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APPRAISAL OF MEASURING ECONOMIC IMPACT OF SPORT EVENTS

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ABSTRACT

Sport events are big business, attracting not only a large number of participants, spectators and sponsorships, but also wide media coverage. The hosting of sport events have led to increased rivalry between nations, regions and cities. Sport events range from mega events, such as the Olympic Games and the FIFA Soccer World Cup, to endurance events, including the Tour de France and the Comrades ultra-marathon, and even small-scale events, such as cricket and football matches. Since an event creates some spending stimulus, it exerts an impact on the local economy. Researchers worldwide have attempted to quantify this impact of sport events for a number of years, which has resulted in an extensive body of literature on the impact of sport events. This has led to the rationale for this paper, that is, to provide an overview of the research that has been conducted over the past two decades (since 1990), on the economic impact of sport events, with special focus on the methodological issues pertaining to measuring the impact of sport events. The literature is not unanimous regarding the measurement of spending, or which spending to include. Neither is there consensus about which method to use in the quantification of the impact.

Key words: Sport events; Economic impact; Spending; Input-Output analysis; Multipliers; Computable General Equilibrium Models.

INTRODUCTION

Events, and specifically sport events, have increased globally in number and scope. This implies that from both a private and public point of view, sport events have become more important for various reasons. While the positive aspects of tourism are often highlighted, such as the influence it exerts on economic growth, development, employment creation, as well as foreign exchange earnings, the seasonality of and leakages associated with tourism remains a drawback for the sustainability of these benefits. The hosting of events is regularly viewed as a means to counter seasonality. But it is not the only reason for the competition between nations and cities to host events. Other reasons for the hosting of events include the following: an improvement in the perception or image of the country or city owing to the event; the events as a tool for economic regeneration; the social and cultural benefits; poverty alleviation and job creation; marketing benefits; infrastructure development, to name but a few (Saayman & Rossouw, 2008; Davies, 2010; Saayman & Saayman, 2012; Li & Jago, 2013; Thomson *et al*., 2013).

The term "event" cuts across a spectrum of activities, including cultural, business, recreational and sport activities. It is, therefore, not surprising that a number of journals are

dedicated to reporting research on events. The context, frequency, type of event, type of participation, and the size of events complicate any overview of events and necessitate the demarcation in this and other articles. This article focuses solely on sport events and specifically on the methodology associated with measuring the economic impact of tourism related to various sport events. The aim of the paper is twofold, namely: (1) to provide an overview of the most contentious methodological considerations in measuring the economic impact of sport events; and (2) to analyse the research carried out over the past two decades (since 1990) on the economic impact of such events, again with a specific focus on measuring the impact. While a number of reviews are available, the aim is not to replace these reviews, but rather to complement them by focusing not only on mega events, which is very popular (Kasimati, 2003; Matheson, 2006; Li & Jago, 2013), but to also address the spectrum of sport events. To contextualise this article, it is, therefore, necessary to describe what is meant by "sport tourism" and "sport tourism events", and to explain the classification of sport events that will be utilised in this article.

Kurtzman (1993) was one of the first researchers to do studies in the area of sport tourism and defines it as "the use of sport as a vehicle for tourism endeavours" (Kurtzman, 2005b:15). This emphasises the relationship between sport and tourism. He elaborates that both participants and spectators can be viewed as sport tourists, but that the sporting activity or contest distinguishes this type of tourism from others. Within the field of sport tourism, he distinguishes five categories of activities, namely: (1) events; (2) attractions; (3) tours; (4) sport resorts; and (5) sport cruises. Since then, several other authors have expanded the definition, including Gammon and Robinson (1997) who elaborated on the concepts of sport and tourism by distinguishing between sport tourism and tourism sport. They further refined both these concepts in terms of hard and soft definitions. However, the focus of this paper falls on sport tourism events, for which the definition offered by Kurtzman since 1993 suffices.

TABLE 1. **TYPOLOGY OF EVENTS**

Category	Size	Frequency	Media coverage	Economic significance	Examples
Type A	Major international	Irregular, one-off	Significant	Large	Olympics, FIFA World Cup
Type B	Major international	Annual	Significant	Large	FA Cup, Grand Slam tennis, Golf Open
Type C	Major international	Irregular, one-off	Limited	Limited	IAAF Grand Prix, World championships
Type D	Major national	Annual	Limited	Limited	National championships

Source: Gratton *et al*. (2000:26)

The complexity of sport events is highlighted by the fact that these events range from mega events, such as the Olympic Games and the FIFA Soccer World Cup, to endurance events, including the Tour de France and the Comrades ultra-marathon, and even small-scale events, such as cricket, netball and football matches. Two typologies of sport events can be

advanced. Firstly, Gratton *et al*. (2000) typify sport events in four categories according to their size, regularity, media interest and economic significance. Table 1 elaborates on the four types of sport events identified by them. Their categorisation is mainly based on what they call 'major' events, which is a shortcoming already identified by Wilson (2006) who adds a Type E event to this framework. He defines Type E events as "minor competitor/spectator events, generating very limited economic activity, no media interest and part of an annual domestic cycle of sport events" (Wilson, 2006:68).

Secondly, Barget and Gouguet (2007) argue that sport has become a private good, rather than a public good and, therefore, any economic analysis of sport events should consider the nature of the event as an economic good. They propose three metrics according to which sport events should be typified, namely frequency, economic weight (including size) and ownership (public versus private).

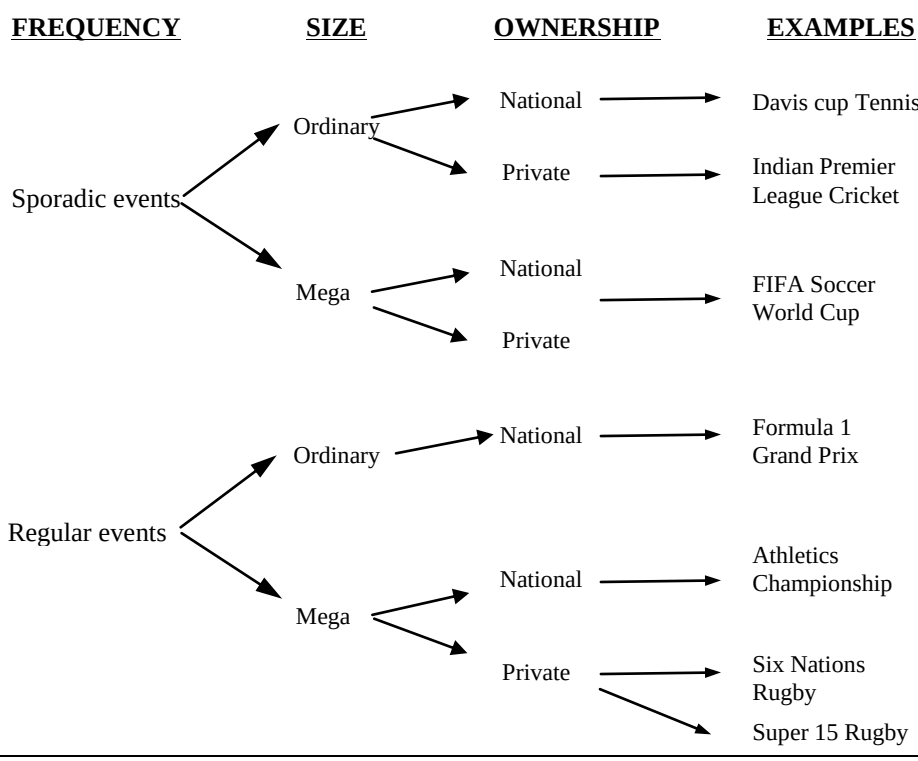

FIGURE 1. **TYPOLOGY OF SPORT EVENTS II**

Source: Barget and Gouguet (2007:167)

Figure 1 presents an exposition of sport events according to this typology. In terms of occasional events, a distinction is drawn between events that attract the general public and those that attract a very specialised and knowledgeable audience. This implies that some

events may possess high societal utility even though they may yield insignificant economic benefits, while other events offer major economic benefits, but little societal utility.

