

A PANEL DATA ANALYSIS OF THE ECONOMIC IMPACT OF THE WORLD CUP

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Abstract

This study attempts to quantify whether the economic impact of the World Cup is significant on the host country. The study uses panel data analysis to test the hypotheses that the World Cup has no effect on GDP growth rates and unemployment. The data represents 15 countries over a 51 year time span that includes 11 World Cup Games. The results indicate that population growth has a significant positive effect on GDP growth rates and a negative effect on unemployment for nations that host the World Cup. The findings contribute to the World Cup literature using panel data analysis and provide decision makers a multidimensional understanding of the perceived economic benefits of hosting a World Cup.

KEYWORDS: (World Cup, Economic Impact, Mega Sports, Sports Economics)

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CHAPTER 1

INTRODUCTION

The World Cup is no doubt classified as a mega sports event that rivals in scope with the summer and winter Olympics and may have significant economic, social, physical, cultural, and political impacts on the host country (Lee & Taylor, 2005, pg. 595). The purpose of this study is to use panel data to determine if there is a significant economic impact on the host nation from hosting the tournament.

The World Cup is an international football competition in which the top football players around the world compete on their national teams for the coveted World Cup Trophy. The international competition started in 1930 and is held every four years, separated by two years with the summer Olympics to avoid direct competition for teams and fans. Currently, the tournament comprises of 32 national teams who qualify through regional tournaments. The tournament has been held 19 times and Brazil is the most successful country, winning the tournament five times.

Fédération Internationale de Football Association (FIFA) is the governing body of the tournament and the FIFA panel determines the host nation through a bidding process. Traditionally, the tournament alternated between Europe and Latin America however, FIFA has recently implemented several plans to include the African and Asian countries as host nations. These initiatives allow for developing nations to perhaps reap the claimed economic benefits of hosting the World Cup. In the history of the World Cup, only four

countries, Mexico, Italy, France, Germany have hosted the tournament on two occasions. In 2014, Brazil will host their second World Cup tournament.

The competition among potential host nations to claim a World Cup during the bidding process indicates a notion that the competition will bring some benefit to the host country. Further, the relevance of scandals during the bidding process indicates that countries will go above and beyond to win a World Cup bid (Matheson, 2006, p. 4).

Even if the economic predictions for hosting a mega event are “wildly optimistic”, countries continually bid aggressively to have the opportunity to host one of these events leading to some controversy. One of the most controversial FIFA decisions was to award the 2006 World Cup to Germany in July 2000. Since FIFA’s previous decisions to award the 1994 World Cup to the United States and the 2002 joint bid to Japan and Korea, there was a movement to award the tournament to an African country for the first time. The supporters made three compelling arguments for an African host; first, an Africa nation had never previously hosted the World Cup tournament, second, the African Football Confederation had the most members of any of the FIFA regions, and finally African nations were becoming more competitive against traditionally dominant European and South American teams.

A variety of countries submitted a bid for the 2006 World Cup, however South Africa and Germany were the two favorites to win the bid. During the initial bidding processes there was further controversy about a secret alliance between Brazil and South Africa. Brazil withdrew their bid but made an alleged deal with South Africa to have their support for a Brazilian bid in 2010. With Brazil out of the race, South Africa and Germany were directly competing for the majority votes of the 24 members venue

selection committee. During the final round of voting, the race came down to the Oceania Football Confederation (OFC), which leaned toward the South Africa bid. The OFC is one of the smallest regions represented in FIFA and does not even have a guaranteed slot for a OFC team in the World Cup tournament. Germany lead 12-11 votes, however if the OFC representative, Charles Dempsey from New Zealand voted for South Africa and there was a tie, the deciding vote would go to Joseph Blatter, the president of FIFA and strong supporter of the South Africa bid. Dempsey ultimately parted from his organization and abstained from voting, allowing Germany to secure the 2006 World Cup. This caused much speculation and there were allegations that, “Dempsey faced death threats and person bribery in order to secure his vote” (Baade & Matheson, 2003, p. 344). In the aftermath, Dempsey resigned and faced harsh criticism from the OFC and the New Zealand Government. This recent controversy highlights the political strife resulting from countries’ desire to host a mega event with the apparent benefits.

