



**HAL**  
open science

## The winner's curse: why is the cost of sports mega-events so often underestimated?

Wladimir Andreff

### ► To cite this version:

Wladimir Andreff. The winner's curse: why is the cost of sports mega-events so often underestimated?. Wolfgang Maennig et Andrew Zimbalist. International Handbook on the Economics of Mega Sporting Events, Edward Elgar, pp.37-69, 2012. halshs-00703466

**HAL Id: halshs-00703466**

**<https://shs.hal.science/halshs-00703466v1>**

Submitted on 1 Jun 2012

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

In Wolfgang Maennig and Andrew Zimbalist, eds., *Handbook on the Economics of Mega-Sporting Events*, Edward Elgar (March 2012).

## Chapter 4

### THE WINNER'S CURSE:

#### Why is the cost of sports mega-events so often underestimated?

Wladimir Andreff<sup>1</sup>

Grenoble taxpayers were not very happy to pay local taxes up to 1992 for covering the financial deficit from the 1968 Winter Games! The 1976 Summer Olympics in Montreal outperformed Grenoble Winter Olympics in terms of deficit: the latter was so deep that Montreal taxpayers had been repaying the debt until 2006, for thirty years. After Montreal's financial mess, the number of candidate cities wishing to host such sports mega-events dropped, and since the 1984 Games in Los Angeles the watchword of local Olympics organizing committees (LOOC) and the IOC became “the Games will pay for the Games”. Such watchword was incentive enough to trigger a new increase in the number of candidates to host the Olympics but not enough to cure the financial mess disease. After having claimed for seven years that the Games will pay for the Games, the 1992 Winter Olympics in Albertville resulted in a \$ 60 million deficit<sup>2</sup>. Were those three exceptions proving the rule that sport mega-events usually are organised at a reasonable and correctly anticipated cost? Unfortunately it is not so.

In the same vein, when the 2012 Summer Games had been allocated to London in July 2005, the expected and advertised cost was in the range of £ 2.4 billion. By the end of 2008, the cost estimates ranged from £ 9.4 billion to £12 billion. Some press articles have suggested that the promoters of London candidature had deliberately underestimated the Olympics bill in

---

<sup>1</sup> Professor Emeritus at the University of Paris 1 Panthéon Sorbonne, Honorary President of the International Association of Sport Economists, Honorary President of the European Sports Economics Association, Honorary Member of the European Association for Comparative Economic Studies, former President of the French Economic Association.

<sup>2</sup> To the best of our knowledge, Albertville Games were the only circumstance in which ex ante economic impact study had dared to predict that they will end up in the red (Andreff, 1991). Such ex ante warning is rather seldom in the literature. Let us imagine what might have happened to a consultant who would have delivered to the mayor of London a pre-2005 study concluding with “give up your candidature to the 2012 Games, it is too much expensive”!

order to get the Games. In particular, the London candidature file had intentionally underestimated the overall cost in neglecting to account for the VAT, the Paralympics budget and a part of security expenditures. London 2012 promoters of course were neither talking about nor expecting the further creation of a new fund in 2008 to cover the rising cost of the Games. There is an impression that having won a harsh struggle in bidding primarily over Paris 2012, London, its authorities, inhabitants and taxpayers are now cursed despite a nice study based on a contingent valuation method which found a positive willingness to pay for hosting the Olympics of non London residents – located in the Bath region (Walton *et al.*, 2008). As to the 2014 Sochi Winter Olympics, the city was awarded the Games in June 2007, exhibiting a \$ 8.5 billion budget. Since then the budget has skyrocketed. In August 2010, it had already reached \$ 33 billion – a more than three fold increase within three years, with an amount that is bigger than the reported cumulative cost of Winter Olympics in Nagano 1998, Salt Lake City 2002 and Turin 2006 taken together.

The aforementioned facts raise three long lasting questions to those cities (countries) which apply to host sports mega-events. Why the actual ex post costs of hosting an event are predictably much larger than the ex ante estimated and expected costs? Consequently, why do the promising prospects exhibited in an economic impact study or a cost-benefit analysis during the candidature usually vanish before the opening ceremony? And thus, why the initial euphoria of an Olympics (or other sports mega-event) bid is followed up with a post-bid curse, post-Olympics disillusion and a substantial bill for the taxpayers of the host city?

Politicians – city mayors, sports ministers, presidents of the Republic, etc. – do respond to these questions with making *tabula rasa* of the past: previous sports mega-events may have shown unexpected extra-costs but our candidature is based on a sound economic evaluation and will not be disappointing in any respect. The success story is to come. Most economists are much more sceptical and criticize analytical flaws and methodological tricks that are usually found in economic impact studies and cost-benefit analyses of sporting events. But no one asks why such tricks and flaws are repeatedly reproduced after so many years of academic criticisms published about them. Our contention is that ex ante benefit overestimation and more basically cost underestimation are deeply rooted in auctioning the allocation of sports mega-events which so often evolves into a so-called winner's curse - or the misfortune of winning a bidding war. The focus here is on the Summer and Winter Olympics, but the background idea is that the same analysis must be relevant for many sports mega-events which are allocated through an auction as soon as the number of bidders is

bigger than one, such as FIFA's soccer World Cup<sup>3</sup>, the Rugby World Cup or UEFA's soccer Euro. The hypothesis of a winner's curse has not yet been examined in such a context though it is sometimes referred to (Leeds and von Allmen, 2002) or further analyzed (Swindell and Rosentraub, 2002) with regards to cities bidding to host professional team franchises in North American team sports leagues.

In view of validating the winner's curse assumption, the chapter starts with a brief overview of the candidature puzzle (Section 1). Then three analytical variants of the winner's curse are presented (Section 2) in order to adopt the one which best fits with the Olympics centralized monopolist allocation process based on auctioning in a context of asymmetrical information (Section 3). From this pioneering analysis are derived a few indicators that can detect a winner's curse dwelling upon its major expected outcomes (Section 4). Finally, a preliminary attempt to verify the winner's curse hypothesis with such indices is undertaken for the Summer Olympics from 1972 to 2012 and Winter Olympics from 1980 to 2014 (Section 5). The conclusion recommends a halt in bidding for the Games, an alternative being to fix an Olympics site once and for all.

### **1. Bidding for sports mega-events: the candidature jigsaw puzzle**

The cradle of the winner's curse, if any, lies in bidding to obtain the Olympics, which means that the roots of the curse emerge during a precise span of time. First, it must be identified. Let us define the overall sequencing of an Olympiad as follows. In  $t-3$ , a city considers the opportunity to participate into bidding for the next Olympics. In  $t-2$ , it starts preparing and promoting its candidature in order to have its application ready in due time for the bid (the IOC votes). In  $t-1$ , the IOC votes determine the winner which will host the Games. Let us date  $t$  the day of the Olympics opening ceremony and  $t+1$  the day of the closing ceremony. Further, assume a post-Olympics economic recession, following growth between  $t-1$  and  $t+1$ , occurs up to a date  $t+2$ . Let us fix  $t+3$  as the date when all economic and social effects of the Games end up – taxpayers have finished to repay the debt if any, residents have benefited from sporting and non sporting infrastructures built up for the Games as well as from positive intangible effects such as feel good, image and reputation satisfactions. Therefore:  $t-3$  to  $t-2$  is a *preparation* stage to a city's candidature; a simplifying assumption is

---

<sup>3</sup> Allmers and Maennig (2009) have already shown that significant net economic benefits cannot be identified for FIFA World Cups in France 1998 and Germany 2006. More in tune with the winner's curse hypothesis, total investment of \$1.35 billion in stadiums for the World Cup 2010 in South Africa was much higher than the \$105 million initially budgeted at the time of the tournament bid in 2004 (du Plessis and Maennig, 2009).

adopted, *i.e.* this stage does not involve any cost even though some preliminary study may be achieved.

$t-2$  to  $t-1$  is a *candidature* stage; ex ante potential or expected costs are assessed and eventually described in the city application file submitted to the country's OC (Olympic Committee) and, then, the IOC in  $t-1$ . This stage is usually six to seven years. It is the stage during which the winner's curse emerges, if any, in the form of an ex ante underestimated potential cost  $c_{t-1}$ . A bidding city usually commands and finances at least one ex ante study regarding the economic impact of hosting the Olympics. Since the cost of such a study is diminutive<sup>4</sup> compared to the expected overall cost of organisation, sporting and non-sporting infrastructural investments contained in  $c_{t-1}$ , it is neglected in the analysis below.

