offering of a place. More specifically, MSEs are an extreme form of what the literature refers to as 'hallmark events'. The following section concerns itself with explaining such hallmark events and defining the MSE concept.

2.3. Hallmark and Mega Sport Events

This paper is concerned with a type of sport events that are characterized by huge investments and societal impacts. Major forms of sporting or cultural events are also referred to as 'hallmark events'.

Hallmark events are one specific tool in the marketing of places, falling within the 'entertainment products' (Kotler, 1999) that a place can offer. Ritchie (1984) defines hallmark events as "major one-time or recurring events of limited duration, developed primarily to enhance the awareness, appeal and profitability of a tourism destination in the short and/or long term" (Ritchie, 1984, p.2)

He also mentions as another defining element of hallmark events their ability to "focus national and international attention on the destination for a well defined and usually short period of time"(Ritchie, 1984, p.2). To attract such attention, the event should be sufficient large in size, but also limited in time. A continuous large attraction, e.g. a theme park such as Disneyland, is not an event and will lose in media attention after its

novelty has passed. Timeliness thus plays an important part in the attention grabbing power of hallmark events.

Ritchie (1984) describes various types of hallmark events, such as world fairs/expositions, carnivals and festivals, cultural and religious events, historical milestones, commercial and agricultural events, political personage events, and major sport events. He explains the difficulty of determining when an event is large enough to be defined as a major sport event, with events ranging in sizes on a continuous spectrum.

Concerning major sport events, Ritchie (1984) offers examples of events that will definitely be labeled as 'major', such as the Winter and Summer Olympic Games and the FIFA World Football Cup, as well as events that range on the border of 'major-ness', such as the Grand Prix racing, Wimbledon, and World Cup skiing. To be on the safe side in measuring the effect of MSEs, we have selected for our analysis not events bordering on the major-ness, but seven of largest sport events (Summer Olympic Games, Winter Olympic Games, FIFA World Cup, UEFA Europe Cup, Africa Cup of Nations, Copa America, and the AFC Asian Cup). All these events require investments on a nation wide level.

The definition we will use for a Mega Sport Event (MSE) is thus based on Ritchie (1984), namely a 'major sport event of limited duration, which is hosted for the purposes of awareness, appeal, and profitability by focusing national and international attention on the destination for a short period of time.'

3. Why Host a Major Sport Event?

This section is concerned with the argumentation for hosting a MSE, or with the justifications for spending such monstrous sums of public money on a singular event. Because it concerns public funding, it can only be justified if the social and economic gains from such an event are directed, for a large part, to the greater society. A theoretical basis for this is provided by various academic sources, which we will review here.

The next subchapter, on the other hand, reviews the critiques from academic literature, covering arguments for *not* hosting a MSE. Before proceeding with the 'benefits', it should be stressed that we cover only social/economic argumentation here because they are the only foundation on which a MSE investment could be publically justified. However, it should be noted that policy makers could have personal gains in organizing MSEs as well, since the money they invest is not their own. Or as Ritchie (1984) puts it: "Less acceptable as a subject of discussion is the degree to which the holding of a given hallmark event may in reality reflect the desire of a small elite to pursue its interests in the name of community development" (Ritchie, 1984, p.4). The widespread corruption allegations surrounding the FIFA and its event bidders are indications for this phenomenon (BBC, 2015).

Ritchie (1984) covers the possible wide ranging and intertwining benefits of hosting a hallmark event, as well as the possible negatives that are discussed in the following subchapter. We will use his theoretical framework to discuss the arguments in favor and opposed to hosting a major sport event.

For the first potential 'positive manifestation', Ritchie (1984) indicates the economic impacts in the form of increased expenditures and the creation of employment in the hosting region. Preuss (2004) indicates that these stem from three main sources: consumption by the organization, tourism and exports, and from infrastructure investments.

Secondly, Ritchie (1984) refers to the tourism and commercial impacts, with a hallmark event having the positive effects of building awareness for the hosting location as a tourist destination – as well as for its commercial and investment opportunities. This is confirmed by Solberg and Preuss (2007), who state that major sport events can strengthen the profile of the hosting location as an interesting tourist destination.

Ritchie & Smith (1991) and Keller (2002) state that major sport events are effective tools in the development of tourist products, which can raise

awareness of the hosting region as a destination for tourist travels. Morese (2001, p. 11) and Rivenburgh et al (2003) note that the desire for future visits of the hosting location can be spurred through the worldwide coverage that accompanies hallmark events, popularizing and stressing the region's positive aspects. While sports hallmark events have an impact on tourism industries all over the world, the strongest economic impact is experienced in the host location (Preuss, 2005).

According to Chalip (2002), tourism is the main source of autonomous money streams deriving from a major sport event and – when placed within a well planned larger tourism strategy – a MSE can effectively stimulate tourism in the post-event period. For some (primarily post-industrial) host cities and regions, hallmark events are intentionally used in this way as a tool for 'reimaging' (Richards & Wilson, 2004). In such cases, the event has the explicit goal of presenting a favorable image of the city or region to visitors, with the goal of nurturing the tourism industry to replace the employment providing power of its perished industries (Smith, 2004).

Law (1992) describes how this use of tourism for economic regeneration originated in US cities in the 1980s and spread from there to cities in Great Britain and the rest of Europe. He makes the case that the property for which the tourism industry is often criticized on, namely that it primarily creates low skilled jobs in the lower salary regions, is actually an advantage when it comes to such economic regeneration of post-industrial cities. Or, as stated by Russo & van der Borg (2002, p. 631): "the tourism industry, one of the fastest growing at the global scale, generates jobs and income especially in those layers of the job market that are most severely disadvantaged by economic conjuncture of variables including non-specialized work, reputedly low-skills part-time jobs and female work."

The hosting of sport events should in such cases be regarded as a tool in a wider strategy of economic regeneration, a strategy made possible by some of the developments and trends mentioned in the previous chapter – such as lower travel costs, the information disruption brought about by the advancement of the internet, a tourist consumer trend of more frequent yet shorter holidays, and a changed perception of cities as places of leisure instead of productivity (Dunne et al, 2010).

With the third positive impact Ritchie (1984) refers to the physical dimension: the improvement of existing and construction of new facilities and infrastructure. Solberg and Preuss (2007) discuss the required infrastructure changes for cities to host major sport events.

They divide the necessary investments/changes into hard (physical) infrastructure, and soft (human capital) infrastructure.

Their hard infrastructure concept connects to Ritchie's (1984) physical dimension, and consists of the primary structure, secondary structure, and tertiary structure. The primary covers the infrastructure directly supporting the actual sport activities, such as stadium(s), indoor arena, special facilities such as swimming pools, etc. The secondary infrastructure covers the supportive functions, such as extra housing and recreation facilities, athletic and media villages, a media and press center, training facilities, parklands, etc. The tertiary structure is the infrastructure to support the mass of visitors, such as airports, mass transportation, roads, hotels, attractions, sewage, telecommunications, etc.

Solberg and Preuss (2007) argue that such infrastructural investments can benefit a city's economy in the long run when they fall into a larger strategic plan that ensures effective utilization in the post-event period. Without a hallmark event, such investments in hard infrastructure might not be feasible in a political or financial sense (Ritchie, 1984).

Fourthly, Ritchie (1984) touches upon the sociocultural effects of hosting a hallmark event, arguing that it creates a "permanent level of local interest and participation in the type of activity associated with the event" (Ritchie, 1984, p. 4). A sport event, for example, could ingrain into the local culture a permanent association with the relevant sport(s), benefiting the population's well being. Furthermore, Ritchie (1984) argues that a hallmark event can strengthen the traditions and values of the hosting location, thus benefitting its culture.

This is related to the fifth impact described by Ritchie (1984), at the psychological level. A hallmark event can increase the level of local pride and community spirit, as well as the awareness of non-local perceptions. Solberg and Preuss (2007) touch upon these two points with their description of 'soft infrastructure' investments, which is the human capital – the knowledge residing within in the local population – that needs to be built up in order to successfully host a hallmark event. These skills can benefit the population in the post-event period as well, boosting the human capital of the host location.

Finally, on a political level Ritchie (1984) argues that the hosting of hallmark events can be a positive factor in raising international recognition for the region and its cultural values, and help in the proliferation of its political values.

So, even though the scientific and political debates surrounding the hosting of MSE's is dominated by its economic and commercial benefits, as it is in this paper, it is important to remember that the benefits associated with major sport events cover a much broader area. Many of these non-economic arguments, however, are difficult to measure, especially between different cases. Money talks: the main justifications for hosting a MSE brought forward by policymakers fall within the economic and commercial categories.

Chalip (2002) poses that an event's main source of autonomous money streams derives from tourism. Also Lee and Taylor (2002) argue that the preciseness of economic impact studies depends largely on accurate numbers of event visitors (Burgan & Mules, 1992; Crompton et at, 2001; Gelan, 2003). This is confirmed by Preuss, who states that "the main part of benefits for the city/region derives from 'new' dollars carried into the city/region by persons affected by the event" (Preuss, 2005, p. 297). This justifies the measurement of visitor numbers as an approximation of a MSE's success.

The Tourism Led Growth Hypothesis (TLG) sheds more insight into the long-term positive economic impacts of tourism (Brida and Pulina, 2010). According to this hypothesis, tourism brings extra visitors into a region, raising its internal demand. Through this, investments in infrastructure and human capital are stimulated and businesses reach economies of scale and scope at a higher pace. Tourism achieves this without an apparent trade-off between environment and economy – as is so characteristic of growth in other industry sectors. In fact, the inhabitants of a region tend to benefit from and enjoy investments related to tourism, such as those going to infrastructure, cultural landmarks, touristic attractions, facilities, and image marketing (Law, 1992).

A large group critical towards the hosting of MSEs exists as well. We will explore their arguments in the following section.

4. Why Not Host a Major Sport Event?

In the prelude to 2014's FIFA World Cup in Football, the host country Brazil experienced severe unrest in the form of protests against the hosting of the tournament. In the country known for football, protesters rallied on the streets, banners and wall graffiti displaying slogans against FIFA, the World Cup, and the politicians responsible for its coming to Brazil. A poll conducted in the weeks before the start of the tournament indicated that 60% of the local population was opposed to the event being held in Brazil, arguing that the investments in new and renovated stadia could be better spent on other causes (Fick, 2014).