On October 30, 2007 Brazil won the right from FIFA to host the 2014 World Cup. In the official Inspection Report for the 2014 FIFA World Cup, Hugo Salcedo (2007), chairman of the inspection team wrote,

The FIFA World Cup in Brazil will bring long-lasting changes for the benefit of the entire country. Both the football community and the population...will gain considerably...in term of the economy, transport, communication, public services and facilities, safety and the enhancement of sporting facilities. (p. 9)

Further in the document under the “Legacy” subsection, the inspection team repeats the previous statement indicating that, “The World Cup will stimulate investment” (p. 11).

It is common for event organizers to confidently claim economic benefits for a host city because it is their top priority to market the tournament.

CHAPTER 2

LITERARY REVIEW

This section covers the sports economic literature on mega sports events. The literature is separated into two categories; ex-ante and ex-post studies. Ex-ante studies are conducted before the event to attract nations to host events and incentivize large public subsidies to meet the infrastructure requirements demanded by the organization overseeing the event. Ex-post studies are conducted after the event and tend to be more scholarly with varying results, depending on the author(s) and event(s) studied. However, the majority of the literature analyzes the effect of one event on a specific region. Only Tien, Lo, and Lin (2011) take a broader approach by using panel data to determine if there is a significant economic impact on the host nation during the summer and winter Olympics over time.

Ex-Ante Literature

Matheson (2006) provides the basis for the literature on national and international mega event impact analysis. Matheson (2006) discusses the validity of ex-ante studies such as the Dentsu Institute for Human Studies research on the economic impact prediction for Japan and South Korea and The South Africa Football Associations estimates for the 2010 South Africa World Cup. The promoters who publish these documents estimate the number of visitors drawn by the event, number of days the

visitors stay in the country, and how much each visitor will spend. These numbers are then combined to estimate the direct economic impact. Finally, the studies multiply the direct economic impact statistic with an economic multiplier to predict the indirect economic impact. Matheson (2006) indicates that these studies estimate the economic multiplier to be approximately 2, thus, “the total economic impact is double the size of the initial spending” (Matheson, 2006, pg. 3). Multiple studies done after the occurrence of mega event find this multiplier preposterously high. This study will explain the economic multiplier theory later in this chapter.

Those who have an incentive to overestimate the economic impact conduct the majority of the ex-ante studies, however there is some literature done by academic scholars. Humphreys and Prokopowicz (2007) analyze the impact of the EURO 2012 Football Tournament on the two host nations, Poland and Ukraine. They estimate the spending in four different categories; infrastructure, hotel, public safety, and stadium spending. The authors then estimate the direct and indirect benefits from foreign tourists, benefits from upgraded infrastructure, and intangible benefits by estimating the number of visitors, average length of their stay, average spending per day. Also, the authors use an input-output model to convert the direct spending estimates into the economic impact on household income. Humphreys and Prokopowicz (2007) conclude that the costs will outweigh the economic benefits if Poland and Ukraine host the EURO 2012 Football Tournament through a simple cost benefit analysis. However, the authors comment that the tournament could bring intangible benefits such as media coverage, national pride, and global exposure.

On the other hand, studies such as Ahlert (2000) provide an ex-ante approach. He predicts that the 2006 World Cup in Germany will have a positive influence on income and employment in the host nation. Again, Alhert (2000) uses a more complex input-output model and hypothesizes and proves that if taxes were increased previous to the tournament to fund the government expenditure, then total GDP, “would increase significantly by about 0.05%” (Alhert, 2000, pg. 125). The author states that the tax increase would slow down the initial effect of the government expenditures, but the total effect on GDP and employment would be positive in following years.

Returning to Matheson (2006), the study concludes that ex-ante studies require making “heroic assumptions” about the state of the economy and estimating variables that determine the mega event’s economic impact. This results in scholars performing their own studies or ex-post research to estimate the economic impact of an event such as the World Cup using data collected during the event. Ex-post studies allow scholars to compare a city or host nation’s economy before, during, and after a major event. Scholars most commonly look at income per capita, employment, and taxable sales. Matheson claims that ex-post studies indicate that ex-ante studies are exaggerated, “often by up to a factor of 10” (Matheson, 2006, pg. 14).

