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H. R. Bohlmann and J.H. van Heerden
University of Pretoria

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Department of Economics
University of Pretoria
0002, Pretoria
South Africa
Tel: +27 12 420 2413
Fax: +27 12 362 5207
http://www.up.ac.za/up/web/en/academic/economics/index.html

THE IMPACT OF HOSTING A MAJOR SPORT EVENT ON THE SOUTH AFRICAN ECONOMY

H R Bohlmann & J H van Heerden
Department of Economics, University of Pretoria, South Africa

Abstract

The impact of the sporting industry on economic decision making has increased dramatically since the global media explosion in the 1980s. Tourism and advertising revenues generated by these mega-events have become a major boost to the economies of hosting nations. In addition, globalisation has placed great emphasis on the importance of foreign direct investment (FDI), especially to developing countries.

This paper seeks to examine the impact of the pre-event phase expenditure attributed to the hosting of the 2010 FIFA World Cup on the South African economy. In this phase, expenditure is mainly geared towards the construction and improvement of infrastructure required to successfully host the event. Using a Computable General Equilibrium (CGE) model developed specifically for the South African economy, the impact of the pre-event phase on the local economy is measured. It is found that there is a positive impact on most macroeconomic variables, including GDP and employment. With the potential economic benefits of the event and post-event phases of the World Cup also taken into account, it can be concluded with relative certainty that the impact of hosting a mega-event on the South African economy is beneficial towards achieving higher economic growth and development. In addition to analysing the impact of the 2010 FIFA World Cup, the outcomes are also used to briefly examine the feasibility of South Africa's bid to host the 2011 IRB World Cup and the 2016 Olympic Games.

JEL classification code C68, O10

Keywords computable general equilibrium, mega-events, economic development

Presenting author H R Bohlmann

Contact details
Department of Economics
University of Pretoria
Pretoria
0002
South Africa
Office +27 12 420 3468
Fax +27 12 362 5207
Mobile +27 72 389 8047
E-mail heinrich.bohlmann@up.ac.za

1. Introduction

> *Games are central to the human experience. Outlets for aggression, universal forms of entertainment, metaphors for the struggle to survive. The cathartic experience of participating in a hard-fought contest takes us one step closer to an understanding of our mysterious, questing nature.*
>
> Mark Frost, author of *The Greatest Game Ever Played*

1.1 Motivation

Sport has always been an integral part of the South African culture, but now it is also becoming an increasingly important part of the economy. The hosting of mega-events such as the Olympic Games is generally reserved for developed countries with an already advanced infrastructure. The FIFA World Cup tournament has been held in developing countries more often, mostly due to the football rich tradition that exists in Latin America. Motivated by a desire to promote football and capitalise on its growing popularity elsewhere in the world, FIFA has begun designating host countries outside of Europe and Latin America. This strategy by FIFA has led to the first ever World Cup being hosted in Africa since the competition began in 1930. South Africa's successful bid to host the 2010 FIFA World Cup poses a unique opportunity to assess the impact of such a large scale event on a developing economy.

1.2 Study Approach

The 2010 FIFA World Cup will be the largest sporting event ever to have been staged on the continent of Africa. The objective of this study is to measure the impact of hosting the 2010 FIFA World Cup on the South African economy. A Computable General Equilibrium (CGE) model, designed specifically for the South African economy, is used for the simulations. The CGE modelling methodology overcomes many of the limitations associated with the long-established input-output method of estimating the impact of mega-events (CREA, 1999).

An important consideration of the study is to decide the time period over which the effects of the World Cup should be modelled. Madden (2002) identified three distinct phases when modelling the total effects of the 2000 Sydney Olympics, based on the classification of expenditures that are immediate consequences of the event. The pre-event phase consists of all the operation expenditures, construction and upgrading of venues and accommodation, and the necessary upgrading of transport infrastructure in the five years preceding the event. The second phase is the year of the event, in this case 2010, during which the major expenditures would be on the operations of the World Cup, and by the visitors to the tournament. The final phase would be the post-event period during which expenditure by

induced international tourism is the only type of expenditure directly related to the hosting of the mega-event.