As much as the responsible politicians and FIFA members would like to make the public believe, this is in fact not simply a case of 'people lacking an understanding of the economic dynamics and what is best for them' versus 'the experts who understand the long term economic benefits'. A significant section of scientific literature is critical towards the desirability of major sport events from the perspective of hosting regions.

A multitude of academic papers question the validity of many of the economic impact studies, especially those conducted by the organizing parties for obvious reasons of impartiality (Tyrell & Johnston, 2001). Various authors even point towards the (potential) downsides of hosting a MSE that *does* succeed in attracting visitors. This section first covers the latter group's arguments using the framework provided by Ritchie (1984). After this we focus on the doubts of whether a MSE is an effective tool for generating short and/or long term visitors in the first place.

Firstly, Ritchie (1984) mentions economic downsides. The massive crowding associated with a successful hallmark event drives up local demand and prices, effectively reducing the local population's prosperity. At the same time, the major investments associated with the event lead to speculation in real estate, driving up prices and reducing housing options for locals.

Secondly, concerning tourism and commercial downsides, Ritchie (1984) infers that the hosting location runs the risk of bad publicity and falling reputation if news about inadequate facilities and/or bad practices reaches the general public. The hotly debated case of Qatar's planned 2022 FIFA World Cup provides a good example (e.g. Waldron, 2016). It is doubtful that Qatar's image will benefit from this event with persistent rumors and allegations concerning human rights violations and corruption. In other words, a poor execution of the event will hurt its host.

Then Ritchie (1984) mentions various other issues. On the physical level a hallmark event could bring negatives in the form of environment damage and overcrowding, while on the sociocultural level the locals may experience the commercialization of their culture as a form of exploitation. Russo (2002) introduces the concept of 'MacDonaldization', a situation that develops through excessive tourism. In this economic evolutionary theory, excessive tourism will make the selection process of commercial entities in inner cities lack in quality considerations, because tourists do not have the necessary local knowledge to distinguish on this. This leads to the survival of poor quality restaurants and hotels, since they have a lower cost structure than those offering higher quality.

On a psychological level, Ritchie (1984) argues that the host region may have a defensive attitude and that there is a risk of hostility between locals and visitors due to misunderstanding.

Many of these points come back in the case of Barcelona. Barcelona's 1992 hosting of the Summer Olympic Games has oftentimes been hailed as a positive example of a MSE's economic impact (Brunet, 1995). Brunet (1995) arguest that the city owes much of its current success on the booming tourism industry that was induced by the 1992 Games.

Since a few years, however, the local population is showing clear signs that they have had enough (e.g. Tremlett, 2010). Dissatisfied with the huge number and type of tourist coming to their city, the huge impact of the visitors on the street view, rising commodity prices, and in more recent years also on house speculation due to platforms like AirBNB, various districts currently feature anti-tourism banners and protest demonstrations. As a response, the mayor has brought concrete plans for containing the flow of visitors, for example by limiting the amount of hotel licenses within the city (Bloomberg.com). These are clear symptoms of excessive tourism.

Finally, on a political level the event could take the form of economic exploitation of the local population for the benefit of a political elite, as we mentioned in the previous chapter. Késenne (2005) continues on this point, indicating that in the distribution of profits it is often external parties – such as the sport-governing bodies – that claim a large piece of the pie. The issue of inefficient distribution of benefits is a recurring one for various authors (Smith, 2005; Solberg and Preuss, 2007), and also one of the doubts aired for example by the anti-FIFA protesters in Brazil (Forbes.com, 2014).

Ritchie's (1984) explanations of downsides take the large impact factor of hallmark events on tourism as a given. Yet a significant section of the literature remains unconvinced even on this point, demonstrating doubts about the potential of MSE's regarding image generation and tourist attraction. These focus on the limitations of long term as well as short term impacts.

Burgan and Mules (1992) point out the short-term nature of hallmark events as a major issue preventing long-term benefits. While a major sport events generate a peak in employee demand, it doesn't result in the creation of permanent jobs. For permanent jobs there would have to be an enduring increase in tourists to the location after the event, something claimed by its proponents but for which several criticisms can be found.

Smith (2004) argues that the unlikeliness for long term effects derives from the difficulty in the creation, management and maintenance of a locational image. Furthermore, he argues that this is becoming more difficult through the 'serial reproduction' of sport initiatives, leading to homogenization between hosting regions rather than differentiation. Two hosting cities of a football tournament will for example both be associated with this generic sport – instead of with their own unique features. Smith (2004) furthermore argues that differentiation is impeded by ever heightening expectations of the events. Each one is expected to top the previous one, with only the most recent and spectacular one sticking in the mind.

Smith (2004) also points out the relative low amount of empirical research studies on the image effects of sport initiatives. In a case study of the 2000 Euro Cup in the Netherlands and Belgium, Oldenboom (2005) surveyed in various countries throughout Europe. He found that while the event had increased awareness initially, only one year later 55% of the respondents could not recall the names of its host countries. And of the respondents in France, Italy, and Spain, only 10% remembered where the Euro Cup of 1996 had been hosted 5 years before. This serves as an indication of the difficulty or retaining awareness advancements.

Finally, even *during* the event the rise in tourism and associated economic benefits can turn out disappointing. While Ritchie and Smith (1991) and Chalip et al (2003) did detect significant reimaging effect on the hosting city, they could not directly tie it to an increase in visitor numbers. Preuss (2004) offers a theoretical framework that helps to understand a moderate effect, even when the event is successful at attracting (inter)national attention. He does so through a categorization of event-affected person movements.

Preuss (2004) argues that while a MSE will be successful at leveraging economic impact by attracting 'Event Visitors', extending the tourist stay of 'Extentioners', and inducing 'Home Stayers' to spend their holidays in their own city instead of leaving, it can also have the opposite effect for other 'city customer' groups. 'Runaways' and 'Changers' are residents that take a holiday to leave the region during the event to escape its overcrowding; 'Avoiders' are tourists that stay away from the region but that would have come if it weren't for the event. While 'Changers' and part of the latter group, 'Pre/Post Switchers' (tourists that change their arrival to before or after the event), have zero impact in the long term perspective, the group with avoiding behavior does explain how the economic impact during a MSE is mitigated (Preuss, 2004).

These redistributive effects are especially relevant when it concerns a region with tourist facilities already running at near-full capacity. On the other hand, these dynamics also partly explain why one can expect visitor effects before *and* after the event, besides for awareness reasons. Lee and Taylor (2005), in assessing the effects of 2002's FIFA World Cup in South Korea and Japan, noted that the "actual tourist arrivals were less than predicted by 37% and they were even down by 12.4% in the same month of the previous year" (Lee and Taylor, 2005, p.601). They attributed this variation largely to a failure to include 'tourist displacement' in the predictions, which they argued was induced by worries about excessive crowding and prices, terrorist threat, and hooligan behavior. Thus they ascribed it largely to a group of 'Avoiders'. Also, in this case the two host countries were each others' prime markets for tourists. The event induced 'home stayers' to not take their regular holiday to the neighboring country (Lee and Taylor, 2005).

As we can see, there are various well grounded doubts about the desirability of hosting a major sport event, many of which deal with the fairness of its benefit distribution. However, it can be argued that according to the tourism led growth hypothesis, as long as the tourism of the location is sufficiently stimulated in the short as well as the long term, the population of the location should profit. However, we've seen that the empirical literature disagrees on this point, with certain cases showing significant and long term increases in tourism (Brunet, 1995) and others providing disappointing results (Lee and Taylor, 2005; Oldenboom, 2005).

The goal of this paper is to measure through a panel data analysis the tourism stimulating potential of major sport events. To do this this, one should first acknowledge that the *how* of a major sport event will play a

major part in its success. In the following section we will discuss the mediating success factors of major sport events.

5. Mediating Factors for the Success of a Mega Sport Event

Whether a hallmark event results in a success by any standards will obviously depend on many circumstantial factors and on *how* it is conducted. Many of these factors are complicated to measure in numerical terms, and therefore most are excluded from this paper's quantitative analysis. However, this section pays them due attention as they can play an interpretative role in explaining the research results. The literature discusses various of these factors.

One of the most important and broader factors brought forward by Solberg and Preuss (2007) is that for a MSE to be successful from a long term perspective, its investments should lie within the city's long-term development plan. The revenue generated by most MSEs cover the event's operational costs, but not the costs of required investment (Preuss, 2004). Furthermore, Solberg and Preuss (2007) note that between locations there are huge differences in the investments that would be required for hosting a MSE. Some have most facilities already in place, others would have to start nearly from scratch.

In deciding whether to make a bid, they argue that the region should compare (i) the city development plan excluding sport event considerations, (ii) sport-event required investments that were already included in the city development plan, and (iii) MSE required investments that were not included in the city plan excluding event considerations. Logically, when only operational costs are covered with the event and the huge infrastructure set up for the MSE is not efficiently utilized in the post-event period, the initial investment cannot be recovered.

Another element that should be taken into consideration is whether the region is already a popular tourist destination or not. Like we mentioned earlier, Preuss (2004) noted that when a city's tourist facilities are already operating at near-full capacity, the substitution effect will be higher. In other words, the positive effect on tourism flows will be mitigated due to 'event tourists' replacing 'regular tourists'.

On the other hand, when the lack of tourists within a destination derives from the fact of low attractiveness, it would be naïve to assume a lasting post-event effect on tourism. As noted by Preuss (2005), long term tourism effects after an event are driven by increased awareness through media, returning visitor stories, and improved tourism products. With a low attractiveness, an increase in awareness is unlikely to lead to significantly more visitors.

Another factor that influences the success of a MSE is the presence or absence of scandals and bad publicity surrounding the event. The cases of the upcoming FIFA World Cups in Russia (2018) and Qatar (2022) provide good examples (e.g. Rumsby, 2015). The persistent news reports concerning the neglecting of human rights put these countries in a negative light, possibly even limiting tourist visits instead of promoting them.

Finally, the actual execution of an event also influences its success. Both the perception on the actual event visitors, as well as the perception that is generated through the media, are negatively influenced when the execution is not up to standards (Ritchie, 1984).

Most of these mediating factors are hard to measure, yet it is crucial to be aware of them since they will explain a significant part of the variation between regions in tourist flows towards a hosting region in the pre-event, event, and post-event periods. Outside of a major sport event, there exists a wide number of factors that influence the number of tourist visitors to a region. The upcoming section is concerned with discussing the various factors that influence tourist flows and what indicators we will use for them in our model.