Ex-Post Literature

One challenge that ex-post studies face is isolating a single event within a country’s economy. Events such the Olympics, Super Bowl, and World Series take place within a single city of an entire nation. Scholars must also distinguish the impact of an event from the unpredictable ebb of the business cycle. Therefore, research is typically

conducted on a regional level, even for the World Cup, which impacts a number of different cities within a country.

The majority of ex-post studies conclude that large sports events have no or a negative economic impact on the host nation. Baade, Baumann, and Matheson (2005) studied the correlation between mega events and taxable sales by looking at a wide range of events; Super Bowl, World Cup, and World Series. The authors argue that taxable sales are the best indicator to measure the impact of a large sporting event for multiple reasons. First, there is a direct connection between taxable sales and sports facilities hosting large sporting events. Many stadiums constructed for specific events such as the World Cup and even for the National Football League franchises are funded through local taxes. Second, taxable sales capture consumer spending, which is the largest component of gross domestic product, “and therefore is a good proxy for economic activity” (Baade, Baumann, and Matheson, 2005, pg. 10). Finally the authors argue that using taxable sales are a better proxy than income statistics to assess the economic impact of a mega event an increase in income is a relatively small increase of the total annual income of any metropolitan area. Thus, income statistics are hard to isolate when and where the effects of an event occurred from the fluctuation of the regular business cycle. Further, per capita income and employment data is available annually and creates a problem of pinpointing a month long sports event. Taxable sales records are available yearly but can be segregated monthly to increase the accuracy in an economic analysis. Therefore, taxable sales are the best proxy to measure the economic impact of a mega event. The authors conclude that mega events ranging from the World Cup to the World Series have negative correlation with taxable sales, “in host regions of \$34.3 million per

event” (Baade, Baumann, and Matheson, 2005, 19). The authors acknowledge that like any econometric study, there is some degree of uncertainty, however they recommend that cities and countries should be cautious when bidding for any sports event.

Similar to previous studies, Baade and Matheson (2004) estimate the economic impact of the 1994 World Cup hosted in the United States. They look at the impact of a single event that spans approximately one month in one host nation. The ex-ante literature sponsored by event staff estimated that the football tournament would attract over 3.4 million fans and have a total economic impact of approximately \$4 billion. The authors analyze a prediction model and growth model of the region using metropolitan statistical area (MSA) data and compared the results to determine if there was a significant economic impact. The authors made the assumption that the observed growth path for a region is optimal because the United States allocated their resources in the most efficient way possible. Then the authors use a second prediction model to estimate the growth path of the tournament regions by using historical data spanning the twenty years before the world cup. The authors compared the two growth paths to analyze if the two models displayed similar growth paths. If the growth path decreased after the occurrence of the World Cup, “then the evidence (did) not support the hypothesis that a publicly subsidized mega-event put those public monies to the best use” (Baade & Matheson, 2004, pg. 347). The study concluded that while some regions such as Chicago experienced a positive impact, the impact was displaced by negative impacts in Los Angeles, New York, and San Francisco. Thus this particular methodology concluded that the economic impact of the 1994 World Cup had a negative impact of \$9.26 billion. Even if readers do not believe the enormous estimated negative impact, the authors can

confidently agreed that the promised \$4 billion impact did not materialize and the World Cup had an overall negative impact on the US economy.

Input-output analysis is also popular among scholars researching the impact of mega events for ex-post studies. Lee & Taylor (2005) used an input-output model to estimate the impact attributable to the 2002 World Cup in South Korea. The study used data collected during the World Cup through surveys at the country's entry and exit points to estimate the characteristics of tourists (spending, lodging, reason for attending, etc) as well as data from the national South Korean input-output table. The data collected from the survey was then aggregated and multiplied with the tourism output multiplier determined from the national input-output table. The multiplier was then used to estimate the direct and indirect affect of tourists on the Korean economy. Using this methodology the authors calculated that, "the World Cup generated an economic impact of US\$1.35 billion of output (sales), US\$307 million of income, and US\$713 million of value added for South Korea" (Lee and Taylor, 2005, pg. 595).

