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ASSESSING THE OLYMPIC GAMES: THE ECONOMIC IMPACT AND BEYOND

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Abstract. This study reviews the literature on the evaluation of the Olympic Games, within the broader framework of their significance as cultural assets and opportunities for endogenous growth and sustainable development of the host city. The study reviews the main approaches to the economic assessment of the Games, from the point of view of the underlying economic concepts and methodologies, as well as of the empirical results obtained. It focuses on the effects that are measured and on those, which even though important, are generally neglected. The methodologies utilized for the quantitative assessments of the Games are reviewed with special emphasis on impact and cost–benefit analysis, both on *ex ante* and *ex post* basis. The studies surveyed are analysed from the point of view of different sets of effects on the host city, and for a limited number of cases, on the host country. While the major focus is on hosting the Summer Olympics, some attention is also paid to the bidding cities, the Winter Olympics and the Paralympics. The general findings appear to be controversial with some hints of positive overall effects, but also with a well-documented tendency to exaggerate the benefits and underestimate the costs of holding the Games in the *ex ante* versus the *ex post* studies. The survey finally suggests that *ex post* cross-country econometric studies tend to catch sizable differential and persistent benefits ignored by individual studies, especially on macroeconomic and trade variables.

Keywords. Cost-benefit; Cultural goods; Economic impact; Games; Olympic; Paralympic

1. Introduction: The Olympic and Paralympic Aura

In addition to the strictly economic elements, the cities which seek the Olympic aura bring to the celebration of this global cultural event a range of natural factors (climate, landscape, the topography of the venues, the accessibility of the area) and cultural factors (pre-existing historical and archaeological sites, local traditions in art and culture, social behaviour). The quality of social life, but also the combination, which is harder to define, of the human resources necessary to spark off a sustained, self-standing and lasting process of growth, depend on this set of factors, on which in practice, the cities which compete to host the Olympics, base the fundamental aspects of their candidature as a cultural proposal.

Although the Olympics stand as a quintessential global public good, the candidature of the host cities depends on a further, not less important local aspect. This aspect concerns the organization of the Games as a cultural event by the local institutions and private individuals, and should be seen as a projection

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of the sense of belonging, the need for social identity on the part of a community, fragmented in the functional and spatial divisions of a complex society. In our days too, culturally speaking, the Games are first consumed from the point of view of people's own culture cognitive roots and only secondarily as participation in the myths of sport as a global form of popular religion (Rizzotti, 2015). Furthermore, the local context today is the place in which there are the greatest opportunities of rebuilding the Olympics as an instrument of cultural policy to associate with the integral development of the community.

The cultural assets which are produced and consumed under the umbrella of the Olympic Games, whether they belong to the tangible sphere (like sports facilities or infrastructures) or the intangible sphere (like the ceremonies and performances) thus have an important status in terms of civilized living, cooperation and social inclusion. This anthropological observation, however, is often obscured by the shadows of the positivist tradition developed in the second half of the last century, which continues to generate sceptical comments on the usefulness of the Olympics, as that of other cultural assets. These comments may serve to suggest caution regarding excessive enthusiasm and may improve the efficiency of these events. However, they should not obscure the fact that culture, contrary to what this tradition and the same comments imply, is one of the critical instruments of economic development. In the broader framework of culture, by offering the opportunity of providing local roots for a global event, the Olympics constitute an exceptional development option for the area which hosts them.

Shoval (2012) divides the history of mega-events such as the Olympic Games into four periods. During the first two, respectively from 1851 to 1939 and from 1948 to 1984, there was the rise and subsequent fall of the World's Fair company, the most important mega-event organizers. The feature of the third phase, which began with the Los Angeles Olympic Games in 1984 and ended in 2000 with the Sydney Games, was the entry of TV companies and private enterprises into the organization and management of the event. The fourth phase, on-going at present, considers a fresh vision of the Olympics in which the Games are to be seen as a cultural heritage for the future: their aim is to promote sustainable long-term growth while the basic principle of keeping costs down remains unaltered. In most of their history, despite their reputation of lavish expenditures, with a few exceptions (Beijing, Sochi and, to a lesser extent, London 2012), the costs of the Olympics have remained below \$10 billion, even though broadcast rights have risen from a few hundred million to just about \$3 billion. As shown by Preuss (2004), contrary to public perception, in every Olympics since 1972 the local Organizing Committee for the Olympic Games (OCOG) has ended up with an operational surplus. Cost overruns and other financial troubles have exclusively concerned infrastructure costs, which in most cases could not be imputed only to the three-week Olympic event. A new management style recommended by the International Olympic Committee, and aimed at broadening the set of cities bidding to host the event, however, further emphasizes financial sustainability, the building of temporary rather than permanent venues and generally more attention to local resources and commitments.

On another note, the Olympics have also experienced an accelerated increase since the 1960 Games in Rome, which saw the participation of about 6,000 athletes, almost all men (women were only slightly more than 600). Gender catch up (with an increase of more than 4,000 number of women) explains almost all the raise of the number of participants, which constantly exceeded 10,000 athletes since the 1999 Games in Atlanta. Participation rates (ratio between tickets issued and sold), on the other hand, went first down from more than 80% in the 1960s to about 72% in Athens 2004, and then soared to practically 100% in Beijing 2008 and London 2012.

This paper aims to review the methodological bases and the empirical findings of the economic literature on the Olympic Games. Although it is based on a wide sample of recent studies, its objective is not to survey the vast amount of literature existing on the subject of the effects of the Olympic Games and of the so-called Mega-Sport Events. Rather, the study aims to survey the more economically oriented and empirical analyses of the Olympics, as opportunities for value creation and as concerted efforts to organize locally an important event of global significance. To this aim, the paper focuses on three main topics: (1) the identification of the values attributable to Olympic Games; (2) the quantification methods

applied for estimating the effects due to Olympic Games event; and (3) the economic valuation of these effects. Even though our main attention is devoted to the Summer Games, we also consider a few studies on the Winter Games, a less glamorous event, which nevertheless shares several features of the Olympics as a major local and global affair. We also pay some attention to the Paralympic Games, an extension of the original concept of the Olympics, which has proven to be both in line with the Olympic spirit and a major success in terms of inclusiveness and popularity of the Games. While part of the literature surveyed concerns broadly the effects of the Games both on the hosting city and country, the study attempts to clearly separate the two effects in the few cases where the estimates for both have been provided. In some cases, which are especially relevant for more recent econometric studies, also effects on bidding countries are reported because they are of clear relevance also for a better appraisal of the impact on the host countries.

The paper is organized as follows. In the second section we analyse the Games as a cultural activity and their non-use values, mainly linked to their intangible legacy. In the third section, we present a survey of the most significant literature on the negative and positive component of the impact attributable to Olympic Games. The fourth section contains an overview of the economic evaluations of the effects of the Games on the host country, with the aim of providing a picture of the methodology adopted for these assessments and of the effects themselves. The fifth section adds a brief note on the Paralympic games and the sixth section presents our conclusions.

2. The Value of Olympic Games

What is the value of the Olympics as a cultural activity? The apparent incorporeal nature of cultural production contributes to the confusion on this subject. The 'existence' value of the Games, that is to say the benefit that the community gains from the event, essentially depends on the fact that the Olympics are a historical reality which reproduces itself in the form of myths and narratives (Slater, 2013), regarding sport like a secular form of popular religion. These stories do not necessarily breed knowledge, at least not in the sense of the rational accumulation of voluntary information, even though they can stimulate the practice of the arts (for example, sculpture at the time of the Greeks, literature and the films created by Olympic events in more recent times). Without claiming to state a definition of their artistic value, perhaps some of their essential characteristics may be captured by looking at their economic qualities. From this point of view, the Olympics, like other cultural goods, are an asset, which can be enjoyed and accumulated in a particular manner, but they are also a public, local and global good.

But why should the Olympics, which, after all, would appear to be an autonomous activity, destined to turn in on itself, have a part to play in the economic growth of a territory? The implicit idea is that even if this activity does not create tangible products directly, except ephemerally (i.e. as financial experts say, even if it has no fundamentals), it generates external effects which influence the productivity of tangible goods. These effects, which artists, men and women of letters and intellectuals produce indirectly, unintentionally and often disinterestedly, are also inspired by sport as one of the great collective myths. They consist in some key qualities, which are essential for civilized living and for the production of civilization itself: trust, freedom, justice, fair play, the sense of an individual and collective identity and, in the last analysis, the capacity to progress and be happy without letting oneself be swept away by egoism and anomie.

Perhaps in reality, but certainly in the collective imagination, the Games are a unique opportunity for economic growth for areas with the capacity to put themselves on the map as landmarks for the culture of sport and great global events. The benefit expected from their celebration in a particular place is a challenge to their qualities as a cultural asset and, especially, to their public nature. The Games are also a relational asset, in the sense that they cannot be enjoyed outside a social context, which is the only vantage point from which their capacity to surprise and gratify can be perceived. At the same time they

are not a voluntary asset; they can only flourish under favourable conditions, namely, if they involve with a sufficient intensity those who are engaged in producing or consuming them, either separately or simultaneously.

The Olympics are also eminently a local public good. They satisfy a need felt by the entire population and are staged thanks to the entire population's production capacity, and they emerge from a specific framework of relationships and institutions and cannot be celebrated in the absence of specific historical ingredients that bind them to the local scene. The Games are a source of identity, and as such, they distinguish one community from the other and are consequently a mark of the success of its territorial base in the economic competition, attracting residents and visitors to enjoy its friendly welcome and admire its qualities. The 'legacy' of the Games, therefore, may go much beyond the production of entertainment and the enhancing of local infrastructure. At the same time, the study of their economic impact may produce valuable material for decision making, but also, perhaps more interestingly, some understanding of the maze of positive externalities and subtle changes in incentives and cultural beliefs needed for economic and social flourishing.

3. The Impact of the Games: Positive and Negative Effects

Hosting the Olympic Games always leaves a lasting imprint on the host city or region and its inhabitants. For example, the Games can transform the host city's aspect by leaving it with a legacy of new infrastructures, refurbished existing structures and the facilities that have been built for the Games themselves. According to Furrer (2002), hosting the Olympics cannot be considered as solely positive or negative, but always has mixed outcomes. Organizing the Games may have a number of different benefits and costs on the host city or region, which may derive from physical, economic, environmental, social, cultural, psychological and political effects. Some of these benefits and costs can be identified and measured because they correspond to 'tangible' effects (for example, increases in incomes, employment, etc.). Other effects are intangible, but correspond to well-defined economic variables, such as various forms of externalities (for example, overcrowding, pollution). Yet other effects are both intangible and ill defined, such as, for example, the so-called 'Olympic Aura' and its associated increases in pride, prestige and even happiness.