This particular study will focus primarily on the expenditure related to the first phase of the 2010 FIFA World Cup and its impact on the local economy. CGE analysis will then be used to assess the impact of this increased infrastructure expenditure on key macroeconomic variables such as output and employment.

2. Literature Review

The first economic impact study of hosting the Olympic Games, conducted for the Los Angeles Games of 1984, was a direct result of the interest generated by reports that Montreal declared a considerable financial deficit from the 1976 Games. Studies concerning sport tourism have also proved popular in recent times. Ritchie and Adair (2002) found a growing recognition of sport tourism as both a popular leisure experience and important economic activity. The Los Angeles Sports and Entertainment Commission (2003) claimed that the average economic impact on a city hosting a major sporting event was US$32.2 million, and the Canadian Sport Tourism Alliance (2003) estimated that in excess of US$2 billion per annum was generated by the sport tourism industry in Canada. Sports events have been the focus of many economic impact studies since 1984, the most applicable of which are briefly discussed below.

An economic impact study of the Rugby World Cup 2003 held in Australia by URS Finance and Economics (2004) found that RWC2003 was estimated to have generated AU$494 million in additional industry sales, an additional AU$55 million in revenue to the Commonwealth Government, and more than 4000 full- and part-time jobs during 2003. The total contribution in additional Gross Domestic Product (GDP) to the Australian economy was estimated at AU$289 million.

The economic impact study of the Sydney 2000 Olympic Games also held in Australia by the Centre for Regional Economic Analysis (1999) estimated that over the twelve years ending in 2005/06 the Olympics is expected to increase New South Wales Gross State Product (GSP) by an average of almost AU$490 million per year. The value of the impact on the Australian GDP was estimated at AU$6.5 billion. This initial estimation was confirmed in a more recent study by Madden (2002). CGE modelling techniques were used to simulate the impact on the Australian economy in both the above mentioned studies.

Kim, Gursoy and Lee (2004) found that the impact of the 2002 FIFA World Cup on South Korea was unsatisfactory from an economic perspective. The benefits of cultural exchanges, and natural resources and cultural development were however found to be adequate. The

lower than expected economic benefits may have been due to the fact that football has not traditionally been a major sport in Asia, but apart from these unsatisfactory gains, the 2002 FIFA World Cup was a successful event for South Koreans without any major societal and cultural problems.

An economic impact assessment by Grant Thornton (2003) of South Africa's 2010 World Cup Bid and the Inspection Group Report for the 2010 FIFA World Cup (2004) highlighted some of the potential benefits to the economy, and found that the staging of the World Cup in South Africa will create significant direct and indirect economic benefits for the country's economy, with minimal tangible and intangible costs.

3. Methodology

3.1 General

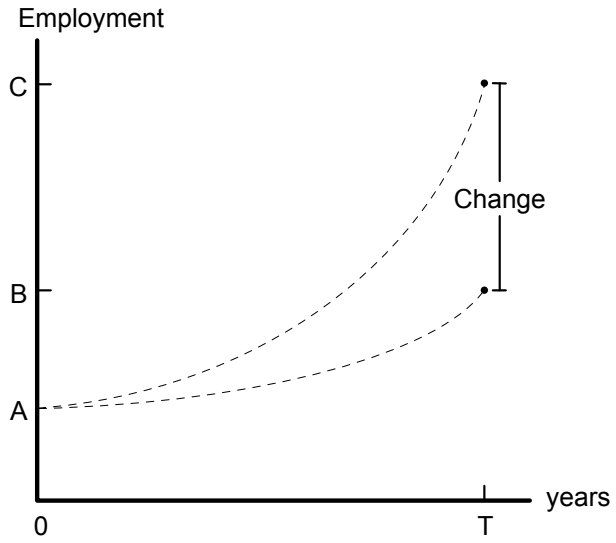
The Computable General Equilibrium (CGE) modelling approach will be used to simulate the impact of the 2010 FIFA World Cup on the economy. The UPGEM model used in these simulations is a 32-sector computable equilibrium model of the South African economy based on the ORANI-G model of the Australian economy. It was created in 2002 by Jan van Heerden and Theuns de Wet of the University of Pretoria and Mark Horridge of the Centre of Policy Studies at Monash University.

