Economic impacts of hosting a major sporting event

Did the 1998 FIFA World Cup in France have positive impacts on employment?

Author: Thomas Giraud

Tutor: Lars Behrenz

Examiner: Dominique Anxo

Subject: Economics
Abstract

This paper examines the effects on employment due to a mega-sport event and more precisely this study demonstrates that the 1998 Football World cup in France had a significant positive effect on employment in the host regions. Moreover, it shows the impact differences between the host regions where some have been more affected than other. This work is the first to analyze the effect on employment in the host regions using a Difference in Difference approach. The basic DID model is then improved to add new parameters in the regression. It is one of the rare studies to find a significant positive impact on the economy owing of the World cup or the Olympic Games.
# Contents

1 Introduction .................................................................................................................. 4

2 Review of literature ....................................................................................................... 5
   2.1 The significant cost of hosting a major sporting event ..................................... 5
   2.2 Impact on growth .................................................................................................... 7
   2.3 An Impact overestimated ...................................................................................... 8
   2.4 Several more cases ............................................................................................... 9
   2.5 Employment effect .............................................................................................. 10
   2.6 Differences between developed and developing countries ......................... 11
       2.6.i Disadvantages for developing countries ................................................... 12
       2.6.ii Advantages for developing countries ....................................................... 13
   2.7 The counterfactual .............................................................................................. 13

3 Empirical application .................................................................................................... 14

4 Methodology ................................................................................................................ 18
   4.1 Model specification ............................................................................................. 18
   4.2 Estimation ............................................................................................................. 22

5 Results .......................................................................................................................... 23
   5.1 Classical Difference in Difference estimation ................................................. 23
   5.2 Modified Difference in Difference regression .................................................. 23

6 Analysis ......................................................................................................................... 24

7 Conclusion and possible improvements .................................................................... 27

8 Appendix ....................................................................................................................... 29

9 References .................................................................................................................... 32
1 Introduction

The Football World Cup and Olympic Games are together the largest sporting events since the 20th century in human history. Both of them happen every four years and nations across the globe apply to host the event in attempt to encourage economical activities as well as acquiring positive political, psychological, sociological and cultural effects in their native countries. Nevertheless, the economical implication of hosting these sporting events is the most studied and researched among all other activities. Since such events involve large scale investments from the public and private sectors, and constructions of new facilities and infrastructures, hosts hope to acquire a significant return on their investments and a boost in their economy. However, studying ex post analyses in the last two decade, only few of them seem to have an improvement on aggregated wages, income, and/or employment generated by mega sport event. Since twenty years, new methods occurred using more disaggregated data and different variables.

In 1998, France hosted the Football World Cup and also won the finale against Brazil, the “country of football”, with a large score of 3-0. Since it was the first time France won the cup, people were euphoric and economist assumed it boosted a little bit the economy in the short run. This study will focus on this event, and its aim will be to find whether the World Cup had a positive impact on the French economy. In order to proceed this analyze, I will look at the employment in France before and after the event. I will use a method became widespread after the work by Ashenfelter and Card (1985): the Difference in Difference method. One of the most famous DID study was realized by Card and Krueger in 1994. They compared employment in the fast food sector in New Jersey and in Pennsylvania. In this case, I will compare employment in the 8 regions that welcomed the World Cup, with the 14 others regions. Data from 8 years before the event and 10 years after will be used.

To my knowledge, the present work is the first to analyze the effects on employment with a Difference in Difference method and to compare the host regions with the non-host regions. It is interesting to see if they have been impacted by the World Cup whereas the remaining regions have not or maybe less. Making use of this method, it may be easier to find a positive effect because it employs disaggregated data. The first
section will present a review of literature where the huge cost of hosting will be shown as well as different past studies on growth and several more cases. The second part will be an empirical application using the data and then a presentation of our methodology. Later will be the exhibition of the results to analyze them in the next part. Finally, the last section will conclude the work.

2 Review of literature

According to Baade, Baumann, and Matheson (2011), trying to find significant economic impacts of mega-events is “equivalent to trying to uncover the proverbial needle in the haystack.” Looking at existing ex post studies like Olympic Games or FIFA Football World Cup, only few of them succeeded to find positive impacts on the economy. The big size of the host country could be a reason because it is hard to identify the mega-event impacts on the global economy. For example, Kurscheidt, Prub, and Schutte (2008) found an impact through substitution-adjusted consumer spending of €3.2 billion during the 2006 football World Cup in Germany. It seems to be a good result but compared with the GDP of Germany in 2006 which was €2325 billion it is only an impact of 0.14%. You could assume that any positive impact of a sporting event will certainly be lost within normal fluctuations in the economy.

How does a country obtain the right to host a major sporting event? It differs a bit for different championship but the main attribution reason is the economic project. Of course politic have to be taken into account but the economic aspect is the most important factor because it gives host country the chance to build or to improve facilities, infrastructures etc.

2.1 The significant cost of hosting a major sporting event

A major sporting event like World Cup or Olympic Games leads to big capital expenditures in new and improved facilities for the host. They can get help from private investments for instance to provide new hostels and other tourist related capacities but a good part comes from public investments. A good way to save money for the state is to
Thomas Giraud

hire volunteers to work in the organization of the event like during the London Olympic Games in 2012. They engaged 70,000 volunteers and they did not even house them or refund their traveling ticket. However it is still very attractive for people because they can in one sense participate and get a great experience from that work.

