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Céline Vial, Eric Barget

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Towards a disaggregated approach to the economic impact of sporting events: the case of the World

Equestrian Games

Eric Barget^a and Céline Vial^{b,c,*}

^aCDES - OMIJ - Hôtel Burgy, 13 rue de Genève, 87065 Limoges.

E-mail: eric.barget@unilim.fr

ORCID: 0009-0000-9270-8062

<https://www.researchgate.net/profile/Eric-Barget>

^bMOISA, Univ Montpellier, CIRAD, CIHEAM-IAMM, INRAE, Institut Agro, Montpellier, France.

^cIFCE, pôle développement innovation et recherche, 61310 Exmes, France.

* corresponding author

E-mail: celine.vial@inrae.fr

Full postal adress: MOISA-INRAE-2 place Pierre Viala, 34060 Montpellier, France.

ORCID: 0000-0002-5442-4015

<https://www.researchgate.net/profile/Celine-Vial-2>

<https://cv.archives-ouvertes.fr/celine-vial>

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Abstract

This article develops a methodology to provide a more precise measurement of the economic impact of sporting events, by considering inputs from a large diversity of event stakeholders and not just from spectators. The case study is the Alltech FEI World Equestrian Games™ 2014 in Normandy, during which 1,946 respondents were surveyed. Even if the direct tourist spending mainly comes from outside spectators, the event participants (athletes and their accompanying people, employees and volunteers), and event partners (exhibitors, catering services, media workers) also contribute significantly to the economic spinoff, as well as the spending of some local spectators ('home stayers'). Differences in behaviour between the various event' stakeholders are considered not only through the initial spending, but also during the multiplier process. This study contributes to improve the economic impact evaluation of sporting events, illustrating the importance of considering events stakeholder diversity through a disaggregated approach.

Keywords: economic impact, Hallmark sporting events, disaggregated model, World Equestrian Games, horse riding

Introduction

Economic impact studies of sporting events have enjoyed growing success, because ‘the evaluation of event impact is practical and helpful in increasing event quality’ (Jingxian et al., 2019), as it underlines possible means to improve impacts and organization, and because policy makers consider sporting events as a way to develop tourism (Ziakas, 2020). Nevertheless, there has been fierce criticism on these evaluations in the 1990s (Howard & Crompton, 1995), or more recently (Barget, 2012) due to a multitude of bias affecting the reliability of estimations. While methodological gaps persist, a great deal of progress had been made, notably through attempts to isolate tourism expenditure that is clearly related to the event as opposed to that which would have occurred anyway (Gratton et al., 2000). The aim of this paper is to build on previous methods to deepen and extend their value. One of the most common approximations conventionally encountered in impact studies is the reduction of expenditure to that made by the spectators attending the event inside the stadiums. However, the various stakeholders associated with a sports event have been largely conceptualized (Ferrand et al., 2015). We can clearly see here the need to offer a more realistic view of the event, taking into consideration consumption behaviours of all economic agents, whether they are event actors (competitors and accompanying people, employees, volunteers), or economic partners of the event (catering services, exhibitors and media workers). Each in their own way participate in the generation of economic spinoff.

The paper uses the Alltech FEI World Equestrian Games™ 2014 in Normandy (2014 WEG) as a practical case study, chosen for several reasons:

Firstly, it is a major sporting event. The World Equestrian Games (WEG) are held every four years and feature the world championships of the eight equestrian disciplines recognized by the International Equestrian Federation (FEI). The 7th edition of the competition took place for the first time in France during 16 days, from 23 August to 7 September, 2014.

Secondly, this equestrian event took place in a renowned 'equestrian area', as Normandy is acknowledged as the first equestrian region of France (Fremont, 2017). Consequently, the local authorities were extremely interested in its economic impact. One of the original features of the event was its association with a 'Territorial Project' carried out by local stakeholders and dedicated to transforming a one-time economic activity into a long-term dynamic for the local area. This 'Territorial Project' is valued jointly with the event in the present study.

Finally, while studies on economic spinoff have generalized for all sporting events, equestrian disciplines were, until recently, seriously neglected in the economic literature. This disinterest was far from justified given the substantial impact of equestrian events on the economic and social development of various areas (Dashper et al., 2021), as well as the growing place of riding in Western countries in general, and in France in particular (Vial et al., 2016).