Like the majority of CGE models, the UPGEM model is designed for comparative-static simulations (Horridge, 2000). The data does not comprise of time series data but is instead compiled from a Social Accounting Matrix (SAM), which implicitly describes the economy at any given time. It is further assumed that economic participants are price takers operating in a competitive market, and that demand and supply equations for private-sector agents are derived from the solutions to the optimization problems e.g. cost minimization and utility maximization (Horridge, 2000). The UPGEM model has a theoretical structure which is typical of a static AGE model. It consists of a number of equations describing, for some time period, i) producers' demands for produced inputs and primary factors; ii) producers' supplies of commodities; iii) demands for inputs to capital formation; iv) household, government and export demands; v) the relationship of basic values to production costs and to purchasers' prices; vi) market-clearing conditions for commodities and primary factors; and vii) numerous macroeconomic variables and price indices (Horridge, 2000). In addition, the model is based on a number of sectors, industries and commodities. Each equation in the model explains a variable which is either endogenous or exogenous. Endogenous variables are explained by the model, whereas exogenous variables are set by the user or are assumed to be fixed. Only exogenous variables can be shocked.

3.2 Interpretation and Closure

In our comparative-static CGE model simulation, the results generated represent percentage changes in the different variables[1]. As an example, the interpretation of the change in employment, due to the introduction of a tariff, is illustrated in Figure 1.1.

Figure 1.1 ***Comparative-static interpretation of results***



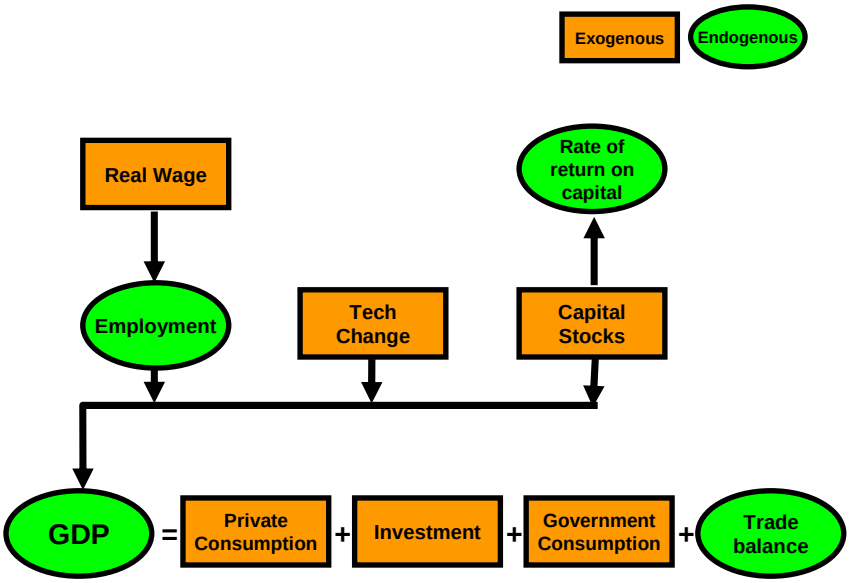
Source: Horrdige (2000)

Figure 1.1 illustrates the change in the level of employment over time. In the base year the level of employment is given as A. If no tariff is introduced the level of employment will change over time to B. Therefore in year T, the level of employment is given as B. With the introduction of a tariff, ceteris paribus, the level of employment in period T would reach C. What the CGE model actually calculates is the percentage change in the employment level, in period T, i.e. the distance BC (Horridge, 2000).

The closure refers to a set of assumptions that are used to explain a specific simulation at a given time. The type of closure depends on the choice of exogenous variables, making the model very flexible in that regard. In a typical short run closure, as illustrated by Figure 1.2, the real wage, technology, capital stock, private consumption, investment, and government consumption are exogenous and set by the user. Only these exogenous variables may be shocked. It is also important to realise that the percentage change in all exogenous variables not directly shocked will be zero. The numeraire in this simulation is the nominal exchange rate, phi, and is also kept exogenous.

[1] Based on Figure 1.1, the percentage change is given as [(C-B)/B]*100.