It costs a lot of money to welcome a mega-event in the short run but that is not all. On the long run it is still very costly to maintain the new stadiums and one saw some countries that deserted their new facilities because of the cost. A very recent example is the winter Olympic Games in Sochi; it cost $51 billion to Russia (International Olympic Comitee, 2014). They are the most expensive games ever. In comparison, the 2008 summer Olympic Games in Beijing cost $40 billion (AFP, 2013) and they were before Sochi the most expensive games. The total budget was 3 times more than expected and people speak about corruption. They spent $17 billion in infrastructures and in the construction of the stadium (AFP, 2013). 2 months after, Sochi is a ghost town. The journalist Alexander Valov uploaded pictures from the Olympic park completely desert (L'Equipe, 2014). The constructions are no longer useful since it was built to host mega-event; they are too big to host little events. A welcome country has to think also about the “after event” otherwise it could be a financial problem in the future.

There are also very significant operating expenditures because of the security, extra police time, renting equipment etc. Indeed, security is enhanced because of terrorism fear. We can recall the politically disastrous during the 1972 summer Olympic Games in Munich which were marred by a terrorist attack who killed 11 Israeli team members. Since this tragedy the security cost is even more important and taken in account very carefully.

For instance, Brazil will host the FIFA World Cup soon; it will start the 12th of June 2014. The country expensed €10 billion in total to prepare the event. This includes the security price of €300 million. Actually, it is a big amount because population in Brazil protests against the government due to the huge expenditures they have done to welcome the event while this amount could have been used to improve education or to help Brazilian people. In comparison, France expensed in total €1.5 billion for the 1998 World cup. The difference comes from the fact they had already all the stadiums and they only needed to renovate and to improve them. They built only one new stadium: the “Stade de France” while Brazil had more construction to manage.
As explained previously, there are huge expenditures to prepare a major sporting event. So from where do they expect to make money? The main source of revenue comes from tourism and visitor expenditures. They also expect a raise in production and so an increase of the GDP growth. Moreover they expect a multiplier effect due to all expenses.

2.2 Impact on growth

Most of economists assume that the impact on the GDP growth rate by the FIFA World Cup is very small or null for the host. We might observe an increase of the GDP growth rate during and few months after the event due to the rise in consumption and therefore in production. However, in the medium and long-term consumption comes back to normal and growth follows the movement.

For instance, Germany hosted the World Cup in 2006 and the country spent €7 billion in infrastructures and facilities (stadium reconditioning and building). At the end, it boosted the GDP by 0.3%. The director of the German Institute for Economic Research Gert Wagner (2007) concluded, “The World Cup’s contribution to economic growth has been negligible. It was great fun. Nothing more, nothing less”. In fact, the FIFA made more benefits with the sold of the “marketing right”.

Several countries knew some problems by welcoming a mega sporting event. Canada hosted the summer Olympic Games in 1976 at Montreal and they suffered a lot from the economic impact. They took more than 30 years to refund their debt who was initially about €1 billion. At Athena in 2004 during the Olympic Games, most of economists assume that the Games damaged the economic Greek situation. It cost nearly €11 billion by current exchange rates, double the initial budget. We know now how huge are Greek’s problems even if it was not the only cause. Furthermore there is the example of Argentina in 1978. During that period, the country’s economy is going very badly. Argentina organized and also won the FIFA World Cup and even so the growth was negative and they noted a big inflation. The French economist Nathalie Hénaff said “for the host, in despite of all economic activities that lead such competitions, the impact does generally not exceed 1% of GDP, which is not big” (le Parisien, 2013).
According to economists, Olympic Games must lead to a fast increase in the growth during the first 3 months but the effect will then slowly disappear. Taking the example of the London summer Olympic Games there are now a lot of interrogations from economists about its real impact on economy. The state tries to convince people that the impact exists but it is still not very clear so far. Government declared the country enjoyed a raise in trade and investment evaluated at €11.5 billion. Foreign tourist expenditures noted an increase around €695 million in 2012. In all, government said in 2013 the total revenue from Olympic Games already exceeded the expenditures caused by all the organization. However, a lot of economists doubt about it. They think government did not take into account all of the expenses in their calculus. They believe it is strongly hard to predict the economic impact of such big event especially in the long run.

Symanski’s (2002) has studied the world’s largest economies over the past 30 years which have hosted either FIFA World Cup or Olympic Games and he concluded that the growth of these countries was significantly lower during the years of FIFA World Cup. His result may imply that governments overestimate the total revenues and don’t take into account the good parameters.

2.3 An Impact overestimated

Matheson Bades (2004) assumed that sporting event studies are often overestimated and wrong according to 3 reasons. Firstly, studies provide a gross measure of direct spending in despite of net measure which does not include the local resident spending. It is assumed that this amount will be spent somewhere else in the economy. Therefore gross measure amplifies the financial result. For instance, during the Olympic Games in Australia the occupancy level was around 100% at Sydney but we noted a decline in Melbourne and Brisbane of 19% and 17% respectively. Second thing: tourism. One can see an increase in the tourist market which is consequent but in the same time a decrease in tourism from populations that are not interested in the particular sport being hosted. For example if one dislike football, one will probably not visit a country welcoming the FIFA World Cup. So we can record a decrease in “regular” tourists compared to the previous years. Finally, the “multiplier” is questioned. The multiplier is
the stimulation of other economic sectors caused by government spending related to the event. For example, unemployment should decrease because of the huge nature of the event, but in fact firms try to increase marginal productivity of workers instead of hiring which is costly. To act in that way they can increase wages and rise the time of work by few hours per week.