The main contributions of this paper can be summarized as follows. It deals with equestrian sports, which is uncommon in the field of economic impact analysis. These events are of interest because of their scale, but also because of the specific logistics necessary due to the involvement of an animal. The method hereafter implemented integrates the improvements from previous research, through carefully analysing the nature of the expenditure in order to ensure that they have been triggered by the event, and by integrating in the calculations specific expenses of locals who have given up spending outside the study area (vacations abroad cancelled...) because of the event. Furthermore, the paper broadens the spectrum of event stakeholders to other categories than fans (competitors, accompanying people, employees, volunteers, exhibitors, caterers, media workers), whose specificities have been overlooked in previous studies. These particularities are taken into account on the one hand at the level of the initial expenditure, and on the other hand through the calculation of a specific multiplier coefficient for each category of stakeholders.

The first part of this paper sets out the theoretical background of economic impact calculations, and identifies good practices in the area. The second part presents the chosen sporting event, the 2014 WEG, allowing us to distinguish the different categories of economic agents associated with the event, and to select the most relevant geographic area and period of analysis. The third part is an implementation of the selected methodological framework, which is based on a disaggregated measurement of both direct spending and the multiplier according to major groups of stakeholders. Finally, the fourth part draws the main lessons from this work and highlights the role of different types of economic agents in tourism impact production.

The scientific background

Economic impact studies turned to be a lucrative business for consulting firms, and useful for politicians to justify their choice of hosting events. There are nevertheless fierce criticisms of economic impact studies. First of all, they measure benefits while costs are totally ignored, and second they deal with a unique category of benefits, i.e. monetary benefits. Social, sporting, marketing, environmental aspects are often not considered at all, so that many economists argue that a cost-benefit analysis would be more appropriate (Taks et al., 2011). Despite these controversies, economic impact studies of sporting events are becoming widespread. They relate to regional science, more precisely to economic regional studies that consider regional growth as exogenous. It means that the driving force of economic growth is to be sought in external outlets rather than in the spatial concentration of activities. Economic-based theory (North, 1955) relies on the idea that exogenous shocks in final demand tend to reverberate throughout the system. We are going to argue that this exogenous shock may be caused by visitors, but also by locals.

Controversies over economic impact calculation

The approach to calculating the economic impact of sporting events has been described by sport economists for many years, and notably by founding fathers of sporting events economic impact studies (Davidson, 1997; Baade et al., 2008). The calculated economic spinoff is going through three stages, keeping in mind that the concept of economic impact only makes sense within a defined geographical area. The first step is to estimate the expenditure (investment, operating budget, and visitor's consumption) benefiting the study area during the event (gross spending). The second step is to consider how this expenditure becomes a net spending if it comes from non-residents and benefits local entrepreneurs or employees. It constitutes an exogenous impulse for the area that stimulates its economy, while expenditure coming from locals is assumed to replace other purchases that could have been made with this money (substitution effect), and thus has no impact on local economic growth. Finally, the third step evaluates the total economic impact, generated through the multiplier effect: each euro injected into the local economy will be spent and generate new income for inhabitants through additional rounds of spending (Barget & Gouguet, 2010).

Nevertheless, this apparent simplicity is misleading, as there is a huge heterogeneity in the methodologies that are implemented. Sports economists have mainly focused on the theoretical model (general equilibrium, different types of multipliers, etc.), and often use econometrics to estimate the influence of a sporting event, a sport franchise, or a stadium on the GDP (gross domestic product) of the metropolitan area. Among American specialists, we should mention the work of Davidson and Jaffee (1997), Matheson and Baade (2006), Baade et al. (2006, 2008), Coates and Humphreys (2002, 2003) and Noll and Zimbalist (1997). Their results are in contradiction with the results of what they call "industry practitioners", some of them explaining this gap as they might not be detectable using annual panel data regressions (Rascher et al.,

2020). In the field of sports management, researchers adopt a more empirical approach, generally within a Keynesian framework. They have largely focused on the measurement of direct effects, in particular on identifying the causal link between the event, the expenditure that is considered, and thus the economic impact. Crompton (Crompton, 1995) was the first to propose a set of principles intended to ensure the reliability of economic impact studies. A first categorization of tourists who attend a sporting event can be found in this research. It was then extended in Gratton's later publications (Gratton et al., 2000; Gratton et al., 2006) as well as in papers written by Preuss (2000, 2004, 2006), and Taks (Taks et al., 2015).

From visitors' expenditure to net spending

The literature was initially structured around identifying the consumption behaviour of outside spectators who are likely to constitute an additional economic stimulus for the host region.