6. What Factors Influence the Tourism Flows of Nations?

MSE's and other hallmark events are obviously not the only factors that influence the amount of tourists to a certain region. The determinants behind the size and direction of tourism flows are highly complex and in many ways dependent on mass psychology. The 'success' of a specific place in this industry depends on a great many factors, touching on the realms of economics, politics, geography, sociology, psychology, biology, media and communication. Prideaux (2004, p.796): "… the multifaceted and multisector nature of the industry means it is not always possible to clearly delineate responsibility for all factors."

Measurable factors with significantly positive or negative effects have however been extracted in a number of empirical research studies. These factors can be roughly divided into demand based and supply based factors.

Demand factors explain the demand for tourism from the people of a certain region. Supply factors, on the other hand, explain the demand for tourism for a certain destination, so from the perspective of the hosting region (Zhang & Jensen, 2007). In other words, demand factors determine *whether* people want to go on holidays, while supply factors determine *what* destination they then choose to go to. Because both are crucial in explaining the variance in visitor numbers for a country, variables from both are included in this paper's theoretical model.

The demand based perspective has been dominant for explaining tourism flows in the majority of literature (Zhang & Jensen, 2007; Papatheodorou, 2001). It looks at what factors determine the demand for tourism in an originating country – as opposed to the factors determining the demand for a destination.

It is a useful approach to estimate bilateral tourism flows between countries and "can function as a short- run forecasting tool to estimate the demand for a destination country from its main markets" (Zhang & Jensen, 2007, p.225). On the other hand, the demand model is limited because it ignores the differentiation of the tourism destination (Papatheodorou, 2001). Some adventurous tourists might, once they decided to go on a trip, spin the miniature globe on their desk and blindly drop their finger to let faith decide their destination. If everyone would choose like this, we could explain a country's tourism numbers solely with the demand based perspective. In reality, however, tourists hold certain preferences concerning their travel destination. This is why, in this paper, supply based factors are included in the model as well.

6.1. Demand Side Factors

The following factors have been identified in literature reviews by Crouch (1994) and Lim (1997) as significant demand side factors, the factors that determine *how much* demand for tourism there will be from a certain market.

6.1.1. Income Level

The most important demand variable is the income level from the originating country or market (Crouch, 1994; Lim, 1997). The price elasticity of foreign travel suggests that it is a luxury product, so its consumption rises with income. That also explains why the majority of tourists originate from OECD (Organization for Economic Cooperation and Development) countries (Zhang & Jensen, 2007). A healthy tourism demand requires a broad middle class, which is why one should also look at the division of income within a country to estimate its tourism demand (Crouch, 1994). A highly asymmetric income distribution is thus not beneficial for tourism demand, since only a small portion of the population will be able to afford leisure travelling.

Lim (1997) argues that the best indicator for the factor of income level would be *discretionary* income – the income that remains after spending on necessities. However, this indicator is unavailable for the majority of countries, which is why instead the factor most commonly measured is a country's gross domestic product (GDP) per capita. We also this indicator for this paper as well, extracted from the UNCTAD database. It is measured in US Dollars at current prices and current exchange rates per capita.

6.1.2. Population Size

The population size of the originating market is the second demand variable (Crouch, 1994; Lim, 1997). Naturally, as the population of a country rises while all else remains equal, its total number of tourism consumers also rises.

6.1.3. Purchasing Power

Next, purchasing power in the originating market relative to the destination market can also play a role (Crouch, 1994; Lim, 1997) as one of the price considerations of travel. If the prices are sufficiently higher in the originating market compared to the destination market, people may actually save money by spending their holidays abroad instead of staying at home. Remarkably, Zhang and Jensen (2007) found that the relation between cost of living and tourism is reversed for OECD countries. This can only be explained by the law of supply and demand, where these countries offer sufficient differentiated value to command high prices.

When looking only at within variation and not at between variation, however, one should expect that price fluctuations are an important factor in tourism flows.

As Lim (1997) rightly mentioned, the best indicator for this factor would be a tourist price index (TPC) focused on products and services typically consumed by tourists. This indicator is however not readily available for most destinations. Instead, Zhang & Jensen (2007) estimate the cost of living with 'the relative price competitiveness of the destination measured by the ratio of GDP in PPP to GDP by market exchange rate at the destination countries'. This represents the relative price level of a country from the perspective of international currency holders.

For our research we've taken a similar approach, calculating this *cost of living* or *relative purchasing power parity* with the PPP data from UNCTAD, which measures the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as one U.S. dollar would buy in the United States. We then adjusted it to fluctuating exchange rates, in that way representing the relative price level of a country from the perspective of an American tourist. The cost of living in the United States hence serves as a benchmark for the other countries in our model. Because of its relative nature between origin and destination, one cannot accurately label this factor as a 'demand' or 'supply' side variable.

This constructed relative price variable captures exchange rate as well as inflation considerations. A high exchange rate and inflation level in the originating market relative to the destination market could positively stimulate the demand for tourism.

The impacts of inflation on tourist demand are more contested, with doubts brought forward by various authors who argue that tourists do respond on exchange rates but not on inflation (Lim, 1997). Artus (1970) and Gray (1966), for example, argue that tourists are generally knowledgeable on variations in exchange rates, but unaware of variations in inflation. In the end, this is a discussion about money illusion. We follow the position of Edwards (1987), who claims that both exchange rates and inflation are significant in the long run, with the former having more impact on demand in the short run.

6.1.4. Transportation Costs

Price considerations for the trip between origin and destination are not included in the aforementioned estimator. For most transactions in our economy the product is – for the largest part – transported to the

consumer. In tourism, however, the consumer moves to the product – towards the destination. This makes international travel a derived demand of tourism (Lim, 1997), and its cost a price that should be considered.

When transportation costs between the originating and destination market are high, it can serve as a barrier for tourism (Crouch, 1994). "For many prospective tourists, air fare represents the foremost hurdle that must be crossed mentally before any tourism decision materializes" (Krause, Jud, and Joseph 1973, p. 59).

The costs of transportation include monetary considerations as well as those for the time and effort involved in travelling from one place to another. These latter considerations are partly responsible for tourists mostly travelling to nearby countries. As mentioned earlier, however, there is a trend in the lowering of transportation costs due to advances in technology and the liberalization of markets (Braun, 2008), entangled with a trend in ever rising mobility.

Unfortunately, accurate measurements of the factor of transportation costs are hard to come by (Crouch, 1994). Lim (1997) explains that the difficulty of finding an accurate estimate are partly caused by the non-transparent pricing policies by airlines. Some exemplary proxies for air fares she does mention are real air travel costs, excursion airfare, and cheapest airfare. Some of these could be collected for some of the European countries in our dataset, but not for most others. And even if we could collect it for all countries, air travel is still just one of the transportation modes available.

To include the price of private gasoline costs would be another option to count for the other transport modes (Lim, 1997), but again this is inaccurate because these do not directly translate into higher prices for end consumers. Through hedging techniques, for example, airlines protect themselves and their customers from price peaks.

Crouch (1994) explains that the matter is further complicated because one should take into account the specificities of the destination, contrasting Australia with European countries as an example. Due to its relative isolation, in Australia air fare would be a most suitable indicator for transport costs. Europe is a different story, however, with free transport of persons between a high amount of heavily populated countries that border one another – with intra travels that because of this are suitable for a wide amount of transport modes. He therefore

concludes that “measuring the cost of transportation between countries within Europe (…) is almost impossible” (Crouch, 1994, p. 14).

He also states that studies which included transportation costs in their models almost never produced an adequate estimation of how it influences tourist demand. Problems related to multi-collinearity have in fact repeatedly made researchers drop it from the model (Fujii and Mak 1980, p. 243; Jud and Joseph 1974, p. 25).

Because of these complications, we have excluded this factor from our model. Instead, we assume they are included in the time trends.

6.1.5. Time Trends

The demand for tourism is also highly influenced by trends. Trends influence the demand for tourism as a whole, for example when driven by demographical and sociological developments, such as the age structure of the population, urbanization, length of paid holidays, level of education, and what type of travels are popular (Barry and O’Hagan, 1972).

Butler (1980) introduced the theory of tourist destinations going through a life cycle that is under the influence of changes in fashion, trends, and taste. And, of course, the attractors of a destination are also subject to change. According to Crouch and Ritchie (1999) “the resources that make up a destination’s factor of endowments change over time, altering the comparative advantage of a destination” (1999, p.142). This way, competitiveness between destinations can change over time (Crouch and Ritchie 1999; Enright and Newton 2004, 2005; Ritchie and Crouch 2003) – making trends a supply side factor as well.

As described earlier, Braun (2008) explained how underlying developments resulted in a greater mobility for individuals and an increase in tourism. In other words, trends influence how popular of a consumption good tourism is, as well as the direction that these tourists flow to.

Time variables are generally used as the proxy to incorporate these various trends in the model, included in the form of dummy variables (Crouch, 1994; Zhang & Jensen, 2007). That’s also the proxy chosen for this research, covering the years 1995 until 2013 (1995=1, 1996=2, etc.).

However, one should be aware of criticism on this practice as well. Crouch (1994) points our attention to the problem of multicollinearity, since the time trends can be correlated with any of the other factors in

the model that vary over time in a consistent manner. He notes that while the existence of general changes over time are supported, it is not clear what these changes really mean. In our case this is not an issue, since we include the time dummies to control for time trends, not to explain them.

6.2. Supply Side Factors

Where demand factors explain the total demand for tourism travels over time, supply side factors explain what specific destinations these tourists travel to. More specifically, they explain why some destinations are more popular than others. These variables are especially interesting for policy makers, because by influencing them they could theoretically raise the competitiveness of their location.

Zhang & Jensen (2007) explain that the supply oriented tradition falls short to its demand oriented counterpart due to scarcity of appropriate data and proxies. Nevertheless, through a panel data analysis they could explain from a supply-side perspective how certain countries enjoy a comparative advantage in the market for tourism – successfully constructing a model from a number of supply side indicators. Now follows a description of the most prominent supply side factors mentioned in the literature.

6.2.1. Natural Endowments

The first of these are a destination's natural endowments. Some places are more attractive for visitors due to their natural characteristics.