This paper contributes to other reviews in this field by not only focusing on mega events that are often reliant on public funding, but also on ordinary and smaller events (Type E), which in most cases are privately funded. In some cases, these events are more frequent, because they take place on a much more regular basis. Recently Dixon *et al.* (2013) confirmed that research on the economic impact of mega events outnumber that of small-scale sport events, which highlights the need for further research in this area. Higham (1999:87) contributes to this classification by defining small-scale sport events as "regular seasonal sporting competitions (ice hockey, basketball, soccer, rugby leagues), international sporting fixtures, domestic competitions, Masters or disabled sports, and the like". In addition, certain papers also add mass participation (recreation) events, which are not generally captured in the typologies above, yet once again play an important role in sport and tourism. Within this framework, the paper addresses both the methodological considerations when measuring the economic impact of a sport event, as well as an analysis of the empirical evidence on the economic impact of sport events.

Based on the above, the authors argue that there are specific classifiers that play a key role in influencing the economic impact that an event has on the economy, and that these can be viewed as building blocks. For the purpose of this paper, the classification of events is performed according to the following framework (Figure 2).

Classifiers	*Ownership*	Government	Federation/ Club	Private
	Frequency	Weekly/ monthly	Annually	Occasionally/ irregularly
	Participants	Professional	Amateur	Recreational
	Type of participation	Individual	Team	
	Length	One day	<Week	>Week
	Economic Scope	National	Regional	Local
	Size	Major	Medium	Small
	Sport events			

FIGURE 2. **BUILDING BLOCKS FOR CLASSIFICATION OF SPORT EVENTS**

Probably the most contentious building block is the first distinguishing factor, namely the size of the event. The definition offered by Li and Jago (2013), that major sport events consist of mega events (Olympic Games, Soccer World Cup, Super Bowl), as well as hallmark events (Commonwealth Games, World Championships), has relevance for this article. Taks *et al.* (2011) define a medium-sized sport event as one where a large contingent of spectators consists of local inhabitants, while the participants may comprise a mixture of local and non-local people. This type of event to some extent corresponds with Type C sport events,

according to the definition by Gratton *et al*. (2000), and also to the 'ordinary' events in the definition of Barget and Gouguet (2007). In our view, mass participation (recreational) sport events that attract international participation also fall into this category. Small-scale events are defined by Dixon *et al*. (2013:98) as "competitions with small local fan bases and/or competitions that attract national and international interest", with the description by Higham (1999) offering some examples of these events. Daniels and Norman (2003) indicate that a distinctive feature of small-scale events is that they rely on the existing infrastructure and, therefore, require little government investment.

The second distinguishing feature is the scope of the event, that is, national, regional or local. This, together with the third building block, the duration of the event, provides a refinement of the first feature, namely the size of the event. Furthermore, the type of participation (team or in individual), as well as the level of competence of the participants (professional, amateur, recreational), are distinguishing features of the events.

The remainder of this article is structured as follows: to shed light on the key methodological considerations and contentious questions in economic impact analyses; summarise and analyse peer-reviewed research on the economic impact of sport events between 1990 and 2003 in the light of the issues identified; and finally present the main findings and conclusions.

KEY CONSIDERATIONS WHEN ASSESSING ECONOMIC IMPACT OF SPORT EVENTS

Determining the economic impact of tourism has gained popularity after the seminal work carried out by Brian Archer (1977) on tourism multipliers, which has led to an increase in research on the impact of tourism on the economy. The application of economic impact studies in tourism is especially useful to informing decisions on tourism development (Kottke, 1988), and this has naturally extended to the hosting of special events.

Tyrrell and Johnston (2006:3) explain that in tourism, economic impact analyses "estimate changes in regional spending, output, income, and/or employment associated with tourist policy, events, facilities, or destinations". The impact originates from an increase in spending in the region, which in this case, is due to the hosting of a sport event. Lee (2001:n.p.) broadly defines the economic impact of a sport event as "the net change in an economy resulting from the sport event", where 'change' refers to the metrics as described by Tyrrell and Johnston (2006). However, with the wide application and clear policy decisions that impact studies have, it is not surprising that it has been misused for political agendas. Most of the said studies are aimed at gaining public support and subsidies to host mega events rather than academic contributions (Dixon *et al*., 2013). A number of papers have addressed these misuses and misconceptions of economic impact studies with some devoted solely to this matter, including two studies conducted by John Crompton (1995 & 2006), one by Abelson (2011), and even a stern word of warning from Brian Archer (1996), who cautions about 'garbage in, garbage out'. This is especially true for the input to economic impact studies, namely the initial increase in spending.

Although very reliant on the initial input (the spending stimulus), the methodological considerations in measuring the economic impact of events are not limited to the question of which spending to include. Firstly, the misuse of the term 'economic impact' needs to be considered, since there are vast differences between concepts, such as economic value, economic significance, cost-benefit analysis and economic impact analysis that are not consistently applied in impact studies. Measuring the initial spending stimulus raises concerns regarding which spending to include, the demarcation of the study area, the collection of the data and the calculation of the direct spending. The last contentious methodological question relates to the method for calculating indirect and induced impacts. These themes are further explored under suitable sub-headings. It is especially the first and the last of these methodological concerns that feeds into the empirical analysis of studies addressing the economic impact of sport events.

Difference between economic significance, economic impact, economic value and cost benefit

While the terms 'economic impact', 'economic benefit', 'economic value' and 'economic significance' are often used as synonyms, there is a clear difference among them and are often misunderstood by those who apply them. Economic benefit is often derived using a cost-benefit framework. Two influential papers that exploit the differences between cost-benefit analysis and economic impact analysis are those of Burgan and Mules (2001) and Tyrrell and Johnston (2006).

Burgan and Mules (2001:323) explain that cost-benefit analysis was developed with the aim to "evaluate alternative uses of public funds from an economy-wide perspective". Various alternative (but similar) projects are subsequently compared to one another and the option with the highest benefit relative to the cost ratio should be adopted as the preferred use of public funds. Tyrrell and Johnston (2006) add that cost-benefit analysis essentially estimates the net economic benefit to be derived from an event and it is, therefore, mostly an *ex ante* analysis. Since the result of the analysis is a net benefit, it can be linked to welfare gains for the community at large (Abelson, 2011). Such an analysis, therefore, extends beyond the tangible benefits to include intangible benefits (excitement, increased exposure, after-event-tourism growth), that can be measured using willingness-to-pay or other contingent valuation methods (Burgan & Mules, 2001).

'Economic value' is a concept closely related to 'economic benefit', since it refers to the "total societal benefit" of an event (Moore *et al*., 1994:63). According to Barget and Gouguet (2007), the total economic value of a sport event consists of the use value and the non-use value of the event. The non-use value, also called intrinsic or existence value, can be defined as "the utility a person derives from knowing that the event exists" (Barget & Gouguet, 2007:170). The use value consists of the actual use value, the optional value and the legacy value. The actual use value refers to the utility that the consumers actually feel owing to the sport event, while the potential value is the utility owing to future benefits than can be derived from the event. The satisfaction of preserving the event for future generations is the legacy value. Methods often used to assess the economic value of an event is the travel cost method, hedonic pricing and contingent valuation.