Substitution and crowding-out effects have also been studied. This leads to the distinction of 5 types of non-local tourists attending a sporting event impact (Preuss, 2000): First, 'Casuals' are outside people visiting the region for several reasons, including the event. Their expenditure must therefore be divided by the number of motives to determine the share that actually results from the event. Second, 'Extentioners' are external people who extend the duration of their stay due to the event. The local expenditure incurred in this additional time is considered as additional spending. Third, 'Avoiders' are external people who would have normally visited the region, but who do not due to the event, either because they are afraid of the disruption, or because of the impossibility of finding accommodation. This is called a crowding-out effect, which means that expenditure by sports fans crowds out normal tourism consumption. Fourth, 'Visitors' are people from outside the area whose trip is specifically devoted to the event. They generally constitute the main part of the direct spending that occurs during the event. Fifth, 'Time-switchers' plan a

tourist visit in order to match their stay with the event and be able to attend it. Only one part of their expenditure should be taken into account according to the number of reasons for coming.

Given this theoretical framework, a detailed analysis of tourists' motives is highly demanding in terms of information. It is also subject to the quality of the responses given, since the investigation of behavioural changes caused by the event is performed on a declarative basis. This explains why few studies have analysed spectator's expenditure in such detail. Kwiatkowski (2016) provides an overview of spectators' diversity according to the nature and reasons for the expenditure made during a major sporting event. Critical lessons emerge from the proposed summary (Table 1), making it possible to determine that a significant proportion of the expenditure usually attributed to sports fans is at least partially a mirage. The visitors at the heart of the economic impact generated often represent less than a third of the fans present in the stadium. The share of visitors who do not come mainly for the event ('casuals'), and those who shift the timing of their trip ('time-switchers') is sometimes substantial (41.4% during the 2010 FIFA World Cup in South Africa). It is therefore crucial to go through a detailed analysis of consumer behaviour, which we will focus on below. The figures also show that there are big discrepancies depending on the event and the host country (Table 1). Consequently, it is impossible to define a general rule to describe the relative weight of the different spectator types.

[Table 1 near here]

An atypical source of direct spending: the expenditure of locals

Kwiatkowski (2016) reconsiders thinking about the expenditure of local spectators first initiated by Preuss (2000). In certain conditions, the expenditure of inhabitants from the hosting area can be a source of direct spending. Agha and Taks (2017), pointed out the fact that it could be the case even for inhabitants who have no link at all with the event. This constitutes a major

methodological issue, since economic growth was previously considered to be exclusively exogenous. Thus, to the 5 categories of outside spectators previously described, we need to add 4 complementary types of local agents. ‘Locals’ are inhabitants whose behaviour is not changed by the event. They do not generate any additional direct spending in the local area, even if they attend the event. ‘Home Stayers’ are inhabitants who canceled an external trip to take advantage of the event. Monetary outflows outside the local area are therefore avoided thanks to the event. ‘Runaways’ flee the town to avoid the disruption associated with the event, taking additional time out. They thus account for additional monetary outflows of money. ‘Changers’ have voluntarily chosen to go on holidays during the event in order to avoid the disruption. As there is no additional trip, the operation is economically neutral.

Therefore, identifying precisely potential direct spending involves closely analyzing the expenditure of outside agents, as well as local agents.

The formula to calculate the net effect on the local economy resulting from the behaviour of all of these residents and spectators profiles is set out below:

$$\textit{Tourist direct spending} = ((SB-OC+SD+(SA/m) + (SE/m)) + (SG-OH))$$

Where:

m = number of reasons for coming

SB = spending from Extentioners B

OC = outflows caused by Avoiders C

SD = spending from Visitors D

SA = spending from Casuals A

SE = spending from Time-Switchers E

SG = spending from Home Stayers G

OH = outflows caused by Runaways H

Based on the existing literature, this paper is devoted to improvements in the measurement of the economic impact of sporting events. To this end, a disaggregated approach is designed, reflecting the specific nature of event stakeholders rather than adopting a global approach that focuses exclusively on spectators. These improvements are tested on a practical case study, the Alltech FEI World Equestrian Games™ 2014 in Normandy.

Methods

The case study and delineation of the analysis

In this part, we describe the sporting event we are working on, and the various economic agents involved in it. Afterwards, we define the analysis spatially and temporally, and explain how was implemented the data collection process.