The following types of benefits and costs have been identified (for a summary see tables 1 and 2):

1. 'Intangible' economic benefits. The most widely publicized economic benefit comes from hosting the Games and from the prestige of putting the city, which organizes them, 'on the map'. The report commissioned by the Government of New South Wales (NSW) finds that the Sydney 2000 Games also acted as a magnet for domestic and international tourism and accelerated the process of the enhancement of Australia's international profile and brand (PriceWaterhouseCoopers, 2002). A set of positive externalities are thus associated with the growth-catalytic nature of the Games and the fiduciary nature of investment, whereby the successful organization of a major event creates confidence in the city, stimulating subsequent investment (Metropolis Commission, 2002). In this respect, Morphet (1996) has argued that the role of the media is vital in terms of creating awareness of the host city or region. Ritchie and Smith's (1991) five-year study of the image of Calgary before and after the 1988 Winter Olympic Games, revealed that the Games had a dramatic impact on the levels of awareness and knowledge of the city of Calgary in Europe and the United States when compared to other Canadian cities. Similarly, in 1996, during the 17 days of the Centennial Olympic Games, it has been reported that two million people visited Atlanta and 3.5 billion people saw the city on worldwide television coverage in 214 countries and territories, and, as a result, the tourist industry of the region increased dramatically (Stevens and Bevant, 1999).
2. 'Tangible' economic effects. First, the Olympic Games bring to the host city a contribution from the International Olympic Committee (for the summer games over 1 billion dollars), to cover the

Table 1. Potential Impacts of the Olympic Games

	Positive	Negative
Economic impacts	<ul style="list-style-type: none"> • Increase in economic activities • Job creation • Increase in labour supply • Rise in living standards • Rise in income 	<ul style="list-style-type: none"> • High costs of staging the event (costs of opening ceremony, security, construction of mega-facilities, etc.) • Increase in local authority debt • Tax increases • Possibility of better alternative investments • Insufficient capital and poor estimate of the costs of event
Physical and environmental impacts	<ul style="list-style-type: none"> • Construction of new facilities • Recovery of degraded areas • Improvement in local infrastructures • Preservation of the heritage • Promotion of the environment • Spin-off for sport • Diffusion of less polluting manufacturing and social standards 	<ul style="list-style-type: none"> • Environmental damage • Overcrowding • Architectural pollution • Unused or underused facilities • Destruction of the heritage • Gentrification process
Sociocultural impacts	<ul style="list-style-type: none"> • Permanent increase in the degree of interest and local participation in the types of activities associated with the event • Increase in the host community's capacities and its ability to organize, plan and implement projects • Making the practice of sport more widespread among all strata of the host population • Diffusion of the Olympic message and values among young 	<ul style="list-style-type: none"> • Marketing activities which may be personal or private • Potential increase in crime • Social displacement
Psychological impacts	<ul style="list-style-type: none"> • Increase in local pride and community spirit • Greater awareness of visitors' perceptions • Joyous and relaxed atmosphere during the event 	<ul style="list-style-type: none"> • Tendency to adopt defensive attitudes with regard to the host region • Hostility
Political impacts	<ul style="list-style-type: none"> • Enhanced international recognizability of the host country and city • Development of planners' skills • Increase in public-private partnerships 	<ul style="list-style-type: none"> • Distortion of the true nature of the event to reflect the values of an elite • Impossibility of attaining objectives • Increase in administrative costs • Use of the event to justify unpopular decisions • Corruption • Failure to cover costs

Source: Open Economics & CEIS-Tor Vergata (2016).

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Table 2. Positive Legacies and Negative Induced Effects of Staging the Olympic Games

	Positive	Negative (as induced effects)
Tangible effects	<ul style="list-style-type: none"> • Philanthropic donations • Participation in sport • New venues for events • Urban regeneration • Extra jobs • A new start-up of businesses • Infrastructures for general use • Increase in tourism • Better environmental conditions 	<ul style="list-style-type: none"> • Unnecessary facilities • Increase in public debt • Temporary nature of extra jobs and economic activities • Tax increases
Intangible effects	<ul style="list-style-type: none"> • Marketing the host city • International reputation • Experience and know-how • Image, identity • Love of country • Opportunities for local businesses • Renewal of community spirit • Production ideas • Production of cultural values • Popular memory • Education • Greater civic sense 	<ul style="list-style-type: none"> • Bad image • Social injustices • Loss of other investment opportunities • Over-crowding

Source: Open Economics & CEIS-Tor Vergata (2016).

operating costs of the event. This boost in expenditure attracts other public or private investment, which, in its turn, may enable the city to improve the standards of its plants and infrastructures. In macroeconomic terms, the Games are an attempt by the host city or region to draw investment or set up new trade relations. The Games can create, then, new jobs and contribute to the economic growth of the city or region (Essex and Chalkley, 1998; State of Utah, 2000; Ference Weicker & Co 2002; Avison Young, 2003). On this basis, the bulk of the literature draws attention to the effects of the event-related job creation on the unemployment rates of the host region (Miguelez and Carrasquer, 1995). It also considers the effects of the visiting spectators and the media-related advertisement on the tourism industry of the host city or region (Hughes, 1993; Kang and Perdue, 1994; Kemp, 2002; Tudge, 2003) as well as the impact of the event on the social standards of the host community (Eitzen, 1996; Lenskyj, 2000). The Olympics can also generate large number of jobs, not only those directly associated with the organization of the event itself but also those in the tourism and retail industry due to the increased volumes of spectators/tourists, and in the construction industry especially when the staging of the event requires major infrastructural development. For example, in Atlanta, the host city of the 1996 Olympic Games, an investment of \$2 billion was made in Olympic-related projects between 1990 and 1997 with a large number of new jobs created in the same period and a cumulative economic impact of \$5.1 billion (Stevens and Bevan, 1999). Barcelona, the host city of the 1992 Olympic Games, had a similar experience, when, from October 1986 to July 1992, the general rate of unemployment fell from 18.4% to 9.6% (Brunet, 1995).

3. Infrastructural and urban regeneration benefits. Olympic cities undergo long-term transformations, such as the construction or requalification of sports facilities and multifunctional arenas, of transport systems and other infrastructures (water supply, energy supply and distribution, etc.). All these developments, together with additional hotel facilities, not only cause considerable improvements in the daily life of the host city's inhabitants but are also a valuable legacy for local, regional and national tourism, raising the standards of infrastructures to a level compatible with international tourism (Essex and Chalkley, 1999, pp. 196–197). In some cases, the Games have helped to take the opportunity to regenerate vast degraded areas (see as example the Games hosted in Barcelona 1992, Athens 2004 and Sydney 2000). Chalip (2006) believes that great sport events improve tourism infrastructures such as parks, jogging areas, sport equipment, public transportation, highways, tourist attractions and air ports and also infrastructure not directly related to the event. Consequently, it has become increasingly common for mega-sporting events to be used as a trigger for large-scale urban improvement (Kitchen, 1996).
4. Social benefits. The Games can provide a unique opportunity to exploit and improve the host community's organizational, planning and execution capacity and ability. For example, the enterprises in the sector enhanced their innovation capacity after playing their part in designing state-of-the-art facilities and services for the Sydney 2000 Games and over 100,000 persons were given expert training (Roper, 2002). The Games are also a chance to enhance and diffuse the practice of sports in the host population and to foster education in sport and Olympic values among the host country's youth. Some studies have suggested that the Olympics help spread values such as respect, tolerance, fair play, balance between body and mind and the pursuit of excellence (Furrer, 2002). Other studies have shown that staging Olympic Games has long-term beneficial social consequences on the host city and region (Gratton and Dobson, 1999) including strengthening local values and traditions (Hall, 1992), generating patriotism and cultivating a sense of community belonging (Wait, 2003). Jarvis (1995) reported that positive social impacts such as feelings of excitement, national pride and a sense of community belonging develop in the host region. This set the foundations for positive interactions between guests and residents, with a consequent increase in the location's viability as a tourism destination. Bull and Lovell (2007) identified social benefits from improved communication and collaboration within the community. Hooper (2001) has argued that increased sport participation provides a sense of well-being through fun and enjoyment, leading to self-fulfilment and achievement, and encourages social interaction and cohesion for those who may feel socially excluded. The London 2012 Olympics as evidence of social benefits across the UK, suggest that the Olympics could be instrumental in supporting the wider regeneration policies. These include the empowerment of disadvantaged groups through employment opportunities, improved employment prospects through experience obtained before and during the Olympics, increased social integration and cooperation through the development of local enterprises and other projects focused on the Olympics, decrease in crime rates, access to education and general welfare and the location (Eftec, 2005). Cultural events during Olympic Games generate global interest and contribute to the image of the host city (Humphreys and Plummer, 1993) while promoting accessibility and inclusion for diverse cultural groups. The Olympic Games place the host city on the global stage and the international media attention for the duration of the event can transmit this image to the world (Hall, 1987). Therefore, the organization of the Games presents a unique opportunity to spread the practice of sports alongside promoting Olympic values and education among the host country with principles such as respect, tolerance, participation, fair-play and solidarity (Frey *et al.*, 2007). A Cultural Olympiad linked to the Sydney 2000 Olympics brought about a 30% increase in visitor participation in cultural activities (Purnell, 2007). It has been also shown that cultural events have the potential to generate a vast amount of tourism when they cater to out-of-region visitors, grants or sponsorships (Getz, 1999). However, it is important that these events are local community rather than tourist oriented to provide an opportunity for celebration of local identity and community empowerment (Raj, 2003).