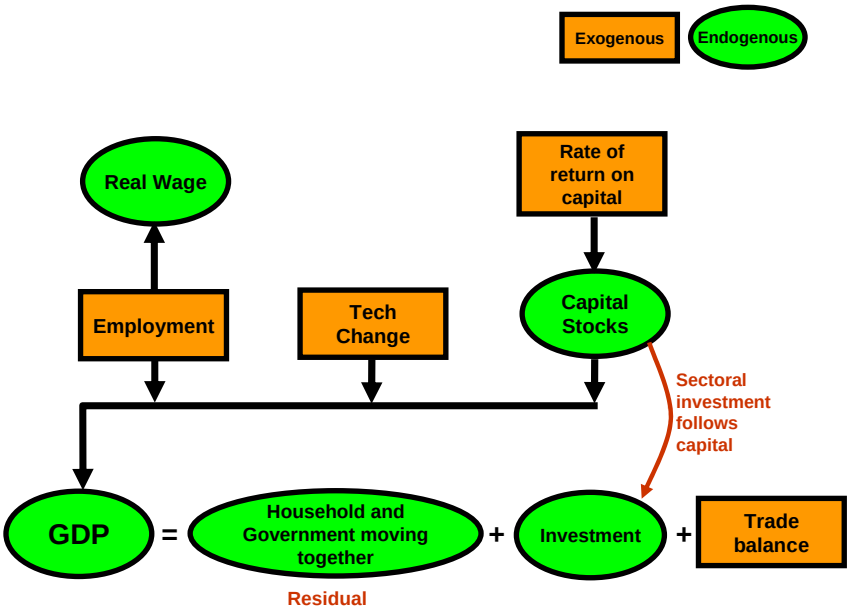
Figure 1.2 ***Standard short run closure***



Source: Horridge (2000)

In a typical long run closure, as illustrated by Figure 1.3 the real wage, capital stock, private consumption, investment, and government consumption are now made endogenous. The rate of return on capital, employment, trade balance and technology variables, amongst others, are now exogenous. The closure used in this simulation will be discussed in the following section.

Figure 1.3 ***Standard long run closure***



Source: Horridge (2000)

4. Model Closure, Data and Shocks

In order to correctly simulate the impact of hosting the 2010 FIFA World Cup on the South African economy, it is critical to use an appropriate model closure given the time period over which the events occur. As indicated in the first section of this paper, there are several phases over which expenditure related to the World Cup can be modelled. This study focuses primarily on the first phase of expenditure and its impact on the local economy. The two most important outcomes to take note of would be the impact on employment and GDP. It was therefore decided to use a slightly modified version of the standard short run closure to simulate the results.

As discussed previously, the nature of the comparative-static CGE model does not require time series data, but is compiled instead from a Social Accounting Matrix (SAM). The input data of the UPGEM model is based on the values of the 1998 SAM of the South African economy published by Statistics South Africa, which implicitly describes the structure of the local economy at that particular time.

The shocks applied to the economy are based on the proposed infrastructure investment and development as indicated by the South African Bid Committee to the FIFA Inspection Group. The main beneficiaries during the first phase of the World Cup will be the construction sector and the increased productivity arising from improvements to the transport infrastructure. Although the second phase of the World Cup will obviously benefit service sectors such as hotels and other accommodation a great deal, it was not included in this round of simulations.

By comparing the proposed amounts to be spent on development of the relevant sectors, to the current level of expenditure, the percentage shock to the industries is calculated and the impact thereof simulated using the UPGEM model. It was decided to shock the capital stock of the construction and transport industries with an increase of 10 percent, the capital-augmenting technological change in construction by 5 percent and the capital-augmenting transport technological change in the transport industry by 10 percent. This was done in order to simulate the effect of the increased activity in the construction industry due to the improvement and building of new stadiums, and infrastructure in general. These improvements to infrastructure, especially the transport sector, will translate into greater productivity and technological progress in the local economy. The main findings of the simulation are reported in the next section. The effects of the two different shocks, the increase in capital stock and the improvement in technology, were disaggregated and the impact of each separately simulated. Scenario 1 in the simulation results refers to the capital stock increase only, scenario 2 the improvement in technology only, and scenario 3 the combined effect of the shocks on the economy as a whole.