A relation between destination competitiveness on the one hand, and products and services on the other, is made by Murphy, Pritchard and Smith (2000), as well as Melian-Gonzales and Garcia-Falcon (2003). Both groups conclude that supply-based factors such as the infrastructure, resources, environment and value of a destination have an influence on the probability of a tourist returning.

Some regions depend on geographic 'natural' features for their pull, such as the Great Canyon, while others depend on man-made 'cultural' features, such as Las Vegas' casino infrastructure (Ritchie, 1984).

In an attempt to capture the competitiveness of tourist destinations, Enright and Newton (2004) have quantified and ranked the importance of 'traditional' tourist attraction factors on the basis of a survey, including some of these natural endowments. These included safety,

cuisine, dedicated tourism attractions, visual appeal, well-known landmarks, nightlife, different culture, and more.

While the pull of such endowments has been proven through survey-based research (Richards, 2002), it is hard to quantify their effects. Each endowment is unique and therefore appreciated by visitors on its own standards.

We adopt the approach of Zhang and Jensen (2007), who capture these country-specific effects through the fixed effects in a panel data model. The panel approach has an advantage in its ability to combine the analysis of both time dependent and country-specific variables in such a way that data requirements are lower for country-specific variables that are relatively fixed over the years (Hsiao, 2014) – such as a country's natural endowments.

6.2.2. Level of infrastructure and technology

As indicated by Zhang and Jensen (2007), one of a country's differentiators are its level of infrastructure and technology. Through their quantitative analysis they showed how international tourism flows can be explained by traditional trade flow theories and fitting variables. They showed that, as with other trade flows, the level of infrastructure and prevailing technology in a country are significant factors for the attraction of tourists.

Geyikdagi (1995) also showed, for example, how Turkey managed to attract tourists by investing in tourist accommodation and transport facilities such as airports and roads. For this he used the variable gross fixed investment in tourism industry. This would be by far the most desirable factor for the model of our research as well, but it is not available for most of the countries we measure arrivals for. As a substitute, Dwyer and Forsyth (1994) make a case for the role of foreign investment in a country for the attraction of international tourism flows.

In their research, Zhang and Jensen (2007) deploy various indicators for the level of infrastructure and technology. One is the country's GDP per capita, to capture the level of economic development and technology. Secondly, they include the stock of foreign direct investment, to capture the level of technology and infrastructure. They mention that data on FDI per industry – specifically the tourism industry – would have been better, but their correlates suggest that the general level of FDI investment is an acceptable substitute. As a third indicator they add hotel capacity, representing a more specific indicator for investments in the tourism industry.

6.2.3. Destination's Population Size

The population size of the destination market is an important supply factor as well, since countries with a higher population are generally larger with more attractions than those with lower populations. Therefore, population size needs to be included in the model to control for the size of a country (Zhang & Jensen, 2007).

6.2.4. Openness

Zhang & Jensen (2007) also show the importance of controlling for differences in institutions, which they do by measuring openness. This variable they construct by adding a country's total exports and imports and dividing it by the total GDP – which is also how it's measured in this paper.

6.2.5. Price Competitiveness

This is the other side of the coin of the *purchasing* power variable discussed among the demand side variables. The price competitiveness of a destination is mentioned as an important variable (Dwyer, Forsyth and Rao, 2007; Zhang & Jensen, 2007). If the prices for goods and services in a destination are lower, this means that a tourist can buy more value for the same amount of money.

As mentioned in the section covering demand side variables, this factor cannot be labeled as either a demand or supply side variable because of its relative nature. Our measure of relative price level for a US tourist captures both the price competitiveness of a region to attract tourists as well as the purchasing power to afford foreign travels.

6.2.6. Marketing

As noted earlier, place marketing is a growing field. Yet according to Crouch (1994), there is a lack of studies accurately measuring its impact on tourism. He ascribes this due to a lack or incompleteness of relevant data, the difficulty of assessing marketing quality relative to quantity, and a collinearity of the importance of tourism and the resulting prominence of it on the policy agenda.

With a lack of data for all the country cases in this study as the main reason, we have not included an indicator for marketing in the model.

7. Models

We will now describe the theoretical model of tourist arrivals and MSE's, followed by the methodology and the statistical model that we use to measure the effects with STATA. The theoretical model consists out of the supply and demand side variables we described above. The statistical model, however, is much more simplified, with many of the variables excluded from the model. Reasons to exclude these variables are the following.

We defined MSE's as 'major sport event of limited duration, hosted for the purposes of awareness, appeal, and profitability by focusing national and international attention on the destination for a short period of time.'

Firstly, some of the variables influencing tourist flows are partly inherent to the hosting of MSE's. A generally fixed part of a MSE, for example, is the upgrading of the host's infrastructure. Including indicators for this variable in the model could thus lead to significant multicollinearity. Secondly, as described earlier, not all variables can be collected for all the hosting countries in the model. And thirdly, the variables that are (relatively) fixed over time do not have to be specified in the statistical model because their effects are taken into account through our panel data methodology. Natural endowments, for example, are by nature fixed over time. We thus do not need to specify them in the statistical model.

7.1. Theoretical Model

We will now proceed with the theoretical model. In our model on tourism arrivals we include both demand side and supply side variables. The demand side explains the amount of total tourism demand, while the supply side models the share that each destination takes from this demand.

We build the supply side model on the framework provided by Zhang and Jensen (2009). We model tourism arrivals at the country level. We assume that the tourism products for each country destination are partly fixed, given by natural endowments, and partly modifiable through intended efforts – such as the hosting of MSE's, other place marketing efforts, etc.

The destination country's number of tourist arrivals **Ar** is the dependent variable in the model. The independent variables include the *total tourist demand* ***D***, the number of competing destinations n, the destination's

value in *natural endowments* ***a*** (culture, climate, landmarks, etc.) , *the destination's population size* ***POPd****, the sensitivity of the market share to differences in price* ***b****, the price level of the destination* ***p****, the marketing efforts* ***M*** *(which includes the hosting of MSE's), the level of infrastructure and development* ***I****, the Openness of the destination* ***OPEN***, and *the average price level of all the other competing destinations* ***pavg***.

Supply Side Model

$$Ar = D * \left(\frac{a + POPd + M + I + OPEN}{n} - b(p - pavg) \right)$$

The total demand **D** is in this supply side model taken as a given. If tourism would be divided equally across destinations, we could stop at dividing D by the number of destinations. The section within the brackets adjusts this equally divided number by taking into account the relative position of the destination in the variables of natural endowments **a**, population size **POPd**, marketing efforts **M**, level of infrastructure **I**, and openness **OPEN**, which all positively influence the share of total tourism demand **D** that the destination receives in arrivals. By dividing their total is by the number of tourist destinations, we get the country's share of tourist arrivals – which then needs to be adjusted for price level considerations.

The price level of the destination **p**, which in our case represents the local relative price level from the perspective of a United States citizen, positively influences the number of arrivals if it is relatively lower than the average price level of competing destinations **pavg**. It's mitigated, however, by the price sensitivity **b** of the destination. A high **b** means that the popularity of a destination is strongly influenced by its price level. Destinations that are competitive in price will thus have a strong advantage in such a case. If the destination's price level is below the average, this is expected to have a positive effect on tourist attractiveness, while if it is above average it is expected to have a negative effect. Through a differentiated value proposition, however, destinations should also be able to command a higher price – which would be reflected in a low **b**.

We now model the total tourism demand **D**. This is the total of demand from all markets or origin countries.

Demand Side Model

$$D = \Sigma \text{ Dmarket}$$

$$Dmarket = IL * POPm - TC + b(p - pavg) + t$$

As we explained in the sector about influencing factors, the demand per origin destination **Dmarket** depends on *the income level of the market* **IL**; *the population size of the market* **POPm**; and *the transport costs* **TC** between market and destination. Furthermore, here the relation with the price level is reversed. When the price level of the originating country is above the average, it will have a positive effect on the demand for tourism, since more foreign destinations will be relatively cheaper. Furthermore, the overall popularity of tourism as a product is also subject to time trends **t**.

Combined Theoretical Model

$$Ar = \left(\frac{\Sigma(IL * POPm - TC + b(p - pavg) + t)\iota}{n}\right) * \left(\frac{a + POPd + M + I + OPEN}{n} - b(p - pavg)\right)\iota$$

7.2. Statistical Model

In the previous section we presented the theoretical model, which comprehensively includes all the significant demand and supply side variables that influence tourism flows as identified in the literature.

Although it is a comprehensive model, as explained earlier, we cannot include all of its variables in the statistical model. The statistical model is simplified, with the following variables dropped for the following reasons.

7.2.1. Country level of development (GDP)

We leave GDP as an indicator of a country's level of development outside of the model because there will likely be a case of reverse causality for smaller, tourist dependent countries. Instead it could be possible to run the model in segments of countries, based for example on the World Bank's classification of countries. The problem is that in our dataset we have just over 30 cases of MSE's. Splitting it up in segments would thus reduce significance of the results.

7.2.2. Travel costs

We leave travel costs outside of the model, mainly due to scarcity of appropriate indicators. We are not measuring bi-directional tourist flows. This means that we would have to use a constructed variable that takes into account *costs of all transport modes*, as well as the intensity that those modes are used.

Also, as with other price considerations, it could be the case that a higher price is *caused* by a higher tourism demand.

7.2.3. Market population size

We leave this out because it is impossible to measure the market of a certain destination. On the one hand, a destination's market can change. On the other hand, natural population growth will be included in the time dummies.

7.2.4. Number of competing destinations

This variable is excluded for similar reasons. It is difficult to indicate what destinations are direct competitors. Also, changes in this respect, for example the opening up of a new market like Burma, will be captured by the time dummies as well.

7.2.5. Natural endowments

Natural endowments are excluded from the statistical model because they are as good as fixed over time – which means that they will be captured by our method of the panel data analysis.

7.2.6. Level of infrastructure (FDI + Hotel Capacity)

The problem with including the level of infrastructure in the model is that its indicators – FDI stock and hotel capacity – are likely highly correlated with the hosting of MSE's. Investment in infrastructure is included in the hosting of a MSE, and often the investments are justified by the hosting plans. Thus by including them in the model, we would reduce the explanatory power of the MSE's. Thus, the statistical model is reduced to the following.