Contrary to cost-benefit analysis, economic impact analysis measures the change in economic activity owing to the event and is, therefore, rather an *ex post* analysis. Tyrrell and Johnston (2006:3) explain that it is "not designed to identify those policies or situations that generate optimal social benefit". Burgan and Mules (2001) agree that the two paradigms that govern the two analyses differ, but argue that economic impact analysis can be consistent with cost-benefit analysis when the economy is not at full employment of resources. However, they continue to state that economic impact analysis is "an appropriate methodology to assess what is essentially a major source of benefit of a special event" (Crompton, 2006:327). Crompton (2006) adds that as soon as cost is included in the analysis, it changes from an economic impact to a cost-benefit analysis.

Compared to an economic impact study, the economic significance of an event does not quantify the loss in economic activity if the event did not take place. It rather measures the size of the event and its associated economic activity and, therefore, offers some useful information when trade-offs are involved (Crompton, 2006). This is especially relevant when local spending is included in the analysis and many economic impact studies conducted by consultants are rather studies of economic significance. This naturally leads to the question of what spending should be included in an economic impact analysis.

Spending to include

Economic impact stems from spending that takes place in the economy that would otherwise not have taken place. According to Hodur and Leistritz (2006), spending stems from three main sources: (1) facility construction; (2) facility or event operations; and (3) participants and spectators who attend the event.

The first, facility construction, is a once-off expense creating once-off benefits that are not associated with all sport events, but regularly with mega events. Recently, Matheson (2012) evaluated the impact of infrastructure development for mega-events in emerging economies since the construction of stadiums and sport halls for these events represents a huge cost to the local taxpayer, even though the benefits may also be substantial. The second source of spending relates to normal business operations and includes supplies, advertising, maintenance, etc. (Hodur & Leistritz, 2006). Both these types of expenses are easy to account for and are used in an economic impact analysis.

Finally, accounting for spending by event attendees is essential. These attendees include, amongst others, sportspersons and coaches, spectators, media representatives, members of broadcasting companies, sponsors and exhibitors (Smeral, 2003). The expenses incurred include travel costs, food, accommodation and other purchases owing to the event (Hodur & Leistritz, 2006). Smeral (2003) distinguishes between gross impact and incremental impact, where the former refers to the impact derived from all event-related expenditure, irrespective of the origin of the spending. Incremental spending, or effective demand, only accounts for spending sourced from outside the study area. Both investment and expenditure by local firms and residents are, therefore, excluded from calculating the incremental impact, since they do not create effective demand.

The most contentious spending is that of the attendees of the event, both in how to obtain it and which spending to include. Since it is only non-resident spending that creates effective demand, the inclusion of local or resident spending is dubbed by Crompton (2006:70) as being the "most frequent mischievous procedure" followed in economic impact studies. In essence, the event causes a divergence of only local expenditure to other sectors of the local economy. However, Crompton (2006) identifies two situations in which it would be acceptable to include local spending: (1) when the aim of the study is to determine the economic significance of the event; and (2) when locals who would have left the area rather stay at home in order to attend the event. The latter is referred to as deflected impact, since the local spending would have been incurred at another venue. However, measuring the deflected impact is quite difficult and is, therefore, often rather excluded from the economic impact analysis.

Two other visitor types that should be treated with care are distinguished by Crompton (1995), namely 'time switchers' and 'casuals'. The former refers to visitors who have been planning to visit the city or region, but planned their visit to coincide with the sport event hosted in the region or city. Casuals, on the other hand, are visitors who are in the city or region for another purpose, and attend the event. The main purpose of their visit is, therefore, not the sport event as such, but that they attend it because they are in the vicinity. Crompton (1995) argues that the expenditure of time switchers and casuals should be excluded from an economic impact analysis, since it represents money that would have entered the economy irrespective of whether the event took place. However, if the event causes these visitors to extend their stay, it can be argued that their spending at the event may be included in the economic impact analysis.

Gelan (2003) argues that although public expenditure on infrastructure falls into the same category as local spending, it might represent incremental spending for events hosted in smaller areas. These areas consequently attract spending from regional and national government for the upgrading or construction of infrastructure, which would not have accrued to them had the event not been hosted in the region.

Study area

The above-mentioned indicates that a clear demarcation of the study area is a necessity when the economic impact of any event is considered. Impact studies can either focus on the national, regional or local economy and the size of the event clearly exerts an influence on this choice. Hodur and Leistritz (2006) reveal that there are two important considerations when choosing the study area: (1) the study area should represent a trade area; and (2) it should include the locations where most of the expenditure associated with the event takes place. This suggests that for small towns that host events and draw on neighbouring towns for accommodation supply, the regional rather than the local impact should be considered.

According to Agha and Rascher (2013), the economic impact of sport events in more geographically isolated areas is more pronounced. This may be attributed to the following: (1) more export revenues are created since there are not many competing facilities in the region; (2) any person in this remote region that wishes to attend a live game will have to travel to the town with the facility available, thus creating an influx of visitor spending; and

(3) locals are more likely to stay in the town in order to attend the sport event, thus increasing the deflected impact of the event.

Defining the study area too widely or too narrowly can have important implications for the outcome of the impact study. An area that is too wide leads to the exclusion of spending by visitors from these areas, thus decreasing the incremental spending influx. A definition of the study area that is too narrow also leads to losses in spending that accrue to the local area, namely the initial spending stimulus. As explained by Stynes (2001), only spending that accrues to the local area should be captured in the economic impact assessment, implying that spending on goods and services from outside the study area should be excluded. He proposes the use of 'capture ratios' to capture only the spending on those souvenirs and other items that are provided by firms and locals in the study area.

Primary data collection

Wilton and Nickerson (2006:17) state that "while measures related to economic impact assessment are conceptually simple, the actual collection of such information is extremely difficult". Since most of the incremental spending due to the event stems from visitors, it entails the collection of primary data and an estimation of visitor numbers. However, spending is not always determined via primary data collection. While other methods are used to obtain expenditure via Tourism Satellite Accounts (TSA) or other accounting models, direct surveying remains the most accurate means to obtain estimates of expenditure.

The method used in surveying, as well as the content of the survey are contentious issues that are often neglected in the literature. Stynes and White (2006) and Wilton and Nickerson (2006) provides an overview of the most contested issues in this regard. It is argued that collecting spending data close to or at the event reduces recall bias and telescoping (including expenditure beyond the study area), in spending estimates. Typically, recall bias leads to an underestimation of spending, and research carried out by Breen *et al*. (2001) indicates that recall bias is found even in exit interviews, that is, when attendees exit the event. Surveying at the event is, therefore, preferred, although it may be costly and be subject to substantial time constraints (Ryan, 1998; Wilton & Nickerson, 2006).

To improve the estimate of the initial stimulus, Stynes and White (2006) propose the inclusion of various spending categories, as well as the segmentation of visitors into distinct classes. The details of the spending categories included in the survey should cover spending on lodging, food and beverages, transport, recreation and entertainment, souvenirs and retail products. Furthermore, the survey should include the number of days spent, as well as the size of the travel party to be able to determine spending per day and per person.

Segmenting the visitors into various categories, namely spectators versus participants, overnight visitors versus day visitors, or according to origin, not only provides a more efficient sample design, but also renders it easier to distinguish between spending that should and should not be included in the analysis (Stynes & White, 2006). Saayman *et al*. (2005) show that segmenting visitors before determining the economic impact does not necessarily lead to a decrease in spending and economic impact, but can actually have the opposite effect.

To determine total spending, the total number of visitors needs to be known. This is not an issue in events where tickets are needed or other access controls are in place before the event is attended. However, for a number of amateur sport events or even attendance at major uncontrolled events (such as the New York marathon or the Tour de France), the number of visitors is not that evident. The participants need to register for these events, but the spectators need to be estimated. Hodur and Leistritz (2006) list a number of methods that can be considered, including a survey of the spectators, the Capacity Utilization Model[1] and the attendance at closing and opening ceremonies.