Main Contextual Data on the WEG

Today, the World Equestrian Games include eight equestrian discipline competitions: the three Olympic disciplines (dressage, show jumping, eventing) and the Paralympic equestrian discipline (para-equestrian dressage), as well as horse driving, endurance riding, reining and vaulting in a circle. In 2014, the event also presented demonstrations of two FEI disciplines to the public: Horse-Ball and Polo. The 2014 WEG did not include massive investment for the construction of sports facilities as the choice was made to reuse facilities that already existed in the region. Consequently, the event was staged at five different venues, located in three among the five counties of Normandy (Calvados, La Manche and Orne).

According to our estimates, around 314,000 spectators attended the 2014 WEG. 64 countries were represented by over 1,000 competitors. Media coverage of the 2014 WEG remained relatively moderate, with around 500,000 television viewers compared to around 4

billion for the 2007 Rugby World Cup, or a cumulative audience of between 25 and 40 billion for the FIFA World Cups and the Summer Olympics. The stakeholders involved in and spending money during the event went far beyond the only category of spectators, as can be seen in Table 2. The event's organizational budget was half made up of public revenues and half of private revenues. Totalling 82 million euros, it remains very modest compared to other major sporting events such as the 2023 Rugby World Cup in France which has a draft operating budget of 409 million euros or the 2018 FIFA World Cup in Russia with 9.2 billion euros.

Spatial and Temporal Boundaries of the Analysis

Agha and Taks (2015) established how territorial delimitation have a tremendous influence on the calculated economic impact. Salgado-Barandela et al. (2023) showed that monetary leaks could be significant for a host region where accommodation capacity is not sufficient compared to the attractiveness of the event. To prevent an inappropriate choice, economic spinoff was estimated for two areas, the 'Normandy' region on the one hand, and the 'Caen la Mer' conurbation on the other.

Normandy is located in the northwest of France. With 3,335,645 inhabitants in 2014 (INSEE (French institute of statistics) population census), it is an aging, agricultural and industrial region. In 2014, Normandy was marked by an important event dynamic, with four major events being held over a short period of time (from the beginning of June to the end of September): i.e., the 70th anniversary of the D-day landings, the restoration of the maritime character of Mont St Michel, the 2014 WEG, and the Kayak-Polo World Championship. This chain of events, which led to repeated and concentrated stimulation over time, gave local businesses an opportunity to capture significant financial flows. However, it also required considerable organization to absorb the large surplus of tourists during this period.

Equine traditions are part of Norman history and culture, with the equine sector generating 8,500 direct jobs in the region (14.5% of all jobs in the area according to INSEE). Normandy has around 100,000 horses (i.e., almost 29 horses per 1,000 inhabitants compared to a national average of 15), 45,000 licensees (i.e., 13.5 licensees per 1,000 inhabitants, while the national average is 10) (Annuaire ECUS 2016), 2 national stud farms and an equine sector competitiveness cluster.

The second area studied is a small part of Normandy, the Caen la Mer conurbation. It includes 50 municipalities around the city of Caen, for a total population of 268,876 inhabitants in 2014. Caen la Mer is a regional economic capital with 142,000 jobs.

Impact studies can be carried out ex-ante or ex-post. Ex-ante analyses seek to anticipate data to evaluate the size of the impact as far as possible whereas ex-post studies rely on concrete data collected after the event. Consequently, ex-post studies are more reliable than ex-ante ones. Nevertheless, ex-post studies sometimes rely on indirect data through the review of hotel stays or changes in spending measured through government collections of taxes. The present study relies on real and concrete data collected before and during the event directly among the stakeholders that realized the spending and not among the beneficiaries of the spending. Calculations were made after the event, qualifying this study as an ex-post one.

Data collection

Data collection is particularly critical for economic impact studies, since the initial measurement bias will be amplified when the multiplier coefficient is applied. Dimitrovski et al. (2023), implemented a critical review of the methodological rigour of the data collection process within tourism and sport journals. One of their recommendations is to distinguish clearly primary and secondary data collection. In the present study, secondary data related to the organization budget

was collected among the organizers of the event through in-depth interviews. Regarding primary data collection, a total of 1,994 questionnaires were completed during the event among the different categories of stakeholders (Table 2). Although we only surveyed 0.4% of the spectators, the number of completed questionnaires was significant. Only 8.2% of total competitors and 5.7% of accompanying people were interviewed due to the relatively limited access to this respondent category. Access to the media space was also very limited and only allowed us to question 0.5% of the population. Regarding the exhibitors and catering services, almost one person per stand/restaurant was interviewed, resulting in 4.2% and 2.0% of the population. Finally, the volunteers were more accessible (5.5% of this population) than the employees (0.7%).