Statistical Model

$$Arrival = \alpha + \beta 1 * POP + \beta 2 * RELPPP + \beta 3 * OPEN + \beta 4 * MSECOMB + \beta 6 * \delta MSElag + \beta 5 * \delta T + \varepsilon$$

We include the destination's population to control for the country's size. We include the openness to account for institutional differences. If, for example, a country opens up economically, the expectation is that it will also be more open to tourists. Then we include the dummy variable of combined MSE's – does the destination host an event that year or not. And we include time dummies to account for larger trends in tourism demand. Also, we include lagged dummy variables to check whether there will be an effect of the event in the 5 years preceding and the 5 years following the event.

8. Study Data

We make use of three prime database sources for this paper. Firstly, we've accumulated data for country-specific economical and demographical variables from the online database of UNCTAD (2015), the United Nations Conference on Trade and Development. From here we extracted time-based datasets on countries' population, foreign direct investment, export and imports, price levels, and exchange rates.

The data on population we extracted from the UNCTAD database supply factor. We accumulated population data on the MSE hosting countries, to be able to control for country size. As indicated by Zhang and Jensen (2009), it is unclear whether it is better to measure tourism success by absolute tourism arrivals or by arrivals relative to the population size of the country. We will test with absolute arrivals and add population size to control for the country's size. The data from the UNCTAD database measures population per country in thousands.

Data for foreign direct investment we take from the UNCTAD database, as a supply side indicator in the MSE hosting countries for the level of technology. We include data on the stock of foreign direct investment, measured in US Dollars at current prices and current exchange rates in millions. We run into the same issue as Zhang and Jensen (2009), who note that while FDI stock for hotels and restaurants would be a better variable for the tourism industry, it is not available enough. They do show, however, that the general FDI stock is sufficiently correlated to be a substitute.

We also extract from the UNCTAD source data on the exports, imports and total GDP of the MSE hosting countries. These are used to set up the *openness index*, which Zhang and Jensen (2009) showed to be a relevant supply side factor, as an indicator for institutional differences between countries. Exports, imports, and total GDP are taken in US Dollars at current prices and current exchange rates in millions.

Then we also take data on purchasing power parity and exchange rates from our second source, the World Bank database, to calculate the cost of living of the MSE hosting destination countries. For this we use purchasing power parity data from the World Bank, which is defined as the number of units of a country's currency that it takes to purchase the same value of goods and services in the local market as you could buy with a U.S. dollar in the U.S.A. By adjusting this for changes in exchange rates, we get the relative PPP, or the price level of a country from the perspective of a U.S. citizen.

Then the third main data source was the World Tourism Organization (UNWTO), which provided us with a dataset on country-specific tourism variables in a time range from 1995 until 2013. It is this dataset that limited the analysis, on the one hand in its window of time, and the other in the number of included countries due to data incompleteness.

From the UNWTO database we took the dependent variable, a country's number of tourist arrivals, and the independent variable of hotel capacity, the number of hotel rooms per 1000 inhabitants – as an indicator of the level of investment in the industry.

Concerning the dependent variable, the country number of tourist arrivals, we've had to make use of varying indicators – based firstly on fit and secondarily on availability. For countries in the European Union we chose for the indicator *tourist arrivals at hotels and similar establishments*, while for countries outside of the European Union we preferred *tourist arrivals at the national border*. This because the EU is a zone of free transport for persons and goods, making it hard to measure tourist arrivals from people arriving from neighboring countries. Countries outside of the EU, however, generally always control the borders and measure the number of arrivals there. We only deviated from this practice in the few rare cases that a non-EU country only provided data on the *tourist arrivals at hotels and similar establishments*.

Furthermore, it must be stated that the number of tourist arrivals is an incomplete measure for *tourism success*. It excludes, for example, the *length of stay*, or the *height of expenditures*. It would be desirable to add such variables, but they are not sufficiently available for the countries in our sample.

The data collected covers 64 countries from all continents. We aimed for a significant representation from all continents. A list of included countries is added in the appendix. Of these, 31 hosted a MSE at least once in the 19-year timeframe between 1995 and 2013.

9. Methodology

9.1. Approach

This study aims to test whether the hosting of a Mega Sport Event has a significant effect on the attraction of tourists to a country, thereby assessing whether it is an effective tool for place marketing.

Various methods could be deployed for this purpose. Firstly, a time series case study could be conducted on one country or MSE case. The upside would the high amount of insight it provides in the particular case, with a lack of generalizability as the main downside.

Another method would be a cross section study of a high amount of countries or cases at a certain time. This could provide insights into the differences between the cases, but it is limited in that it provides no insight over time – an aspect that is extremely important for the measurement of long-term investments like the hosting of MSE's. Furthermore, for our study this type of approach would be extremely problematic, because MSEs are by nature rare events, thus the amount of cases on a particular point in time is too low.

The third alternative, and the one chosen for this research, is the conduction of a panel study in which both the dimensions of cross-country and time are explored.

With a panel study, destination-specific variables are omitted from the analysis. The advantages of this approach, however, include the generalizability of the results, a benefit very relevant to our study. The applications of a time series case study are limited to a policy maker when it concerns a case in a different, incomparable country.

Another benefit of the panel study is that it diminishes requirements for time fixed, country specific factors – such as natural endowments (Hsiao, 2014). It can indicate the significance of such factors, but without giving insight into the why behind it – for which a case study would be more appropriate.

A panel study allows time-variant factors such as GDP or the hosting of MSE's to be analyzed in a wide amount of countries over a long period of time. The main advantage is that through tracking the variables throughout time, the bias of time-invariant unobserved heterogeneity is excluded. This makes it easier to assume that the found effects are in fact causal of nature.

We test with a panel model with the assumption of differing intercepts for the countries i and the time t (a two-way fixed effects model). A panel data model has the advantages of reducing problems with collinearity due to differences for explanatory variables between regions, and reduces problems with omitted variables due to the introduction of specific effects for countries (Hsiao, 1986). The latter include factors that remain the same during longer periods, but which do play a big role in the attractiveness of a region for tourists (e.g. landmarks, nature, culture). The fixed effects thus embody the *ai* of each individual country, their time invariant effects.

9.2. Results

We run the analysis in STATA. By creating a histogram of all the variables we'll use in the analysis, we see that tourist arrivals, population, FDI stock, inward FDI flows, and relative price level are not normally distributed. Thus we use their log values.

We correlate the main independent variables to check for high correlations (Appendix B).

With FDI stock and Hotel Capacity having the highest correlation of 0.2981, we don't see any issues. We do, however, decide to drop FDI Stock and Hotel Capacity from the model, because of possible reverse causality. Tourists might come to a country because they have sufficient tourism infrastructure, but it could also be the case that they have sufficient tourism infrastructure because of the tourism numbers. What's more, we've seen that tourism infrastructure investments are inherent to MSE's. Thus including these as independent variables in the model could steal away the effects of hosting a MSE.

We see that the dataset includes 1,216 observations, over a 19-year timespan from 64 countries (Appendix C). The dataset includes 35 MSE cases. We see that for tourist arrivals, population, and openness, the between variation is much greater than the within variation. This means that countries differ in these variables much more between one another than they do in time for themselves. The relative price level is an exception to this, which is logical because this variable represents a relative position towards the US price level.

We also see that we have a very balanced dataset. We have 64 countries in the dataset and a 19-year period, with 1216 maximum observations per

variable. The tourist arrivals variable has 1180 observations, with an average of time observations T of 18.4375, ranging between 6 and 19. The openness variable has 1190 observations, with a T of 18.5938, ranging between 12 and 19. The relative price level variable has 1180 observations, with a T of 18.4375, ranging between 0 and 19. With this last variable, we have two countries with almost entirely missing data. The data seems to be missing at random, however.

We then generate time dummies to add time trends to the model and get to the actual running of the regression. We will first determine whether we should use the FE or RE estimator. In this, we include the following variables.

$$Log\ Arrivals\ = Open + lgpop + lgrelprice + MSE + Years$$

Where the FE estimator (Appendix D) only measures *within* variation, the RE estimator (Appendix E) measures both *within* as *between* variation. To test whether we can also use the RE estimator, we do the *Hausman test* (Appendix F), which tests whether the time invariant effects (alpha-i) are correlated with the X's. If they are not, RE is preferred to FE. The result shows that the difference in coefficients is systematic, which means that we should make use of the FE estimator.

Regression Table

Log Ar	*FE estimator*	*RE estimator*	*FE robust*	*FE Robust mse*rel*
Major Sport Event	0.0177 (p=0.715)	0.0205 (p=0.684)	0.0177 (p=0.645)	0.0545 (p=0.159)
Openness	0.6039 (p=0.000*)	0.5943 (p=0.000*)	0.6038 (p=0.008*)	0.6056 (p=0.008*)
Log Population	0.343 (p=0.034*)	0.6017 (p=0.000*)	0.3432 (p=0.598)	0.343 (p=0.598)
Log Relative price	-0.2156 (p=0.000*)	-0.1298 (p=0.000*)	-0.2156 (p=0.016*)	-0.216 (p=0.016*)
MSE*relative price level				0.02184 (p=0.065*)
R2-within	0.6261	0.6206	0.6261	0.6268
R2-between	0.000	0.1108	0.000	0.000
R2 overall	0.0128	0.1563	0.0128	0.018
Number of observations	1120	1120	1120	1120

*P values indicated by star *, coefficients between brackets ()*
The FE estimator shows a within R2 of 0.6261, which indicates a relatively high explanatory power of the model. The between and overall R2 we cannot interpret with the FE estimator. We see that the explanatory variables openness, population, and relative price level are all positive and significant at p = 0.05.

As expected, the coefficient of the relative price level is negative – indicating that affordability of a destination plays a role in the attraction of tourists.

All years are significant as well. We see that the coefficients of the years become increasingly negative the further back we go. This is as expected, since it compares with the last omitted year (year 19). This thus clearly indicates that there is an overall time trend of growing tourism. The MSE variable, however, is insignificant with a P value of 0.715.

To check whether heteroskedasticity is a problem, we run the estimator with a robust option (Appendix G). We see that with the robust option, the P value of the log population becomes strongly insignificant (P = 0.598). This suggests that heteroskedasticity is a problem with this variable. The findings of the other variables are not influenced. We run the following models with and without the robust option.

Perhaps it's the case that the effects of the MSE manifest themselves in the years preceding or following the event. To measure this, we create lagged dummy variables and run the FE estimators with them.

First we run the FE estimator with the before years (Appendix H). We see that none of the preceding years have any significant effects. Then we test whether together they are significant, and they are not. Then we do the same with the after years (Appendix I), but again they don't provide any significant results.