Estimating direct economic impacts

Ryan (1998) asserts that it is important to make sure that one does not calculate total visitor expenditure (or gross expenditure) due to the event, but rather the extra spending that would not have taken place in the city or region if the event did not occur. Smeral (2003) refers to this as incremental spending. This implies that all the issues raised above should be incorporated into one framework to ensure the correct calculation of the direct impact of the event. The analytical framework proposed by Stynes (1999), adapted and applied by amongst others Gelan (2003) and Saayman *et al*. (2005), makes provision for all the corrections to visitor spending discussed above, is presented in Table 2.

TABLE 2. **ANALYTICAL FRAMEWORK FOR ESTIMATING DIRECT IMPACT OF VISITOR SPENDING**

Equation description	Number
$S = V_e\Sigma_j\lambda_{v,j} + L_s\Sigma_j\lambda_{l,j}$	(1)
$V_e = \phi V$	(2)
$L_s = \psi L$	(3)
$\lambda_{v,j} = \delta_{v,j}\beta_{v,j}$	(4)
$\lambda_{l,j} = \delta_{l,j}\beta_{l,j}$	(5)
$S = \phi V\Sigma_j\delta_{v,j}\beta_{v,j} + \psi L\Sigma_j\delta_{l,j}\beta_{l,j}$	(6)
$DS = \sigma(\phi V\Sigma_j\delta_{v,j}\beta_{v,j} + \psi L\Sigma_j\delta_{l,j}\beta_{l,j})$	(7)

Source: Adapted from Gelan (2003:414)

Equation (1) indicates that total spending (S) is the sum of both local (L_s) and visitor (V_e) average spending. These, $\lambda_{v,j}$ and $\lambda_{l,j}$, represent the average expenditure on spending category j per visitor and local respectively. Both the number of visitors in each category (L_s and V_e) and the average spending ($\lambda_{v,j}$ and $\lambda_{l,j}$) per category are further explained in equations (2) to (4). Equations (2) and (3) express L_s and V_e as proportions of total visitors (V) and total

[1]This entails a survey of the accommodation units to determine the percentage of non-local visitors attending the event.

residents (L) respectively, with ϕ and ψ representing the corresponding ratios. Note that ϕ indicates the ratio of visitors who are in the town or region due to the event, while ψ is the ratio of locals that remained in town because of the event (deflected impact). Similarly, the amount of average expenditure on each category, $\beta_{v,j}$ and $\beta_{l,j}$, should be weighted using the proportions that are incurred by the local community, $\delta_{v,j}$ and $\delta_{l,j}$ (equations 4 and 5). By substituting equations (2) to (5) into equation (1), total spending is defined in equation (6).

A scalar capture ratio σ is included to account for 'imported products' bought by visitors and locals. Equation 7, thus, indicates the direct sales effect on the local economy; the most important economic impact indicator in the local study area.

Total economic impact determination

Once the direct incremental spending due to the event is determined, the indirect and induced effects of this spending on the city or region should be determined. This has been a subject of much controversy, which has picked up steam over the past decade with avid believers in the superiority of some methods compared to others. However, while this aspect is often emphasised, Brian Archer's warning of "garbage in, garbage out" should not be discarded.

Two main methods used to assess the total economic impact of an event are input-output (I-O) models (and variants thereof), and Computable General Equilibrium (CGE) models. However, Li and Jago (2013) mention that some use of econometric models can be found in the literature (Kasimati & Dawson, 2009), and that it is surprising that it is not used more often in conjunction with CGE models in particular.

Input-output models have traditionally been the most popular method used in economic impact studies. They use matrix algebra to determine the income, employment and production that are necessary to satisfy a certain level of demand (Kottke, 1988). I-O models generate multiplier estimates, which are subsequently applied to direct incremental spending estimates in order to quantify the secondary effects of the event. The uses, abuses and misinterpretation of multipliers (Crompton, 2006), have led to distrust in the results generated from these models. Many variants of I-O models are available and have been applied in economic impact studies, including: (1) Social Accounting Matrices (SAM), which is an extension of the I-O model to include different household segments; (2) regional I-O models, such as RIMS II and IMPLAN, which are designed for a specific region; and (3) partial I-O models, which generate proportional multipliers. The latter has seldom been applied to sport events research, although it is quite popular in other rural tourism settings.

I-O models have been widely criticised, and the main criticisms raised include the following (Dwyer *et al*., 2005; Abelson, 2011): (1) no resource constraints are taken into account, and therefore, no crowding out takes place; (2) price effects are ignored; (3) constant proportions between inputs and outputs are assumed; and, therefore, (4) they deliver only positive impacts.

CGE models have their foundation in neo-classical micro-economics and consist of a number of equations that describe the various relationships within the economy (Song *et al*., 2012). Dwyer *et al*. (2005:353) describe them as constituting "current best practice in assessing

economy-wide changes in expenditure within an economy". In a CGE model, the economy is modelled as a system, with realistic assumptions of resource constraints, price adjustments and inter-linked markets (Dwyer *et al*., 2005). The CGE model is estimated from a base year and the assumptions used influence the outcomes that the model predicts. These assumptions include the source of capital, the availability of labour and whether unit cost is rising or falling (Abelson, 2011). Although Dwyer *et al*. (2006a) argue that CGE models can be applied to events of all sizes and also for once-off events, Abelson (2011) doubts their application to these types of events. This sentiment is echoed by Taks *et al*. (2011) who state that smaller events are less likely to have crowding out effects and do not distort normal business patterns very easily, thus rendering I-O type analyses more accurate. Li and Jago (2013) confirm that event impacts using CGE modelling have focused primarily on major events.

The use of CGE versus I-O have been debated for more than a decade, with one of the early comparisons provided by Zhou *et al*. (1997), for tourism to Hawaii. They show that the main advantage lies in the flexibility of CGE models, especially in resource allocation, and found lower total impacts using this model compared to those of the I-O model. This sentiment is echoed by Dwyer *et al*. (2005, 2006a), who have made extensive contributions to research regarding the application of CGE modelling in tourism. The differences in assumptions underlying I-O and CGE models are summarised by Dwyer *et al*. (2005), and presented in Table 3 below. The flexibility that CGE models offer is clearly visible in this comparison.

TABLE 3. **ASSUMPTIONS UNDERLYING I-O AND CGE MODELS**

I-O model assumptions	CGE model assumptions
All final demand components are exogenous	All main final demand components are endogenous
Capital, labour and land is endogenous	Capital and land are given exogenously
There are no price-induced substitution effects	Price-induced substitution effects occur
Government expenditure remains constant and is exogenous	Government budget deficits are fixed
Employment is perfectly elastic (flexible)	Employment can be regarded as fixed or flexible

Source: Dwyer *et al*. (2005:354)

While the literature mainly follows the process described above, that is, using micro survey data to compute the direct effect augmented with either input-output analysis to analyse the indirect and induced effects, there is another form of *ex post* analysis that follows a very different process in determining the effect of an event on an economy, namely regression analysis. This type of analysis is especially popular in the USA, championed by Victor Matheson (often in co-operation with Robert Baade). This method compares the performance of a city or region during the event with that of cities or regions that have not hosted the event, or with the same city/region prior to the event. The performance is measured using

common economic performance measures, such as personal income, income per capita, employment and taxable sales (Matheson, 2006). This method normally entails the estimation of time series models (Baade & Matheson, 2004), although cross-section regressions and panel regressions are also used (Tien *et al*., 2011), especially when more than one hosting city or event is analysed.

When regression analysis is considered to assess the economic impact of an event, the following considerations should be kept in mind: (1) it is often difficult to isolate the economic impact of an event which takes place within a large, diverse metropolis and normal business fluctuations may obscure the impact of the event; (2) the event has to be isolated within space and time (identifying the study area is again paramount); (3) monthly and quarterly data should be used rather than annual data, since the effect of the event tapers down with time; and (4) it is more difficult to detect the effect of recurring and regular events than single events when using this method (Matheson, 2006).