Another study that concluded a positive economic impact from a mega event is Baade and Matheson's (2002) study on the 1984 Los Angeles and 1996 Atlanta Summer Olympic Games. Again, the literature is an analysis of two distinct events in very specific regions. The Olympics Games governing committee has many similarities to the World Cup. The Olympics is also controlled by a single governing organization, the International Olympic Committee (IOC) which, reinforces the perception that hosting the Olympics brings in billions of dollars in profit. Further, the IOC requires host cities to follow strict infrastructure guidelines, causing cities to fund stadium upgrades and city

improvements with public money. Finally, the bidding of the Olympics is also tainted by scandal, displaying the fierce contest by countries and cities to host one of these events.

The study uses five theories of economic growth to research how the Olympics affect the change in growth in metropolitan employment both in the long run and short run. The models isolate the impact of the games by carefully considering and choosing external and internal factors that might attribute to the natural cycle of the economy. The study concludes that the economic impact of the Olympics is small. The results indicated that the Olympics had a short-term positive impact, however there was no change to the steady-state growth pattern of the cities. The authors comment that their results indicate the impact of the Olympics is transitory. The Summer Olympic games in Los Angeles produced 5,043 jobs in preparation for the games, however the model failed to find any variation in the net change of jobs.

The final literature review is Tien, Lo, and Lin (2011), which this study attempts to emulate with the World Cup. The study has two components. The first component explores the effect of the Olympics on GDP growth rates, unemployment rates, and change in investments. The study uses panel data with the following independent variables; population growth, game phase, and developed or developing country. The authors run a fixed effects panel data regression. The second component is an event study methodology. The event study is an attempt to determine the impact of neighboring countries and the global economy on the particular economy that the authors are analyzing. A comparison is made between neighboring economies to estimate if the economic performance is isolated to the specific mega sports event. The conclusion is that the Olympic games have no significant effect on the host nation. There is only an

increase in the GDP growth rate and lower unemployment rates in the period leading up to the world cup. The study agrees with the ex-post literature that the majority of mega sports events have no significant economic effect on the host cities or nations.

The literature generally attributes the incorrect economic predictions due to a number of theoretical economic reasons. The first reason is a fundamental theory of economics, opportunity cost. Economists cannot, with a 100% accurately assess the economic benefits of events and consider all the opportunity costs. Even though some authors conclude that a large sports event has a positive impact on the host's economy, the opportunity cost of the next best alternative for the public funds is not considered. A country should only invest in a mega event, "only if the net benefits exceed those from an alternative use of the funds" (Baade and Matheson, 2002, pg. 8). A developing country may have higher opportunity costs of hosting an event such as the World Cup because the benefits of the World Cup would out weight the next best use of those funds.

Another theoretical issue that varies among the literature when studying the economic impact of a mega event is the differentiating between "gross" and "net" measurements. Many studies use national input-out matrices for an input-output analysis or computable general equilibrium model to calculate a spending multiplier. This methodology requires the author to aggregate all the spending done during the event to solve for direct spending and then indirect spending. However, "spending on a mega-event displaces spending that would have occurred otherwise as a local residents purchase tickets to the event rather than spend that money on other activities" (Baade and Matheson, 2004, pg. 1090). To eliminate the issue, economists need to eliminate a proportion of the spending in their aggregation by local residents assuming that they too

participate in a fraction of the events and festivities. However, economists also argue that impact by the local population is comparatively minimal to the spending by tourists attending the event and that not eliminating their spending will have no significant effect on the analysis.

Another theoretical issue closely related the difference between “gross” and “net” measurements is the substitution effect. The broadest substitution scenario is assessing if the spending associated with a sports event would have still occurred in the local economy on a different event at. Therefore economists theorize if a country didn’t win the bid to host a mega event, would that same country have spend a similar amount of money on a different public expenditure project. Similar to the previous example of local residents enjoying the games, the local community may just substitute their spending from a different event to the mega-sports event and thus have no aggregate economic impact from the studied event.