Finally, we test for interaction effects. It might be that we miss the significant effects of MSE's because they depend on an interaction with another independent variable. We run the model with the following interaction variables.

MSE and FDI stock. It could be that an MSE is only effective at attracting tourists when there is a sufficient amount of FDI stock present in the country, which would allow for making the necessary infrastructure investments for a successful event.

MSE and inward FDI flows. Similar to the FDI stock, but instead of the stock present in the country, this measures whether the level of inward FDI flows a country attracts in the year of the hosting of the event influences whether the MSE significantly attracts tourists.

MSE and Openness. It could be, for example, that only more open countries significantly attract tourists with an MSE. Tourists attitudes could be less favorable towards more closed countries.

MSE and Relative Price Level. It is conceivable that it is easier for countries with a lower price level to attract tourists with a MSE. It could also be, however, that a lower price level indicates a lower value offering. In this case, it could also be expected that countries with a higher price level are more effective at attracting tourists through MSE's.

After generating these interaction terms, we run the FE estimator for each of them. We see that all but one interaction terms are strongly insignificant.

Most interestingly, the model with the robust option shows a significant interaction effect with MSE and relative price level at a significance level of P = 0.10 (Appendix J). It shows a coefficient of 0.02184 at a P value of 0.065. The coefficient is interpreted that a country in a MSE year compared to a non-MSE year, generates 2.184% more tourist arrivals with every 1% that its relative price level is higher, ceteris paribus.

Even though this is not a strong significance level, probably partly because of the low number of cases, its interpretation is very interesting. While overall we cannot find a significance that hosting a MSE leads to more tourist arrivals, this suggests that there *is* a positive relation when the hosting country has a *higher* price level. This could be related to the finding of Zhang and Jensen (2009) that a lower price level is beneficial to tourist arrivals overall, but that for OECD countries this effect is reversed. They argue that it's probably because the countries with a higher price level have a superior tourist offering.

10. Conclusions & Recommendations

The goal of this research was to understand whether and how the hosting of MSE's influenced the tourism flows of a destination country.

We've laid the foundations in the literature overview, answering the sub-questions of *what a mega sport event is*, *how the growing attention for this phenomenon can be explained*, *why a city or nation would or would not want to host one*, and *what intermediating factors could influence its 'success'*? The answers to these questions provided us with the necessary background information to put the result of the quantitative part into perspective.

To set up our quantitative analysis we then looked at the academic literature to identify the factors that influence tourism flows on a national level, which we divided into demand and supply factors. With these we set up our theoretical and statistical models, the latter of which consisted mostly out of demand based factors. With the statistical model we ran a panel data analysis on a dataset comprised out of variables from the sources UNWTO, UNCTAD, and the World Bank. This quantitative analysis was aimed at answering the main research question of this thesis: To what extent can MSE's impact a country's tourism flows? For this, we looked at the countries' event, pre-event, and post-event tourist flows.

Overall, our results suggest that an MSE is a poor tool for attracting tourist flows, at least on a nation-wide basis. Although the R2 indicated strong models, with none of the variations of estimators we ran did we find a direct significant result of the MSE dummy variable. Only with one interaction effect did we find any significance. The theoretical section of this paper provides various explanations for these 'disappointing' findings.

The temporal nature of the events was mentioned, for example, to be too short-term for any significant effect (Burgan and Mules, 1992); as was the difficulty to create, manage, and maintain a locational image and the decreasing strength of these events through their serial reproduction (Smith, 2004); and their low 'memorability' (Oldenboom, 2005). While Ritchie and Smith (1991) and Chalip et al (2003) did detect significant reimaging effect on the hosting city, they also could not directly tie it to an increase in visitor numbers. Preuss (2004) framework of 'runaways', 'changers', and 'avoiders' provides explanation for the lack of significance.

Another explanation would be the set up of this research, which we'll come back to later on.

One significant finding we did make was with the interaction variable of MSE's and the destination's relative price level. Surprisingly, we found that countries with a *higher* relative price level *were* significantly attracting more tourists, at a significance level of P=0.1.

To understand this, we should go back to the explanation from Zhang and Jensen (2009). They found that while affordability was a relevant factor to attract tourists for non-OECD countries, for OECD countries the effect was *reversed*. Thus, the countries with the higher price levels were more successful at attracting tourists. To this they gave the explanation that these countries offered a higher tourist value and could thus demand a higher price.

This leads us to hypothesize that maybe an MSE by itself is not enough of a reason for the average tourist to go to a certain destination, but it can be a trigger to visit a certain destination when it already has a significant value offering. A qualitative follow up research on the travel motivations of MSE visitors would be interesting.

In contrast, Preuss (2004) predicted that for cities whose hotel facilities run at near-full capacity – which are likely high value offering destinations –, the substitution effect of event tourists replacing regular tourists would be higher. Our finding could suggest that, at least on a country scale, this is not the case.

Although more research would have to be done on this interaction effect between price level and MSE's, if this finding were true it would have major implications for the countries applying to host. Because if only the countries with a high touristic value offering can significantly attract tourists, it would only make sense for such countries to be hosts.

The last FIFA World Cup was hosted in Brazil; the one before that in South Africa; the upcoming 2018 will be hosted in Russia; and the one that follows in 2022 is planned for Qatar. It is doubtful whether most of these countries fit the profile of high tourist value providers. Especially when one takes into account that such destinations likely require significantly higher investments to build the required facilities (Solberg and Preuss, 2007).

An interesting follow-up research would be to compare MSE case studies of 'premium' tourist destinations with MSE case studies of 'discount'

destinations, to analyze whether there is a structural difference in the success of attracting tourists.

With that we come to the limitations of this paper's research setup. We added big sport events, differing greatly in nature, to one 'pile' of MSE's. With this we assumed that the tourist-attracting power of these events are relatively equal across country types, which is likely not the case.

These assumptions were necessary to conduct a panel data analysis, since separating for individual MSE types and country types would result in too narrow of a dataset. What we *did* prove is that *not all MSE types* have a significant positive effect on tourist flows *across all country types*.

A larger time range on tourist arrival data was not available, but if it were, it would be possible to include more events. This would open up a world of opportunities. For example, it would be possible to run the model per country type, as Zhang and Jensen (2009) did; per geographical region; or per individual MSE type. With a sufficient number of cases one could also measure the effects of factors like the number of hosts per event.

What's more, while our research suggests that MSE's are ineffective at impacting tourism numbers on a national scale, in reality most MSE's are hosted in only one or a few cities in the country. That's why it would be interesting to measure the effects of tourism on a city scale. Such data is, however, less readily available.

Then it must also be stressed that there are more goals behind the hosting of a MSE than mere tourist numbers. As mentioned in the earlier section about reasons to host a MSE, these can be tangible, such as foreign direct investment, but also intangible, such as cultural pride (Ritchie, 1984). Ergo, one cannot discard the practice of hosting a MSE solely on the basis of this research.

Our research does suggest that the criticism and demonstrations towards the hosting of MSE's is founded. It suggests that MSE's are a poor tool to attract tourists. And if they are a valid tool at all, probably only so for countries that have already captured a premium tourist position. So the 'Our cup is on the streets' protests seem to be right. Brazil would be better off spending the investments in the upcoming Summer Olympics on education and healthcare.

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Appendices

Appendix A: Countries included

Algeria
Angola
Argentina
Australia
Austria
Azerbaijan
Belgium
Bolivia
Brazil
Burkina Faso
Cambodia
Canada
Chile
China
Colombia
Ecuador
Egypt
Ethiopia
France
Georgia
Germany
Ghana
Greece
India
Indonesia
Israel
Italy
Japan
Jordan
Kenya
Korea
Laos
Lebanon
Madagascar
Malaysia
Mali
Mexico
Mongolia
Nepal
Netherlands
New Zealand
Niger
Nigeria
Pakistan
Paraguay
Peru
Philippines
Poland
Portugal
Russia
South Africa
Spain
Surinam
Switzerland
Tanzania
Thailand
Tunisia
Turkey
Ukraine
United Kingdom
Uruguay
USA
Venezuela
Vietnam

Appendix B: Correlation Matrix

```
. correlate hc popd open relppp2 fdistock msecomb
(obs=892)

             |       hc     popd     open  relppp2 fdistock  msecomb
-------------+------------------------------------------------------
          hc |   1.0000
        popd |  -0.1783   1.0000
        open |   0.0743  -0.2086   1.0000
     relppp2 |  -0.0267  -0.0208  -0.0573   1.0000
    fdistock |   0.2981   0.1404   0.1302  -0.0305   1.0000
     msecomb |   0.0716   0.0034   0.0149   0.0013   0.0026   1.0000
```

Appendix C: Describe dataset

```
. xtsum $id $t tourarr popd open relppp2 msecomb

Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
id       overall |  42.59375   18.62949         11         75 |     N =    1216
         between |             18.76904         11         75 |     n =      64
         within  |                   0   42.59375   42.59375 |     T =      19
                 |                                          |
t        overall |      2004   5.479479       1995       2013 |     N =    1216
         between |                   0       2004       2004 |     n =      64
         within  |             5.479479       1995       2013 |     T =      19
                 |                                          |
tourarr  overall |   9451240   1.67e+07       9546   1.35e+08 |     N =    1180
         between |             1.59e+07   62460.68   1.01e+08 |     n =      64
         within  |              4956676  -4.56e+07   4.35e+07 | T-bar = 18.4375
                 |                                          |
popd     overall |  83562.07   211237.8     445.83    1362514 |     N =    1216
         between |             212332.9   491.8753    1297803 |     n =      64
         within  |             14284.65  -79698.79   238925.1 |     T =      19
                 |                                          |
open     overall |  .6918868   .3517713   .1411532   2.118385 |     N =    1190
         between |             .3361462    .228336   1.836472 |     n =      64
         within  |             .1194906   .1255079   1.208984 | T-bar = 18.5938
                 |                                          |
relppp2  overall |  2.605079   29.24778   6.33e-09   890.9277 |     N =    1180
         between |             9.869967   2.03e-08   69.67483 |     n =      64
         within  |             27.50861  -66.59741   823.8579 |     T = 18.4375
                 |                                          |
msecomb  overall |  .0287829   .1672646          0          1 |     N =    1216
         between |             .0295501          0   .1052632 |     n =      64
         within  |             .1646729  -.0764803   .9761513 |     T =      19
```