For instance, Vladimir Poutine hopes a rise in GDP growth during the next years around 5%. It seems overestimated and economists forecast a number around 2.5%. In the past, government often overestimated the impact since they want to reassure population or at least not scare them.

2.4 Several more cases

It is assumed that there is not a significant effect on the global activity for the host country. For instance the 1998 World Cup in France, since 1 year the country knows an economic recovery because of the increase of the growth in the United States. In 1998, France reached a growth rate of 3.3% (Insee, 2012) while it was only around 2% in 1997 and 1% in 1996. Economist stated that the World Cup was just a little help and it made people euphoric especially because France won for the first time. Such events are the only one that can generate such emotions to people and influence them to expense more. It was surely the case when France won.

In 2002, the World Cup was co-hosted by Japan and South Korea. It is now a drag to the local economy. A study (by the Dentsu Institute for Human studies) estimated a $24.8 billion impact for Japan and an $8.9 billion impact for South Korea. It represents, as a percentage of national income, 0.6% and 2.2% of the total Japanese and South Korean economies, respectively (Finner 2002). Nevertheless, 8 of the 10 stadiums built or renovated in Japan lose between $2 million and $6 million a years. A member of the 2002 World Cup Bidding Committee in Japan said: “no strategy, no success” and “they did not have a strategy” talking about the use of the stadiums. As a consequence, the World Cup generated a real boost for both countries but in other hand it also produced a loss of money due to the maintenance price.
More recently, we can study the case of the FIFA World Cup in South Africa in 2010. It was the first time that Africa welcomed such event, so it was really expected by the entire continent. The positive effects of the event were very short and lower than the expectations of the government in term of new employments and decrease in criminality. Thus, 309,000 tourists came to assist the event and they expensed roughly $400 million according to studies from the department of tourist. However, estimations were about 480,000 tourists and 3 times more in expenditure than reality. The country saw a small positive effect on the growth in the short run due to the temporally activity in the country. In South Africa the increase was estimated around 0.4 percentage points of GDP growth. It was a very short positive effect, but a long cost due to the maintenance price of the new stadiums which are enormous and kind of useless especially for South Africa. The World Cup cost $4.3 billion for the state and the total incomings for the government will not exceed $4 billion.

2.5 Employment effect

Host countries saw a small or null impact on the growth of the host countries or cities, but how does it impact employment? They need more workforces to build new facilities and to manage the event so it should have a positive impact on employment. Indeed, the demand on the market in several sectors increases so firms need to raise their production in order to answer the boost in demand. Thus they hire more people and employment rises. A good part of these new jobs will disappear in the long-run. Most of employments generated by a mega-sporting event are temporary. A study showed the employment effects of the 1974 football World Cup in Germany (Florian Hagn and Wolfgang Mennig, 2007). As a result, they demonstrated that the 1974 World Cup in Germany was not able to engender any medium to long-term employment effects that were significantly different from zero. This study examined the employment effects on the 9 host cities in comparison to 66 others cities in Germany. Thus the data involved the 75 most densely populated municipalities in the year 1974 and the observations stretched from 1961 to 1988. They used as independent variables the population, the relative income of the municipalities and the share of gross added value of the economic sectors agriculture and manufacturing, as well as the sectors trade and transport in the
municipalities. This study was the first to utilize these different data but it failed to prove a positive significant impact on employment. However in contrast to the conclusions in similar studies, they could not clearly reject the hypothesis of the positive effect of a mega-sporting event.

Another study about employment effect was realized by Arne Feddresen and Wolfgang Maennig (2013) about the 1996 Olympic Games in Atlanta, United States. Here, they used monthly data, they analyzed 16 different sectors and they utilized modified Difference in Difference model and a nonparametric approach to isolate the employment effect. It was the first study like that and they found significant positive short-run employment effects only during the Olympic Games. These effects have been seen on the sectors of “retail trade,” “accommodation and food services,” and “arts, entertainment, and recreation.” By isolated sectors they increased their chance to find a positive effect since they employed disaggregated data. Always about the 1996 Olympic Games, Hotchkiss, Moore, and Zobay (2003) found a boost of employment by 17.2% in Georgia counties affiliated to Olympic activities. It was in total 293,000 additional jobs raised from the Olympic Games.

It is obvious to assume that a mega-sporting event will raise employments in the country. Nevertheless, this increase will not affect all sectors and could be too small to be significant. For example, it will impact more the service-related industries than the mining or utility industry. The strongly impacted sectors may be hospitality because of an increase in demand for hostel, food services, retail trade and event management. Moreover, the construction industry may be also affected since it requires more workers to improve and build new infrastructures and stadiums.

We have seen different cases in both developing and developed countries. Since they are different in much ways, they may also exist differences in the approach of hosting a major sporting event.