When attempting to aggregate the total net spending by tourists during an event, researchers need to account for the “crowding out” effect. The crowding out effect postulates that event visitors “crowd out” or discourage other visitors who would normally attend the country for vacation, business, etc. Thus, research fails to identify the displaced visitors and more importantly, there is lack of information on the spending of the displaced visitors to compute a net spending calculation (Baade and Matheson, 2004, pg. 1090). In addition to the crowding out effect, Baade, Baumann and Matheson (2005) argue that there is also a “time switching” affect. Time switching, “occurs when a traveler rearranges a planned visit to a city to coincide with a mega-event” (Baade, Baumann, and Matheson, 2005, pg. 6). For example, tourist may have always wanted to visit Japan, but

the World Cup influences the tourist to visit in 2002 instead of a different date. The World Cup did not change the visitor's decision whether to come and spend money in Japan, but rather changed when he would come. Thus, Japan did not gain a net benefit from this visitor.

The fifth theoretical issue is the principle of the multiplier to calculate or approximate the effect of indirect spending. Indirect spending is the spending directly associated with direct spending. For example, an influx of tourists for an event increases the income of local residents through their spending. This results in the local residents having more purchasing power, who then consequently spend more and the cycle continues. This phenomenon makes it difficult for scholars to accurately estimate an economic multiplier for the event.

The final issue is one that also affects calculating the multiplier and is the economic concept of "leakages" (Baade, Baumann, and Matheson, 2005, pg. 8). The concept indicates that spending may not directly go to local residents. The authors note that many businesses that profit from mega events are multinational corporations. Take for example the hotel industry. Multinational corporations control the majority of hotels and an increase in tourist spending does not equal a proportional increase in income for local residents. Thus, money "leaks" out of the local economy and into other regions or more importantly into different countries. Properly identifying the magnitude of leakages is essential for calculating an appropriate spending multiplier.

This paper attempts to take a broad analysis of the economic impact of a mega event, specifically the World Cup. The majority of academic analyses examine a single sports event on a specific region to determine the economic impact using input-output

analysis or CGE models. However, they do not look at the trend of the economic impact these sports events have on the economy of host nations. Only Tien, Lo, and Lin (2011) conduct a study analyzing the trend of the Summer and Winter Olympic Games. The Olympics Games occur only in a single in comparison with the World Cup where multiple cities, often up to 10, will host matches over a month long time frame. Therefore, the World Cup has a larger potential impact on the host nations economy because the event is not concentrated on a single region. This study attempts to analyze the economic impact trend of the World Cup using data from the past 50 years.

The following are the hypotheses in the study.

Hypothesis 1: Hosting the World Cup has no effect on GDP growth performance.

Hosting the World Cup has the expected benefit of a positive impact on GDP performance. Countries spend exuberant amounts of money to attract foreign tourists who insert money into the host nations economy via hotels, games, merchandise, etc. Further, the local economy must create additional jobs in preparation for the event as well as to meet the demand of the influx of tourists.

Hypothesis 2: Hosting the World Cup has no effect on unemployment.

Winning a World Cup bid and hosting the games also has the expectation of lower unemployment rates in the host nation. Countries must prepare for the event, improving infrastructure, building stadiums, and improve security. Theoretically, such preparations would lower the unemployment statistics of the host nation.

Hypothesis 3: Hosting the World Cup has no effect on foreign direct investment.

Finally, hosting a World Cup brings attention to the host nation and theoretically would attract new foreign investors. Companies should see an opportunity with high public exposure and invest in the nation before and after the games.

The remainder of this paper adds to the scholarly work on mega-events, specifically the World Cup by using panel data to determine significance of variables that affect GDP growth rates, unemployment rates, and foreign direct investment (FDI) in host countries.

CHAPTER 3

DATA AND METHODOLOGY

The data was collected from the World Bank, UN database, International Monetary Fund, International Financial Statistics, and LABORSTA. Due to availability, the study consists of data from 1970 to 2011, comprising of eleven World Cups in nine countries. During the time period, Mexico and Germany are the only countries to host the World Cup two times. Our dependent variables are national GDP growth rates and unemployment rates. For the GDP growth rate sample, there are 735 observations ranging from 1970 to 2011, however Germany and Switzerland lack the first 10 and 20 years of GDP data respectively. The number of observations for unemployment is smaller due to the availability data before 1990. For example, there are no published unemployment rates for South Africa before 1994. The total number of observations for unemployment is 557.