Appendix D: FE Estimator

```
. xtreg tourarr_log open popd_log logrelppp2 i.msecomb dyear1-dyear19, fe
note: dyear19 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6187                         Obs per group: min =         1
       between = 0.0010                                        avg =      17.5
       overall = 0.0175                                        max =        19

                                                F(22,1034)         =     76.26
corr(u_i, Xb)  = -0.3501                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 tourarr_log |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5476681   .0778417     7.04   0.000     .3949224    .7004137
    popd_log |   .3902767   .1628077     2.40   0.017     .0708055     .709748
  logrelppp2 |  -.0991262   .0135705    -7.30   0.000     -.125755   -.0724974
   1.msecomb |   .0225363   .0489656     0.46   0.645    -.0735471    .1186197
      dyear1 |  -.6694001   .0651522   -10.27   0.000    -.7972457   -.5415545
      dyear2 |  -.6291484   .0630135    -9.98   0.000    -.7527973   -.5054996
      dyear3 |  -.6268632   .0604874   -10.36   0.000    -.7455552   -.5081712
      dyear4 |   -.621237   .0586598   -10.59   0.000    -.7363429   -.5061311
      dyear5 |  -.6046503   .0573975   -10.53   0.000    -.7172791   -.4920215
      dyear6 |  -.5793668   .0552558   -10.49   0.000    -.6877931   -.4709406
      dyear7 |  -.5885143   .0545681   -10.78   0.000    -.6955911   -.4814375
      dyear8 |  -.5821566   .0536437   -10.85   0.000    -.6874196   -.4768936
      dyear9 |  -.5544089   .0530197   -10.46   0.000    -.6584474   -.4503704
     dyear10 |  -.4470353   .0515498    -8.67   0.000    -.5481895   -.3458812
     dyear11 |  -.3731382   .0509556    -7.32   0.000    -.4731264    -.27315
     dyear12 |   -.311027   .0503548    -6.18   0.000    -.4098364   -.2122177
     dyear13 |  -.2237818    .050012    -4.47   0.000    -.3219184   -.1256452
     dyear14 |  -.2006198   .0495399    -4.05   0.000    -.2978299   -.1034096
     dyear15 |  -.1777145     .04961    -3.58   0.000    -.2750622   -.0803667
     dyear16 |  -.1257514   .0490214    -2.57   0.010    -.2219441   -.0295587
     dyear17 |  -.1134187    .048878    -2.32   0.021    -.2093301   -.0175072
     dyear18 |  -.0528759   .0490167    -1.08   0.281    -.1490595    .0433076
     dyear19 |           0  (omitted)
       _cons |   10.46749   1.686238     6.21   0.000     7.158656    13.77633
-------------+----------------------------------------------------------------
     sigma_u |  1.8464854
     sigma_e |  .25925607
         rho |  .98066751   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(63, 1034) =   347.92            Prob > F = 0.0000
```

Appendix E: RE Estimator

```
. xtreg tourarr_log open popd_log logrelppp2 i.msecomb dyear1-dyear19, re
note: dyear19 omitted because of collinearity

Random-effects GLS regression                   Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6116                         Obs per group: min =         1
       between = 0.1516                                        avg =      17.5
       overall = 0.1963                                        max =        19

                                                Wald chi2(22)      =   1553.50
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
 tourarr_log |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5600902   .0794316     7.05   0.000     .4044072    .7157733
    popd_log |   .6185306   .0869576     7.11   0.000     .4480968    .7889644
  logrelppp2 |  -.0401706   .0121335    -3.31   0.001    -.0639517   -.0163895
   1.msecomb |   .0238892   .0508915     0.47   0.639    -.0758563    .1236347
      dyear1 |  -.7074661   .0598912   -11.81   0.000    -.8248508   -.5900815
      dyear2 |  -.6579735   .0585665   -11.23   0.000    -.7727618   -.5431852
      dyear3 |  -.6494582   .0569143   -11.41   0.000    -.7610083   -.5379082
      dyear4 |  -.6349594   .0557309   -11.39   0.000    -.7441899    -.525729
      dyear5 |  -.6101778   .0549749   -11.10   0.000    -.7179267    -.502429
      dyear6 |  -.5780038   .0533824   -10.83   0.000    -.6826313   -.4733763
      dyear7 |  -.5830514   .0532134   -10.96   0.000    -.6873478   -.4787551
      dyear8 |  -.5734583    .052733   -10.87   0.000    -.6768131   -.4701035
      dyear9 |  -.5484414   .0526731   -10.41   0.000    -.6516788   -.4452039
     dyear10 |  -.4441163    .051788    -8.58   0.000    -.5456189   -.3426138
     dyear11 |  -.3721221   .0516298    -7.21   0.000    -.4733146   -.2709296
     dyear12 |  -.3110989   .0513721    -6.06   0.000    -.4117864   -.2104114
     dyear13 |  -.2291245   .0513259    -4.46   0.000    -.3297215   -.1285276
     dyear14 |  -.2075423   .0511055    -4.06   0.000    -.3077073   -.1073774
     dyear15 |  -.1804088   .0512769    -3.52   0.000    -.2809096   -.0799079
     dyear16 |    -.12901   .0508627    -2.54   0.011    -.2286991   -.0293209
     dyear17 |  -.1198882   .0507883    -2.36   0.018    -.2194314    -.020345
     dyear18 |   -.055178   .0509664    -1.08   0.279    -.1550702    .0447143
     dyear19 |          0  (omitted)
       _cons |   8.315548   .9159612     9.08   0.000     6.520297     10.1108
-------------+----------------------------------------------------------------
     sigma_u |  1.0804322
     sigma_e |  .25925607
         rho |  .94555599   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix F: Hausman Test

```
. hausman fe re

                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+------------------------------------------------------------
        open |    .5476681     .5600902       -.0124222                .
    popd_log |    .3902767     .6185306       -.2282538        .1376399
  logrelppp2 |   -.0991262    -.0401706       -.0589556        .0060776
   1.msecomb |    .0225363     .0238892       -.0013529                .
       dyear1 |   -.6694001    -.7074661         .038066        .0256486
       dyear2 |   -.6291484    -.6579735        .0288251         .023252
       dyear3 |   -.6268632    -.6494582         .022595        .0204812
       dyear4 |    -.621237    -.6349594        .0137224        .0183043
       dyear5 |   -.6046503    -.6101778        .0055276        .0164994
       dyear6 |   -.5793668    -.5780038       -.0013631        .0142662
       dyear7 |   -.5885143    -.5830514       -.0054629        .0120834
       dyear8 |   -.5821566    -.5734583       -.0086983        .0098428
       dyear9 |   -.5544089    -.5484414       -.0059675        .0060524
      dyear10 |   -.4470353    -.4441163        -.002919                .
      dyear11 |   -.3731382    -.3721221       -.0010161                .
      dyear12 |    -.311027    -.3110989        .0000719                .
      dyear13 |   -.2237818    -.2291245        .0053427                .
      dyear14 |   -.2006198    -.2075423        .0069226                .
      dyear15 |   -.1777145    -.1804088        .0026943                .
      dyear16 |   -.1257514      -.12901        .0032586                .
      dyear17 |   -.1134187    -.1198882        .0064695                .
      dyear18 |   -.0528759     -.055178         .002302                .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(22) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       93.04
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

Appendix G: FE estimator with robust option

```
. xtreg tourarr_log open popd_log logrelppp2 i.msecomb dyear1-dyear19, fe robust
note: dyear19 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6187                         Obs per group: min =         1
       between = 0.0010                                        avg =      17.5
       overall = 0.0175                                        max =        19

                                                F(22,63)           =     16.52
corr(u_i, Xb)  = -0.3501                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for 64 clusters in id)
------------------------------------------------------------------------------
             |               Robust
 tourarr_log |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5476681   .2245321     2.44   0.018     .0989765    .9963596
    popd_log |   .3902767    .656869     0.59   0.555    -.9223711    1.702925
  logrelppp2 |  -.0991262   .0445176    -2.23   0.030    -.1880874   -.0101649
   1.msecomb |   .0225363   .0391408     0.58   0.567    -.0556803    .1007529
      dyear1 |  -.6694001   .1674971    -4.00   0.000    -1.004116   -.3346838
      dyear2 |  -.6291484    .158553    -3.97   0.000    -.9459912   -.3123056
      dyear3 |  -.6268632   .1534221    -4.09   0.000    -.9334529   -.3202735
      dyear4 |   -.621237   .1465546    -4.24   0.000     -.914103    -.328371
      dyear5 |  -.6046503   .1408402    -4.29   0.000    -.8860969   -.3232037
      dyear6 |  -.5793668   .1332785    -4.35   0.000    -.8457027    -.313031
      dyear7 |  -.5885143   .1273659    -4.62   0.000    -.8430347   -.3339939
      dyear8 |  -.5821566   .1229269    -4.74   0.000    -.8278063   -.3365068
      dyear9 |  -.5544089   .1121019    -4.95   0.000    -.7784266   -.3303911
     dyear10 |  -.4470353   .1028766    -4.35   0.000    -.6526177    -.241453
     dyear11 |  -.3731382   .0903681    -4.13   0.000    -.5537244    -.192552
     dyear12 |   -.311027   .0764009    -4.07   0.000    -.4637021    -.158352
     dyear13 |  -.2237818    .070062    -3.19   0.002    -.3637895   -.0837742
     dyear14 |  -.2006198    .060847    -3.30   0.002    -.3222128   -.0790268
     dyear15 |  -.1777145   .0501854    -3.54   0.001     -.278002   -.0774269
     dyear16 |  -.1257514   .0397222    -3.17   0.002    -.2051299   -.0463729
     dyear17 |  -.1134187   .0298797    -3.80   0.000    -.1731285   -.0537088
     dyear18 |  -.0528759   .0229131    -2.31   0.024     -.098664   -.0070878
     dyear19 |           0  (omitted)
       _cons |   10.46749   6.783158     1.54   0.128    -3.087565    24.02255
-------------+----------------------------------------------------------------
     sigma_u |  1.8464854
     sigma_e |  .25925607
         rho |  .98066751   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix H: Lagged Effects Before Years

```
. xtreg tourarr_log open popd_log logrelppp2 dyear1-dyear19 i.msecomb i.m1se i.m2se i.m3
> se i.m4se i.m5se, fe
note: dyear19 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6190                         Obs per group: min =         1
       between = 0.0009                                        avg =      17.5
       overall = 0.0171                                        max =        19