2.6 Differences between developed and developing countries

From 1896 to 2004, only one summer Olympic Games have been accommodated to developing countries, the 1968 Games in Mexico City was the only case. Henceforth it
changed, in 2008 it was hosted by China and it will be welcomed by Brazil in 2016. Developing countries increase their demand in hosting mega-event.

2.6.i Disadvantages for developing countries

Developing countries know some deficiencies which can be costly to host a mega-sport event. The infrastructure expenditures are likely to be higher in developing countries than in developed countries. For instance in 1998, France only needed to build the “Stade de France” and refurbished existing stadiums while South Africa in 2010 had to build entirely new facilities to host World Cup. The reason: their existing stocks of sport infrastructures are lower and emerging firms involved in the construction and preparation may know a lack in the technologies and management expertise available in comparison with developed countries.

Another point concerns the opportunity cost of capital which may be higher for developing countries. For example, Nigeria built in 2001 his new national stadium for $330 million. This amount is bigger than the annual national government expenditures on education and health. (Farah, 2001) In such countries it is criticized to spend as much money in facilities because they have more important issues.

We can see a difference in the utilization of facilities after the event: the demand for sport infrastructures in developed countries is higher than in developing countries because sport is considered as a luxury good. They have to take care about not having investments in facilities considered as “white elephants”.

Finally, tourists are more likely to be attracted by industrialized states than developing nations. Visitors can worry about the security, the infrastructures and the quality of accommodation. For example in South Africa, where criminality is extremely consequential and where according to the ONU in 2000 it is the country with the world highest rape rate per habitant, obviously it discouraged people to come. As a consequence stadiums are less full in developing countries.
2.6.ii Advantages for developing countries

Even if they might have some problems compared to developed nations, developing countries also know advantages. First, they normally have lower wages and so lower employment costs to build and to manage infrastructures. During the event, they raise prices for foreign visitors and thus make more money.

Secondly, investments in infrastructures are not only based on sport facilities but also on non-sport and they may be useful in the future economic development. For example, only a fraction of the $22 billion expensed in infrastructures for the Beijing Olympic Games was destined to sport facilities. On the other side, it is not manifest that non-sport infrastructures will help to economic development. They may go unused after the completion of the event.

Finally, the high unemployment or underemployment in developing countries may benefit to firms since the opportunity labor cost is close to zero. During the 1996 Olympic Games, Atlanta had almost a full employment so they had to import labor force from away. When the Games ended, workers returned home and repatriated their working earning which reduced the multiplier effect in Atlanta because they will spend their money outside. Atlanta does not plenty benefit from its investments if the resulting indirect spending takes place outside of Atlanta area. In the case of a city with unused labor force, earning generated by the event may rest in the local area after the end of the event.

It would be interesting to compare developed and developing countries economic effects but this study will only focus on the employment effect with the example of a developed country: France.

2.7 The counterfactual

Any analysis of economic impact due to a mega-sporting event has to deal with one important concern: the counterfactual. One does not know what would have happened in the case of the public money needed for the event had been used for a different investment. Furthermore we might ask whether the observed impacts are caused or not
by the event or whether they are provoked by a macroeconomic shocked in the same
time. To avoid these two issues, two different type of research have been made. The first
one have been done by Baade and Matheson (2001), Coates and Humphreys (2002) and
Matheson (2005). They used panel data and growth models to compare the forecasted
values with the observed values of economic indicator. The second type of study has
been effectuated by Feddersen, Grötzing, and Maennig (2009). They used Difference in
Difference approach in order to isolate the impact of sport events from macroeconomic
shocks using a control group formed by other geographic units. These two approaches
are preferred because when you don’t take into account the counterfactual the bias is
stronger.

3 Empirical application

This paper concerns the effects of the football 1998 World Cup in France on
employment. Relevant annual regional data from Insee the French National Institute for
Statistics and Economic Studies are used from 1990 to 2011 on employment. In order to
organize the World Cup, France had to present at least 10 stadiums with high capacity.
Therefore 10 cities in France hosted the event: Paris and Saint Denis (Ile de France),
Marseille (Provence-Alpes-Côte d'Azur), Lyon and Saint Etienne (Rhônes-Alpes), Lens
(Nord-pas-de-Calais), Nantes (Pays de la Loire), Toulouse (Midi-Pyrénées), Montpelier
(Languedoc-Roussillon), Bordeaux (Aquitaine). These cities are located into 8 different
regions over 22, excluding the Dom Tom. Thus 14 regions didn't host the World Cup; the
work will be to compare these regions with the host regions in attempt to find whether
the World Cup had a significant impact.

Firstly, the data are presented to give an idea about the variable. Only one year over
two is provided to make the table shorter. Values represent the sum of the host region
on one side and non-host regions on the other side.
**Table 1**: total employment in host and non-host regions over time.