$t-1$  to  $t$  is an *investment* stage both in organisation and (sporting and non-sporting) construction. During this stage the real cost of hosting the Games materialises into an ex post actual cost in  $t$  that is  $C_t$  which may or may not differ, from  $c_{t-1}$ . Both ex ante expected and ex post actual costs are to be taken into account when it comes to identify a possible winner's curse.

$t$  to  $t+1$  is a Games *unfolding* stage which reaches a peak in direct tangible revenues accruing to the LOOC and also a peak of the Olympics economic boom, including sometimes some unexpected extra costs at the very last minute.

$t+1$  to  $t+2$  is the span of time of post-Olympics *recession* when local economic activity is slowing down for some months up to one year or so, despite the possibility of modest post-Olympics revenues and intangible social costs and benefits.

$t+2$  to  $t+3$  is a longer period of time along which all medium and long-term tangible (paying the debt, using and maintaining sporting and non-sporting facilities) and intangible (local population satisfaction, improved image of the host city, better social cohesion, various social costs and benefits) effects come to an end<sup>5</sup>.

If some supplementary information happens to be published about ex post costs after  $t$ , it must be picked up for the assessment of a possible winner's curse.

Nearly all bidding cities hire a consulting company or research centre to carry out an ex ante economic impact study or an ex ante cost-benefit analysis, usually a contingent valuation at this stage. The projected costs and revenues from the Games are a requisite part of the application file remitted to the IOC. A glance at the existing literature demonstrates that ex

---

<sup>4</sup> Around \$1 million, but the overall cost of the bid can reach up to \$100 million, not to speak of under the table expenses, also neglected here.

<sup>5</sup> Except  $t$  to  $t+1$  which lasts two weeks, and  $t+1$  to  $t+2$  sequence which is rarely longer than one full year, all other sequences occurs over several years.

post economic impact and cost-benefit analyses are substantially fewer than ex ante studies. Host cities generally do not commission an ex post evaluation of the actual costs, revenues and benefits that could reveal too many differences between initial costs-benefits and the ex post reality. Thus, the few existing ex post studies are mainly due to academic research. There is a good reason for that. When, for the same sport mega-event, there are both ex ante and ex post studies, the latter exhibits a disappointing economic outcome. One of the rare events for which one can compare ex ante economic impact study commissioned by the organisation committee (ESSEC, 2007) to ex post economic impact study and cost-benefit analysis with a rigorous methodology (Barget and Gouguet, 2010) is the 2007 Rugby World Cup in France. The results are:

Ex ante economic impact: € 8 billion.

Ex post economic impact: € 539 million.

Ex post net social benefit (social benefits minus social costs): € 113 million.

The aim here is not to discuss the analytical flaws and methodological tricks of economic impact studies and cost-benefit analyses. Most economists do not trust the former and prefer the latter though with some reservations (Baade and Matheson, 2001; Barget and Gouguet, 2010; Crompton, 1995; Johnson *et al.*, 2001; Hudson, 2001; Késenne, 2005; Matheson, 2009; Porter, 1999; Walker and Mondello, 2007). They raise serious doubts about the excessively optimistic estimates of the ex ante studies. Scepticism is widespread among academic economists who are used to cut down with more rigorous methods the anticipated net benefits exhibited in studies doomed to be utilised by bidding cities for the purpose of announcement and promotion of their candidature. However, no one economist has analysed so far why such overestimation of positive sports mega-events economic impact, including their ex ante cost underestimation, is so systematically reproduced from one bidding city to the other, and from one Olympiad to the next one. This is due to a missing relationship that economists have not yet established between economic impact studies underestimating the costs and overestimating the benefits, on the one hand, and the need for a city to outbid other bidding cities, on the other hand, *i.e.* to ex ante exhibit the biggest expected economic impact or net social benefit, and afterwards to be plagued with a winner's curse.

Moreover, the sceptical assessments of professional economists remain unheeded, or even unheard, by decision makers and city authorities who repeatedly commission ex ante economic impact studies, in particular between  $t-2$  and  $t-1$ . All city mayors and candidature promoters of bidding cities are very much eager to obtain a study exhibiting a positive economic impact derived from hosting the targeted sports events, and are ready to pay a

significant amount of money (to a prestigious consultant) for getting such conclusion. Cognizant of this purpose, consulting companies obligingly deliver impact studies which exaggerate positive economic spillover since providing a conclusion that predicts fantastic economic impact is a precondition to be selected in the future as a consultant by other cities or countries applying as potential hosts for some sports event.

Thus, when focusing on methodological weaknesses of economic impact studies, most economists touch a really sensitive issue. However, they do not perceive that methodological shortcomings are there on purpose, to support and embellish the application file of a bidding city. Cost underestimation and benefit overestimation are embedded in the process of bidding for the Olympics, and this guarantees that ex ante expected costs will be higher than ex post actual costs (and anticipated benefits higher than the real ones). In some sense, wrong (*i.e.* overestimating) economic impact studies are a launching pad for the winner's curse. This is the reason why comparing costs publicised during or at the end of the candidature stage with actual organisation and investment costs at the end of the investment stage or later, is crucial to check the very existence of a winner's curse and, by the same token, the fallacy of nearly all ex ante economic impact studies delivered to cities bidding for a sports event.

Are ex ante impact studies and cost-benefit analyses really needed or useful, a relevant question correctly raised by Baade, Késenne, Matheson and others? One may have some doubts since the result is known in advance: an underestimated initial cost of hosting the sports event and, consequently, a cost overrun ending with an extra cost to be paid by taxpayers whatever their willingness to pay which has been expressed ex ante. Our point here is not to assess the accuracy of ex ante studies. Nevertheless, should they have sometimes forecast ex ante negative or nil economic impact then we would not have suspected them to be so much involved in the generation of a winner's curse.

Three last dimensions of the candidature puzzle must be mentioned. First, there is difficulty in explaining with standard econometric models which are the determinants of bidding success for Olympic Games. Feddersen *et al.* (2008)<sup>6</sup> have attempted to do so for Summer Games between 1992 and 2012 with a model comprising seventeen variables that should likely be considered before the IOC votes -- the distance of sporting venues from the Olympic village, local weather and unemployment being the most significant variables. The outcome is interesting and, at first sight, surprising. The model correctly predicts the IOC decision for 100% of failed bids. In contrast, it correctly explains only 50% of successful bids. Feddersen

---

<sup>6</sup> See also A. Feddersen and W. Maennig's contribution to this Handbook.

*et al.* include no variable that represents the cost of the Games as publicised by bidding cities. Excluding cost from the model is probably a good econometric choice since cost must not be a priority variable in IOC votes. However, if cost is unheeded as a IOC decision criterion, the probability that a successful bidder will be cursed and pay the price for that during the investment stage of the Olympiad is extremely high.

Second, it is not always the least expensive Olympics project which is voted for by IOC members. For instance, Chappelet and Kübler-Mabbott (2008) carefully checked that IOC votes had been several times an entire surprise since it was not the best quality candidature file that had been selected; they openly mention the 1996 and 2012 Summer Olympics and the 1998, 2006 and 2014 Winter Olympics<sup>7</sup>. Does this mean that IOC voters do not care about the cost of the Games while bidding cities are very much concerned about it? If so, a winner's curse may be rooted in such an attitude asymmetry.

A third dimension of the candidature puzzle goes in line with the previous argument. It is very often the bidding city with the highest organisation and/or investment cost that is eventually successful. Table 1 reinforces such assumption with the 2012 and 2016 Summer Olympics. Both London and Rio de Janeiro had exhibited the highest investment and overall cost in their bids.