To address the issue of multi-site event, surveys had to take place on the five event venues, taking into account all the diverse types of stakeholders present in each one. Finally, the surveys were two-third carried out in Caen (67%), which was the main site hosting the event, and one third in all the other event venues.

Concerning the profile of the respondents, the sample consists of 17.5% foreigners. Average age is around 41 years and parity was globally respected with a total of 56% women investigated (Table 2). In addition, half of the spectators interviewed come from Normandy (including 21% living in the Caen la Mer conurbation), which shows that the event attracted a strong contingent of local inhabitants. Likewise, a large proportion of exhibitors, caterers, employees and volunteers were from Normandy, as were all the French media interviewed.

[Table 2 near here]

A disaggregated measurement of spending

Part of the literature addressed the question of the impact of sporting events by choosing a supply-side approach for the collection of data, which is carried out in particular from the hotel industry, as well as for the calculation of a sectoral input-output multiplier. In this regard, Depken and Stephenson (2018) showed that occupancy effects before and after most events hosted in Charlotte metropolitan area are at best modest. In this article, we instead adopt a demand-based approach through a rigorous analysis of the additional amount of money spent in the region by the various categories of stakeholders involved. The multiplier used is of Keynesien type, therefore also calculated from the propensities to consume locally versus importations of goods and services. In line with Gratton et al. (2006), we argue that a sports event must be analysed as a set of stakeholders. As Barget and Ferrand (2012) showed, the previous impact calculation methods do not consider the contribution of all categories of economic agents to the local economy. This observation led us to adopt a dichotomous approach based on groups of economic actors, and to use a disaggregated formulation, first in the measurement of the gross and net spending, and second in the specification of the multiplier.

The measurement of the direct effect (initial direct spending) covers the analysis of both organizational and economic agents' expenditure. The valuation of the spinoff linked to organizational expenditure raises few methodological challenges. It relies on an analysis of the budget origins and spending destinations to only take into account the money that comes from outside the study zone and which is spent inside the study zone, all purposes included (contracts with service providers, material purchase, staff salaries...).

First methodological improvements concern the analysis of economic agent spending. The calculation incorporates two types of enhancements. On the one hand, expenditure of economic agents (providing they come from outside the study area) is analyzed separately for the different

stakeholders involved in the event: spectators, but also competitors and their accompanying people, individuals involved in the organization as employees or volunteers, and service providers that include caterers, exhibitors and the media. On the other hand, under certain conditions, purchases made by local spectators can be considered as a source of direct spending, especially if they replace expenditure that would have been made outside the study area if the event had not occurred (avoided leakages).

Net spending from the consumption of external agents

Table 3 summarizes the calculation methods of external agents' net spending.

[Table 3 near here]

We carried out a detailed analysis of the various stakeholders' expenditure (conditions of implementation, reasons for the trip and expenditure, etc.), following the recommendations of the authors presented above. In other words, we combined the requirement of a detailed analysis by group of economic actors, an evaluation of their numbers, and an in-depth study of the nature of the expenditure. The approach includes several stages for each category of actors and for each of the two study areas (Table 3).

First, we determined the number of people coming from outside the study area. To this end, statistics from organizers (number of tickets sold or offered, number of competitors, stands, employees, volunteers, etc.) was supplemented by data collected from surveys (dwelling place, number of tickets purchased or received free of charge per spectator, number of accompanying people per competitor, number of workers per stand, etc.). For example, the number of spectators was evaluated through dividing the number of tickets sold or offered by the organizers by the average number of tickets held by spectator (collected from surveys), as each spectator can attend several competitions that can occur on one or several days.

We then estimated the amount of expenditure for each visitor category. This expenditure must be caused by the event and must be spent inside the study zone. Since the purchase amount given by respondents generally relates to a whole group of individuals, we divided it by the number of people in the group to obtain the individual expenditure. There can be several motives for the trip (tourism, visit to family or friends...), so we needed to transform the global expenditure into a ‘centered expenditure’, i.e., resulting just from the purpose of attending the 2014 WEG. This was done by dividing the expenditure by the number of reasons for coming, enabling us to resolve issues related to occasional visits (‘casuals’) and extended stays (‘extentioners’). We did the same thing concerning temporal displacements of visits (‘time-switchers’), considering that they would have spent less during their stay in the absence of the event.