5. Simulation Results

When interpreting the findings of the different scenarios, it is essential to keep the type of closure used in mind. The simulation results of the shocks applied to the economy depend to a large extent on the model closure. In the standard short run closure, variables constraining real GDP from the expenditure side such as the total amount of private consumption, investment, and government consumption are exogenous and the percentage change to these variables will be zero. In this specific simulation, two exogenous variables constraining real GDP from the supply side, capital stock and technological change, are shocked. The level of employment and the trade balance are endogenous, and their effects on real GDP are therefore solved within the model. This particular closure also allows for real household consumption to be endogenous. An in-depth discussion on the closure of a model can be found in Horridge (2000).

Keeping the restrictions of the specific closure used in mind, and the nature of the different simulation scenarios[2], the following macroeconomic results were obtained for the given shocks applied to the economy.

Table 1.1 ***Selected macroeconomic variables***

Macros	**scenario 1**	**scenario 2**	**scenario 3**
% Δ in real GDP (x0gdpexp)	0.49	0.48	0.94
% Δ in employment (employ_iop)	0.17	0.23	0.38
% Δ in consumer prices (p3tot)	-0.32	-0.33	-0.60
% Δ in price of labour (p1lab_iop)	-0.32	-0.33	-0.60
% Δ in total exports (x4tot)	1.37	1.48	2.81
% Δ in competitiveness (p0realdev)	0.47	0.41	0.83
% Δ in balance of trade (contBOT)	0.23	0.29	0.51

It is clear that all the selected macroeconomic variables show an improvement after the shocks are applied. The separate impact of the increase in the capital stock and the technical change to the construction and transport industries, as indicated by scenarios 1 and 2, show very similar results. In scenario 1, real GDP growth **(x0gdpexp)** increases with 0.49 percent compared to 0.48 percent in scenario 2, equating to a contribution of more than R5 billion to the economy in each case. Naturally, when these two effects are combined in scenario 3, the overall impact on real GDP increases to over R10 billion. The simulation results for scenario 3 indicate that employment levels will improve by 0.38 percent due to the shock, creating more than 50,000 jobs. The increase in construction activity during this pre-event phase is expected

[2] Scenario 1 refers to the simulation where the capital stock of the construction and transport industries are increased with 10 percent. Scenario 2 refers to the simulation where technical change to the both the construction and transport industries improves productivity with 5 and 10 percent respectively. Scenario 3 refers to the simulation where the overall impact of both shocks on the economy is measured simultaneously.

to increase employment, particularly in the unskilled labour segment. This increase in employment levels is of great importance given South Africa's labour market problems. However, the concern is that this increase in employment levels might only be a short term phenomenon. South Africa's long term structural unemployment will not be solved by the hosting of a mega-event such as the World Cup, but it will definitely ease the problem in the short term. Alternative means such as the improvement in education and overall factor productivity remain the only true measures of addressing the unemployment issue. Inflation will tend to decrease due to the higher levels of productivity caused by the various shocks. The price level of goods and services **(p3tot)**, and nominal wages **(p1lab_iop)** both decrease with 0.60 percent. The decline in the general level of prices is due to the increase in productivity, and the fact that real wages is held constant in this model closure, forces nominal wages to decline with the same amount. The increase in total exports is directly attributable to the increase in international competitiveness **(p0realdev)** of locally produced goods and services. Lower costs of domestic goods would as theory predicts, lead to an increase in demand from foreign countries and therefore an increase in total domestic exports.

When examining the changes to real GDP from the expenditure side through the **contGDPexp** variable, the contribution of each sector to the GDP can be isolated. The results are shown in the table below.