5. Psychological benefits. Many studies have shown that hosting the Olympic Games can create a sense of enthusiasm and pride among the local inhabitants, giving the impression of a community and of unity, which may even transcend social and ideological divides (Waitt e Furrer, 1999). The London East Research Institute (2009) argues that many cases show a deep connection between hosting major sporting events and community mental health, including self-esteem, confidence and well-being (DCMS Games Impact Study, 2009). Atkinson *et al.* (2008) stated the social effects on the host city of the Olympic Games for the community members might include health benefits, mental health, social skills and capital. The Olympics can strengthen regional traditions and values, and increase local pride and community spirit (Essex and Chalkley, 1999). For example, Truno (1995) found evidence of increased civic pride during the Barcelona 1992 Olympics and remarked that 'the citizens have turned the city's streets into the world's largest stadium'. This was also boosted by media coverage, which was presenting Catalans as among the most celebrative people in Europe (De Guevara, Collier and Romani, 1995).
6. Environmental benefits. The Games certainly have a lasting environmental impact on the host city. By their very nature, the Games entail new building and further pressure on the environment because of more traffic, higher water consumption and an increase in the production of waste. In spite of this, they may lead to environmental benefits such as new standards in the construction industry, the use of renewable sources of energy, cleaner technology innovations, improvements in the management of drinking and wastewater, new waste management systems and environmental education schemes. Chalkley (1999) noted that before 1994 there was not much attention to the environment topics. In 1994, the IOC (International Olympic Committee) and UNEP (United Nations Environment Programme) began to pay more attention at the concept of sustainable development. The same year, the Lillehammer Games in Norway were named as the first green competition. Thus, environmental issues, along with sport and culture were named as the third pillar of the Olympic Charter.
7. Political benefits. Favourable impacts at political level have been reported, for example, in South Korea, where the Seoul 1998 Olympics launched the country on the international stage and improved its position among the Asian tigers (Metropolis Commission, 2002). The Games may also be a good thing at the level of local politics, for example, by fostering new forms of public-private partnerships to complete wide-ranging projects or speed up public investment decisions. In Athens, valuable forms of cooperation were realized among public authorities and between these and the private sector. The latest management practices can also spread to the various public bodies thus making them more efficient (Furrer, 2002).

These benefits, however, must not obscure the risks and the costs associated with the nature of the Olympics as a partly unpredictable happening. Regarding this aspect, Preuss (1998) analysed the main arguments submitted by convinced opponents of the Games in a work based on documents and interviews of economics experts, with special regard to the Games hosted in Athens (2004), Sidney (2000), Atlanta (1996) and Barcelona (1992). These arguments, which are all of economic nature, can be listed as follows. (1) The risk of the host city incurring too much debt. (2) Not investing the funds allocated to put on the Games in other projects, which would be more effective in social terms. (3) The inequitable distribution of the benefits from the Games almost exclusively favour the wealthiest classes. (4) The precarious nature of the jobs created. (5) The increase in the cost of living and rents in the host city.

Preuss tries to answer these arguments considering the effects of the Games hosted in Munich, Montreal, Los Angeles, Seoul, Barcelona and Atlanta in the period from 1972 to 1996. He proposes the following point-by-point response. (1) The Olympic Games may leave the city in excessive debt if the sports facilities and transport infrastructures necessary for the Games to take place are almost non-existent and if there is no demand for such services on the inhabitants 'part'. (2) The money spent on the Games could be put to a better use by funding projects more responsive to social needs, only for the resources that would be available in the absence of the Games. (3) The Games are to the benefit of the whole population, in terms

of new jobs and income increase. Nevertheless, they may give rise to a process of gentrification, which favours the wealthiest classes more than others. (4) The Olympics create many short-term jobs and in some sectors create the conditions which stimulate permanent employment. (5) There is no evidence that the Games give rise to a lasting increase in the cost of living and rents.

The author's analysis leads him, therefore, to claim that the criticisms put forward are often not expressed carefully and could be the result of the lack of a sufficient grasp of economics. However, the supporters of the Games have their own biases, since they tend to have too little knowledge of the events that have taken place previously, and their forecasts tend to be too optimistic. Consequently, the arguments by the opponents must be taken into consideration, if they are expressed robustly and seem plausible, because the cities selected are not always suitable to host the Games.

Taking into account also Furrer's (2002) study, the main possible unfavourable effects of the Olympic Games on the host city and its inhabitants could be identified in the following:

1. Overbuilding. This is the case of the so-called 'white elephants', a term describing the plants, and facilities (including Olympic villages and hotels) of excessive size planned to deal with the 'Olympic queues' and ticket sales. White elephants may arise from ambitious designs by architects and city planners. They may be too large and costly to maintain to harmonize with a long-term urban planning policy and meet the local inhabitants' needs with regard to cultural and leisure facilities (for example, the Australia stadium and the SuperDome for the Sydney 2000 Games and the stadiums for the 2002 FIFA World Cup Korea-Japan).
2. Negative social implications. In many instances, an Olympic Games preparation is 'fast-tracked' with only limited public consultation and an incomplete evaluation of the social implications (Hall, 1992). It has also been noted that heightened interurban competition can produce socially wasteful investments, which exacerbate rather than ameliorate urban problems (Harvey, 1989). Therefore, there is a need for a greater understanding of social impacts (Chalip, 2007). Understanding such impacts is important in the planning, management and subsequent legacy of major sport events also ensuring stakeholder support (Hardy and Beeton, 2001). Previous research has described the Olympic Games as a self-serving commercial circus of property developers, construction companies, equipment suppliers and commercial sponsors whose benefits do not necessarily extend to the local communities (Keating, 1991). Burgan and Mules (1992) and Gelen (2003) reported that there were increases in crime rates and vandalism as a result of event-related evictions and relocation of businesses. Gibson (1998) suggested that the perceived inconvenience associated with event-related construction in the years leading up to the event negatively influences tourism activity. It has been also shown that event-related construction, improvement of transport infrastructure and urban renewal causes inconvenience to the residents of an Olympic city (Cashman, 2002) and that the increases on the price of land and housing rentals in and around an Olympic city are perceived negatively by local residents (Collins, 1999).
3. Inequitable distribution of benefits. The challenge for public authorities and those who implement town plans is to avoid that the positive effects of the Games mainly benefit the well-off classes. The findings of the various urban planning studies suggest that cities with growing inequalities suffer from an increase in the marginalization of social groups and the crime rate. The issue of the equitable distribution of the benefits of the Games is thus an important one, which has remained largely unresolved. Many observers have warned of the risk of an increase in inequalities between the different strata of society or the different geographic areas of the city. This potential negative influence may often be seen in relation to various factors such as the spatial concentration of the new Olympic facilities and infrastructures in specific areas of the host city; the gentrification processes, and increase in public debt (which may have a serious influence on future public investment in various services). When state and federal governments contribute to the staging of a mega-sporting event, they inevitably make use of public money. Although one could claim that tax money can be

used for projects upon which an elected government decides, when an event creates public debts, citizens are unfairly taxed to pay off these debts (Lenskyj, 2000). Nagano, for example, the host city of the 1998 Winter Olympic Games, faced severe financial consequences for hosting such a big event and taxpayers suffered debts of up to £20,000 per household to balance the city's books (Essex and Chalkley, 1998). Moreover, the economic growth generated from such events may make the life of low-income residents more difficult. Even though Preuss (2000) disputes the empirical evidence on these effects, Hall and Hodges (1998), for example, emphasize the fact that a mega-sporting event may have a negative impact on the house market and land values. They claim that the building of event-related infrastructure can involve housing relocation because of the compulsory purchase of land for clearance and building, and it can also lead to a rise in rents and house prices. A case in point was reported by the task force investigating the social impact of the 1996 Atlanta Games, whereby 15,000 residents were evicted from public housing projects which were demolished to make way for Olympic accommodation. Consequently, mega-sporting events, such as the Olympics, could serve to exacerbate social problems and deepen existing divides among residents (Ruthheiser, 2000). A final negative factor may be lack of consultations with the local communities, which are denied participation in decisions affecting their future. The Metropolis study of the impact of large-scale events emphasizes the risk of the centre of the host city monopolizing the profits from the event, with little or no benefits for the other localities in the conurbation or region (Metropolis Commission, 2002).

4. Private interests. The consequence of seeing the Games as a business may lead to lack of public involvement and community consultation in planning major projects. Many observers have tried to show that the anti-democratic procedures of the agencies responsible for planning big events may make them subservient to the interests of private capital. In her study of the Sydney 2000 Olympic Games, in which she tried to assess the impact of the Games on certain areas of the city, Owen pinpointed some features of this 'local Olympics entrepreneurialism'. These include 'increased centralization of planning powers; increased privatization of government operations; the relaxation of normal planning requirements; reduced or tokenistic community consultation; subversion of democratic principles; and reduced public accountability' (Owen, 2001, p. 6). Hall (1987) suggests that the decisions affecting the hosting of a mega-event grow out of a political process which not only involves the interests of political authorities, but also those of private, profit-oriented organizations. The NSW government in Australia, for instance, which was heavily involved in the organization of the Sydney 2000 Olympics, has adopted more entrepreneurial-driven forms of governance, since a broad range of non-government, often private, organizations were incorporated into the NSW Government's decision-making and policy formulation process (Dunn and McGuirk, 1999). Therefore, under the new urban politics imperatives, a decision to bid for mega-events, such as the Olympics, is not solely made by local or regional governments, but often involves business corporations (Essex and Chalkley, 1998). In that sense, mega-sporting events are often credited with mobilizing corporate elites and local politicians in profitable alliances that not only can boost local construction and retail and tourist industries but can also generate substantial infrastructure funding from higher levels of government. The practices of such alliances, which are termed by Lenskyj (2000) as 'Politics of Place', usually involve campaigns to persuade the citizens of the host city that the event will transform their hometown into a 'world-class' city, thus justifying the use of tax money. However, Eitzen (1996) through his analysis of Toronto's bid for the 2008 Olympics, has claimed that taxpayers disproportionately bear the burden when they give consent for the use of tax money for the staging of mega-sporting events.
5. Environmental impacts. Miller (2002) noted that the increase in the number of people (overcrowding) during the Games leads to an increase in demand for infrastructure and services. Moreover, demand for housing, water, energy and transport increases and more waste is generated during the Games. Finally, there is an increase in air, water and soil pollution. Miller also noted that the

responses for pressures during the Games have included the use of public transportation, bicycles and walking. For example, in Munich, a 20-km extension of the subway was made for better public transportation and in Los Angeles 1984, a new 20-bus transit station was built for easy access. Although the staging of a mega-sporting event, which includes also the building of new sport facilities, accommodation and new infrastructures, can contribute to the urban improvement of the host city or region, attention should be placed on the processes involved for accomplishing major construction projects. As Lenskyj (2000) points out, the set deadline for the construction of venues and the completion of infrastructure supports are often used by local politicians as the excuse for major constructions to bypass the usual stages in urban development applications, including social and environmental assessment, public hearings and so on. For the Athens 2004 Games, the decision about the construction of the rowing centre for the Games at the Marathonas Lake was criticized for lacking adequate environmental analysis. It has been claimed that the project will undermine the natural resources of the waterland and cause collateral damage in the area (Mberi, 2001). The staging of a mega-sporting event may pose additional environmental problems, related to the construction of temporary structures for the needs of the event. At the Atlanta Games, for instance, four sports were hosted in temporary facilities which had to be demolished after the Games because of their limited usefulness to the local community (Lenskyj, 2000). In this case, the practices of disposing of such material, which cannot be recycled, fail to qualify as ecologically sustainable development. Finally, when infrastructure projects speed up, other public works can be delayed or displaced. Moreover, when a large proportion of state funds are channelled into one metropolitan area, this often results in fewer infrastructure projects in suburban areas and in other regions (Ruthheiser, 2000). The choice for such projects is usually a political one, since the cost of the often extensive event-related infrastructure is primarily covered by local governments (Preuss, 2000). This, in turn, stresses the role of governments and the subsequent politics involved in hosting a mega-sporting event (Malfas *et al.*, 2004).