**Table 1: Ex ante cost: comparison between cities bidding for the Olympics**

<i>2012 Summer Olympics: announced costs</i>			
New York	<b>London</b>	Madrid	Paris
Overall: 10,68M\$	<b>Overall: 18,25M\$</b>	Overall: 3,64M\$	Overall: 8,87M\$
Investment:7,59M\$	<b>Investment.:15,79M\$</b>	Investment:1,64M\$	Investment:6,21M\$
<b>Operation: 3,09M\$</b>	Operation: 2,46M\$	Operation: 2M\$	Operation: 2,66M\$
Moscow			
Overall: 11,86M\$			
Investment:10,07M\$			
Operation: 1,79M\$			
<i>2016 Summer Olympics: announced costs</i>			
Chicago	Tokyo	Madrid	<b>Rio de Janeiro</b>
Overall: 3,3M\$	Overall: 4,07M\$	Overall: 4,18M\$	<b>Overall: 9,53M\$</b>
Investment: 2,6M\$	Investment:2,11M\$	Investment: 2,35M\$	<b>Investment.:7,6M\$</b>
Operation: 0,7M\$	<b>Operation: 1,96M\$</b>	Operation: 1,83M\$	Operation: 1,93M\$

Sources: bidding committees.

<sup>7</sup> In fact, Chappelet and Kübler-Mabbott rely on this empirical evidence for introducing an analysis of lobbying, influenced votes, and corruption in the process of allocating the Games. Such misdoings are connected with the winner's curse issue even though they are not the most significant proof of it.



## 2. Three variants of the winner's curse

According to those sports economists who explicitly refer to the winner's curse, the latter is defined as "the tendency of a winning bid to be in excess of the real value of the asset sold in the auction" (Sandy *et al.*, 2004, p. 309) or, phrased differently, "since the most optimistic among the potential bidders makes the winning bid, there is a good chance that the actual revenues (...) will be less than that bidder anticipated" (Ibid., p. 131). Note that here the winner's curse is merely understood as the result of bidders' behavior, it is comprehended only as a demand side triggered mechanism. No specific mention is made of the supply side except saying that it is a monopoly, like the IOC or FIFA for instance. Leeds and von Allmen (2002, p. 160) add: "Economists call this paradox – in which the 'winning' city is actually worse off than it would have been had it lost the bid – the winner's curse." One implication from these definitions is that, on the demand side for an auctioned asset, there must be more than one bidder for the winner's curse to emerge.

Sports economists have less emphasized the supply side aspect: is there any specific strategy and, derived from it, issues of monopolist organisations such as the IOC, FIFA, UEFA, etc., that could influence the auction in such a way as to come out with a winner's curse? One objective of this chapter is to respond this question as well. Joining the demand side and supply side dimensions, one reaches analytical problems like bilateral monopoly<sup>8</sup> or moral hazard and adverse selection issues in a relationship between one monopoly and several bidders; such issues are related to information asymmetry in principal-agent theory. Since usually more than one city is bidding for the next Olympics, the latter framework is the relevant one all the more that the IOC is, to some extent, a centralised and private bureaucracy at a global level. Although there are strong rivalries across its members (decision makers, voters), this organisation is not operating, properly speaking, on a competitive supply side market for the Olympics. The IOC does not sell its exclusive sports event in a genuine market where a fully-fledged market mechanism determines an equilibrium price.

From the very beginning, the winner's curse had been imported into sports economics from the auction theory where it was born in 1971 in Western economics literature. In fact, the winner's curse was well known even earlier in centrally planned economies (CPEs) because it was the everyday life of centralised allocation of inputs and state finance.

---

<sup>8</sup> If there were just one single bidding city for each Olympics, the situation would be one of a bilateral monopoly. Economic theory has demonstrated since the Edgeworth diagram that, in this case, the outcome of negotiations and the precise terms of the transaction will depend on the respective bargaining power (or simply the naked power) of the two bilateral monopolists (the IOC and the single bidding city).

### 2.1. *The winner's curse: "you have won the bid and will lose money"*

The winner's curse hypothesis was first advanced by Capen *et al.* (1971) to explain the low returns on investments to companies engaged in competitive bidding for oil and gas leases. The impression was that winning bidders had paid a too high price for oil and gas leases (Gilley *et al.*, 1986); they had been cursed. In other words, they had paid an auction price higher than any likely market price and had undertaken too high a cost to be recouped by the revenues of their investment in oil and gas exploitation. Similarly, Gilberto and Varaiya (1989) have provided evidence of a winner's curse to explain large takeover premiums in auctions for failed banks, in sharp contrast to the orthodox view endorsed by the mainstream finance literature.

In all such circumstances, it was noted that in any auction-type setting, where the value of the auctioned object is uncertain but will turn out to be the same for all bidders, the party that overestimates the value of the object is likely to outbid its competitors and win the contest. The items won, however, are more often than not those whose value has been overestimated. Auction winners who fail to recognize this possibility are likely to be cursed by having paid more for an item than its true value. Thus, there is adverse selection in this outcome. The bidding process results in winning bids that produce below normal or even negative returns contrary to all that is learned from the theory of rational investment decision. Thaler (1994) stresses the asymmetric information across bidders, which leads to an extreme form of the winner's curse in which any positive bid yields an expected financial loss to the bidder. An increase in the number of other bidders implies that to win the auction you must bid more aggressively. Yet the presence of more bidders also increases the chance that if you win, you will have overestimated the value of the object for sale – suggesting that you should bid less aggressively.

A parallel can be drawn here with allocation of the Olympics through an auction bid. The IOC, when calling cities to bid and fixing a deadline for the submission of candidature files, is in a situation that compares with a state or a region calling companies to bid for oil and gas leases. No one a priori knows the real market value of being selected as the next Olympics host city, not even the IOC. What the IOC looks for is to find a city eager to host the Games and organise them in the best way (i.e., the ex ante supposedly best project). Thus, the IOC is interested in eliciting aggressive bidding to get the "best" project because it will benefit from the resulting winner's curse. Bidding cities are exactly in the conditions that Thaler points at:

if they want to have a chance to get the Games, they definitely must overbid other bidders until the date<sup>9</sup> of allocation (IOC members' vote). Assuming that the IOC is used to choose the best project from an economic point of view<sup>10</sup>, the winning city is absolutely cursed since it has promised to invest and pay too much to get the Olympics, while the IOC is going to obtain a grandiose project for which it will not pay the full price. It appears here, first, that the supply side also matters in the analysis of the winner's curse and, second, that adverse selection is likely to allocate the Games to the city applying with the most expensive project. The more a bidding city has underestimated the announced costs for hosting the Olympics, the more the winner's curse will materialise in ex post extra costs, and a possible financial deficit, and the more the IOC will have got a magnificent project without paying its full cost.

## *2.2. Being cursed on financial and second hand markets*

Forty years after the article by Capen *et al.*, the literature about the winner's curse has grown for a very simple reason: the concept has found many applications in financial markets which now comprise the great bulk of the winner's curse literature (Kagel and Levin, 2002). In particular, it is utilised to explain the share value underestimation in initial public offerings and the positive initial returns earned by investors on new issued equities (Rock, 1986; Levis, 1990). Though it is a widespread phenomenon, it has been under the spotlights during IPO's privatisation on new tiny stock exchanges in post-communist transition economies (Andreff, 2000 & 2003). Overbidding is also present in different auction mechanisms such as sealed-bid auctions, English auctions, first-price auctions with insider information, blind-bid auctions, and bilateral bargaining games (the latter would apply to Olympics bids only if there is one single candidature). In the background, one finds sophisticated models and a lot of technicalities that would not be easy to transfer to analysing city bids for hosting the Olympics.

The winner's curse issue has also been found in second hand markets, primarily on the market for 'lemons' where the true value of the second hand car is uncertain and unknown to the purchasers (bidders) while hidden by the seller. Akerlof (1970) has demonstrated that with such information asymmetry the market will lead to adverse selection and the winning purchaser will be cursed. There is even an application of the winner's curse concept in sports

---

<sup>9</sup> The selection process of the host city has evolved in two steps, first across potential bidders of a same country, and then across "qualified" bidding cities of different countries. This does not change the likelihood of the winner's curse to emerge and probably increases the pressure on cities to bid even more aggressively.

<sup>10</sup> This assumption is dropped below when introducing non-economic factors that influence the IOC votes.

labor markets wherein a veteran sells his services on the talent market. Cassing and Douglas (1980) have argued that with free agency teams will tend to acquire a biased set of players, those for whom the bidder has overpaid. Because of information asymmetries and uncertainty, bids by potential team owners will not always mirror the true worth of a player, but the team that values correctly has a poor chance of signing a player compared to a team that overestimates the player's value. The latter is cursed.