EMPIRICAL LITERATURE ANALYSIS

To compile a list of the publications that focus on the economic impact of sport events, a search was conducted using the following search engines: Google Scholar, Science Direct and within the following databases of EbscoHost: Academic Search Premier, Business Source Premier, EconLit, and Hospitality and Tourism Index. In addition, South African publications were sought using Sabinet. For the purpose of this article, only published journal articles were considered (no books or working papers are included). The literature under review was augmented by electronic searches using the recent reviews offered by Matheson (2002), Hodur and Leistritz (2006), Matheson (2006) and Li and Jago (2013).

The key words included in the search were 'economic impact' and 'sport event' and for the academic databases, these words had to appear in the abstract. The searches identified a total of 81 journal publications between the years 1990 and 2013[2]. By scrutinising the above reviews, an additional 14 journal articles were added to the current list.

The analysis was performed using the classification as described in the introduction and by focusing on the various aspects, as identified in the review of the methodological concerns raised above. Firstly, a general overview is presented.

General analysis of all the articles

Figure 3 illustrates the distribution of articles over the various years under consideration. It is evident that the published research increased significantly during the first decade of 2000, after which it showed a noticeable decline to reach levels similar to that of the 1990s after 2010. The year 2006 logged a record number of publications, namely 17 in total. This can be partially attributed to the special edition published by the *Journal of Travel Research* on the economic impact of events. It is interesting that no scientific contributions could be found for the years 1997 and 1999.

[2]This includes sources that do not offer electronic full-text.

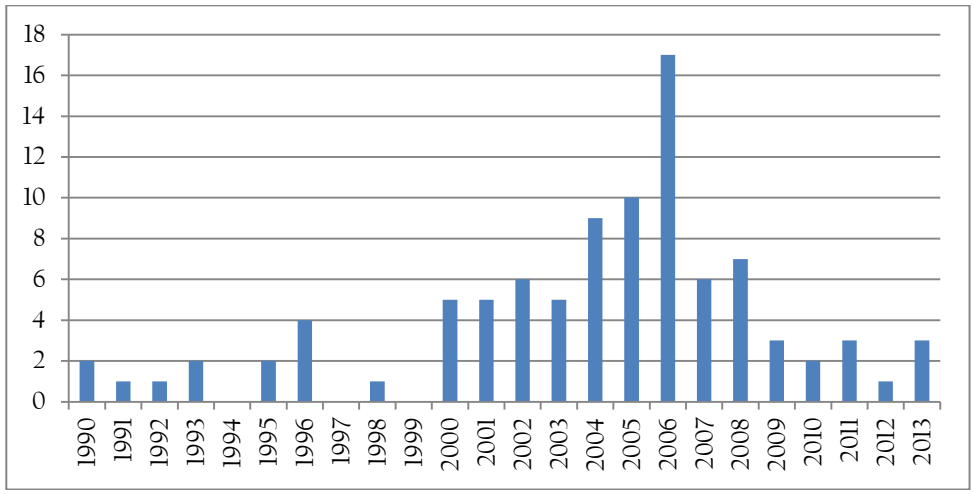

FIGURE 3. **NUMBER OF ARTICLES PUBLISHED PER YEAR**

The articles are further classified as either a case study of small, medium or major events, or as reviews or articles that deal with methodological issues.

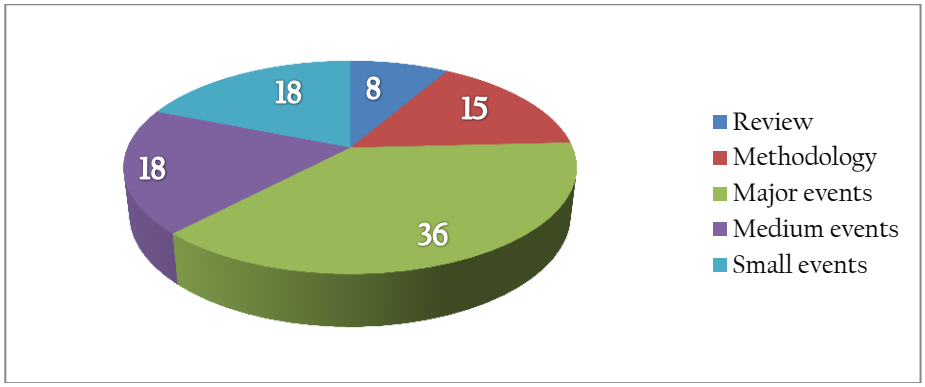

FIGURE 4. **DISTRIBUTION OF ARTICLES ACCORDING TO TYPE**

An analysis of the total number of articles (Figure 4) reveals that the majority deal with major events (38%), which is not surprising since major events often attract large audiences and rely on public funding. This excludes reviews that also mainly focus on major events. It is also interesting that 15 articles (almost 16%), deal with methodological issues, indicating both the large number of aspects to consider, as well as the different views available on determining the economic impact of sport events. Figure 5 illustrates the distribution of the total number of articles between the various types described above.

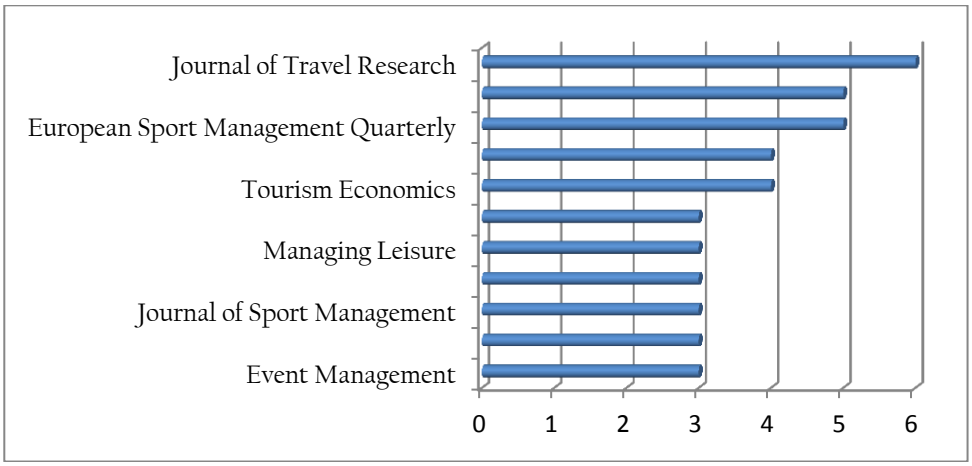

FIGURE 5. **DISTRIBUTION OF ARTICLES AMONG JOURNALS**

The distribution of publications amongst journals is also worth noting, with the research attracting interest from tourism, event, leisure and sport journals. Figure 5 illustrates the number of articles published in various journals over the past 24 years (1990-2013). Only journals that had published at least three articles on the economic impact of sport tourism are shown in the graph.

It is evident (Figure 5) that the special issue on the economic impact of events, published by the *Journal of Travel Research* in 2006, places this journal on top of the list, with a total number of six articles having been published on this topic. The sport journals, *Journal of Sports Economics* and *European Sport Management Quarterly* follow with five articles each, after which the tourism journals, *Annals of Tourism Research* and *Tourism Economics*, take the third position with four articles each.

Table 4 presents an overview of the review articles published since 1990. In 1992, the first review was published by Burgan and Mules, and in their article they furnish an overview of the calculation of direct spending, as well as the use of input-output models to generate multipliers. This is followed by two very brief reviews by Lee (2001) and Matheson (2002); it is apparent why Li and Jago (2013) refer to these reviews as "early reviews".