4. Review of the Literature on the Assessment of the Impact of the Olympic Games

This section reviews some of the studies on the economic impact of the Games for the host country, with the aim of providing a picture of the methodologies adopted for these assessments and of the effects estimated. These studies are distinct from cost–benefit evaluations, since they are limited to simulating the effects of the Games on various economic variables, such as employment and GDP, but do not attempt to evaluate the final effects on the well-being of the country through one or more summary indicators. Studies that assess the economic impact of Olympic events may be classified under two headings: *ex ante* studies (preceding the event) and *ex post* studies (following the event) (for a summary see table 3).

4.1 Ex Ante Impact Studies

Ex ante impact studies focus on the infrastructure costs that have to be incurred during the years preceding the Olympics, on an estimate of the number of visitors expected and the number of days of stay and expenditure of each visitor during the event (Matheson, 2006). These studies use two main methodological approaches: (1) the input–output (I-O) method, and (2) the Computable General Equilibrium (CGE) models. Some studies use aggregate multipliers, taken or extrapolated from other studies. *Ad hoc* models are also found among the less common *ex ante* methodologies (for example, Chen, 2008a).

I-O Methods. Introduced by Wassily Leontief in 1941, the I-O method was widely used in economic studies from the start (Blake, 2005). The classic I-O models are based on sectoral interdependence tables and do not incorporate behavioural functions. These models are simple and efficient in terms of implementation costs, but are useful only in assessing the consequences of increased demand on

Table 3. Main Valuation Methods Used to Assess the Effects of the Olympics

Impact Analyses: <i>Input Output (I-O)</i> , <i>Social Accounting Matrices (SAM)</i> and <i>Computable General Equilibrium (CGE) Models</i>		
<i>Ex Ante Studies</i>		
Characteristics	Description of the analyses surveyed	Empirical results
<ul style="list-style-type: none"> • I-O Models have a simple structure and easy to implement, useful in assessing the impacts on industry caused by variations in the demand • They do not account for behaviour and supply constraints and tend to overestimate the impact of the event • SAM are more complex, as they include all the income formation circuit and the main stakeholders of the economy • CGE are even more complex and difficult to implement. They consider both demand and supply, and technical and behavioural relations • Their results depend on macroeconomic closure rules (choice of endogenous and exogenous variables and the identification and quantification of the shocks) 	<ul style="list-style-type: none"> • These studies focus on the impact of the expenditure for infrastructure, and additional demand from the visitors expected and the local population as a consequence of the event • They generally conclude that staging sports events have favourable effects on public budgets and on the national and regional economies • The economic effects may be estimated in terms of growth in employment and/or GDP • A recent analysis (Open Economics and CEIS, 2016) suggests that holding the Olympic Games in Rome in 2024 would be a positive economic event, both in terms of cost-benefit balance and, more generally, owing to the favourable effects it would have on the local and the national economy in the short and long term. These positive effects extend to increases in aggregate (GDP), business' and households' incomes, public finances and employment • Some studies use multipliers taken from other cases or estimated <i>ad hoc</i>. They are thus disconnected from specific I-O, SAM or CGE models and are generally unreliable 	<ul style="list-style-type: none"> • Percentage change of real GDP 0.15% (Aus) (New South Wales Treasury, 1997 – Impact of 2000 Sydney Olympics) • The total economic impact in terms of: (a) GDP 5.1 US\$ billion and (b) 77,000 new jobs for the 1996 Atlanta Olympics (Humphreys and Plummer, 1995) • The total economic impact in terms of: (a) GDP 6.3 US\$ billion and (b) 100,000 new jobs for the 2000 Sydney Olympics (Arthur Andersen, 1999) • The total economic impact in terms of: (a) GDP 10.7 US\$ billion and (b) 244,000 new jobs for the 2010 Vancouver Olympic and Paralympic Games (InterVISTAS Consulting, 2002) • The total economic impact in terms of: (a) GDP 5.3 US\$ billion and (b) 69,578 new jobs for the Washington-Baltimore bid, 2012 (Fuller and Clinch, 2000) • The economic impact in terms of GDP: 4.3US\$ billion for the Houston bid, 2012 (Airoola and Craig, 2000) • Total economic impact estimates in terms of GDP range from 2.3 US \$ billion (Los Angeles, 1984) to 13.2 US \$ billion (Beijing, 2008), with a GDP percentage impact of 0.47% in the year of the Olympics (PricewaterhouseCoopers, 2004) • Overall positive net impact: 0.01% increase in GDP over 2005–2016; 0.004% change in welfare (equivalent variation) (Blake, 2005 – Impact of 2012 London Olympics) • An overall increase of about 1.2M jobs for the UK over 2006–2012, of which 240,000 are in London, and a further 1.8M jobs over 2012–2021, of which 440,000 are in London (Cambridge Econometrics, 2007 – Impact of 2012 London Olympics) • Expected annual GDP growth of 0.8% from 2004 to 2008 (Ralston, 2008)

(Continued)

Table 3. Continued

Impact Analyses: Input Output (I-O), Social Accounting Matrices (SAM) and Computable General Equilibrium (CGE) Models		
Ex Ante Studies		
Characteristics	Description of the analyses surveyed	Empirical results
		<ul style="list-style-type: none">• The economic assessment of the Impact of Rome 2024 Olympic and Paralympic Games, based on SAM estimates shows an overall increase of about 9117 permanent jobs and an annual average increase of GDP in the Lazio Region of around 0.4% (Open Economics and CEIS, 2016) in the period 2018–2025
Ex Post Studies		
	<ul style="list-style-type: none">• Giesecke and Madden (2007, 2011) use a CGE model to estimate the impact of the 2000 Sydney Games trying to eliminate potential benefit overestimation factors (for example, by not including public inputs among costs, overestimating tourist demand from abroad and assuming elastic factor supply)• Madden (2006) use a dynamic CGE model to estimate the economic impact of 2000 Sydney Games. The results are very sensitive to degree of slackness of labour market and the size of export demand shock• Li <i>et al.</i> (2011) use a static CGE model to estimate the economic impact of 2008 Beijing Games	<ul style="list-style-type: none">• A loss of 2.1 billion dollars in Australia's public and private consumption in terms of net present value (Giesecke and Madden, 2007)• An increase of real GDP about 1.83% and an increase of employment about 1.77% over the period 1994–2006 (Madden, 2006)• Long-term economic effects are small (Li <i>et al.</i>, 2011)

(Continued)

Table 3. Continued

Cost–Benefit Analysis		
Ex Ante Studies		
Characteristics	Description of the analyses surveyed	Empirical results
<ul style="list-style-type: none">• Cost–Benefit Analysis aims to quantify and express in a common numeraire, and in money terms, positive effects (benefits) and negative effects (costs)• It presents the final value of the project in terms of NPV (Net Present Value)• It tries to consider economic, social, environmental and intangible effects (including the legacy of the Games)	<ul style="list-style-type: none">• To evaluate the Economic Net Present Value (ENPV) to staging the Olympic Games in Rome 2024, an <i>ex ante</i> cost–benefit analysis considers three scenarios: base scenario (more probable); pessimistic scenario (worst); optimistic scenario (best) (Open Economics and CEIS, 2016)• A study (Mc Hugh, 2006) provides an approximation of the true costs and benefits of the 2010 Vancouver Winter Games from a CBA perspective.	<ul style="list-style-type: none">• The ENPV and the Economic Internal Rate of Return (EIRR) are positive in all the three scenarios. In particular, in the base scenario of 2017 they amount to an Economic Net Present Value, as calculated at a discount rate of 5%, equal to 2.9 billion Euro, with an Economic Internal Rate of Return of 31.09% (Open Economics and CEIS, 2016)• Estimated net benefits of the Vancouver Winter Games are negative: –101M US\$ (Mc Hugh, 2006)
Ex Post Studies		
<ul style="list-style-type: none">• Most cost–benefit studies are based on <i>ex post</i> analysis. They tend to be inconclusive on the economic side, but show evidence that large-scale sports events, including the Olympics, are unfavourable to the state budgets• Preuss (2004) finds that since 1972 every Organizing Committee of the Olympic Games (OCOG) has produced a net financial gain, but only if investments are not considered part of the OCOG budgets		<ul style="list-style-type: none">• Budget of the Beijing Games: 1609M US\$ Operating Expenses; 16M US\$ Surplus; 1625M US\$ Revenues. Capital infrastructure expenditures: 14.257M US\$ Capital infrastructure expenditures are nearly nine times larger than the revenue and operating expenses of the Games (Owen, 2005)• According to Shaffer <i>et al.</i> (2003) the Vancouver Games entail a significant net cost to British Columbian taxpayers. The minimum net financial cost estimated in this study is 860M US\$ (2010 NPV). It is more likely to be over 1.2 US\$ billion and could reach or exceed 2 US\$ billion if the Richmond/Airport–Vancouver rapid transit line is advanced for the Games. Direct impacts estimated at 1.2 US\$ billion to 2.7 US\$ billion in GDP and 31,000–71,000 person years of employment

(Continued)