Since the previous examples are not that close to an auction bid for hosting a sports mega-event, the rest of the chapter does not follow this path.

### *2.3. The winner's curse in a context of centralised allocation of investment funds*

In central planning (CPE), every year investment funds were allocated across state-owned enterprises through an auction opened by the central state administration (central planning agency or industrial ministries). It was obviously not a market allocation but a call sent to enterprises to submit investment projects, the central authorities being supposed to finance the best projects. In Yugoslavia until 1956, the Federal Institute for Planning was auctioning investment funds every year, was collecting projects submitted by "self-managed" enterprises and eventually was supporting those investment projects which were deemed to be the most efficient and closest to central plan objectives (Neuberger, 1956). The national investment fund was allocated across those enterprises having provided the best projects. In the USSR, a national investment fund was distributed by Gosplan across industrial ministries whose job was to allocate their industry investment fund among the enterprises under their tutelage, according to some centralised "efficiency" criteria (Dyker, 1983). Those efficiency criteria used in the Soviet Union until the 1960s were absolutely debatable with regards to their economic rationale (Andreff, 1993). However, after economic reforms, the criteria for investment decision making came closer to those applied in public enterprises in market economies. In the latter, for each investment project  $k$  was calculated its discounted net benefit (its social profitability), that is:

$$B_k = \sum_{t=0}^N \frac{R_{kt} - C_{kt}}{(1+a)^t}$$

where  $R_{kt}$  stands for all revenues derived from the investment over its life's length (from  $t = 0$  to  $N$ ),  $C_{kt}$  stands for all investment costs ( $C_{kt} = C_0 + C_t + C_{ft}$  with  $C_0$  the initial investment cost,  $C_t$  the cost of all further annual investment 'slices' in case of a pluri-annual investment, and  $C_{ft}$  the operational cost of the equipment over its life's length) and  $a$  is the national

discount rate fixed by a central planner<sup>11</sup>. In the face of rival projects submitted by enterprises, industrial ministries normally should have stuck to two selection rules:

1/ choose an investment project if, and only if  $B_k > 0$ , for any  $k$ ;

2/ choose investment project 1, then project 2, then project 3, etc., until the finance of the industry investment fund is exhausted if  $B_1 > B_2 > B_3 > \dots > B_n$ . If the ministry investment fund could only afford to finance the first three projects, it would have allocated all its investment fund to the most socially profitable projects. Each enterprise, once obtained its own investment fund, was committed to include the selected investment project (including its costs and revenues) in its own annual plan and to compulsorily fulfil it.

However, in practice, investment fund allocation did not proceed exactly in such smooth and theoretical way due to a context of information asymmetry. Each enterprise director had a good knowledge about his/her enterprise's existing equipment, technology, production capacity, real costs, the skills and productivity of manpower and, therefore, the time required to achieve the new investment project with the allocated investment fund. In contrast, the industrial ministry (and of course the central planning agency) had only a blurred idea, or no idea at all, about the magnitude of enterprise inside managerial variables. In such context, in order to augment its chance to get some investment fund, each enterprise was very much eager not to reveal the true value of its inside managerial variables – information non transparency creating a moral hazard situation – and incited to “cheat”<sup>12</sup> with regards to the reality of its investment costs and revenues, and the required completion duration of the investment project. It has been demonstrated that cheating on investment projects was rather the rule than exception in CPEs (Kornai, 1980; Dyker, 1983; Andreff, 1993) in the form of:

- Any enterprise was announcing an investment and operation cost  $c_k$  for the project  $k$  sent to the ministry and not the actual cost  $C_k$ , with obviously  $c_k < C_k$ , in order to augment its chance to get investment funds from the ministry.
- Any enterprise was announcing a very optimistic – often absolutely unrealistic – completion duration for the project  $k$ ; Soviet economies have remained forever famous due to their unfinished investment building sites resulting from unattainable completion durations.

---

<sup>11</sup> If  $Rkt$  were to include social indirect and non pecuniary benefits while  $Ckt$  were to include social indirect and non pecuniary costs, the investment choice would have relied on standard cost-benefit analysis. Soviet enterprises and planners did not mind such indirect and non pecuniary effects.

<sup>12</sup> The verb “to cheat” is used to mean what is pointed at, in academic terms, as information bias, distorted information and/or information manipulation in the communication between enterprises and their tutelage authorities (industrial ministries).

- Any enterprise was anticipating overestimated revenue from the investment:  $r_k > R_k$ , with  $r_k$  the ex ante announced revenues and  $R_k$  the actually expected revenues.

An obvious consequence of investment cost underestimation and investment revenue overestimation is that the social profitability of an investment project  $k$  sent by an enterprise to the ministry was quite higher than its real social profitability:  $b_k > B_k$ .

Since all enterprises had adopted such a strategic behaviour, central authorities and ministries were absolutely confused, when not entirely incapable to rationally make a decision about how and to whom to allocate the national investment fund. Facing a myriad of fabulous investment projects, ministries had a tendency to inflate the number of financed projects in the first year of five-year plan – overinvestment - which was generating a typical investment cycle in CPEs (Bauer, 1978) with quite fewer investment projects financed by the end of five-year plan. Indeed, all the projects submitted to a ministry were unrealistic, exhibiting an extraordinary social profitability, unbelievably low costs and a very short span of time to be completed. Thus, the aforementioned decision rule 1 was eliminating not even one project. The rule 2 was eliminating projects that seemingly were the most extraordinary. In such a confused situation, adverse selection was the most common outcome and inefficient or low-efficiency investment projects were financed, including after some bargaining, lobbying and bribery of the ministry's civil servants in charge of investment funds by enterprises.

Enterprises ordinarily were more often cheating by underestimating costs and completion durations than overestimating investment revenues. Thus, basically consider only the costs to simplify the issue. Let us assume that during the auction, a ministry was receiving investment projects such as:

$$c_1 < c_2 < c_3 < \dots < c_k < \dots < c_n$$

If it were choosing the first three, it might well have selected the least efficient or, at least it was not sure to have kept the three most efficient ones. If in reality all projects had exactly a same actual cost  $C^*$ , it would have meant that  $c_1 = C_1 - C^*$  was the investment project for which the ex ante cost announced by an enterprise was the most underestimated compared with its actual cost. It follows that  $c_2 = C_2 - C^*$  was the second most underestimated project in terms of cost, and  $c_n = C_n - C^*$  was the project with the least underestimated cost. The latter was nevertheless the one which had no chance to be funded while the first projects 1, 2, and 3 were the most likely to be financed by the ministry although being the most underestimated, *i.e.* the least feasible in terms of cost and completion duration. Adverse selection is obvious.

Now, let us relax the assumption that all projects had a same actual cost  $C^*$  but, instead, they had different costs. Then all ministry decision making would depend on the relationship

between actual costs and the announced costs  $c_1 < c_2 < c_3 < \dots < c_k < \dots < c_n$ , that is, on the degree of cost underestimation specific to each investment project. Let us imagine that actual costs indeed were such as  $C_1 < C_2 < C_3 < \dots < C_k < \dots < C_n$ . Then the risk of adverse selection is difficult to exactly assess but it is minimal. On the other hand, the risk of selecting inefficient investment projects was quite high if the actual costs  $C_1$ ,  $C_2$  and  $C_3$  were such that the real social net benefits were  $B_1$ ,  $B_2$  and  $B_3 < 0$ , despite ex ante announced social benefits  $b_1$ ,  $b_2$  and  $b_3 > 0$  declared by enterprises during the auction. Now, if actual costs were such as  $C_n < \dots < C_k > \dots < C_3 < C_2 < C_1$ , then adverse selection reached its maximum. The latter hypothesis corresponds to a reality where the less actually efficient is an investment project, the more the enterprise underestimates (hides or cheats about its own inefficiency) its actual costs. Such hypothesis was more than realistic in Soviet economies because those enterprises submitting the lowest quality investment projects were more eager to cheat (underestimate costs) than rival enterprises.