<table>
<thead>
<tr>
<th>Year</th>
<th>Host regions</th>
<th>Non host regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>14839843</td>
<td>8417554</td>
</tr>
<tr>
<td>1992</td>
<td>14606202</td>
<td>8362503</td>
</tr>
<tr>
<td>1994</td>
<td>14636089</td>
<td>8335843</td>
</tr>
<tr>
<td>1996</td>
<td>14744639</td>
<td>8397072</td>
</tr>
<tr>
<td>1998</td>
<td>15228542</td>
<td>8641606</td>
</tr>
<tr>
<td>2000</td>
<td>16073536</td>
<td>9032389</td>
</tr>
<tr>
<td>2002</td>
<td>16410063</td>
<td>9109441</td>
</tr>
<tr>
<td>2004</td>
<td>16505684</td>
<td>9142859</td>
</tr>
<tr>
<td>2006</td>
<td>16919297</td>
<td>9210552</td>
</tr>
<tr>
<td>2008</td>
<td>17117195</td>
<td>9220564</td>
</tr>
<tr>
<td>2010</td>
<td>17121718</td>
<td>9137715</td>
</tr>
<tr>
<td>mean</td>
<td>15836619</td>
<td>8818918</td>
</tr>
</tbody>
</table>

Source: Insee; own calculation

Regarding the data, total employment in host regions is almost twice more important than remaining regions. One can say that both host and non-host regions are roughly constant over time until 1996 and then they are increasing. The rise looks bigger for the host regions and also bigger from 1998 to 2002. In the case of the non-host regions, data stay constant after 2002 while it keeps increasing for the other regions. The rise seems to be more significant for the host regions. The World Cup occurred in 1998, the time period where the expansion was the largest. We can make the hypothesis that the World Cup positively impacted employment. As an initial look at the possible effect, figure 1 shows us the employment in host regions and non-host regions from 1989 to 2010.
One can note an increase of employment in 1996 in both host and non-host regions. However, the raise in the host regions seems to be wider than the others regions and it keeps growing until 2009 while it stops in 2003 for the remaining. This graph might give an idea about the effect of the World Cup and one can say that there is a positive effect on employment according to this graph. Nevertheless, we have to take the results with caution because we cannot be sure that the rise in employment is caused by the 1998 World Cup. Indeed, the economic context was good just before the event because of the high growth of United States at this moment and it could explain in part that increase. Secondly, most of the host regions are more important in term of production and activity than the non-host regions so it could also explain this difference between both of them.

In order to find a better correlation between the World Cup and employment in France, I will run a regression using the difference in difference approach. The method
consists of analyzing the difference in differences of employment from regions that hosted the World Cup and them that did not. I will make use of the same employment data utilized just above from 1990 to 2010.

Before that, the graph when one takes the difference in differences between the host and non-host regions is presented in figure 2. The year 1989 is taken as a reference and then for each year one takes the difference value at t minus the difference value at 1989. Example for 1992: = (value from host regions at 1992 – value from non-host regions at 1992) – (value from host regions at 1989 – value from non-host regions at 1989). With a graph like that it is easier to say if there is an effect after 1998 or not.

Figure 2

Source: Insee; own calculation
At the first look, one can easily say that there is a significant rise from 1996 until 2007. Before 1996 the curve is roughly constant with little waves. After 2007 it keeps growing very slowly. According to this graph, it is obvious that something happened in 1996 and had an impact on employment in the host regions during 10 years. One can assume the effects of the World Cup started in 1996 because of the construction and improvement of facilities as well as all preparation due to the World Cup. It is easier to see the impact with this graph than the first one which was a bit wave. It is clear here that the difference in employment between host and non-host regions increased just before the World Cup.

According to the first 2 graphs, I expect the regression to find a significant positive effect. Indeed the second graph is very clear and tends to show us a real impact since 1996 on employment. Now after the examination and presentation of the data, the methodology of the regression will be presented. I will use the Difference in Difference model in attempt to find a significant positive effect on employment due to the 1998 World Cup.

4 Methodology

4.1 Model specification

In this section the model used to conduct the regression is described. Since the work by Ashenfelter and Card (1985), the use of Difference in Difference method has become very widespread. It is a method employed to measure the changes induced by a particular treatment or event. The usual case is when outcomes are observed for two groups and two time period. A group is exposed to a treatment only in the second time period while the other is not exposed at all. The second group is called the control group and the first one the treatment group. As mentioned before, I use this method in attempt to find an effect on the employment. Here, the treatment group will be having hosted the World Cup and the control group will include the other regions. Two indicators based on time dimension t and spatial dimension i can be defined: \(X_{t1}\) takes the value 1 if i belongs to the treatment group otherwise it equals to 0; it represents the
group effect. \( X_{2t} \) takes the value 1 if \( t > 1997 \) otherwise it takes 0; it corresponds to the business cycle effect. Then, \( X_3 \) is the interaction between both effects and takes the value 1 when both \( X_1 \) and \( X_2 \) are equals to 1 otherwise it is equal to 0. The Difference in Difference approach permits to compare the change in employment in the treatment group to the change in employment in control group before and after the event. The group effect captures differences across groups that are constants over time while the year effect catches differences over time that are common to all groups.

Difference-in-difference estimators assume that in absence of treatment the difference between control (B) and treatment (A) groups would be constant or ‘fixed’ over time. DD estimators are a special type of fixed effects estimator.

**Figure 3**: example of DID method.

\[(A-B) = \text{Differences in groups pre-treatment represent the ‘normal’ difference between groups.}\]

\[(A'-B) = \text{total post treatment effect} = \text{normal effect } (A-B) + \text{treatment effect } (A'-A)\]

DD estimates compare the difference in group averages for the outcome pre-treatment to the difference in group averages post treatment. The larger the difference post treatment the larger the treatment effect.
After this short explanation about how consists the DID method, the regression model is presented. A typical regression model in DID would be:

\[ \text{Outcome}_{it} = \beta_0 + \beta_1 \text{Treat}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Treat} \times \text{Post})_{it} + \epsilon \]

The parameter \( \beta_3 \) on the interaction term is our Difference in Difference estimator. It is shown in table 2.