Table 3. Continued

Impact Analysis: <i>Comparison of the situation with and without the Event</i>			
<i>Ex Post Studies</i>			
Characteristics	Description of the analyses surveyed	Empirical results	
<ul style="list-style-type: none">• They are generally unreliable to draw inference because they lack proper controls and an acceptable counterfactual situation• Mostly unreliable again, the biggest issue being distinguishing the economic impact of the Games from the normal economic fluctuations	<ul style="list-style-type: none">• Some of the <i>ex ante</i> posited effects did not appear to materialize <i>ex post</i>. These included tourist and employment increases, new industrial plants, tax proceeds and revenues from the management of sports facilities• A number of <i>ex post</i> studies suggest that an Olympic event can have positive effects on employment in the host country, but that these effects are often transitory and limited to the year of the Games	<ul style="list-style-type: none">• The total impact of the 1992 Barcelona Olympic Games was estimated at 26,028M US\$; the annual average effect of employment for the period 1987–1992 from the economic impact of the Games was 59,328 jobs (Brunet, 1995, 2002)• An increase in employment of 293,000 jobs in areas that hosted events for 1996 Atlanta Olympic Games (Hotchkiss <i>et al.</i>, 2003)• The Olympic Games have the highest average cost overrun of any type of megaproject, at 156% in real terms. Cost overrun is found in all Games, without exception (Flyvbjerg <i>et al.</i>, 2016)• Average actual outturn cost for Summer Games is 5.2 US\$ bn (2015 level), and USD 3.1 US\$ bn for Winter Games. The most costly Summer Games to date are London 2012 (15 US \$bn); the most costly Winter Games Sochi 2014 (21.9 US \$bn) (Flyvbjerg <i>et al.</i>, 2016)• The <i>Olympic Games Knowledge Management Program</i> appears to be successful in reducing cost risk for the Games: the difference in cost overrun before (166%) and after (51%) the program began is statistically significant (Flyvbjerg <i>et al.</i>, 2016)	
Impact Analysis: <i>Econometric Studies</i>			
<i>Ex Post Studies</i>			
<ul style="list-style-type: none">• These studies analyse the impact of Olympics by using different control variables in a cross section or panel of cities, including those who hosted the event and those who did not	<ul style="list-style-type: none">• The analysis allows more reliable inference and often reveals positive results.• Although the economic dimensions of the Olympics are relatively small compared with host countries' economies, the aggregate effects, especially the macroeconomic effects and the effects on the big production sectors, may be substantial	<ul style="list-style-type: none">• Using the log-linear gravity model, Rose and Spiegel (2011) obtain statistically robust and stable results of mega-events (such as the Olympics and the World Cup) on exports: trade is over 20% higher for host countries.• An econometric study (Tucker, 2006) provides more robust and more conclusive evidence of the positive impact of the Games on employment than other studies to date. Through the carefully considered use of a fixed-effects framework, the study has made cross-Games analysis feasible (six Summer Games from 1984 to 2004: Los Angeles, Seoul, Barcelona, Atlanta, Sydney and Athens)	

(Continued)

Table 3. Continued

Impact Analysis: <i>Econometric Studies</i>		
<i>Ex Post Studies</i>		
Characteristics	Description of the analyses surveyed	Empirical results
	<ul style="list-style-type: none"> For example, a study based on an econometric model (Ahmar, 2008) investigates the employment impacts of nine different major sporting events on their host cities, from 1984 to 2004 (i.e. Los Angeles (1984)–Athens (2004)) 	<ul style="list-style-type: none"> Using a conservative estimate of the deviation of actual employment levels from expected employment, a positive, significant but transitory impact emerges from hosting the Games on local employment, lasting from 2.5 years before the event until 2 years after (Ahmar, 2008) Using a dynamic panel, a recent study (Chong and Hui, 2012) concludes that host countries benefit from a substantial additional GDP per capita growth effect range from 1% to 3%, which already begins when the success of the bid is announced, remains considerable up to the eighth year, and may last up to 16 years after the event A meta-analysis of 40 retrospective studies (Van Ewijk, 2015) of the impact of the Olympics concludes that, regardless of whether the individual studies report uncertain or negative findings, when considered as a whole, the positive economic results tend to emerge to a good degree of statistical significance Kavetsos and Szymanski (2008) use the results of a direct survey obtaining econometric estimates, which show that there is a positive effect on the residents' happiness because of the conditions determined in a country that hosts mega-sports events, rather than because of the victory of the nation's athletes Baade and Matheson (2002) results in terms of new jobs are: 42,448 (State of Georgia – period 1994–1996) for 1996 Atlanta Games and 5043 (Los Angeles – period 1984) for 1984 Los Angeles Games
<ul style="list-style-type: none"> Some studies apply survey methods to both the Olympics venue and to a control group before, during and after the mega-event 	<ul style="list-style-type: none"> This method may be used to evaluate more judgmental aspects of the mega-event, such as its impact on the host country's image Baade and Matheson (2002) conducted an <i>ex post</i> analysis based on an econometric approach for the assessment of changes in employment in Atlanta and Los Angeles, which were attributable to the 1996 and 1984 Games, respectively 	

(Continued)

Table 3. Continued

Contingent Valuation		
Ex Ante Studies		
Characteristics	Description of the analyses surveyed	Empirical results
<ul style="list-style-type: none"> • In <i>ad hoc</i> surveys, the interviewees are asked to state whether they are willing to pay for some non-market goods by answering an appropriately designed set of questions • The expression 'contingent' refers to the fact that the interviewees are asked to state their willingness to pay (WTP) for hypothetical events concerning the availability of the non-market goods of interest 	<ul style="list-style-type: none"> • Although widely used for the assessment of externalities, public goods and environmental effects, this is a controversial method because it is based on the assessment of hypothetical scenarios 	<ul style="list-style-type: none"> • A study (Humphreys <i>et al.</i>, 2011) estimates WTP using data from nationally representative surveys before and after the Vancouver Games. It suggests that <i>Own the Podium program</i> (subsidized by Canadian government) generated intangible benefits equal to 2–4 times its cost. The aggregate value of the intangible benefits generated by the program range from 251M US\$ to 3.4 US\$ billion • A study (Atkinson <i>et al.</i>, 2008) focused on interviews to people living in London, Manchester and Glasgow, estimates the WTP to host the 2012 Olympic Games in London on the basis of the intangible impacts that this event might provide. Annual mean WTP is £22, £12 and £11 per year (for 10 years) in these three UK cities, respectively. An illustrative total (UK) WTP for intangible impacts is in the region of £2 billion • In the context of the 2012 London Olympic, WTP estimates by Walton <i>et al.</i> (2008) supports the thesis that intangible benefits are not limited to the host city. The results supported the notion that non-Londoners were also willing to pay to fund the London Games: the aggregated WTP was approximately £5.8 million (Bath) and £173.2 million (South West of England), respectively • Heisey (2009) conducted a careful CV study of the WTP in three cities bidding for the 2012 Olympics: Berlin, Chicago and San Francisco. WTP measures varied across cities and the corresponding aggregate ranged from roughly \$5 billion for Chicago, around \$3 billion for San Francisco and over \$1 billion for Berlin

Source: Our elaboration.

inter-industry exchanges. Because they consider final consumption as exogenous, however, these models do not allow income–consumption multiplier effects to be taken into account, nor, on the other hand, can they consider possible crowding-out effects or possible conditions for supply, and thus their consequences on prices. Some scholars maintain (Blake, 2005) that for these reasons I-O models systematically overestimate the impact of events. These considerations apply to the Regional Input-Output Modelling System (RIMS II), a countrywide, input–output based, simulation model that is frequently used in studies into the effects of major events in the United States. As reported by Kasimati in 2003, RIMS II was used to assess the impact on the local economy deriving from the Los Angeles 1984 Olympic Games. An updated version of this model was the basis to analyse the economic impact of the Atlanta 1996 Olympic Games and in the Houston bidding process, in order to assess the effects of the 2012 Games (Airola and Craig, 2000). A model based on alternative input–output tables, also developed in the United States and known as IMPLAN (Impact analysis for PLANning), was used in the bidding process for the metropolitan area of Washington-Baltimore to assess the economic impact of hosting the 2012 Games (see Fuller and Clinch, 2000). In 1993, the I-O model was also used by KPMG Peat Marwick to assess the economic impact of the Sydney 2000 Olympics (Kasimati, 2003). Another study (InterVISTAS Consulting, 2002) estimates with an I-O model the economic impact of the Vancouver 2010 Winter Olympic and Paralympic Games.

In order to estimate employment opportunities and the capacities required in the various phases of the London 2012 Olympic and Paralympic Games, in 2007 Cambridge Econometrics conducted a study for the Sector Skills Development Agency using the Regionalised Multisectoral Dynamic Model (RMDM) for the UK economy. This model is a combination of econometric time series relationships and cross-section relationships (Cambridge Econometrics, 2007).

Ex ante estimates of the economic effects of hosting the Games are often cast in terms of growth in employment and/or GDP, and are liable to the risk of over-optimistic estimates of the benefits (Crompton, 1995; Humphreys and Plummer, 1995; Airola and Craig, 2000; Fuller and Clinch, 2000; Hudson, 2001; Shaffer *et al.*, 2003, p. 4), a particularly common risk for studies adopting the I-O method. For the Athens Olympics some studies focused on the economic effects of the Games using macroeconomic multipliers, but their estimates of economic impact in a medium GDP scenario was well outside the range of values for other Olympics. Except for the Athens Olympics, GDP impact estimates ranged from 2.3 billion dollars for the Los Angeles 1984 Olympics at 1984 values (with a GDP percentage impact of 0.47% in the year of the Olympics; PricewaterhouseCoopers, 2004) to 13.2 billion dollars for the Beijing 2008 Olympics (with an expected annual GDP growth of 0.8% from 2004 to 2008; Ralston, 2008). In any case, a broad-based viewpoint has to be taken when assessing these economic effects, considering the impact over the whole country and not only on the individual state or city hosting the Games. Specifically, in a study conducted in 2005 Blake assessed the impact of the London 2012 Games. The results obtained showed that the GDP effects were considerable for the whole UK, even though they were higher for London. Estimates of the GDP increase in the period from 2005 to 2016, in fact, were 1.9 billion pounds for the UK, against 5.9 billion pounds for London.

Covering the period of 1984 through 2012, all the *ex ante* economic studies indicate the significant role of the Summer Olympic Games in the promotion of the host economy. They highlight the extension of the Games' economic impact well beyond the actual period of the event occurrence itself. Economic growth, increased tourism and additional employment are some of their major findings. However, the high expectations raised by most of them carry a potential bias, because the ambition of those commissioning the studies is to favour the hosting of the Games (Kasimati, 2006).