Between 2003 and 2006, four review papers focusing on the modelling of the economic impact of sport events were published, with Dwyer, Forsyth and Spurr contributing two papers on the comparison of CGE and I-O modelling. Hodur and Leistritz (2006) provide a more comprehensive review dealing with the various issues associated with the economic impact analysis of sport events. Li and Jago (2013) refer to this period as being the 'dynamic development' of economic impact analysis. The last review was published as recently as 2013 by Li and Jago, but focuses only on the reviews to date and major sport events.

TABLE 4. **REVIEW ARTICLES**

Description	Author(s)	Journal
Direct spending calculation, Input-output modelling	Burgan, B & Mules, T	*Annals of Tourism Research* (1992)
Brief review	Lee, S	*The Sport Journal* (2001)
	Matheson, VA	*The Sport Journal* (2002)
Review of modelling, assess Olympic empirical findings	Kasimati, E	*International Journal of Tourism Research* (2003)
Comparison of CGE IO, Application Australian Grand Prix	Dwyer, L, Forsyth, P & Spurr, R	*Journal of Travel Research* (2005)
	Dwyer, L, Forsyth, P & Spurr, R	*Tourism Review International* (2006b)
Review of issues	Hodur, NM, & Leistritz, FL	*Journal of Convention & Event Tourism* (2006)
Review of issues and major events	Li, S & Jago, L	*Current Issues in Tourism* (2013)

Table 5 outlines the published articles that address various theoretical and methodological issues pertaining to the economic impact of sport events. A number of key contributors to the methodology and theory are worth mentioning: Trevor Mules contributed three articles, while John Crompton and Larry Dwyer both contributed two articles. One of the most cited articles that influenced practices on the economic impact of sport events is that produced by Siegfried and Zimbalist (2000).

TABLE 5. **METHODOLOGY AND THEORETICAL ARTICLES**

Title	Authors	Journals
Economic impact analysis of sports facilities and events: Eleven sources of misapplication	Crompton, JL	*Journal of Sport Management (1995)*
The economics of sport facilities and their communities	Siegfried, J & Zimbalist, A	*Journal of Economic Perspectives (2000)*
An economic perspective on special events	Mules, T & Faulkner, B	*Tourism Economics (1996)*
A framework for assessing tangible and intangible impacts of events and conventions	Dwyer, L, Mellor, R, Mistilis, N & Mules, T	*Event Management (2000)*
A framework for assessing direct economic impacts of events: Distinguishing origins, destinations, and causes of expenditures	Tyrrell, TJ & Johnston, RJ	*Journal of Travel Research (2001)*

TABLE 5. **METHODOLOGY AND THEORETICAL ARTICLES (*cont.*)**

Title	Authors	Journals
Comparative economic impact analysis: Differences across cities, events, and demographics	Mondello, MJ & Rishe, P	*Economic Development Quarterly (2004)*
Do we need an economic impact study or a cost-benefit analysis of a sports event?	Kesenne, S	*European Sport Management Quarterly (2005)*
Economic impact: Sport tourism and the city	Kurtzman, J	*Journal of Sport Tourism (2005a)*
Sport and economic regeneration in cities	Gratton, C, Shibli, S & Coleman, R	*Urban Studies (2005)*
Local business leveraging of a sport event: Managing an event for economic benefit	Chalip, L & Leyns, A	*Journal of Sport Management (2002)*
Public sector support for sport tourism events: The role of cost-benefit analysis	Mules, T & Dwyer, L	*Sport in Society (2005)*
Economic impact studies: Instruments for political shenanigans?	Crompton, JL	*Journal of Travel Research (2006)*
Sport events: uses and abuses of economic impact studies	Jeanrenaud, C	*Finance & the Common Good (2006)*
Central place theory and sport tourism impacts	Daniels, MJ	*Annals of Tourism Research (2007)*
The economic impact of sports, sporting events and sport tourism in the UK: The DREAM model	Gibson, H, McIntyre, S & MacKay, S	*European Sport Management Quarterly (2005)*

Major event analysis

Table 6 presents a description of the 36 articles based on major sport events for the period 1990 to 2013. It is evident that the case studies and literature are dominated by studies on the Soccer/Football World Cup (16 articles), as well as the Olympic Games (13 articles). The economic impact of American Football (the Super bowl) is also well documented, with Victor Matheson being the main researcher in this regard. Relatively less attention is devoted to major events such as the Commonwealth Games, the Tour de France and EURO Cup Soccer.

TABLE 6. **ARTICLES ON MAJOR SPORT EVENTS**

Sport events	Authors	Journals
American Football	Baade, RA & Matheson, VA	*Reflets et perspectives de la vie économique (2000a)*
	Coates, D & Humphreys, BR	*Journal of Sports Economics (2002)*
	Matheson, VA	*Journal of Sports Economics (2005)*
	Matheson, VA & Baade, RA	*European Sport Management Quarterly (2006)*
	Baade, RA, Baumann, R, Matheson, VA	*Southern Economic Journal (2008a)*
Commonwealth games	Preuss, H	*European Sport Management Quarterly (2005)*
EURO Cup Soccer	Humpreys, BR & Prokopowicz, S	*International Journal of Sport Management and Marketing (2007)*
Olympics	Madden, J	*Current issues in Tourism (2002)*
	Hotchkiss, J, Moore, R & Zobay, S	*Southern Economic Journal (2003)*
	Preuss, H	*European Sport Management Quarterly (2004)*
	Malfas, M, Houlihan, B & Theodoraki, E	*Municipal Engineer (2004)*
	Madden, J	*Public Finance and Management (2006)*
	Solberg, HA & Preuss, H	*Journal of Sport (2007)*
	Porter, PK & Fletcher, D	*Journal of Sport Management (2008)*
	Kasimati, E & Dawson, P	*Economic Modelling (2009)*
	Giesecke, J & Madden, J	*Economic papers (2011)*
	Li, S, Blake, A, Thomas, R	*Economic Modelling (2013)*
Olympics & Australian Football League	Siegfried, J & Zimbalist, A	*Australian Economic Review (2006)*
Olympics & Soccer World Cup	Whitson, D, Horne, J & Manzenreiter, W	*Sociological Review (2006)*
	Matheson, V	*International Journal of Sport Finance (2009)*
Rugby World Cup	Jones, C	*International Journal of Tourism Research (2001)*
Olympics & Australian Football League	Siegfried, J & Zimbalist, A	*Australian Economic Review (2006)*
Olympics & Soccer World Cup	Whitson, D, Horne, J & Manzenreiter, W	*Sociological Review (2006)*
	Matheson, V	*International Journal of Sport Finance (2009)*
Rugby World Cup	Jones, C	*International Journal of Tourism Research (2001)*
Tour de France	Bull, C & Lovell, J	*Journal of Sport & Tourism (2007)*

TABLE 6. **MAJOR SPORT EVENTS ARTICLES (*cont.*)**

Sport events	Authors	Journals
World Cup Soccer	Baade, RA & Matheson, VA	*Marquette Sports Law Journal (2000b)*
	Szymanski, S	*World Economics (2002)*
	Baade, RA & Matheson, VA	*Regional Studies (2004)*
	Matheson, VA & Baade, RA	*South African Journal of Economics (2004)*
	Horne, JD & Manzenreiter, W	*Review of the Sociology of Sport (2004)*
	Lee, CK & Taylor, T	*Tourism Management (2005)*
	Horne, J & Manzenreiter, W	*Sociological Review (2006)*
	Kim, HJ, Gursoy, D & Lee, S-B	*Tourism Management (2006)*
	Ahlert, G	*Journal of Convention & Event Tourism (2006)*
	Bohlmann, H & Van Heerden, JH	*International Journal of Sport Management and Marketing (2008)*
	Saayman, M & Rossouw, R	*Acta Commercii (2008)*
	Allmers, S & Maennig, W	*Eastern Economic Journal (2009)*
	Fourie, J & Santana-Gallego, M	*Tourism Management (2011)*
	Cornelissen, S	*Tourism and Hospitality Planning and Development (2004)*