To calculate gross spending, we considered the location of the purchase that was mentioned by the survey respondents or the organizers. In the case of exhibitors and catering services located on site, the proportion of traders whose head office was located in the study area was estimated, and only expenditure benefiting these traders was considered as a source of impact.

The calculation of net spending was then carried out by multiplying gross spending by the local added value ratio, which reflects the share of expenditure which remains in the study area. The methods for calculating this ratio were specified by Barget (2012).

This global approach was implemented for each category of economic agents, nevertheless, for the competitors, calculations were complicated by the fact that they are accompanied (2.8 accompanying people per participant on average). In the expenditure they declare, competitors include their close relatives (1.3 individuals on average). However, it does

not include the expenditure of additional accompanying people (on average 1.5 additional accompanying people per competitor), which needs to be identified and added.

Spending coming from local agents' expenditure

Around half of spectators of the games come from the Normandy region (table 4). This high proportion underlines the fame and success of the event among local inhabitants.

As explained before, Normandy spectators can also generate impact, for example if they would have attended the 2014 WEG elsewhere in the world, or those who would have spent this money for another activity outside Normandy if the event had not taken place. These two categories of spectators are named 'home stayers' and were surveyed to take into account their spending (Table 4).

[Table 4 near here]

The next steps to calculate gross and net spending are similar to those used for the other stakeholders.

A disaggregated multiplier model

The multiplier process is developed through a demand-driven approach. Due to the separate treatment of the different event stakeholders, a disaggregated formulation is used. Wilson's multiplier combines the economic base multiplier and the Keynesian multiplier, which enables to take into account the spending behaviour of the economic agents involved in the first round of expenditure resulting from the event (m_1 must therefore be estimated separately for each of them).

The Wilson's multiplier formula (Vollet & Guerin, 2005) is:

$$Y = X + m_1X + m_1m_2X + m_1m_2^2X + \dots + m_1m_2^nX$$

Where:

Y = is the global economic impact

X = is the net monetary injection

m_1 = the propensity to spend locally or the proportion of X that turns into local value added during the first round of spending (estimated with a Keynesian model)

m_2 = the propensity to spend locally during subsequent rounds of spending (estimated through the economic base theory)

According to Rioux and Schofield (1990), based on the work of Wilson and Raymond (1973), the multiplier can thus be expressed as follows:

$$K_r = \frac{1 - m_1 + m_2}{1 - m_2}$$

The value of the multiplier depends on both m_1 and m_2 . If leaks associated with the first round are large (m_1 close to 0), then the multiplier is low. On the contrary, if the leaks are low (m_1 close to 1), then the multiplier is potentially high, its magnitude depending on the characteristics of the local community (expressed through m_2 , which corresponds to the propensity to consume locally during the following rounds). The use of such a multiplier is appropriate when m_1 and m_2 are different, otherwise we can stick to an aggregate multiplier which implicitly states that $m_1 = m_2$. To present the method for calculating these propensities, we refer to the work of Vollet and Guerin (2005).

Calculation of m_1 is carried out on the basis of surveys administered to the various economic agents. For different consumption items, we determine the proportion (a_{ij}) of expenditure linked to the sporting event and made in the study area by agents of type i for different sectors of

expenditure j . Then, the proportion of added value (b_{ij}), assimilated with the ratio of wages/sales, is calculated for the different categories of expenditure.

$$a_{ij} = \frac{d_{ij}}{D_i}$$

Where:

a_{ij} is the percentage of expenditure related to the event that is made in the local economy by economic agents i (competitors, spectators, employees...) in different spending sectors j (transport, accommodation, tourism...).

d_{ij} corresponds to the local expenditure of agents i in sector j .

D_i is the expenditure of all agents i .

$$b_j = \frac{S_j}{VE_j}$$

Where:

b_j represents wages related to sales in sector j .

S_j are total wages in sector j .

VE_j is the sum of sales in sector j .

Finally, the propensity of agents i to spend locally (m_{1i}), is calculated as follows:

$$m_{1i} = \sum_{j=1}^n a_{ij} b_j$$

The propensity to spend locally, a_i , was determined at the geographic levels of the Caen la Mer conurbation (a_{iA}), and the Normandy region (a_{iR}). If we compare the results obtained here for spectators ($m_1 = 0.55$ at the level of Normandy) with those of the other categories of stakeholders (for example $m_1 = 0.27$ for competitors or 0.10 for caterers), we understand the

importance of dissociating the behaviors of the different groups of agents involved in the first round of income generation (Table 5).