The independent variables of the study are dummy variables indicating three distinct phases of the World Cup, a variable distinguishing whether a country is developing or developed, and the countries population growth rates.

The dummy variables are included to indicate the three phases of the World Cup. Phases are divided into 3, three-year phases of the World Cup, therefore nine years of data for each World Cup. The pre-World Cup phases is $t-4 \sim t-1$, the World Cup phase is $t-$

1~t+1, and finally the post- World Cup phase is t+1~t+4. Another dummy variable included in the study is to differentiate between developing and developed countries. The majority of countries are developed countries with the exception of South Africa, Mexico, Chile and Argentina. It is worth noting that before 1997, the International Monetary Fund labeled South Korea as a developing country.

Finally, country population growth statistics are included in the study. Population growth data is included from 1970 to 2011 and is complete for all 15 countries with an average population growth of 1.054.

TABLE 3.1
DESCRIPTIVE STATISTICS

Country	Performance			Unemployment		
	Start	End	N	Start	End	N
Argentina	1961	2011	51	1970	2011	41
Brazil	1961	2011	51	1976	2011	36
Chile	1961	2011	51	1975	2011	37
France	1961	2011	51	1970	2011	41
Germany	1971	2011	41	1991	2011	21
Italy	1961	2011	51	1970	2011	41
Japan	1961	2011	51	1969	2011	42
Republic of Korea	1961	2011	51	1969	2011	42
Mexico	1961	2011	51	1988	2011	24
South Africa	1961	2011	51	1994	2011	18
Spain	1961	2011	51	1969	2011	42
Sweden	1961	2011	51	1969	2011	42
Switzerland	1981	2011	51	1975	2011	37
United Kingdom	1961	2011	51	1971	2011	41
United States	1961	2011	51	1961	2011	51
TOTALS			755			556

TABLE 3.2

CORRELATIONS

	GDP Performance	Pre-WC	WC	Post-WC	Population Growth	Developing
GDP Performance	1.0000					
Pre-WC	-0.0629	1.0000				
WC	-0.0594	-0.0591	1.0000			
Post-WC	-0.0457	-0.0583	-0.0598	1.0000		
Population Growth	0.2618	-0.0301	-0.0251	-0.0613	1.0000	
Developing	-0.2010	0.0225	0.0195	0.0513	-0.7615	1.0000
Observations = 735						

	Unemployment	Pre-WC	WC	Post-WC	Population Growth	Developing
Unemployment	1.0000					
Pre-WC	0.1004	1.0000				
WC	0.1206	-0.0529	1.0000			
Post-WC	0.0204	-0.0508	-0.0489	1.0000		
Population Growth	0.0110	-0.0474	-0.0805	-0.1055	1.0000	
Developing	-0.1652	0.0228	0.0477 9	0.0749	-0.7102	1.0000
Observations = 557						

The study uses a cross-sectional time series regression to test the hypotheses.

Equation 3.1 tests whether hosting a World Cup will have any effect on economic performance and unemployment.

$$g_{i,t} = \beta_0 + \beta_1 d_{i,1} + \beta_2 d_{i,2} + \beta_3 d_{i,3} + \beta_4 Pop_{i,t} + \beta_5 Developing_{i,t} + \varepsilon_{i,t} \quad (3.1)$$

$g_{i,t}$ represents the dependent variable; GDP growth rate and unemployment rate.

The independent variables are as follows. $d_{i,1}$ through $d_{i,3}$ designate the three World Cup phases; pre-World Cup, World Cup, and post-World Cup phases. The pre-World Cup phase is $t-4 \sim t-1$, the World Cup phase is $t-1 \sim t+1$, and finally the post-World Cup phase is $t+1 \sim t+4$. $Pop_{i,t}$ represents the population growth of country i at time t and finally $Developing_{i,t}$ is dummy variable to distinguish whether a country is classified as a developed or developing country. The panel data in this study is strongly balanced.