**Table 2**: explanation of the DID estimate.

<table>
<thead>
<tr>
<th></th>
<th>( t=1 )</th>
<th>( t=2 )</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (treatment group)</td>
<td>( b_0+b_1 )</td>
<td>( b_0+b_1+b_2+b_3 )</td>
<td>( b_2+b_3 )</td>
</tr>
<tr>
<td>B (control group)</td>
<td>( b_0 )</td>
<td>( b_0+b_2 )</td>
<td>( b_2 )</td>
</tr>
</tbody>
</table>

The term \( t=1 \) corresponds to the time pre-event while \( t=2 \) post event. As explained previously, \( \beta_1=0 \) for the control group, \( \beta_2=1 \) after the event otherwise 0 and \( \beta_3=1 \) when \( \beta_1 \) and \( \beta_2 \) are equals to 1 otherwise 0. When one takes the difference in differences the only parameter left is \( \beta_3 \). It represents the DID estimator.

In this case the first and basic model will be:

\[
(1) \quad Y_{it} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2t} + \beta_3 X_{3it} + \epsilon_{it}
\]

\( Y \) is the dependent variable = employment.

\( \beta_0 \) is the intercept.

\( \beta_1, \beta_2, \beta_3 \) are the coefficients for \( X_1, X_2, X_3 \), and respectively.

\( X_1 = 0 \) if the region \( \notin \) treatment group; \( X_1 = 1 \) if the region \( \in \) treatment group.

\( X_2 = 0 \) pre-event so \( X_2 = 0 \) before 1998; \( X_2 = 1 \) post-event so \( X_2 = 1 \) while and after 1998.
\( X_3 = X_1 \times X_2 = 1 \) if \( X_1 = X_2 = 1 \) otherwise \( X_3 = 0 \); \( X_3 \) is the interaction between time effect and treatment effect. It is our most important variable in the model.

\( \epsilon_{it} \) is the error term.

Equation (1) is the simplest simplification that can detect the discontinuity caused by the World Cup. However, some problems arise when estimating this equation. We know that to obtain unbiased estimates the covariance between the error term and the variable must be null. Therefore the equation must be in accordance to the following constraint:

\[
(2) \quad \text{Cov}(\epsilon_{it}, X_{1i}) = 0 \quad \text{and} \quad \text{Cov}(\epsilon_{it}, X_{2t}) = 0
\]

When one look at the figure 1, one can see that both host regions and remaining regions enjoyed a positive employment growth rate from 1996 until 2007. This result advances a positive correlation between \( X_2 \) and \( \epsilon_{it} \). Furthermore, the big difference between the mean total employment per year in host regions and in non-host regions, 15,836,619 and 8,818,918 respectively, may lead to the suggestion that there is a positive correlation between \( X_1 \) and the error term. As demonstrated by Dachis, Duranton, and Turner (2012), correlations between two explanatory variables (\( X_1 \) and \( X_2 \)) and the residual \( \epsilon_{it} \) could bias estimates of \( \beta_1 \) and \( \beta_2 \). Moreover it may bias the estimate of the interaction variable. To deal with this problem, region-fixed effect and time-fixed effect are included in the model. Thus, \( X_2 \) is replaced by a dummy variable for each year from 1991 to 2010 so 20 dummy variables while \( X_1 \) is changed by a dummy variable for each host regions so 8 dummy variables are defined. Furthermore an interaction with time is added for each host regions. By this way, the effects in each host regions induced by the World cup can be analyzed and the number of employment created by the World Cup will be known.

\[
(3) \quad Y_{it} = \beta_0 + \beta_1 \delta_i + \beta_t D_t + \beta_3 X_{3it} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \beta_{10} X_{10t} + \epsilon_{it}
\]

\( \delta_i \) is the region-fixed effect, it includes the 8 dummies. \( D_t \) is the time-fixed effect and it includes the 20 dummies; \( X_3, X_4, X_5...X_{10} \) are the interactions between the time variable
and the 8 host region dummies. With this second model, one have more chance to identify a significant positive impact on employment because host regions are differentiated each other and they are no longer considered as a whole. Furthermore there are variables for each year so one can see when the effect was the strongest.

4.2 Estimation

A lot of studies have been done on the economic impacts of a World Cup using Difference in Difference strategy. However, it is the first study that analyzes the employment effect of the 1998 World Cup in France. There exists some works about the impact on tourism but not on employment with a DID method. Many past studies on economic impacts of a World Cup did not find significant positive results. Only few of them succeeded to do it.

Two estimations have been run with employment as dependent variable using the Difference in Difference model and then a modified DID method as described previously. The reason I made use of this type of regression is because it seems to be the easiest and more practical way to show the effects on a treatment group of a certain event using a control group. This method required data from several years before and after the event to compare the regions. In this case, 8 years before and 12 years after the event have been used. According to the graphs presented in the 3rd section, a positive impact on employment is expected due to the World Cup.

Past studies have been further than this regression, they took in account more parameters in their models but it was not possible to follow their methods here since it required more complicated data. It would had been hard to find them and also tough to employ them.