A more recent development of the *ex ante* analysis is the adoption of Social Accounting Matrices (SAM) and CGE models, which are considered a step ahead of the input–output method in assessing the impact of the Games and other mega-sports events. While SAMs extend the I-O model from production to all other components of income formation, CGE models integrate the technology-dependent representations of the economy from the I-O models with the dynamics of behavioural functions. However, behavioural parameters are not usually econometric estimates, but deduced from the set of data for a single year or

specified exogenously. SAM and CGE models are more expensive to develop than I-O models owing to their more complex structure and the greater quantity of data necessary. SAMs are a first attempt at representing the mechanisms of a market economy and were originally conceived as an extension of the I-O model by Stone and Brown (1962) and gradually developed into CGEs above all by the World Bank (Pyatt and Round, 1979, 1985, 1990; Norton and Scandizzo, 1981; Tarr *et al.*, 2001). Compared with I-O models, SAM develops an integrated representation of the relationships between production sectors and institutions (households, businesses, government, capital formation and the rest of the world) which takes the entire process of the circulation of income into account and not only, as in I-Os, the interdependences between final and intermediate production.

At a later stage, CGEs incorporate SAMs, and are able to combine their Keynesian characteristics with the basic elements of the Walrasian theory of general equilibrium to calculate various alternative static equilibria. CGEs may also incorporate inter-temporal effects and dynamic adjustments and can handle the effects of crowding-out and resources constraints. For example, in 2000 and 2005 Blake used a CGE model to analyse the economic effects of tourism in Spain and the impact deriving from the London 2012 Games (Blake 2000, 2005); Li and Blake (2008) used a CGE model to assess the economic impact of international tourism on the Chinese economy during the Beijing 2008 Games. In order to assess the economic impact of the Sydney 2000 Olympics, some studies (New South Wales Treasury, 1997; Arthur Andersen, 1999) used a special CGE model version, the Monash Multi-Regional Forecasting Model (MMRF). This model allowed a consistent assessment of the impact of the Games on the NSW State and on the other States, as well as on the entire nation. In 2016, a regional SAM was used to assess the economic impact of the 2024 Summer Olympics in support of the candidature of Rome as a host city (CEIS and OpenEconomics, 2016).

Ex ante studies based on SAM and CGE models also have weak points, which arise in particular from the choice of endogenous and exogenous variables and the identification and quantification of the shocks, which can represent the event adequately. Furthermore, their structure is complex, and though more reliable than I-O models, CGEs are not immune from the risk of over-optimistic estimates of benefits. Giesecke and Madden (2007 and 2011) find three sources of this risk: failure to treat public inputs as costs; elastic factor supply assumptions; and overestimation of foreign demand impacts by including the expenditure deriving from induced tourism.

4.2 Cost–Benefit Studies

Unlike the I-O and CGE approaches, cost–benefit analysis (CBA), as a method of assessment, clearly distinguishes positive (benefits) from negative impacts (costs), quantifying them in monetary terms and presenting the final value of the project in terms of net present value (NPV). Apart from purely economic impacts, CBA may also consider financial, social, environmental and other effects. Consequently, with this approach the impact of projects financed from public funds can be valued with greater precision, evaluating the decision to hold the event more accurately and efficiently from a social point of view (Lenskyj, 2000; Boardman *et al.*, 2006).

In evaluating mega-sports events, CBA has to sort out what the net benefits for the local population are by indicating which of the money flows in the economic impact analysis are a cost and which are a benefit (Késenne, 2005; Barget and Gouguet, 2010). According to Taks *et al.* (2011), the data requirements to perform a CBA are extensive, and we have found only a few studies, which actually applied CBA for evaluating sport events, and most of them for *ex post* assessments.

The estimates of the net effects on the national and regional economy of putting on sports events is one of the most salient examples of the differences between the results obtained by analysing impact with the I-O and CGE methods and the cost–benefit approach. Unlike the impact studies, many of the cost–benefit assessments have looked only at the financial balance and have not tried to evaluate the broader effects of

the event. Consequently, they have been generally unfavourable for the local economy (see, for example, Rappaport and Wilkerson, 2001; Shaffer *et al.*, 2003; Long, 2005; Mules and Dwyer, 2005; Owen, 2005).

In order for a CBA study to look at the broader question of social gains and losses, it needs to estimate as benefits and costs all the relevant effects of staging the event. On the cost side, CBA relies on estimates of opportunity costs, rather than on financial costs. On the benefit side, CBA's main problem is the estimate of the increase in value of consumption of local residents, including the public good value of the event (Taks *et al.*, 2011). Both on the cost and the benefit side, shadow prices have to be used to value tangible as well as intangible effects. One way to measure benefits is through willingness to pay (WTP) valuation techniques (for example, Barget and Gouguet, 2010; Johnson and Whitehead, 2000; Johnson *et al.*, 2001; Mules and Dwyer, 2005; Walton *et al.*, 2008). The consumer surplus is an important component of the benefit side (Campbell and Brown, 2003; Dwyer *et al.*, 2006). It refers to the consumption benefits experienced by the local population and can be calculated by measuring the difference between the WTP of the locals to attend the event, and the actual amount they spent. According to Mules and Dwyer (2005), only the consumers' surplus of local residents who attend the event are relevant. In several studies, consumer surplus is estimated approximately at a half the total spending of locals (see also Kesenne, 2005).

The other important component of the benefit side is the value of 'public spirit' associated with hosting a world event. This benefit is typically cited as an important justification for hosting a mega-event. Yet, as of 2010, there were almost no studies as to what this public spirit was worth for any mega-event. Policymakers clearly felt no obligation to provide an estimate of the value of this public spirit (Belfield, 2012). Other economic benefits are difficult to estimate *ex ante* and are often not confirmed by *ex post* studies. These include the increase in the number of tourists and in employment rates (or a reduction in unemployment rates), the increase in the number of new industrial plants, the rise in the number of taxpayers and the increase in revenues from the management of sports facilities. For example, only 31% of the Atlanta Olympic Committee's expenditure for the Summer Olympics was estimated to have had a positive impact on the local economy (Baade and Matheson, 2002).

To sum up, while financial CBA suggests that most large-scale sports events, such as the Olympics, were not a good thing for the state budget, staging mega-sports events may be useful for society and the local residents in that improvements in urban infrastructures help to raise living standards. A range of political aspects should also be considered, such as increased prestige for the country concerned and for the host city, and moral factors such as the host population's pride and patriotism. Indeed, these are the aspects that lead Governments to bid to put on the Olympics and other large-scale sports events. Unfortunately, the contributions of these factors in terms of benefits and costs are still hard to estimate accurately using the cost-benefit method. Consequently, mega-event CBAs have large errors on both the cost and benefit side and the size of the estimate error may be very large (Belfield, 2012).

As mentioned above, economic CBA often uses contingent valuation (CV) studies to quantify intangible benefits and costs. The CV method is a 'non-market' type of analysis because it entails the attribution of a monetary value to goods and services which have no reference market and are often considered public goods. The approach is based on interviewing individuals with referendum types of questions aimed to measure how willing they are to pay for a given event to be held or not (Coates and Humphreys, 2003). Specifically, the interviewees are asked to state whether they are willing to pay for some non-market goods by answering an open or closed question questionnaire. The expression 'contingent' refers to the fact that the interviewees are asked to state their WTP for hypothetical products or services, and in the case of the Games, for hypothetical events to take place (Walker and Mondello, 2007).

Scholars find that this is a controversial method because it relies on the assessment of hypothetical scenarios (Walker and Mondello, 2007) which could give rise to overestimates by the interviewees. For example, some studies show an overestimate on the part of the interviewees of WTP for a hypothetical scenario as compared with the present scenario (Kealy *et al.*, 1988; Seip and Strand, 1992; Johannesson *et al.*, 1998), while other empirical works do not report substantial differences (Carlsson and Martinsson,

2001; Sattler and Nitschke, 2003). One of the most important criticisms of CV studies comes from Hausman (2012), who identifies three kinds of problems: (1) a bias in the sense of overstatement of values for WTP; (2) a large difference between WTP and willingness to accept; and (3) the embedding problem, which is due to the fact that WTP for a component of a package may be larger than the WTP for the whole (Hausman, 2012). Other studies have tried to allow for the problem of overestimating WTP by correcting the results obtained using *ex ante* or *ex post* techniques (List, 2001; Johnson *et al.*, 2007; Whitehead and Cherry, 2007).

The literature suggests caution in interpreting the results obtained through the CV studies which have been widely used to quantifying the success of sport events (Ratzel and Weimann, 2006; Humphreys *et al.*, 2011; Wicker *et al.*, 2012), but only used in a few studies to evaluate the intangible effects of the Olympic games. In addition to the general problems outlined by Hausman (2012), in fact, CV surveys applied to sport mega-events suffer from the wide latitude of the questions that can be asked, corresponding to the multiple, vague and sometimes ambiguous nature of the concept of intangibles (which may cover expectations of tangible benefits on the part of the respondents) as well as to the modality and timing of payment. These questions may vary from pure referendum queries on the WTP for an yearly tax for a predetermined amount of time to support the holding of the event, to WTP in terms of volunteering in kind contribution (in terms of hours of work), to expectations of expenditures in case the event would be held. These problems notwithstanding, the results of CV studies in general suggest that significant intangible benefits may be taken into account in a CBA for big sport events (Dwyer *et al.*, 2000; Barget and Gouguet, 2007; Süßmuth *et al.*, 2010). According to one set of studies, one such an intangible set of benefits is linked to the opportunity provided by the mega-sport events to achieve sport success and to the increase in the probability and extent of such a success in the case of a host country (Ratzel and Weimann, 2006; Humphreys *et al.*, 2011; Wicker *et al.*, 2012).

Specific CV studies of perceived benefits from the Olympics are limited to a few recent cases from which sizable estimates emerge for the intangible benefits. These studies are especially affected by the problem that they are based on questions which may not make sufficiently clear to what extent the payment requested is more or less likely to materialize, whether is a once and for all donation or a periodic one for a given period of time. The first of these studies is by Atkinson *et al.* (2006), based on an earlier report by Economics for the Environment Consultancy (Eftec, 2005). It used a sample of 558 households in Greater London, to find the mean WTP for the 2012 Olympics. The study found a mean WTP of £22 per year per household, which equates to an aggregate benefit of £500 million. Consistently with the expectations of spatially declining benefits from the centre to the periphery of the Games, on the other hand, the mean WTP turned out to be respectively £12 and £11 for Manchester and Glasgow.