Propensity m_2 is estimated by the economic base model (Vollet, 2007):

$$m_2 = \frac{\text{Non - basic activity}}{\text{Total activity}}$$

The distinction between basic and non-basic activity was made using the location coefficient method (ratio between the relative share of an activity in the total economic activity of the study area, and the relative share of this activity in the total activity of a reference area - usually the national economy). The location coefficient measures the degree of local specialization of a region i in activity j . Its mathematical formulation is:

$$Q_{ij} = (X_{ij} / X_i) / (X_j / X)$$

where X_{ij} is a measure of activity j at regional level i ;

X_i is the total economic activity of region i ;

X_j is a measure of activity j at national level;

X is the total national economic activity.

If $Q_{ij} > 1$, then activity j has a higher relative weight in the region i than at national level,

and the activity is considered as basic for that region. In other words, the difference between $\frac{X_{ij}}{X_i}$

(regional indicator) and $\frac{X_j}{X}$ (national indicator) is assumed to be exported. Basic activity is

measured by the difference between the regional structure of employment and the situation obtained by applying the national structure of employment to the region. The location coefficient method implies strong assumptions: the national economy taken as a reference must be just self-

sufficient in each activity, with productivity identical in each region for all sectors, and per capita consumption identical in all regions, both in volume and structure.

m_2 is calculated 0.78 at the level of the conurbation and 0.67 at regional level (Table 5).

This reflects the fact that a larger share of activity is export-oriented (basic activity) at the regional level compared to the situation at the conurbation level.

[Table 5 near here]

Regarding data collection, data needed to estimate the propensity to consume locally during the first round of spending was collected through the questionnaire survey, so that they are specific to each type of event stakeholders. For the following rounds, data was computed from government statistics and the French statistic institute. Finally, we can see how useful it is to estimate a specific multiplier coefficient (K) for each category of economic agents, as their values have proved to be very different (Table 5).

Main Results

The short-term economic impact is calculated by multiplying initial spending by the multiplier coefficient independently for each category of economic agents. The total economic impact amounted to 50,803,897 euros in the Caen la Mer conurbation (Table 6). To this, can be added the economic impact of the Territorial Project (the expenditure to improve the impact of the event on the local area), which gives an impact of around 55 million euros. The benefits are greater for the entire Normandy region (around twice as much as for the conurbation), giving a total of 102,255,177 euros. In the same way, the gross spending and the net spending are higher for the region than for the conurbation. These differences underline that the spending due to the 2014 WEG comes largely from outside the region and mainly benefits entrepreneurs and employees located in the region but outside the conurbation. The induced effect (difference between the total

impact and net spending) reflects the magnitude of the income generated by the multiplier process. For Caen la Mer, induced spending is valued at €23,257,846 for an initial total net spending from all sources of €27,546,051 (46% of total benefits with an average multiplier for all injection sources of 1.84). For the Normandy region, induced spending reached €43,676,508 and was generated by initial spending of €58,578,669 (43% of the spinoff with a multiplier of 1.75) (Table 6).

[Table 6 near here]

It seems appropriate to compare the amount of the event economic impact with the global wealth of the region in order to put the results into perspective. According to the French Institute of Economic Statistics, the region's GDP amounts to 90.5 billion euros. Contribution of the event to the economy is therefore modest, with only 0.11% of the regional GDP.

The structure of the impact appears to be distinctive at the conurbation level, as the spinoff is not primarily tourism-related, but linked to organizational expenditure for 60.6% of the total (and then to spectators for 28.3%). On the contrary, at regional level, the impact is much more traditionally the result of spectator spending (76.4%). This difference between the origin of the impact for the conurbation and the region can be explained firstly by the fact that the funding of the event partly came from the region (outside the conurbation), secondly by the concentration of operating expenditure in the conurbation, and thirdly because visitors spent more in the rest of the region than in Caen la Mer.

Among spectators, visitors remain the most important to consider but home stayers expenditures are not insignificant, particularly at the Normandy level with 5.7% of the global impact, whereas only 0.5% at the conurbation level. In table 4, we can see that the proportion of home stayers among local spectators are close at both levels, but the spending is logically higher for Normandy home stayers (€58.3) than for those from the conurbation (€7.4). This underlines

the interest to take home stayers' impact into account but only at bigger scales than a local one as conurbations. This is challenging since it is difficult to know what these individuals would really have done in other circumstances and valuation is based on statements made during the survey.