A number of tests were conducted to determine the optimal method for testing the hypotheses. The first test was the Hausman test to determine the most favorable methodology between fixed and random effects regressions. The author believed this was an advantageous start because Tien, Lo, and Lin (2011) used a fixed effects panel data regression to test the economic impact of the Olympics on the host nation using the same variables. The results of the Hausman test are the following:

TABLE 3.3
HAUSMAN TEST RESULTS

	Coefficients		b-B Difference
	Fixed	Random	
Population Growth Rate	1.4073	1.3376	0.0697
Developing	-2.0173	-0.04497	-1.5676
Pre-WC	-0.8380	-0.9406	0.1026
WC	-0.8166	-0.9100	0.0933
Post-WC	-0.5805	-0.6579	0.0770
Ho: difference in coefficients not systematic			
Chi ² (5) = 6.13			
Prob > Chi ² = 0.2934			
Dependent Variable: GDP growth rate			

	Coefficients		b-B Difference
	Fixed	Random	
Population Growth Rate	-3.1187	-3.0251	-0.0936
Developing	-2.2154	-3.1259	0.9104
Pre-WC	-0.0388	0.1604	-0.1992
WC	0.1854	0.4033	-0.2178
Post-WC	-0.0539	0.0632	-0.1171
Ho: difference in coefficients not systematic			
Chi ² (5) = 3.58			
Prob > Chi ² = 0.6112			
Dependent Variable: Unemployment			

The results of the Hausman tests fail to reject the null hypothesis, that the error terms are not correlated with the regressors due to the Prob > Chi² value being greater than 0.05. Therefore the test concludes that fixed effects is not the optimal methodology but does at the same time does not guarantee that the random effects methodology is also optimal.

Another test is the Breusch-Pagan Lagrange multiplier (LM) test that tests between using a random effects regression and a simple ordinary least square regression (OLS). In the LM test, the null hypothesis is that the variance across countries is zero. Therefore, by rejecting the null hypothesis, we can conclude that there is variance among countries in the panel data and can reject the OLS methodology for a random effects model. The following is the results of the LM test for all three dependent variables.

TABLE 3.4

BREUSCH-PAGAN LAGRANGE MULTIPLIER TEST RESULTS

GDP Growth Rate (country, t) = $Xb + u(\text{country}) + \epsilon(\text{country}, t)$		
	Variance	S.D.
GDP Growth Rate	12.5684	3.5452
ϵ	10.7488	3.2785
u	1.3594	1.1659
Test: $\text{Var}(u) = 0$		
Chibar ² (01)= 90.82		
Prob > Chibar ² = 0.0000		

Unemployment (country, t) = $Xb + u(\text{country}) + \epsilon(\text{country}, t)$		
	Variance	S.D.
Unemployment	26.3937	5.1374
ϵ	8.4249	2.9025
u	8.8529	2.9753
Test: $\text{Var}(u) = 0$		
Chibar ² (01)= 2145.45		
Prob > Chibar ² = 0.0000		

The results of the LM test conclude that random effects is the proper methodology to use with the panel data. In all three tests, the Prob > Chibar² is less than 0.05 indicating that there is a significant difference in variance across countries. Therefore, we can reject the null hypothesis that there is no variance across countries. Consequently, we conclude that OLS is not an accurate methodology for the study and we proceed with a random effects panel data analysis.

The assumption behind the random effects model is that the variation across entities or the unobserved effect is uncorrelated with each explanatory or independent variables in the model. A problem in the random effects regression is serial correlation. In the study, the model corrects for serial correlation problems by running a generalized least square (GLS) panel data random effects regression. The GLS estimator estimates

the unknown parameters in the model and fixes for serial correlation and heteroscedasticity.

CHAPTER 4

RESULTS

The random effects GLS panel data regression corrected for serial correlation and heteroscedasticity provides the following results.