The conclusion is that when a centralised organisation in a monopoly situation utilises an auction to proceed with funds allocation to bidding enterprises, adverse selection is extremely likely to appear. And the winner's curse is there in. The ministry is cursed in so far as it has allocated investment funds to less efficient projects and it will become aware of it when enterprises which have benefited from the funds allocation will be unable to complete their investment projects at the announced cost within the announced deadline. The state-owned enterprise, in some way, is cursed as well: through cheating, it has submitted an infeasible investment project and, in practice, it will not be able to complete it within the deadline at ex ante announced cost. In the Soviet system, an enterprise which was not correctly fulfilling its plan was normally sanctioned (lower bonuses, fewer honorific rewards, dismissal or even worse under Stalin). In an attempt to avoid sanctions, enterprises were adding to informational cheating some bad management practices (Andreff, 1993) coined as 'strategic behaviour' in standard economic theory<sup>13</sup>.

When lagging behind its annual investment plan time schedule, an enterprise was attempting to bargain an extension of its initial investment fund, allocated at the beginning of the year, but which had revealed to be too short due to cost and completion duration underestimation. First, it was a bargaining with centralised authorities (ministries) to obtain a facilitating revision of its planned objectives: allocation of extra investment fund, extra inputs or

---

<sup>13</sup> This third variant of the winner's curse fits with a public choice approach since the winner is cursed after on purpose underestimating/overestimating public investment decisions while in the first one the winner is cursed simply due to his/her wrong estimation of the magnitude of oil and gas leases and the interest of exploiting them. There is no public choice and no one cursed on purpose in the latter case.

manpower, downward revision of plan targets including that the investment project initially submitted will not be completed in due time and so on. Big Soviet enterprises had elaborated a specific strategy based on *tolkachi*. A *tolkach* was an enterprise employee especially engaged for staying in Moscow and canvassing tutelage ministries with demands for extra investment funds, extra inputs, and downward revision of plan targets. In other words, it was the Soviet variant of lobbying. The *tolkach* had become a quasi-institution, though informal, of the Soviet economy and, in some sense, he was a derived product from enterprise winner's curse. Being cursed by its own cost underestimation strategy, the Soviet enterprise always attempted to get extra means for completing its investment project through some pressures on and drawing the attention of centralised tutelage authorities.

*Tolkachi* were endowed by their enterprise directors with (illicit) secret funds that enabled them to bribe those ministry bureaucrats who were likely to deliver extra investment funds and extra inputs to the enterprise, to treat enterprise's demands as well as those emanating from rival enterprises (also cursed during the auction) and to push the enterprise demand files up to decision makers in the Kafka-like universe of a Soviet ministry. It was common practice that Soviet enterprises were corrupting bureaucrats in charge of allocating investment funds and other material means. In a nutshell, in view of avoiding the worst consequence of the winner's curse consisting in sanctions for plan non-fulfilment, a Soviet enterprise was usually resorting to bargaining, lobbying and bribery, the three recipes of a 'successful' enterprise management in a centralised economy with information asymmetry.

### **3. The Olympics centralised allocation process with asymmetric information**

There is a similarity between the centralized auction for allocating investment funds in a CPE and how the auction functions through which the Olympics are allocated to a bidding city. However, similar is not identical even though the selection mechanism of a host city proceeds, in absence of a genuine market for the Games, with an auction by a (global) centralised authority or organisation, *i.e.* the IOC. From the starting point of the comparison, a difference must be underlined. In a CPE, a centralised body offers funds to achieve an investment, then opens an auction for investment projects, and finally allocates investment funds to various enterprises for projects to be achieved within an annual deadline. With the Olympics, the IOC publicises the task of hosting and organising the next Games within a precise deadline, then it calls for projects. These projects are not applying for IOC funding; rather, they are candidates to raise funds from different sources in order to cover the cost of



those investments required to host the Games. At the end of an auction which usually takes several years, the IOC allocates the right to host the Olympics to the most interesting city project. However, the fact that the object of such auction is not merely a finance allocated by the IOC but the status of being the next hosting city of the Olympics does not reduce or eliminate the risk of a winner's curse. The risk may be even higher than in a CPE allocation process because the incentive to cheat is much stronger. A city which wants to host the Games commits itself to heavily invest over a six to seven years span of time and then hopes to benefit from the "Olympics host city" label that provides a unique capacity for collecting and mobilising finance. The city financial commitment and concern are in the range of billion dollars to host the Olympics, whereas, in CPEs, enterprise investment was in the range of million roubles, sometimes less.

Now, considered as an auctioneer, does the IOC behave as a central planner or an industrial ministry allocating investment funds when it opens an auction for the next Games? A weak variant of a central planner model is due to Oskar Lange (1937) adapting the Walrasian auctioneer model. The auctioneer announces some price system, enterprises of the planned economy proceed with their economic calculation (profit maximising under a resource constraint) and then send back to the planner-auctioneer those output and input quantities that maximize their profit. If the quantities supplied and demanded by all enterprises do not equalize, the planner revises its price system, then enterprises recalculate their plan projects and send newly calculated quantities to the central planner. This iterative process lasts until supply-demand equality for all products and resources at equilibrium prices<sup>14</sup>. The auction for the Olympics differs from Lange model because the IOC initially does not announce any price. Moreover, the IOC explicit or implicit objective is not to reach Walrasian equilibrium prices and quantities.

An inverted planning model to Lange's has been suggested namely by Malinvaud (1967), Manove (1971) and, for operational planning in Hungary, by Kornai and Liptak (1965). Here the idea is that the planner announces quantities of output to be produced and inputs to be allocated and enterprises respond, after their own economic calculation, with prices and costs. The iterations go on until they converge toward equilibrium – the saddle point theorem. This process is closer to the IOC auction. The IOC, in some sense, announces quantities to be produced that is a defined assortment of sporting venues and infrastructure that must be completed and operational within the opening ceremony deadline. In addition, each bidding

---

<sup>14</sup> For a modelling of this iterative process: Andreff (1993).

city adds an optional number of non-sporting infrastructure investments, some IOC required, that may facilitate or embellish hosting the Games: transportation, high tech telecommunications, urban reconstruction, etc. Does the IOC get back prices and costs from bidding cities? No. It receives candidature files including both quantities of sporting venues and non-sporting infrastructural investments, and costs (prices) of all those investments and the LOOC expected organisation costs. To pursue this comparative analysis, objectives of respectively the IOC and bidding cities must now be questioned.

The very existence of the IOC is justified by four responsibilities or objectives, one of which being to elect (choose) every fourth year a host city for the Summer Olympics and Winter Olympics, and then to supervise its LOOC (Chappelet and Kübler-Mabbott, 2008). Is this objective maximized under some constraint as in the auctioneer-planner model? The constraint is that a bidding city must provide all the required facilities and must commit itself to stick to an operational budget, this is a minimal precondition for a city to be selected. Are there other conditions that would maximize the IOC objective function? Another one certainly is the best possible quality of the Games which consists of a guarantee of well-functioning and secure sports contests (quality of sporting equipment, distance between Olympic venues and the Olympic village, etc.), an excellent hosting quality (Olympic village, transportation, hotels), overall security, nice opening and closing ceremonies, the quality of media and telecommunication and, nowadays, an environmental quality, all prerequisites according to the 20 chapters contained in a candidature file. Thus, if the IOC is maximizing something, it is the overall quality of the project which must benefit from worldwide media coverage, leave a grandiose image of each Olympiad, and an unforgettable memory and indelible marks on the host city landscape. In view of obtaining a grandiose project, the IOC interest is to pave the way for or even fuel overbidding across bidding cities. This is what it clearly started to do after the single candidature of Los Angeles for the 1984 Olympics.

I intentionally have not mentioned the cost of the Games as one of the variables included in the IOC objective function with a background idea of cost minimising. First, it is more than likely that the cost of the Olympics is not a decisive criterion in the votes of the 104 IOC members. Besides, the criterion of minimal cost to some extent clashes with maximising the fantastic quality of the Games that is sought. A proof of such contention is that the IOC often selects the most expensive rather than the cheapest project (Table 1), which means both adverse selection in terms of cost, and that the winner's curse is at work. Afterwards, cost inflation and cost overruns are basic indices of the winner's curse.