Walton *et al.* (2008) used a survey in Bath (about two hours from London) to estimate the WTP for the same event, benchmarking with the findings of the Eftec report for Manchester and Glasgow. They report a 95% confidence interval for the median value ranging between £19 and £55 per household. Considering the fact that the Eftec estimates are annual and individual estimates, these figures correspond to much lower values, depending, among other things, on the discount rate that one uses to annualize them.

Heisey (2009) conducted a careful CV study of the WTP in three cities bidding for the 2012 Olympics: Berlin, Chicago and San Francisco. Three distinct measures were developed: (1) the traditional average WTP obtained from a subset of respondents to the question that asks if and how much residents were willing to donate if they were assured the Olympic Games would be hosted by their city. (2) A measure converting the average WTP response from the remaining subset from hours to monetary terms using each city's per capita GDP. (3) A measure combining the previous two and including the entire sample size for each city. Measures varied across cities with Chicago's WTP ranging from \$54.79 to \$71.98, San Francisco from \$21.16 to \$56.08 and Berlin from 16.35€ to 18.74€. The corresponding aggregate ranged from roughly \$5 billion for Chicago, around \$3 billion for San Francisco and over \$1 billion for Berlin. These are much larger figures than the Eftec study of the UK, for which a comparable figure for the entire

country, taken into account the individual and annual nature of the WTP exhibited, is of about £3.2 billion of intangible benefits.

Finally, and more recently, Wicker *et al.* (2015) used a nationwide survey of 6,977 respondents in Germany to estimate that 72% of the population exhibited a positive WTP, and that they would be willing to pay an average of 47€ per year over a five-year period. At a 5% discount rate, this means an aggregate WTP for the country of about 10 billion Euros, suggesting that intangible effects by themselves would be such to compensate to a reasonable target cost figure for the Games to be held.

4.3 Ex Post Studies

In comparison with *ex ante* studies, only a small number of *ex post* impact studies of hosting the Olympics have been conducted, in part because of what has been called a ‘theoretical gap’ (Ahmar, 2008). An *ex post* analysis, in fact, examines the economic situation in the geographic area involved in the Olympic event before and after, trying to isolate the event from the influence of other factors, which could have arisen at the same time and have contributed to its economic impact (Baade and Matheson, 2002). The main question of *ex post* studies, therefore, is how to make a correct definition of how the situation would have been if the event had not taken place (the counterfactual or base situation). *Ex post* impact studies thus attempt to provide details of the economic impact of a particular mega-event on the basis of various economic indicators, such as GDP changes, per-capita income of the host city’s residents compared with other similar cities, employment rates, sales of various goods, occupancy of hotel facilities, airport traffic, etc.

Ex post studies are more difficult to conduct and to interpret. *Ex ante* assessments, in fact, can be considered simulation exercises and may convey much information even in the common case, where positive effects are exaggerated and negative ones are overlooked. *Ex post* studies, on the other hand, have to deal with the much harder problems of inference from empirical evidence, often without sufficient data and lack of control groups and variables. In spite of the fact that they seem to be the ultimate test for the hypotheses contained in the *ex ante* evaluations, they are thus less reliable than *ex ante* evaluations both in principle and in fact.

The features of two main *ex post* methods may be summarized as follows. A first method uses similar cities, which have not hosted such an event as bases for reference (situation in the absence of the event), and compares their performance with that of the city hosting the Olympic event. This requires the identification of variations in different economic indicators between the two cities before, during and after the mega-event. A second method uses the past as the counterfactual situation, calculating the economic identifiers only of the host city during the Olympic event and comparing them with those of the same city over different periods. In some cases, *ex post* analysis has relied on *ad hoc* sample surveys: this is a less utilized qualitative method, consisting in submitting questionnaires to a control group before, during and after the mega-event. This method is useful to evaluate more judgmental aspects of the mega-event, such as its impact on the host country’s image.

Baade and Matheson (2002) conducted an *ex post* analysis for the assessment of changes in employment in Atlanta and Los Angeles, which were attributable to the 1996 and 1984 Games, respectively. These two authors adopted an econometric approach based on behavioural functions with dummy variables for the Olympic event. The study estimated regression coefficients for the Games, which did not prove to be statistically significant. Giesecke and Madden (2007, 2011) assessed the economic impact of the Sydney Olympics by conducting an *ex post* analysis based on a dynamic CGE model. In 1995 and 2002, Brunet conducted two descriptive *ex post* analyses which sought to summarize the impact of the Barcelona 1992 Olympics from a number of different points of view (costs incurred, sources of finance, urban transformation, employment, etc.), also evaluating the legacy of the mega-event. In all these and similar studies, as Baade and Matheson (2002) and Matheson (2006) stress, the biggest issue is the identification

of the economic impacts perceived as the results of a mega-event and their separation from normal economic fluctuations, which have been seen to be very hard to isolate for vast metropolitan areas.

Ex post studies analysing the impact of the Olympics are not consistent in confirming or denying the benefits estimated in *ex ante* studies. Giesecke and Madden (2007, 2011) use a CGE model to estimate the impact of the Sydney Games trying to eliminate potential benefit overestimation factors (for example, by not including public inputs among costs, overestimating tourist demand from abroad and assuming elastic factor supply). Specifically, the analysis conducted by the two authors suggests that the Sydney Games generated a loss of 2.1 billion dollars in Australia's public and private consumption in terms of NPV. Humphreys and Plummer (1995) concluded that the economic effects are temporary because the economy returns to its normal level after the event. Moreover, only few *ex post* studies identify significant economic benefits in the long run (Hagn and Maennig, 2007). For example, Kang and Perdue (1994) concluded that the Olympic Games of Seoul (1988) had created 1.3 billion additional income from tourism in Korea; Jasmand and Maennig (2007) and Sterken (2006) also found significant economic benefits in the long run. On the job creation side, Hotchkiss *et al.* (2003) found positive employment effects for the Olympic Games of Atlanta (1996) with employment growth of 0.2% higher in comparison with a scenario in which Atlanta did not host the games. Subsequently, Hotchkiss *et al.* (2015), using others empirical methods, continue to find a statistically significant and substantial employment impact of the 1996 Olympic Games in Atlanta. Post-Olympics versus pre-Olympics employment gains in counties affected by the Olympics exceeded employment gains in the rest of the counties in Georgia by 11% by the end of 2000. Other studies focusing on the impact of the Olympic event in terms of employment (Baade and Matheson, 2002; Tucker, 2006; Ahmar, 2008) show that an Olympic event can have positive effects in the host country, but that these effects are often transitory and limited to the year of the Games. In general, the *ex post* studies seem to corroborate the hypothesis that *ex ante* impact studies tend to exaggerate the economic benefits of mega-events (Van Ewijk, 2015). Matheson (2005) even claims that *ex ante* studies tend to exaggerate the benefits up to a factor of 10. Also, according to Matheson (2002), most *ex post* studies find no statistically significant positive correlation between sports facility construction and economic growth.

A weakness of both *ex ante* and *ex post* studies is the tendency to focus only on measurable outcomes (tangible effects), such as expenditure increases and employment gains (Walton *et al.*, 2008). This approach overlooks other potential gains such as civic pride, prestige, community spirit and legacy of sporting facilities (collectively referred to as intangible gains). Some of these intangible gains are either induced effects or externalities and could be quantified using economic models. Other, more intangible benefits are difficult to quantify, but could still be partly estimated by using methods such as CVs or hedonic prices. Many scholars indeed stipulate that these intangible effects could be at least as large as corresponding tangible effects (Noll and Zimbalist, 1997).

Only recently some studies have focused on estimating the intangible benefits linked to individual perception from staging mega sport events (Maennig and Porsche, 2008) showing, for example, that there is a considerable feeling in favour of hosting big football events (Allmers and Maennig, 2009; Kavetsos and Szymanski, 2010). A number of studies have also examined the impact of the announcement of hosting the Games, or failing to be successful in bidding to host them, on stock market valuations. The implication is that the perception that the Games provide profitable business opportunities, as well as an increase in general optimism, can improve stock values. Such effects appear in studies of the Olympics by Veraros *et al.* (2004), Kavetsos and Szymanski (2008), Leeds *et al.* (2009) and Downward *et al.* (2010).

Other intangible effects that have been documented in the literature are bound up with the host country's image, the sentiment of national pride and greater knowledge and practice of elite sports (Barget and Gouguet, 2007; Atkinson *et al.*, 2008; Jinxia and Mangan, 2008). Intangible effects appear also to derive from the sporting success of the nation's athletes in the Games or other mega-events. Sporting success may create public goods such as sentiments of national pride (Allison and Monnington, 2002; Johnson, 2008), local unity (Castellanos *et al.*, 2011) and a feeling of well-being among the population (Forrest and Simmons, 2003). Every citizen can derive a benefit from the attainment of sporting successes, for

example, by talking about the winning athletes (Downward *et al.*, 2009). Moreover, success in sport may make people happier and can influence the perception of their own financial position and that of their country (Dohmen *et al.*, 2006).

Some research has stressed the importance of sporting success, suggesting that Governments are increasingly aware of the value of success in elite sports (Green and Houlihan, 2005, p. 1). The value of success in the Olympics, however, is difficult to measure. The literature suggests that the major factors affecting the value of sporting success are capital consumption, intangibles and socioeconomic factors. The first factor is the repetitive consumption of sport (Schellhaaß and Hafkemeyer, 2002), for example, watching the Olympics on TV. The intangible factor is the cultural significance or the non-use value of sport events. As intangible assets, sports' events contribute to the creation of social capital, which involves the effects generated by honour, prestige and recognition. The study of the population of Canada by Humphreys *et al.* in 2011 concludes that these intangible elements have a significant influence on the value of success in the Olympics. This value is different according to individuals' socioeconomic backgrounds; specifically, the context in which a person lives and the related income can play a crucial role in the quantification of the value of Olympic success (Becker, 1962).

Hedonic pricing is an alternative approach to value both private and public goods provided by the Olympics. It is based on the principle that the value of a given good is affected by external environmental or perceptual factors that can raise or lower the 'base' price of that good. It is commonly applied to the housing market, where the price of a house can be affected by factors such as scenic views, house appearance, and neighbourhood demand. The hedonic pricing model estimates the extent to which such factors affect price and demand, that is, how much people are willing to pay for that good when considering these factors. Gergaud and Ginsburgh (2013) argues that this method is useful to analyse the consequences of a regular cultural event, a new construction (such as a museum, a concert hall, a stadium) or of the listing of an existing building on prices in the neighbourhood.