Table 1.2 ***Contribution to changes in GDP from the expenditure side***

contGDPexp	**scenario 1**	**scenario 2**	**scenario 3**
Consumption	0.10	0.14	0.22
Investment	0.17	0.08	0.24
Government	0	0	0
Stocks	0	0	0
Exports	0.34	0.36	0.69
Imports	-0.10	0.07	-0.17

The increase in investment of 0.24 percent in scenario 3 percent is simply due to the shock applied to the capital stock of both the construction and transport industries, and would otherwise have been zero given the nature of the short run closure[3]. Consumption increases due to the relative decline in prices and higher employment levels. Government and stocks are both exogenous in the closure and changes in these variables are therefore zero. Due to the relatively lower domestic prices, as indicated by the **p3tot** variable in Table 1.1, the foreign demand for local exports has increased with 0.69 percent overall. The demand for imports has also decreased due to the now relatively cheaper domestic goods. The net effect

[3] The variables **x1cap("constr")** and **x1cap("transser")** in the UPGEM model were each shocked with 10 percent.

of changes in imports and exports of 0.51 percent corresponds to the percentage change in the balance of trade **(contBOT)** variable shown in Table 1.1. The cumulative change of 0.94 percent from the various sectors indicated in Table 1.2 corresponds with the percentage change in real GDP **(x0gdpexp)** of 0.94 percent previously discussed.

From an industry specific point of view, it is interesting to note which industries are impacted on most favourably. Results for key selected industries are shown in Table 1.3 below.

Table 1.3 ***Percentage change in activity level of selected industries***

x1tot	**scenario 1**	**scenario 2**	**scenario 3**
Food processing	0.12	0.16	0.26
Construction	1.12	0.56	1.65
Transport services	4.01	4.29	8.41
Electricity	0.27	0.30	0.55
Business activities	0.53	0.52	1.02
Other manufacturing	0.27	0.29	0.53
Other activities/services	0.36	0.39	0.72

It is not surprising that the biggest winners are the construction and transport services industries, those directly affected by the shock. Construction increases by a larger margin in scenario 1 than in scenario 2 due to the nature of the shocks, and transport service activity increases by more than 4 percent in scenario 2 due to the technical change associated with the shock. In general, the results are as expected with all related industries showing positive gains, albeit very moderate.

The financing of the proposed infrastructure developments has not been discussed in this simulation due to the unavailability of information. Government has however pledged to finance the renovations to the Soccer City Stadium in Johannesburg.

From a cost-benefit analysis viewpoint, South Africa's bid to host the 2011 IRB World Cup and the 2016 Olympic Games makes a great deal of sense. Given the high level of infrastructure that would be in place after the 2010 FIFA World Cup, these costs would not have to be repeated when hosting future mega-events, whilst the possible gains might even exceed those of the 2010 World Cup. The revenue generated from tourism, increased tax income, and ticket sales should prove to have a significant impact on the economy if South Africa's bid to host these events is successful.

6. Conclusion

> *The dream of a nation has come true today. Some South Africans may not have food or a job, but they now have hope. FIFA has said Africa is worthy. It is wonderful to be an African today.*
>
> Danny Jordaan, *CEO of South Africa's bid committee*

This study examined the impact of the pre-event phase of the 2010 FIFA World Cup on the South African economy using a Computable General Equilibrium (CGE) modelling approach. The results from the UPGEM model show that the pre-event phase of the World Cup will have a positive impact on the South African economy. The contribution to real GDP is estimated to be in excess of R10 billion, with thousands of jobs being created by the construction of new venues and upgrading of existing infrastructure. In addition, this improvement to the infrastructure of the country, especially the transport sector, will benefit productivity in the longer term and further increase GDP. Given the fact that the expected gains from the second and third phases of hosting the World Cup have not been included in the simulation, we can conclude with relative certainty that the country as a whole will benefit significantly in terms of higher economic growth and development over the next decade. Studies indicate that the overall impact of the World Cup might contribute in excess of R20 billion to GDP, generate 159 000 jobs annually, and increase government revenue from taxes by an additional R7 billion (Grant Thornton, 2003). Potential foreign direct investment (FDI) due to the World Cup is another important boost to the economy, expected to play an increasingly larger role in the domestic economy over the next couple of years.

Future research on this topic may include the building of a dynamic version of the UPGEM model to achieve better simulation results. This is a very intensive exercise though as dynamic models require far more information about changes in exogenous variables than comparative-static models (Horridge, 2000). In addition, it would be appropriate to simulate the overall impact of the different phases of the World Cup simultaneously using CGE analysis.

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