The objective function of bidding cities is crystal clear and consists in getting the Games. Therefore, each bidding city must promise fixed quantities of sporting facilities and a variable quantity of non-sporting infrastructure, focusing on their excellent quality since it will be selected or not on these aspects of its candidature. Before Montreal 1976, investment cost and the LOOC operational budget did not matter that much. Since then, and after Los Angeles 1984 demonstrated that the local organizing committee of the Games can end up in the black, the cost dimension of candidatures has become much more significant, though not the major decision criterion. Bidding cities primary interest is to maximize (and focus on) the qualitative components of their candidature, thereby encouraging grandiosity in their project proposal. After 1984, bidding cities started to be interested in exhibiting also reasonable or even low costs in parallel with the supposedly unbelievable quality of their candidature. The only way to reconcile an extravagant project with costs that must not be outrageous is, explicitly or implicitly, to cheat, *i.e.* to communicate and fill the candidature file on the basis of costs that are underestimated by different means (omitting the VAT, the Paralympics budget, etc.). All in all, it is the bidding cities interest to overbid upward with respect to the quality and downward with respect to the publicised cost of their project. Such strategy compares with the one of rival enterprises struggling for the allocation of investment funds in a CPE except that cities are seeking to get the Games, because it is a precondition for mobilising huge finance necessary for hosting the Olympics. Thus, rival bidding cities are in sync with the principal objective of the IOC, which is to balance outward extravagance with the appearance of reasonable cost.

The parallel with enterprises in CPE cannot exactly be extended to the completion duration of investments since it was absolutely mandatory, but nearly never met, in Soviet-type planning. Yet, the completion duration is mandatory and cannot be circumvented in hosting the Olympics - it is not feasible to start up the Olympics sports contests if the stadium is not entirely achieved – but the IOC recurrent worries about delayed Olympics building sites can be used as a control variable of the winner's curse. Building delays usually generate cost overruns when it comes to rushing in order to stick to the deadline. Revising building costs upwards (thus revealing the initial cost underestimation) or even giving up some Olympics building to curb skyrocketing costs are also windfall effects of the winner's curse. Another revealing factor is when the LOOC or the host city obtains extra finance or extra public subsidies, for instance, from the government. A financial deficit or an ex post lower financial surplus than expected by the LOOC provides another proof of the winner's curse while a sanction of the latter is a bidding city budget deficit which must be covered with a specific

post-Olympics taxation. Given all the financial consequences of hosting the Games, one can understand that bidding cities, just like former Soviet enterprises, do not skimp on the means to get the sports event and do not hesitate to engage in lobbying or, in the worst case, in corrupting some IOC voters, *i.e.* the most unscrupulous or greedy members of the IOC.

A last point is that information asymmetry is crucial in the genesis of the winner's curse. A bidding city perfectly knows down to the tiniest detail its candidature project so that it is at ease to communicate in such a way as to bring out specific aspects of the file, in particular its supposedly fabulous quality. In contrast, this in-depth knowledge of the candidature file allows the bidding city promoters to keep in the shadow those less exciting characteristics of the project namely excess costs, harsh security issues, negative externalities and possible crowding out effect. An economic impact study is definitely instrumental to highlight the best features and blur the least performing ones. The IOC is not able to reach a similar knowledge (information) about each bidding city project and cannot control how much accurate or fallacious is the information delivered in the application file, namely about actual costs, externalities, etc. The Olympics site visits by the IOC representatives are not enough to compensate for information asymmetry between bidding city promoters and the IOC voters. It is all the more so that "the IOC members are renowned for not really taking into account the technical recommendations and focus on their political and personal judgment of the candidatures" (Chappelet and Kübler-Mabbott, 2008, p. 87) when they are going to vote.

#### **4. Indicators of the winner's curse**

One can infer from the above analysis some indicators that would enable to spot and check the existence of a winner's curse resulting from the auction for allocating sporting mega-events to a host city.

*Indicator 1: Unexpectedly higher net social cost or lower net social benefit*

The most convincing index of a winner's curse obviously is a significant difference between *ex ante* and *ex post* net social outcome of a sporting mega-event that can be observed in comparing the results of an *ex ante* and an *ex post* cost-benefit analysis of the same event. The winner's curse hypothesis would be confirmed if *ex post* net social cost is significantly higher than *ex ante* net social cost or if *ex post* net social benefit is significantly lower than *ex ante* net social benefit (like with the aforementioned 2007 Rugby World Cup). A significant difficulty with indicator 1 is that an *ex post* cost-benefit analysis usually is not available or published after each Olympic Games. Therefore, some proxies are required. The three

following indicators are consistent with the winner's curse hypothesis although each of them alone is not sufficient to definitely establish a curse. However, if they are recurring from one Olympics to another (like the recurring cost underestimation of Soviet enterprises), one would lean towards the belief that a winner's curse is at work in the Olympics allocation to bidding cities.

#### Indicator 2: *Cost overruns*

A first proxy is a recurring difference<sup>15</sup> between ex ante cost in the candidature file and ex post cost reached on the opening day or after. Let us coin it a cost overrun index such as:

$$c_{t-1} < C_t \text{ (or } c_{t-1} < C_{t+3} \text{ when data is available for } C_{t+3}\text{)}.$$

Given that over a period of six or seven years there is some inflation in any country and that upward cost revisions happen at a more or less clearly defined date and are usually published in current prices, one can accept as a proof consistent with an existing winner's curse a difference of at least 30% between ex post actual and ex ante anticipated cost. The data to be found are the initial cost in the candidature file in  $t-1$ , the actual cost at the moment of the opening ceremony  $C_t$  and, if one can circumvent data paucity about  $t+3$ , the actual cost  $C_{t+3}$ . Any extra cost or upward cost revision would fuel relevant data for the cost overrun indicator. An additional remark is necessary about this first indicator as well as the next indicators. The announced cost  $c_{t-1}$  is an official figure and well publicised by the bidding committee in the candidature file and by the IOC. Such ex ante cost is not debatable once published. Looking for the actual cost in  $t$  or  $t+3$  is obviously less easy and may be cumbersome and boring. Indeed, it is not the interest of a host city to unveil that actual cost of the Olympics has markedly surpassed ex ante cost. Thus the genuine ex post actual cost is not always much publicised in official documents. Then there is sometimes no other way for researchers than relying on data published in the press or in documents published without the IOC or the host city stamp.

#### Indicator 3: *Ex post revisions in the Olympics project*

When there is no data about ex post cost, a second proxy can be used when some significant revisions occur in the Olympics project between  $t-1$  and  $t$ . For example, the emergence of a new building in the project which was not included in the candidature file is an explicit index of an initial cost underestimation. Similarly, an upward revision of expenditures linked to one

---

<sup>15</sup> Olympics cost overruns may have various – including some exogenous (bad weather, overall skyrocketing inflation in the host country, etc.) – origins, not to speak of a bad local management of the Olympics project. But if cost overruns are so regularly recurring that they appear to be the rule in every Olympics rather than the exception, one can conclude that cost overruns are an embedded outcome of a winner's curse (like they were in the process of allocating investment funds in CPEs).

sporting facility or non-sporting infrastructure project between  $t-1$  and  $t$  can also reveal the existence of a winner's curse. Or, when a building which was forecast in the candidature file happens to be cancelled between  $t-1$  and  $t$ , this also reveals an initial cost underestimation: due to the latter the bill skyrocketed after  $t-1$  and the host city has no other way to curb cost overruns than by giving up some edifice described in the candidature file.

*Indicator 4: Delayed completion of an Olympics investment*

The completion dates of different Olympics facilities which are mentioned in the candidature file simply cannot be missed. Thus, a delayed completion of an Olympics investment only translates into a time lag between expected and actual completion dates, and in a subsequent final rush in the last weeks before the opening ceremony to complete the unfinished building – by the way it is exactly the investment cycle described for the CPEs (Bauer, 1978). A final rush at the very last minute always inflates the actual investment cost.

When no one of the first three proxy indicators can be fuelled with data or if one wishes to further confirm the existence of a winner's curse, some other variables can be used as proxies. However, they are less significant than the first three indicators.

*Indicator 5: Extra public subsidy or extra public finance*

If the cost of hosting the Olympics was initially underestimated, one way out for the LOOC and the host city is to bargain and obtain an additional public finance or an extra subsidy, for instance from the government or some regional authorities between  $t-1$  and  $t$ .