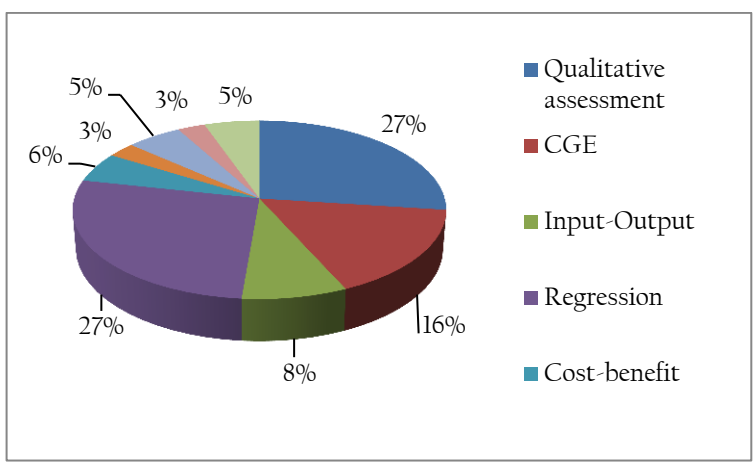

FIGURE 6. **METHODS USED IN ECONOMIC IMPACT ASSESSMENT OF MAJOR SPORT EVENTS**

It is interesting to note that most of the articles were published in the first decade of 2000, with none prior to 2000 and only three articles since 2010. There was clearly a surge in interest in quantifying the impact that these major events exert on the economies that host them. An analysis of the methods used in determining the economic impact is illustrated in

Figure 6 and it is interesting that qualitative assessment was still the dominant method with 27% of the articles that did not report any use of quantitative techniques. Regression analysis shares the top spot with qualitative assessment, mainly due to the contributions by Matheson and Baade. Furthermore, it is evident that CGE and I-O modelling techniques are also quite popular (together they represent 24% of all the methods followed), with limited scope for the other methods. A closer inspection of the trend in the methods used reveal that CGE and macro modelling are gaining momentum, while I-O methods are falling out of favour when assessing the economic impact of major events.

Analysis of medium-size sport events

Table 7 summarises the 18 published case studies of medium-sized sport events. It is evident that a much wider spectrum of sport events are covered in the research, compared to major sport events that are relatively concentrated on the Olympic Games and the Soccer World Cup. Some of the smaller world cup/championship events (cricket, skiing, ice hockey and judo), are rather classified as medium-sized events due to the nature of the spectator numbers and economic significance.

TABLE 7. **ARTICLES ON MEDIUM-SIZED SPORT EVENTS**

Sport event	Authors	Journals
Badminton, boxing, athletics grand prix, swimming, golf, cricket	Gratton, C, Dobson, N & Shibli, S	*Managing Leisure (2000)*
Badminton, boxing, swimming, show jumping, Judo, indoor climbing, half marathon, snooker	Gratton, S, Shibli, S & Coleman, R	*Sociological Review (2006)*
Baseball	Baade, RA & Matheson, VA	*Journal of Sport Economics (2001)*
Baseball, football, basketball, hockey	Lertwachara, K & Cochran, JJ	*Journal of Sports Economics (2007)*
Cycle - mass participation	Saayman, M, Rossouw, R & Saayman, A	*Africa Insight (2008)*
Grand Prix	Frairley, S, Tyler, BD, Kellett, P & D'Elia, K	*Sport Management Review (2011)*
Golf - British Open	Gelan, A	*Annals of Tourism Research (2003)*
Indy Car	Black, T & Pape, A	*Australian Accountant (1995)*
Marathons	Coleman, R & Ramchandani, G	*International Journal of Sports Marketing & Sponsorship (2010)*
	Kotze, N	*Urban Forum (2006)*
	Saayman, M & Saayman, A	*International Journal of Event and Festival Management (2012)*
Meta-analysis of 13 studies	Hudson, I	*Journal of Sport & Social Issues (2001)*

TABLE 7. **ARTICLES ON MEDIUM-SIZED SPORT EVENTS (*cont.*)**

Sport event	Authors	Journals
Motor cross, Grand Prix	Dwyer, L, Forsyth, P & Spurr, R	*Journal of Travel Research (2006b)*
Winter Games	Murphy, PE & Carmichael, BA	*Journal of Travel Research (1991)*
	Carmichael, B & Murphy, PE	*Festival Management and Event Tourism (1996)*
World Champs - Nordic Ski, Ice Hockey, Judo	Solberg, HA, Andersson, TD & Shibli, S	*Event Management (2002)*
World Champs – skiing	Andersson, T, Rustaf, A & Solberg, H	*Managing Leisure (2004)*
World Cup –Cricket	Saayman, M, Saayman, A & Du Plessis, C	*Journal of Sport & Tourism (2005)*

These smaller world cups/championships, as well as marathons are popular case studies found in literature. With the exception of the two papers on the Winter Games in British Colombia (Canada) by Carmichael and Murphy, all the research was published after 2000. It also appears that different authors are interested in assessing the economic impact of medium-sized events, compared to major events. Dwyer and Matheson and Baade contributed only one article on medium-sized events, while authors, such as Saayman and Saayman, as well as Shibli contributed three joint articles each and Gratton, Andersson and Solberg, and Carmichael and Murphy contributed two joint articles each.

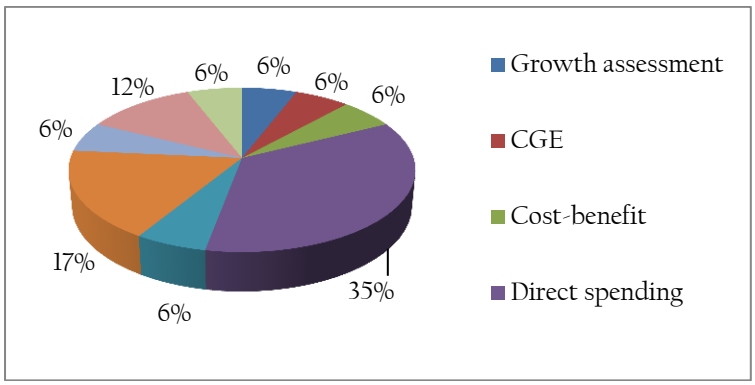

FIGURE 7. **METHODS USED IN ECONOMIC IMPACT ASSESSMENT OF MEDIUM-SIZED SPORT EVENTS**

In terms of the methods used in the assessment of the economic impact, Figure 7 shows that again wide disparities exist between major and medium-sized events. The most popular method used in the case studies is direct incremental spending, with 35% of all articles focusing on determining the extent of additional spending owing to the event. This is followed by qualitative assessment (17%), which remains popular even for medium-sized

sport events. Contrary to the methods used at major events, the use of I-O methods outnumber CGE methods by far, with SAM and I-O multipliers equalling the use of qualitative assessments at 18% of all the studies. CGE modelling and even regression analysis is used in only 6% of the studies respectively indicating that these methods are clearly more suitable for major events.

Analysis of small sport events

Table 8 provides an overview of the 18 case studies published as scholarly articles on the economic impact of small sport events.