TABLE 4.1

RANDOM EFFECTS REGRESSION RESULTS FOR GDP GROWTH RATES

GDP Growth Rate	Coefficient	Standard Error	z	P> z
Population Growth Rate	1.1474**	0.2477	4.63	0.000
Developing	-0.0251	0.3962	-0.06	0.949
Pre-WC	-0.9493*	0.5561	-1.17	0.088
WC	-0.8967*	0.5434	-1.65	0.099
Post-WC	-0.5722	0.5505	-1.04	0.299
_cons	2.4248	0.4930	4.92	0.000
Prob > Chi ² =0.0000				

**p<0.05 *p<0.10

TABLE 4.2

RANDOM EFFECTS REGRESSION FOR UNEMPLOYMENT

Unemployment	Coefficient	Standard Error	z	P> z
Population Growth Rate	-1.6694**	0.5058	-3.30	0.001
Developing	-3.4390**	0.6358	-5.41	0.000
Pre-WC	2.4706**	0.9452	2.61	0.009
WC	3.0460**	0.9799	3.11	0.002
Post-WC	0.8725	1.0186	0.86	0.392
cons	10.5287	0.8323	12.65	0.000
Prob > Chi ² =0.0000				

**p<0.05 *p<0.10

The results exhibit a number of interesting facts about the economic impact of hosting the World Cup tournament. First, the model obtains three significant coefficients for population growth, pre-World Cup phase, and the World Cup phase on GDP growth. The model indicates that there is a positive correlation with GDP growth and the population growth rate of a specific country. The result supports the conclusion that developing countries have higher population growth rates in comparison with developed nations and thus a World Cup in South Africa might have a large economic impact than in South Korea. Developing nations usually have higher GDP growth rates due to their economic potential. However, the pre-World Cup and World Cup phase coefficients display a negative correlation with GDP indicating that overall GDP growth rates actually suffer before and during the World Cup. This result, disagrees with the literature. Economic theory assumes that GDP growth would be highest before and during an event due to preparation costs and a massive influx of tourists. However, economic principles such as the crowding out effects may have affected the model.

In the unemployment, there are four significant coefficients. Country population growth rates and the dummy variable for developing or developed countries have a negative correlation with unemployment. The correlation indicates that countries with high population growth rates and are classified as developed nations have lower unemployment rates. The correlation between developed nations and unemployment agrees with the historical data and economic theory. Developed nations typically have lower unemployment rates due to a strong economy. Further, countries with high population growth rates tend to historically be developing nations. Therefore, it is interesting that the model predicts countries with high growth rates have lower unemployment rates. More research should be conducted to fully understand this phenomenon in the model. The other interesting significant figures are the pre-World Cup and World Cup phase coefficients. Both coefficients are positive indicating a positive correlation with unemployment. During the pre-World Cup and World cup phase, unemployment was higher in countries that hosted the World Cup. This conclusion disputes the majority of the ex-ante literature explaining or perhaps marketing the benefits of hosting a World Cup.

CHAPTER 5

CONCLUSION

This study attempts to quantify the economic impact of the World Cup for countries over time to assess if it is in their best interest to host the event. The study uses panel data to analyze the trend of the economic impact on the host nations over approximately the last 50 years. Organizations such as FIFA and the IOC are notorious for sponsoring ex-ante literature that supports their economic incentives to convince nations to voraciously bid against each other for the economic benefit of hosting a mega-event and spend large public sums of money for the event. However, the majority of the ex-post literature disagrees with the results from the ex-ante literature, concluding that mega events bring little to no economic benefit to a host country. This study coincides with the majority of the ex-post literature. The pre-World Cup and World Cup phase both had negative correlations with GDP performance. Further, both of those phases had a positive correlation with unemployment, indicating unemployment rates were higher before and during the World Cup and that perhaps the World Cup has a negative impact on the overall economy.

The results also call to attention the high cost of hosting these events, many which are funded with public subsidies. The findings indicate that such high spending will not have a positive economic impact and countries perhaps should deliberate on a more

efficient allocation of those funds to different projects. If the economic benefits are not the principal concern of hosting such an event, countries should carefully understand the negative impacts before pursuing an agenda to profit from the intangible benefits of mega events.

Finally, the study has some limitations. First, this is an undergraduate research paper and there is more room for further academic study both in economic theory and statistical analysis. Second, the study lacks unemployment data from certain countries. Complete unemployment data sets were not found in any United States government archives or United Nations databases. Perhaps, the countries with missing data points have more complete data sets available to the public. The author recommends that the model should be reevaluated and regressed 4 years after the 2014 World Cup in Brazil. The 2014 World Cup will add more observations in the panel data and perhaps create more accurate independent variable coefficient estimates.

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