*Indicator 6: Host city fiscal deficit and debt*

When extra cost of the Olympics project comes out with a heavy financial burden for the host city its budget plunges into a fiscal deficit and a public debt that is to be repaid over time. The same index may register the transformation of ex ante LOOC (or overall) surplus into ex post LOOC (or overall) deficit.

*Indicator 7: A disappointing number of 'foreign' visitors*

When the number of 'foreign' (*i.e.* coming from outside the host city or region) visitors in  $t$  is lower than expected in  $t-1$ , then revenues will be lower than expected and, possibly, will increase financial losses.

Two more qualitative indicators may confirm an existing winner's curse: a) there are clear signs that a bidding city has attempted to influence the IOC voters through lobbying with some IOC members; b) since outcome uncertainty about who will host the Games lasts until the IOC votes, and given that some IOC members are less scrupulous and disinterested than they should be, a bidding city can be led one step forward into bribery and corruption that can be taken as a winner's curse confirmation. However, lobbying and corruption per se are not

decisive indicators of a winner's curse. Lobbying and corruption are unfortunately common practices in various economic activities attempting to influence different decision makers, including in some rigged relationships between money and sports like fixed matches and on line sport gambling (Hill, 2010). Spotting lobbyists, even when lobbying is very effective as during the London campaign for the 2012 Olympics (de Rendinger, 2006), is not an easy task and does not alone guarantee the existence of a winner's curse, except if it is to complement, for instance, a cost overrun or a delayed completion indicator.

## 5. Preliminary indices verifying the winner's curse hypothesis

The present essay aims to validate the winner's curse hypothesis. Below I sample some readily available data on the costs of hosting the Olympics that are consistent with this hypothesis. The data gathered in these tables must not be taken at their face value since, as mentioned above, some do not bare an official stamp. The only important point here is to check whether  $C_t > ct-1$ , ex post is higher than ex ante cost, meaning that a *cost overrun* had occurred. Data have been collected, when easily available, for Summer Games since 1972 and Winter Games since 1980.

**Table 2: Ex ante and ex post cost of Summer Olympics**

Host city, year (Nb of bidders)	ct-1: ex ante cost	Ct: ex post cost	After t cost
Munich 1972 (4 bidders)	Overall cost: \$2705m	Investment cost: \$1757m00 LOOC operation cost: \$656m00	
Montreal 1976 (3 bidders)	Investment cost: \$549.5m00  Olympic stadium cost: \$172m	Investment cost: \$3395.6m00 LOOC operation cost: \$476m00	Operation: \$1592m Stadium: \$1000m
Moscow 1980 (2 bidders)	Overall cost: \$3.7bn Operation cost: \$2bn Investment cost: \$1,7bn	Overall cost: \$9bn	
Los Angeles 1984	No commitment	Overall cost: \$1592m LOOC operation cost: \$546m	
Seoul 1988 (2 bidders)	Overall cost: \$3.1bn Investment cost: \$3450m	LOOC operation cost: \$664m00 Investment cost: \$4063m00	Extra cost: \$2bn
Barcelona 1992 (6 bidders)	Investment cost in: 1985: F13bn; 1988: F23,5bn 1990: F35,5bn; 1992: F41,5bn LOOC operation cost: \$1670m	Investment cost: \$10134m00 Overall cost: \$9.3bn  LOOC operation cost: \$1793m00	Debt: \$6.1bn
Atlanta 1996	Overall cost in 1990: \$2021m	Investment cost: \$1324m00	

(6 bidders)		LOOC operation cost: \$1346m00	
Sydney 2000 (5 bidders)	Overall cost in 1994: \$3428m Investment cost: \$2500m LOOC operation cost: \$1463m New South Wales Invt: \$1220m	Investment cost: \$2601m00 LOOC operation cost: \$2434m00 New South Wales Invt: \$1249m	Overall cost: \$6.6bn
Athens 2004 (5 bidders)	LOOC operation cost: \$2162m00 Overall cost: €4.6bn	LOOC operation cost: \$2404m00 Overall cost: €6.0bn (June 2004)	Overall: €9.6bn
Beijing 2008 (5 bidders)	Investment cost: \$1600m00 Invt cost in 2006: \$2800m LOOC operation cost: \$786m00  Olympic stadium cost: €300m Overall cost: €2.2bn (\$bn1.9bn) 2004 \$2.4bn in 2006	Investment cost: \$2170m00  LOOC operation cost: \$1458m00 Infrastructure cost: \$35.6bn Olympic stadium cost: €380m Overall cost: \$43 to 45bn	Invt cost: €13.5bn  Infrastr: €29bn
London 2012 (5 bidders)	Overall cost: £3.4bn in 2005; £3.674bn end 2005; £9.3bn in 2007 £10.0bn in 2009 Investment in 2005: £2.664bn in 2006: €15.0bn LOOC operation 2005: £1010m in 2006: €1900m	Overall in 2011: \$19bn (£11.6bn)	

m: million; bn: billion; \$m00: in 2000 dollars; Australian dollars for Sydney; F: French francs

Sources: Andreff & Nys (2002), Auf der Maur (1976), Barget & Gouguet (2010), Gouguet & Nys (1993), Preuss (2004 & 2006), Zimbalist (2010 & 2011), bidding committees, press articles.

**Table 3: Ex ante and ex post cost of Winter Olympics**

Host city, year (Nb of bidders)	ct-1: ex ante cost	Ct: ex post cost	After t cost
Lake Placid 1980 (2 bidders)	Initial operation cost: \$47m Investment cost: \$129m	LOOC operation cost: \$96m	Op. loss: \$8.5m
Sarajevo 1984 (3 bidders)	Operation cost: \$17.6m	Operaton cost: \$20.2m Investment cost: \$15.1m	
Calgary 1988 (3 bidders)	Initial overall cost: can\$500m	Overall cost: can\$1000m LOOC operation cost: \$636m	
Albertville 1992 (7 bidders)	Initial total cost: F2933m in 1987: F3160m; 1991: F11487m of which operation cost: F3233m; sporting equipments: F714m infrastructures: F8630m Accommodation cost: F289m	Overall cost: F12bn  LOOC operation cost: F4200m sporting equipments: F5755m infrastructures: F7800m Accommodation cost: F575m	Op. loss: \$60m (F285m)  Extra sport equipt cost: F286m
Lillehammer 1994 (4 bidders)	Overall cost in 1988: \$1511m	Overall cost: \$1700m	Op.loss: \$343m
Nagano 1998 (5 bidders)	Overall cost in 1992: \$450m	Overall cost: \$875m	Debt: \$11bn



Salt Lake City 2002 (4 bidders)	Operation cost: \$400m in 1989; 1996: \$1000m; 1998: \$1300m	Operation cost: \$1.9bn	Op. loss: \$168m
Turin 2006 (6 bidders)	Investment cost: €3.5bn Operation cost: \$660m	Investment cost: €13bn Operation cost: \$1357m	Op. loss: \$38m
Vancouver 2010 (3 bidders)	Operation cost: \$846m	Operation cost: \$1269m Investment cost: €1.31bn	Op. loss: \$37m
Sochi 2014 (3 bidders)	Initial total cost: \$8.4bn 2007: \$12bn; 2010: \$33bn		

m: million; bn: billion; \$00: in 2000 dollars; Australian dollars for Sydney; F: French francs; Y: yen

Sources: Andreff & Nys (2002), Barget & Gouguet (2010), Burton & O'Reilly (2009), Chappelet (2002), Elberse et al. (2007), Jeanrenaud (1999), Solberg (2008), Tihi (2003), Zimbalist (2010 & 2011), bidding committees, press articles.

**Table 4: Summer Olympics: operational and construction cost increases**

Olympics	Operational cost			Construction cost		
	1st estimation	last estimation	Increase	1st estimation	last estimation	Increase
Munich 1972	1968	1974	222%	1965	1974	171%
Montreal 1976	1972	1977	538%	1972	1977	385%
Los Angeles 1984	1981	1984	20%	1983	1984	3.4%
Seoul 1988	1982	1989	82%	1982	1989	352%
Barcelona 1992	1988	1993	28%	n.a.	n.a.	n.a.
Atlanta 1996	1989	1997	51%	1989	1997	14%
Sydney 2000	1993	2001	68%	1990	2001	228%

Source: Solberg and Preuss (2007).