For what concerns the Olympic Games, the hedonic method has been used to estimate the effect on property and rental prices due to this mega-event. The studies that incorporate these effects are generally based on data collected during the Games, or after them. They are thus *ex post* studies, even though their results can be extrapolated and used in *ex ante* assessments. Unlike the CV studies, they focus on a relatively narrow aspect of the possible benefits or costs of the event and touch a relatively controversial and not well understood area of economic theory, which is the relationship between economic performance and asset prices. They also present the risk of double counting if they are used together with other methods (including CV) to estimate economic impact.

Most of the hedonic price studies focus on the increase in property values and their implications for residents. For example, Kavetsos (2012) presents a study that estimates the impact of the London 2012 Olympics announcement on property prices. Using a self-constructed dataset of a sample of property transactions, he estimates that properties in host boroughs sold at between 2.1% and 3.3% higher prices, depending on the definition of the impact area. A similar investigation based on radius rings suggests that properties up to three miles away from the main Olympic stadium sell for 5% higher. He also estimates that the overall impact on the price of properties in host boroughs amounts to £1.4 billion, having substantial social and financial implications for existing residents. Carlino and Coulson (2004) provide estimates for property value models and hedonic wage models, which indicate that rents are 8% higher and wages 2% lower in cities, which host franchises of the National Football League. Bao and Wang (2010) provide a setting to analyse the impact of the Olympic Games on property prices and, by focusing on the Wangjing area in Beijing, they estimate the impact of the 2008 Olympic Games on Beijing's residential property market using transaction data between 1997 and 2008. Coates and Matheson (2009) examined the relationship between hosting mega-events such as the Super Bowl, Olympics, and World Cup and rental housing prices in host cities.

Finally, it is interesting to consider some recent findings of econometric studies, which use the abundant historical material available today to estimate the macroeconomic effects of the Games. In general, these

studies suggest an important finding, which we risk to overlook by examining the separate effects of the Games: although the economic dimensions of the Olympics are relatively small compared with host countries' economies, the aggregate effects, especially the macroeconomic effects and the effects on the big production sectors, may be substantial. Various econometric studies also suggest that the Olympics have a considerable impact on exports. Using the log-linear gravity model, for example, Rose and Spiegel (2011) obtain statistically robust and stable results of mega-events (such as, in particular, the Olympics and the World Cup) on exports. Surprisingly, the authors discover that even the non-selected candidate countries experience a similar impact on their exports. This suggests that the international community interprets candidature for the Olympics as an opening signal, which a country launches, when it announces its participation in the bidding process rather than merely as an expression of its wish to host the Games. A recent study (Chong and Hui, 2012) analyses if, and to what extent, a host country's economy has seen improvements in the pre- and post-Olympic periods. Using econometric estimation methods on a dynamic panel, the study concludes that host countries benefit from a substantial additional GDP per capita growth effect (from 1% to 3%), which already begins when the success of the bid is announced, remains considerable up to the eighth years, and may last up to 16 years after the event. Another recent study (Demir *et al.*, 2015), also conducted on a panel of host countries, presents evidence of the fact that in spite of a nil or even negative effect on tourism, the Olympics had positive structural effects on GDP, which helped to strengthen the countries' economic growth and enhance the well-being of their inhabitants. Finally, a meta-analysis of 40 retrospective studies (Van Ewijk, 2015) of the impact of the Olympics concludes that, regardless of whether the individual studies report uncertain or negative findings, when considered as a whole, the positive economic results tend to emerge to a good degree of statistical significance. Also worth mentioning is the research carried out by Kavetsos and Szymanski (2008). These authors use the results of a direct survey obtaining econometric estimates, which show that there is a positive effect on the residents' happiness because of the conditions determined in a country that hosts mega-sports events, rather than because of the victory of the nation's athletes.

To conclude, while the *ex post* evaluations on individual effects are more controversial, the most recent econometric literature suggests that the host country can count on a number of benefits thanks to the positive impact on the economy and that these benefits last for several years after an Olympic event has been held. Some of these, like a rise in exports, are direct parts of the macroeconomic impact. Others such as tourism, social well-being and happiness are more problematic because they are difficult to measure and because they emerge as differential effects, that is, as benefits which are seen in comparing the relative performances of countries which have played the part of Olympic hosts and have seized the opportunities offered by the Games at the time in different ways. These opportunities appear to be, in many cases, the main legacy of the Olympics, especially in terms of the benefits, which strongly depend on the particular circumstances of the time and on the place where the Games take place. As opportunities, therefore, they should be assessed not only in terms of expected values, which may even be nil or negative (see, for example, tourism), but also in terms of 'real option' values, that is, benefits that may be seized if the circumstances are favourable enough.

5. A Few Words on the Paralympic Games

Perhaps because of their different scope and the greater importance of intangibles and legacy, the Paralympic Games have rarely been assessed from an economic point of view, except, still in a few cases, anecdotally. This can be in part explained with the fact that their growth has coincided with the decision to schedule the events in concomitance (i.e. right after) the Olympics, since the Games in Seoul in 1988. Since that year, therefore, it has become difficult to separate their impact from that of the Olympics, except for some very specific effects (such as the inspiration for people with disabilities to practice sport).

Two specific classes of impacts can be distinguished, concerning, respectively, the increase in well-being of the people with disabilities, and the attitudes of integration and propensity to inclusion of society towards them. They have been reviewed within the general context of the 'legacy' of the games in a recent paper by Misener *et al.* (2013), but refer more generally also to the economic and social impact of the Games. On the first issue, for the 2000 Sydney Paralympic Games, for example, Darcy (2001) reports planned effects on enhanced accessibility for the disabled of venues, infrastructures and public transportation. Similar plans and *ex ante* predicted impacts appeared to be in place for the 2008 Paralympic Games in Beijing (Shuhan and LeClair, 2011) and in London for the 2012 Games (Gold and Gold, 2007). In all these cases and in what can be found in the literature neither *ex ante* nor *ex post* systematic and quantitative assessments of these impacts appear to be present. On the inclusiveness issues, Darcy (2003) and Cashman and Darcy (2008) present the case for the effectiveness of the national education program for the 2000 Sydney Games, in terms of social change and greater understanding and acceptance of people with disabilities and disability sports.

More generally, the narratives emerging from the Paralympic Games, their representation of the athletes as 'heroes' and generally the perceptions generated in the host community as well as in the participants and visitors may re-verberate positively on the perception of the disabled, including by themselves. At the same time, as noted by Goggin and Newell (2001) in their study of the 2000 Sydney Paralympic Games, heroic narratives may also backfire and reinforce stereotypes by putting too a heavy weight on differences rather than similarities between disabled people and the rest of the population.

The inclusiveness legacy figures also prominently in the diffusion of sport among the disabled, both because this may be an important means of improving their physical and psychological condition and because it is by itself a factor of greater social and cultural integration. While evidence on increased participation is limited to a few studies such as Greig *et al.* (2006) for the 1977 Toronto Games and Darcy and Appleby (2011) for the 2008 Sydney Paralympics, no real evidence seems to be present in the literature on a cause–effect relationship.

6. Conclusions

According to the interpretation suggested by social exchange theory (Wait, 2003), the main impact of the Olympics depends on the perception and the attitudes of the population of the host city. This is the result of an exchange relationship between the individual and the mega-event, which is constantly renegotiated, based on rationality, satisfaction, reciprocity and social justice. Increasing feelings of antagonism are likely to occur when the perceived social costs outweigh the benefits of the exchange relationship between the event and the individual, and a circular relation between perceived and realized benefits and costs can be in general created by boosting (or abating) real effects according to whether these are perceived as positive or negative.

These relational aspects are common to many cultural mega-events, which are both global and local in character, for which local people may be gratified but also harbour a hidden suspicion on the usefulness of the global spillover of any locally financed activity. In the case of the Games, they are especially significant, since economic impact and cost–benefit studies tend to neglect intangibles, whose underpinnings are typically perceived effects, and general attitudes of concerned citizens. Thus, for example, antagonist groups can perceive and explicitly describe the Olympics as a way to promote special interests, reduce public utility and foster inefficiency and corruption. Alternatively, promoters can describe their breath and scope as a unifying social event as a unique opportunity to pursue an inclusive and cohesive form of metropolitan development.

The studies surveyed in this paper suggest that attempts at objectifying the evaluation of the Games by trying to measure their effects are likely to yield some positive empirical evidence on both the net benefits and the risks of the Games. Some of the results of these studies appear well established, such as,

for example, that *ex ante* studies tend to exaggerate the gains and undervalue the losses, while *ex post* studies are mostly unreliable as forms of statistical inference. Furthermore, most studies both *ex ante* and *ex post* fail to provide acceptable estimates of intangible effects, including economic externalities and various sorts of non-market goods.

More specific indications for a team of researchers charged with the task to value the Games can be derived by the analysis of the strengths and weaknesses of the studies surveyed. First, *ex ante* analysis should clearly distinguish between the simulation of the effects (impact), and the cost–benefit assessment of the Games and a suitable counterfactual situation should be identified and valued in both cases. Impact analysis will always require a suitable economic model, possibly a CGE, and should be regarded as essentially a simulation exercise, although some of its results (for example, shadow prices) could be used in the cost–benefit assessment. CBA, on the other hand, should be based on a careful and exhaustive evaluation of the benefits and costs of the games. These should include and indeed give priority to intangibles, especially those more directly related to the intrinsic nature of the Olympics as a public good. In turn, realistic estimates of both tangible and intangible effects could be based on a panoply of direct and indirect techniques, including CV methods, demand and supply estimates, hedonic studies and the use of data from other *ex ante* and *ex post* evaluation exercises of similar events in the same city or elsewhere. *Ex post* evaluators are more difficult to advise. While *ex post* CBA studies should follow similar guidelines of *ex ante* studies, defining a credible counterfactual is for them a much greater challenge, especially if some statistical analysis is attempted in the form of multiple comparisons and/or of controls via econometric modelling.

More generally, the economic evaluations of the Olympics may not be persuasive and will be largely inconclusive, if personal attitudes and convictions of the subjects involved are not taken into account in the evaluation. While this can be achieved to some extent through WTP surveys, a full assessment appears to be possible only if the Olympic Games as a local and global good becomes a process, with sufficient communication and understanding of the parties involved, both locally and globally, and under repeated and rigorous quantitative assessment of realized and perceived benefits and costs.

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