TABLE 8. **SMALL SPORT EVENTS ARTICLES**

Sport event	Authors	Journals
11 events	Hodur, NM, Bangsund, DA, Leistritz, FL & Kaatz, J	*Tourism Economics (2006)*
2 Small mass participation events	Nogawa, H, Yamaguchi, Y & Hagi, Y	*Journal of Travel Research (1996)*
Hockey tournament	Yardley, JK, MacDonald, JH & Clarke, BD	*Journal of Park and Recreation Administration (1990)*
Sevens rugby, sailing, cycling, surfing, soccer match	Turco, DM, Swart, K, Bob, U & Moodley, V	*Journal of Sport Tourism (2003)*
National sports championship	Turco, DM & Navarro, R	*Sport Marketing Quarterly (1993)*
Baseball	Dixon, AW, Henry, M, Martinez, JM	*Journal of Issues in Intercollegiate Athletics (2013)*
College football	Baade, RA, Baumann, RW & Matheson, VA	*Journal of Sport Economics (2008b)*
Cooper River Bridge run	Daniels, MJ, Norman, WC & Henry, MS	*Annals of Tourism Research (2004)*
Football	Lee, S, Harris, J & Lyberger, M	*Event Management(2010)*
Indoor bowls, netball	Ryan, C	*Tourism Economics (1998)*
Sailing	Diakomihalis, MN & Lagos, DG	*Tourism Economics (2008)*
Soccer	Cela, A, Kowalski, C & Lankford, S	*World Leisure Journal (2006)*
Swimming	Wilson, R	*Managing Leisure (2006)*
University sport games	Walo, M, Bull, A & Breen, H	*Festival Management and Event Tourism (1996)*
Walk/Run, Tennis, Golf, Soccer, regional champs	Daniels, MJ & Norman, WC	*Journal of Sport Tourism (2003)*
	Wang, P & Irwin, RL	*Sport Marketing Quarterly (1993)*
	Hefner, FL	*Journal of Sport & Social Issues (1990)*
	Lee, M	*Journal of Convention & Event Tourism (2007)*

It is evident that a wide spectrum of sport events are considered in the research, ranging from fun runs to sailing to soccer and hockey matches. It is also often found that more than one event is covered in such an article. Contrary to the research on major and even medium-sized events, the economic impact of small events has delivered a relatively even stream of research over the past 24 years. Again, the authors are quite different, with only Matheson and Baade also contributing to research on small sport events together with major and medium-sized events. The literature is furthermore, not dominated by one or two authors, with only Turco, Daniels and Norman contributing more than one paper on the economic impact of small sport events.

In terms of the most popular methods followed in the economic impact assessment, Figure 8 indicates that direct incremental spending analysis and regional I-O modelling outscore the other methods with 22% of the articles using these methods respectively. It is evident that I-O modelling remains popular in the economic impact assessment of small events where 39% of all the papers use I-O modelling techniques. I-O modelling and its variants are also gaining momentum in the economic impact assessment of small sport events. The only other noteworthy method is the application of multipliers to direct spending estimates, many of which were taken from theory or similar studies.

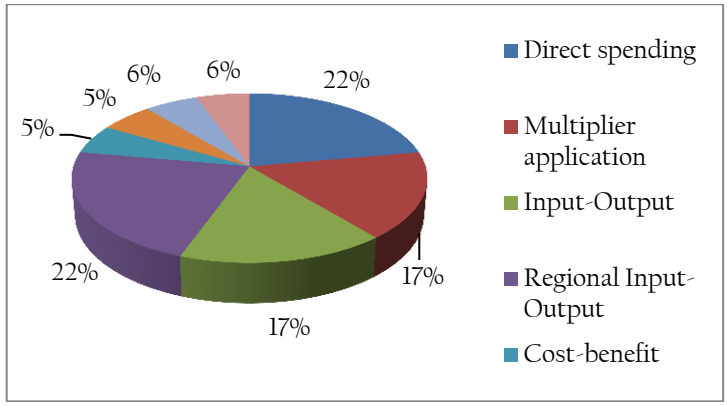

FIGURE 8. **METHODS USED IN ECONOMIC IMPACT ASSESSMENT OF SMALL SPORTS EVENTS**

Figure 8, therefore, illustrates that the methods used in the assessment of the economic impact of small sport events differ markedly from those of major and even medium-sized events. The absence of any qualitative assessment is a noteworthy omission in this line of research and the same can be said for CGE modelling. Regression analysis is also less popular, confirming the notion that methods such as CGE and regression analysis are more suited to larger sport events. Furthermore, I-O analysis remains the dominant method in small sport events and instead of losing steam (as is the case in major sport events); it is gaining momentum as regional I-O models become more readily available. However, contrary to other local impact analyses, there is little evidence that proportional multipliers, based on small-scale (partial) I-O models, are used in the analysis of the impact of small sport events on the local economy.

FINDINGS AND CONCLUSIONS

The purpose of this paper was firstly to provide an overview of the most contentious methodological considerations in measuring the economic impact of sport events, and secondly to analyse the research carried out over the past two decades (since 1990) on the economic impact of such events. Although other reviews are available, this review focused not on major events only, but also on medium and small events. In order to provide a framework for the analysis of the empirical research the classification of sport events were firstly scrutinised, and for the purposes of this review, a classification scheme was adopted based on various building blocks of sport events that take seven different metrics into account.

Based on the analysis, the following findings are evident. The published research regarding the economic impact of sport events showed a slow start since the 1990s, but most of the published studies were conducted between 2004 and 2008. The review papers also revealed a similar trend, with a significant decline being evident since 2006. The early research mainly focused on small and medium-sized events, with the rapid growth in the first decade of 2000 mainly driven by research on major events. However, the trend appears to be moving back towards smaller events.

Possible reasons for the increasing trend experienced during 2004 to 2008, firstly, include the wider access of researchers with modelling skills (CGE, I-O and regression analysis), to the data on sport events and the greater demand for this type of research. In addition, research was often used as a vehicle to test the claims made by consultants. The declining trend since 2008 might be attributed to there being a wider variety of issues that attract the attention of researchers in terms of sport events and sport tourism in general. Furthermore, the surge in publications during the early years of this century left researchers with the dilemma that it becomes more difficult to make a contribution to this line of research (a requirement for scientific publications), which can still be attained in small event research because these events differ significantly from one another. The decline in case studies available also filtered through to a decline in the number of review papers.

Secondly, the analysis showed that most of the research that was carried out was based on major events and the same applies to the number of available review studies. The surge in research found in the first decade of the 2000s can be attributed mainly to these studies. The major event studies are furthermore dominated by three events, namely the Olympic Games, the FIFA Soccer World Cup and American Football. This is understandable, given that large sums of public money are normally used to finance these events and to provide costly infrastructure in particular.

Thirdly, there has been a clear development in terms of methodology to assess the economic impact of sport events. Some of the methodological papers available are clearly an argument against the misuse of economic impact analyses by consultants. Starting with direct spending estimates and the application of multipliers, modelling methodology developed with the availability of I-O models (and especially regional I-O models), followed by CGE models that address some of the shortcomings of I-O models. Although the modelling methodology has developed substantially, it has exerted a greater impact on major and medium-sized

events, with methodological developments for small events not being influenced to the same extent. This is expected, since large-scale models are not suitable for assessing small events.

This research has made several contributions since it is a review that classified sport events in three categories (major, medium and small), based on various building blocks of sport events. Furthermore, the scientific research contributions in each of these categories were analysed. The main methodological issues encountered in economic impact studies of sport events were succinctly summarised in order to guide the reader in the method followed in the analysis of the various economic impact studies conducted for sport events. The researchers identified clear trends in the economic impacts of various sport events and methodologies used, which may assist future researchers. Besides the renewed focus of research to smaller sport events, major events again fall under scrutiny with Brazil providing a case in point. Communities in Brazil are demonstrating against the use of public funds for the development of infrastructure for the FIFA Soccer World Cup. Given that this is a country where soccer is the national sport, the economic impact is clearly not sufficient to swing the public vote. Future research may develop sufficiently to provide a more comprehensive impact that these events have on supporting communities.

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