                                                F(27,1029)         =     61.92
corr(u_i, Xb)  = -0.3489                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 tourarr_log |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5472801   .0781216     7.01   0.000     .3939843    .7005759
    popd_log |    .385816   .1633418     2.36   0.018     .0652948    .7063371
  logrelppp2 |  -.0988119   .0136146    -7.26   0.000    -.1255275   -.0720963
      dyear1 |  -.6709765   .0655549   -10.24   0.000    -.7996131     -.54234
      dyear2 |   -.631183   .0636096    -9.92   0.000    -.7560024   -.5063637
      dyear3 |  -.6277024   .0609006   -10.31   0.000     -.747206   -.5081989
      dyear4 |  -.6251622   .0592722   -10.55   0.000    -.7414705    -.508854
      dyear5 |  -.6053748   .0577322   -10.49   0.000     -.718661   -.4920885
      dyear6 |  -.5813767   .0557009   -10.44   0.000     -.690677   -.4720764
      dyear7 |  -.5926184   .0551582   -10.74   0.000    -.7008539   -.4843829
      dyear8 |  -.5837522   .0542448   -10.76   0.000    -.6901952   -.4773093
      dyear9 |  -.5531246   .0534516   -10.35   0.000    -.6580113    -.448238
     dyear10 |  -.4492927   .0518626    -8.66   0.000    -.5510612   -.3475242
     dyear11 |  -.3742421   .0512067    -7.31   0.000    -.4747235   -.2737607
     dyear12 |  -.3107561   .0505223    -6.15   0.000    -.4098946   -.2116176
     dyear13 |  -.2237277   .0501345    -4.46   0.000    -.3221051   -.1253502
     dyear14 |  -.2007874   .0496645    -4.04   0.000    -.2982427   -.1033321
     dyear15 |   -.178825   .0497824    -3.59   0.000    -.2765117   -.0811383
     dyear16 |  -.1266727   .0492403    -2.57   0.010    -.2232955   -.0300498
     dyear17 |  -.1122299   .0490981    -2.29   0.022    -.2085737    -.015886
     dyear18 |  -.0518394   .0491765    -1.05   0.292     -.148337    .0446583
     dyear19 |           0  (omitted)
   1.msecomb |   .0227964   .0494317     0.46   0.645    -.0742021    .1197949
      1.m1se |   .0138055   .0487162     0.28   0.777    -.0817889    .1093998
      1.m2se |   .0046163   .0494761     0.09   0.926    -.0924692    .1017018
      1.m3se |  -.0180029   .0511208    -0.35   0.725    -.1183157      .08231
      1.m4se |  -.0027175    .051901    -0.05   0.958    -.1045614    .0991265
      1.m5se |   .0436523    .055853     0.78   0.435    -.0659466    .1532511
       _cons |   10.51504   1.691929     6.21   0.000     7.195014    13.83506
-------------+----------------------------------------------------------------
     sigma_u |  1.8460027
     sigma_e |   .2597748
         rho |  .98058161   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(63, 1029) =   339.75             Prob > F = 0.0000

.
. test 1.m1se 1.m2se 1.m3se 1.m4se 1.m5se

 ( 1)  1.m1se = 0
 ( 2)  1.m2se = 0
 ( 3)  1.m3se = 0
 ( 4)  1.m4se = 0
 ( 5)  1.m5se = 0

       F(  5,  1029) =    0.17
            Prob > F =    0.9720
```

Appendix I: Lagged Effects Post Years

```
. xtreg tourarr_log open popd_log logrelppp2 dyear1-dyear19 i.msecomb i.mse1 i.mse2 i.ms
> e3 i.mse4 i.mse5, fe
note: dyear19 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6189                         Obs per group: min =         1
       between = 0.0012                                        avg =      17.5
       overall = 0.0182                                        max =        19

                                                F(27,1029)         =     61.88
corr(u_i, Xb)  = -0.3476                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 tourarr_log |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5478452   .0783727     6.99   0.000     .3940565    .7016338
    popd_log |   .3903821   .1633572     2.39   0.017     .0698308    .7109335
  logrelppp2 |  -.0987758   .0136154    -7.25   0.000    -.1254929   -.0720587
      dyear1 |  -.6711314   .0654894   -10.25   0.000    -.7996395   -.5426234
      dyear2 |  -.6304301   .0633099    -9.96   0.000    -.7546614   -.5061988
      dyear3 |  -.6290147   .0607891   -10.35   0.000    -.7482994   -.5097299
      dyear4 |  -.6228747   .0589385   -10.57   0.000    -.7385282   -.5072212
      dyear5 |  -.6068689   .0577001   -10.52   0.000    -.7200922   -.4936455
      dyear6 |  -.5826525   .0557498   -10.45   0.000    -.6920487   -.4732563
      dyear7 |  -.5908478   .0550061   -10.74   0.000    -.6987848   -.4829108
      dyear8 |  -.5857893   .0541424   -10.82   0.000    -.6920315   -.4795471
      dyear9 |  -.5562465   .0533613   -10.42   0.000    -.6609559   -.4515372
     dyear10 |  -.4516148   .0521808    -8.65   0.000    -.5540078   -.3492218
     dyear11 |  -.3747895   .0513081    -7.30   0.000    -.4754699   -.2741091
     dyear12 |  -.3144322   .0508238    -6.19   0.000    -.4141622   -.2147021
     dyear13 |   -.226661   .0505243    -4.49   0.000    -.3258034   -.1275186
     dyear14 |  -.2045741   .0501726    -4.08   0.000    -.3030263   -.1061219
     dyear15 |  -.1796106   .0499409    -3.60   0.000    -.2776083   -.0816129
     dyear16 |  -.1283778   .0493366    -2.60   0.009    -.2251896   -.0315661
     dyear17 |  -.1156345   .0491994    -2.35   0.019    -.2121773   -.0190918
     dyear18 |  -.0540041   .0492057    -1.10   0.273    -.1505591    .0425509
     dyear19 |          0  (omitted)
   1.msecomb |   .0256087   .0494973     0.52   0.605    -.0715184    .1227358
      1.mse1 |   .0207816   .0483835     0.43   0.668      -.07416    .1157232
      1.mse2 |   .0100188   .0483404     0.21   0.836    -.0848382    .1048758
      1.mse3 |   .0137495   .0458103     0.30   0.764    -.0761427    .1036417
      1.mse4 |   .0053505   .0457877     0.12   0.907    -.0844974    .0951984
      1.mse5 |   .0200703   .0470398     0.43   0.670    -.0722346    .1123751
       _cons |   10.46805   1.692194     6.19   0.000     7.147504    13.78859
-------------+----------------------------------------------------------------
     sigma_u |  1.8442256
     sigma_e |  .25983287
         rho |  .98053637   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(63, 1029) =   334.50             Prob > F = 0.0000

. * test joined effects after years

. test 1.mse1 1.mse2 1.mse3 1.mse4 1.mse5

 ( 1)  1.mse1 = 0
 ( 2)  1.mse2 = 0
 ( 3)  1.mse3 = 0
 ( 4)  1.mse4 = 0
 ( 5)  1.mse5 = 0

       F(  5,    63) =    0.79
            Prob > F =    0.5615
```

Appendix J: Interaction Effect MSE * Relative Price Level

```
. xtreg tourarr_log open popd_log logrelppp2 dyear1-dyear19 i.msecomb mserel, fe robust
note: dyear19 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      1120
Group variable: id                              Number of groups   =        64

R-sq:  within  = 0.6193                         Obs per group: min =         1
       between = 0.0010                                        avg =      17.5
       overall = 0.0175                                        max =        19

                                                F(23,63)           =     17.43
corr(u_i, Xb)  = -0.3494                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for 64 clusters in id)
------------------------------------------------------------------------------
             |               Robust
 tourarr_log |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .5496875   .2249878     2.44   0.017     .1000853    .9992897
    popd_log |   .3893582   .6567981     0.59   0.555    -.9231482    1.701865
  logrelppp2 |  -.0992474   .0445351    -2.23   0.029    -.1882436   -.0102512
      dyear1 |  -.6692097   .1674381    -4.00   0.000    -1.003808   -.3346114
      dyear2 |  -.6295721   .1585095    -3.97   0.000     -.946328   -.3128162
      dyear3 |  -.6261941   .1532079    -4.09   0.000    -.9323557   -.3200325
      dyear4 |  -.6189423   .1465464    -4.22   0.000    -.9117919   -.3260928
      dyear5 |   -.607416    .141048    -4.31   0.000    -.8892779   -.3255541
      dyear6 |  -.5773748   .1331014    -4.34   0.000    -.8433567   -.3113928
      dyear7 |  -.5862326   .1272716    -4.61   0.000    -.8405647   -.3319006
      dyear8 |  -.5819154   .1229223    -4.73   0.000    -.8275561   -.3362748
      dyear9 |  -.5571157   .1123181    -4.96   0.000    -.7815655   -.3326659
     dyear10 |  -.4469668   .1028888    -4.34   0.000    -.6525737   -.2413598
     dyear11 |  -.3750213   .0904468    -4.15   0.000    -.5557648   -.1942778
     dyear12 |  -.3068363   .0764752    -4.01   0.000    -.4596598   -.1540128
     dyear13 |  -.2252008   .0699845    -3.22   0.002    -.3650537   -.0853479
     dyear14 |  -.2007266   .0608549    -3.30   0.002    -.3223355   -.0791178
     dyear15 |  -.1782754   .0501139    -3.56   0.001      -.27842   -.0781309
     dyear16 |  -.1257089   .0397239    -3.16   0.002    -.2050907   -.0463271
     dyear17 |  -.1134666   .0298878    -3.80   0.000    -.1731926   -.0537406
     dyear18 |   -.052912   .0229247    -2.31   0.024    -.0987234   -.0071007
     dyear19 |          0  (omitted)
   1.msecomb |   .0645418    .041452     1.56   0.124    -.0182934    .1473769
      mserel |     .01071   .0058177     1.84   0.070    -.0009156    .0223357
       _cons |   10.47484   6.782218     1.54   0.127    -3.078343    24.02802
-------------+----------------------------------------------------------------
     sigma_u |  1.8462005
     sigma_e |  .25916821
         rho |  .98067451   (fraction of variance due to u_i)
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