The DID method utilize the OLS regression and STATA has been used to run the estimate.
5 Results

I ran two regressions, the first one follows the classic and basic DID estimate while the second modifies the original one.

5.1 Classical Difference in Difference estimation

Firstly, the initial and classical DID regression has been run. Result gave positive coefficients for the three independent variables and also for the constant. The variable treatment, that means to have hosted the World Cup or not, had a coefficient equal to 1,241,280 at 1% significance level. The time variable that took the value 0 before 1998 and 1 after 1998 had a coefficient equal to 49,238 but this result was not significant at 5% level. Finally, the interaction variable between the 2 first had a coefficient equal to 168,867 and this result was also not significant at 5% level. The constant was equal to 598,903 and significant at 1% level. The R-squared and Adj R-squared were quite low, approximately equal to 0.33. With this first regression we found only 2 significant results over 4.

Secondly, the modified regression results will be presented.

5.2 Modified Difference in Difference regression

This second regression improved the first one by replacing the 2 first variables by dummy variables and the last one by interactions for each host regions as explained previously. It no longer took every host regions as a whole. It was better because some regions could have been more affected than other where only several matches occurred while some welcomed twice more games. First, all the dummy variables for the time-fixed effect were not significant. From 1991 to 1999 each year was negative coefficients excepted in 1997 but from 2000 to 2010 they were all positives coefficient. All the values were less than 100,000 employments created. Nevertheless, as said before none of them was significant. As a contrary all the host regions were significant at 1% level excepted one that was significant at 5% level. They were all positive coefficients. The most impacted regions were Ile de France and Rhône Alpes, with a coefficient equal to
4,783,780 and 1,691,361 respectively. The less impacted was Languedoc Rousillon with a coefficient equal to 161,573. Finally 3 interactions were significant while the 5 others were not. The significant interactions include the region Ile de France, Rhône Alpes and Provence Alpes Côte d’Azur with positive coefficients equals to 388,830, 234,448 and 212,694 respectively. However, the remaining interactions were all positive coefficients but not significant. Moreover the constant was also positive and significant.

These results will be analyzed in the next part.

6 Analysis

I have made an OLS regression using the method of Difference in Differences in order to find a positive effect on employment and to try to find an economic effect through employment due to the World Cup in France in the host regions. Previous researches on similar topic but with different countries had problems and failed to find significant results. To my knowledge, only few studies have found significant positive effects from sport event. Hotchkiss et al. (2003) succeeded to find a significant positive employment effects on regions in Georgia related to the 1996 Atlanta Olympic Games. My study is the first to focus on the employment effect on the 1998 World Cup in France using the DID method. It was already applied in United States to find the effects of the 1996 Atlanta Olympic Games. The major problem of different past studies occurred because it is hard to find a significant effect of an event since the country is big and the effects are very small compared to the total production of the country. My study focuses on region i.e. the 22 regions in France so it might be easier to find significant results with disaggregated data.

The first regression showed positive effect on employment but the results were not significant at 5% level for the two variables “time” and “interaction”. Moreover, the interaction variable was the most important and could not find a positive significant result. Nevertheless the treatment variable was significant and it meant that it had a positive effect on the employment since 1990. Regions that have hosted the World Cup had an impact around 1,241,280 more jobs. It was a significant raise regarding to the
total population in France. This first regression was the basic DID method, without added any parameters. On the next one, the host regions were no longer used as a whole but as different variable for each host regions. By this way one can differentiate the regions because there are big disparities between them. As a matter of fact some of them are more actives and more important than other so they grow faster and secondly they did not host the same number of matches during the World Cup. For instance the finale was played in Ile de France as well as one semi-final whereas some regions hosted less important games.

The second regression that improved the first model gave interesting results. The most important variables in this regression were the interactions between the 8 host regions and the time. As a result, 3 of them found a positive and significant coefficient. That means that employment in these regions has been impacted by the World Cup. In Ile de France, 388,830 jobs have been created because of the event; it is more likely to be jobs in the sectors construction, retail trade and food services as well as in tourism. In the two others regions, more than 200,000 jobs were created each. Employment in Ile de France increased almost twice more than the two other which were Rhône Alpes and Provence Alpes Cote d’Azur. This result is in accordance with the expectations; some regions knew bigger effects than other. However, the remaining 5 interactions were positives but not significant. It is not possible to affirm that employment in these regions increased because of the World Cup. Nevertheless, the 8 dummy regions were all positives and significant coefficients. For instance, according to the results the region Ile de France had an increase in employment since 1990 around 4,800,000 jobs created. 388,830 of them were induced by the World Cup which is only a little part. All the host regions knew an increase in employment since 1990; it seems to be totally logical result. There are big disparities between them, for instance the region Languedoc Roussillon had a rise in employment of 161,573 since 1990 while the expansion in Nord Pas De Calais was 743,383. On the other hand, it seems to be also logical that employment in non-host regions also increased since 1990 so only the interaction variables can explain a rise due to the 1998 World Cup. Finally, the 20 year dummy variables were negatives before 1999 and positive after 2000. It looks like the time had a negative effect on employment since 1990 and then a positive after 2000 but none of them were significant so we cannot conclude anything about these results.
To summarize, the first regression was not able to show a significant positive effect on employment because the estimates were probably biased and host regions were not differentiated while the second regression which was improved to obtain unbiased estimates found a positive effect on employment in three host regions according to the interaction variables. The results are in respect with those found on the graphs above. According to the second graph, we expected a significant positive effect on employment. The regression can confirm the increase due to the World Cup. Regarding to the graph that plot the difference in differences of the employment, the curve was almost constant before 1996 but it increased in 1996 until 2007. It meant a significant rise in employment for the host regions just before and after the World Cup.