The impact generated by the event's economic partners comes in third place, with 6.6% of the impact for both areas, which is significant. This is due to the presence of journalists (even if their number was limited, their expenditure was significant), and to the exhibitors and catering services (who were relatively numerous). Moreover, we see the importance of taking the expenditures of the event actors into account (4.5% of the impact at the regional level and 3.6% for the conurbation). Among them, the competitors and accompanying people contribution to the total impact, while modest, is not negligible (around 2% of the spinoff for both areas, as their spending is high even if they are not numerous). Volunteers and employees have little spending but their high number makes their impact interesting to consider.

Table 3 also helps us to understand the reasons why the impact is higher or lower for the different categories of economic agents through the percentage of economic agents located outside the study area, and the amount of expenditure. Individual visitor spending is largely higher for the region than for the conurbation, showing that they spent a large part of money in the region outside the conurbation. It is fairly moderate in comparison to other events, but this is offset by the high number of outside spectators, i.e. visitors. The other categories of economic agents are fewer, but have high levels of spending, which explains their contribution to the economic spinoff despite their numbers. Finally, organizational expenditure is largely financed from external funds (sponsorship, ticketing, etc.).

These results highlight the importance to take into account not only the impact from organisation and visitors, but also from the other stakeholders of the event, as they here represent 10.2% of the global impact at the regional level and 11.1% at the conurbation level.

Discussion and conclusion

This article scientifically develops and empirically tests a method to improve the measurement of a sporting event through the example of the 2014 WEG. The results show that the economic spinoff was significant, both for the Caen la Mer conurbation and for the Normandy region, illustrating the fact that such mega-sports events can economically irrigate a vast area. With an economic impact of nearly €51 million for the Caen la Mer conurbation and over €102 million for the Normandy region, the 2014 WEG are unquestionably a major sporting event, although they lag far behind the Big Five (Summer Olympics, Winter Olympics, Football World Cup, Football Euro, Rugby World Cup), but are on the same level as the 6 Nations Rugby Tournament or the Superbowl, for instance. Today, bids to host mega-sports events tend to be rarer due to the costs involved. In this context, economic impact evaluations of an academic nature like the present study can help to encourage potential candidates, giving powerful argument to promote the event with private partners and local authorities keen to see a return on their investment (Kesenne, 2005).

Beyond the empirical results, the proposed approach shows how specificities of economic agents involved in the event can be taken into account, whether in terms of measuring initial inflow of money or calculating the multiplier coefficient. In our case, this was an important metric as organizational expenditure represented only a small part of the overall impact, which was essentially of a tourist nature at the regional level. The disaggregated method implemented

showed that, as expected, the additional tourist injection came mainly from outside spectators. Nevertheless, purchases made by the main event actors (competitors, accompanying people, employees and volunteers) and partners (exhibitors, restaurant owners, media workers) contributed significantly (more than 10%) to the economic spinoff, as did the spending by some local spectators (home stayers). This method, by considering all stakeholders of the event, enables a more accurate valuation of the impact. Moreover, the substitution effect is lower as expenditure of some local actors is taken into account, additionally the operating budget largely comes from outside the study area (85% for the conurbation and 50% for the region). In a managerial perspective, these results suggest to organizers of sports events to get interested in the spending of all event actors. Incentives to spend money during the event should then be targeted towards all types of the event actors and not only visitors.

Finally, the method developed here extends the traditional approach by considering all the stakeholders of the event (that is to say competitors and accompanying people, volunteers, employees, catering services, exhibitors, and media workers, in addition to visitors and organisational spending). In the spectator category, not only visitors are taken into account, but also ‘casuals’, ‘extensioners’, ‘time-switchers’, as well as the leakage avoided by ‘home stayers’. However, two categories of agents responsible for a drop in the spending are still not taken into consideration: the ‘runaways’, inhabitants living close to the event venues, who flee the event and therefore cause additional monetary leakage, and the ‘avoiders’, regular tourists who abandon their visit, which represents a drop in the usual tourist consumption. Considering these two last categories is an interesting research avenue to perfect the economic impact evaluation. For ‘runaways’, surveys among the population in the neighbourhood of the event venues could be implemented, either before or after the event, to identify ‘runaways’ number and collect information among them. For ‘avoiders’, tourism statistics on previous years could be collected

to identify a reference value that could be compared with effective data of the year of the event, to underline the negative effect of the event on ordinary tourism. Finally, the paper hopes to pave the way towards a less global but more nuanced and contextualized analysis of sports events.

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