Indeed, the effects on employment of the event started before the beginning since the constructions and the management had to be finished before 1998. Firms had to hire new workers to prepare everything in time. During 1998, employment may rose in the sectors of tourism, retail trade and accommodation and food services. In the same way, firms needed to answer the expansion of demand by increasing their production and therefore they hired new employees. After the event, there is still the cost of maintenance that might positively affected employment. Furthermore, the multiplier effect could also impact consumption of population in the host regions and firms needed to produce more. In total, the World Cup had an effect on employment during the event as well as ante and post event. My regression caught only the effect in 1998 so a part of the rise before the event was not taken into account since some jobs have been temporary and they no longer existed in 1998. If my time variable had the value 1 after 1996 and 0 before the increase could have been even higher and it would be interesting to improve my regression.

According to past studies there could be a possible problem in these two regressions. In fact, a common problem with all empirical analyses on Difference in Difference approach concerns the exact definition of the treatment group. In most of the cases and also in that one, the analyzed intervention is not totally exogenous and it cannot be clearly distinct based on those dimensions. The 1998 World Cup should define a treatment with regard to three dimensions: time, space, and magnitude.

About the time dimension, it corresponds to what has been said before: it is assumed that the effect on employment might start before the event because of the anticipation
effect. Equivalently, the amplitude and the duration of the effect might not be derived from theoretical considerations. Finally, from a spatial point of view one can assume that the treatment might generate spillover effects to neighbor regions as well as an increase in number of tourist because they might stay in conjunct areas. There exists several ways to deal with these facts as including the surrounding regions which could be also affected but it will not be explained in this paper since it is not used here. Moreover, it was hard to add conjunct regions since there are only 22 regions in France. Nevertheless, it could have been possible to take into account counties instead of regions. By this way it would have been easier to measure the spillover effect in other counties. In fact, there are 96 counties in metropolitan France and only 10 of them hosted the World Cup. Moreover, by using the host counties the data would have been more disaggregated than in this paper and the results might have been better.

After this analyze, the last part will conclude the paper.

7 Conclusion and possible improvements

This paper was the first to analyze the effects on employment in France due to the 1998 World Cup. More precisely it studied the effects on the host regions in comparison to the non-host regions in France. I used a Difference in Difference method to catch the possible effects and then an improved method was presented to obtain better results. Firstly a significant positive impact on employment owing of the World Cup was found in the second regression. Nevertheless, host regions have been not impacted in the same scale. According to the regression, only 3 regions over 8 found a significant positive effect and the region Ile de France was the most affected. It seems to be logical since this region welcomed more matches and even more important one than the other. Moreover, according to the graph and to the regressions, employment in host regions increased more than in the other regions. In the regression, a significant positive impact on employment in host regions was found for all of them and in the graph we saw that the rise occurred in 1996. It can be explained by the fact that construction and preparation to the event began two years before the start of the World Cup.

In my regression, I employed regional data in order to get more chance to find a positive impact. It seems to be easier to find an effect using regions as treatment and
control groups than using countries. Moreover, in order to ameliorate the regression, I used time fixed effect and region fixed effect to differentiate the regions and the years so it was easier to identify the time effect and region effect. A possible way to improve this work would be to differentiate sectors. A study from Arne Feddersen and Wolfgang Maennig on employment in the case of the 1996 Olympic Games in USA analyzed the impact for 16 different sectors or subsectors. As a result they found significant positive employment short-term effects in the sectors of “retail trade,” accommodation and food services,” and “art, entertainment, and recreation.” They used more disaggregated data than in this work and it would be interesting to apply the same method in the case of the 1998 World Cup in France. Furthermore, it assumed that host regions will generate a spillover effect on surrounding areas. The increase of tourists in the host country also affects the remaining regions since they will not all stay in these regions. As a consequence, the tourism related industry as hostel companies’ rise also in conjunct areas. Another way to improve this study could be to include in the regression a parameter that catches this effect on the non-host regions. As explained before, to use counties instead of regions could improve the results and moreover it would be easier to catch the spillover effects. Finally, it would be interesting to change the time variable, to take time = 1 after 1996 instead of time = 1 after 1998 because the construction and management of the event started 1 or 2 years before the event. By this way the anticipation effect is included in the model

As a conclusion, according to this paper, one can confirm that a mega sporting event like a World Cup has a positive economic effect on the host country’s economy. In this case, France saw a significant positive impact through its employment.
## 8 Appendix

1st regression: basic DID

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Model 1</th>
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<tr>
<td>Time</td>
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<tr>
<td></td>
<td>(109,698)</td>
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<td>Interaction</td>
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<td></td>
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<tr>
<td>R-squared</td>
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Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
2nd regression: modified DID

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<tr>
<td>year2009</td>
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<td>Value</td>
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</tbody>
</table>

Observations: 462
R-squared: 0.965

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
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