There is practically no sign of a winner's curse involved in Los Angeles 1984, which is an expected result since the 1984 Olympics was not auctioned, Los Angeles being the only candidate. Nevertheless, it must be reminded that Los Angeles had very little construction expense and the city had agreed to host the Games only on the condition that it took on no financial obligation (Zimbalist, 2011). In the case of Lake Placid 1980, the second bidding city, Vancouver, withdrew a few days before the IOC votes, which may have alleviated the winner's curse. It has been difficult to find enough information comparing ex ante and ex post costs for Munich 1972 so that the conclusion of an existing winner's curse still hangs over. On the other hand, data are not absolutely reliable for Moscow 1980 and Sarajevo 1984. Nearly all other Olympiads show recurring cost overruns consistent with the winner's curse hypothesis and it is already crystal clear for London 2012 and Sochi 2014 as exhibited in Tables 2 and 3.

With regards to Summer Olympics, without commenting each data per se, Tables 2 and 4 show a strong tendency of Games ending up with higher ex post actual than ex ante expected

cost. It appears that cost underestimation often is more due to investment and infrastructure costs than to the LOOC operation cost. If the criterion of a 30% cost overrun in current prices is adopted, the winner's curse is likely to exist for Montreal 1976, Moscow 1980, Seoul 1988, Barcelona 1992, Athens 2004, Beijing 2008, and London 2012. With a 30% extra cost criterion the hypothesis is rejected for Atlanta 1996 and Sydney 2000. In the two latter cases, complementary proxies must be meaningful to conclude.

Turning to Winter Olympics, with the same criterion, a winner's curse is recognized for Lake Placid 1980, Calgary 1988, Albertville 1992, Salt Lake City 2002, Turin 2006, Vancouver 2010 and Sochi 2014. On the other hand, complementary indexes are crucial to conclude about Lillehammer 1994 and Nagano 1998.

Looking now at the *ex post revisions* indicator, it can be witnessed for several Games. The most infamous and costly revision probably is the story of the Montreal Olympic stadium roof (Auf der Maur, 1976) which eventually had been completed as late as 1985, nine years after the Games, at nearly a sixfold increase. Moreover, transforming the velodrome into a *Biodôme* had triggered an additional \$1.5 billion cost. In Albertville, the cost of Courchevel ski-jump has been revised from \$13million up to \$26 million, La Plagne bobsleigh run from \$15 million to \$50 million. A \$1,346 million expenses targeted at public transportation equipment was eliminated from the initial Albertville LOOC budget. In Sydney, two galleries of the Homebush Bay stadium were forgone due to excessive cost.. In Beijing, simplifying the "Bird's Nest" structure of the stadium is a revision that has saved 50% of steel costs; the project of Olympic swimming pool, eventually assessed as too sophisticatedly equipped, was streamlined. In Vancouver, the security budget multiplied seven times between 2003 and 2010, from \$153 to \$1,070 million. The cost of London Olympic stadium has been revised upwards from \$406 million to \$850 million while the cost of infrastructures is up by \$170 million; the Olympic park has inflated by \$1,440 million over its initial \$5.3 billion bill. Rosa Khutor ski resort has been added, after the bid, to Sochi project; it is opportunely financed by Interros, a holding company owned by a rich oligarch, Vladimir Potanin.

Next, consider the *delayed completion* indicator The Albertville urban project still remains uncompleted. The completion delay of the Centenary Park in Atlanta required additional jobs and overtime work, and thus has generated extra cost. In Athens, a number of building sites had been lagging behind the schedule, in particular the new tramway, a circular motorway and a suburban train to the new airport. In January 2004, only one (the Nikaia gymnasium) of the 33 Olympic sites was ready. Then, the final investment rush occurred. Several London

Olympic sites, including Wembley stadium, are late and the LOOC meets increasing hindrances to programming all sporting equipments in due time.

As a result, and as usual with the Olympics, extra *public finance and subsidies* are obtained by the LOOC. Montreal 1976 had got overall \$1 billion public subsidies. Albertville 1992 had received an extra financial aid from the government in 1987 up to one quarter of the LOOC budget, and again a \$46 million extra finance after the Games, in July 1992. In Sydney, the riding school had obtained an operation subsidy of \$676,000 per year and the Blacktown Olympic Park \$654,000 per year. The city of Athens has never stopped raising public loans when preparing to host the Games and helps to account for the increase in Greece public debt. The Italian government provided a \$223 million to the LOOC in 2005 in order to cope with its budget deficit which burst out as early as 2004.

A LOOC deficit does not emerge as often as it should because extra expenditures are transferred to (or subsidised by) the host city budget and sometimes the region or national government budget. Nevertheless a loss – an operation deficit – has been registered for Munich 1972, Montreal 1976, Lake Placid 1980, Albertville 1992, Lillehammer 1994, Sydney 2000, Salt Lake City 2002, Athens 2004, Turin 2006, Vancouver 2010, and probably though unofficially for Seoul 1988 (Preuss, 2004) and slightly for Atlanta 1996. Given the heavy subsidies collected by Barcelona 1992 (and a subsequent \$6.1 billion debt), the \$3 million official financial surplus is practically fictitious. Lake Placid deficit also was not officially that visible since it had immediately been covered by an exceptional aid from the New York state.

As a consequence, money is taken out of the taxpayer pocket. The debt of Montreal 1976 was reimbursed by taxpayers through an extra local tax (\$176 million) and a Québec provincial special taxation on tobacco (\$480 million). Moreover, running Montreal Olympic sporting facilities has created a \$13 million annual deficit over 35 years. The city of Barcelona budget had to charge \$1.7 billion repayment on to the taxpayers. The deficit of Albertville LOOC has reached \$60 million and the city's debt was \$2,400 per inhabitant; it has been financed by a 4% increase of the local housing tax. Several municipalities of the Tarentaise valley, which hosted the Albertville Games, such as Pralognan, Brides-les-Bains, Macôt, Les Saisies and Courchevel were also indebted. Sydney Games eventually generated a \$168 million debt. New South Wales pays \$37.3 million per year to operate former Olympic sites<sup>16</sup>. The

---

<sup>16</sup> A related issue is that some Olympic facilities are no longer used (in particular ski jumps and bobsleigh runs) after the Games. However, it is not a proof of the winner's curse per se since the non use is due to a short (or non existing) local demand for such facilities though they are absolutely required by the IOC.

Australia stadium had not been financed by issuing shares on the stock exchange and is in financial disarray, and running the Superdome and the water sports centre are in the red. It is estimated that Greek taxpayers will pay for the Games deficit until 2030.

On the Olympics revenues side there are less determinants of the winner's curse than on the costs side. One is ex ante overestimation of the number of visitors attracted by the Games, in particular foreign visitors. For instance, in Albertville, a substantial share of the printed 800,000 tickets went unsold. One fourth of Atlanta tickets were left unsold. The number of visitors at the Sydney Games was lower than predicted (Preuss, 2004). However, one cannot find a major source of the winner's curse in missing or lost revenues.

If, by chance, it were not possible to find any sign of lobbying and corruption during the Olympics bids, then we would have a good counterfactual to the winner's curse hypothesis. But lobbying has seemingly become an almost unavoidable strategy to win the Olympics bid. Lobbying has a cost though often unknown (of course unpublicised). In a few cases, some information has filtered through the press: Sydney has lobbied and paid about \$0.5 million honoraries to overbid Beijing for the 2000 Games. Just before the votes for allocating the 2008 Games, Beijing committed itself to build ten stadiums in African countries to win over some IOC members from that continent. London also adopted aggressive marketing and lobbying tactics whose effect is considered by some as a major determinant of its winning bid for 2012. De Rendinger (2006) describes in detail the sequencing of London lobbying "technology": first hunting, then farming, then convincing, then closing, and eventually controlling (some future votes); he mentions that Paris 2012 candidature did not follow a similar strategy. Moreover, London had opportunely offered \$24 million to aid sport participants of poor countries if it would win the bid. Such strategy of course has been called into question in the French press asking whether the IOC has not turned itself into a lobby<sup>17</sup>.

With regards to corruption, the Sheridan report published in 1999 has established that Sydney 2000 bribed VIPs to become the Olympics host city. In September 1993, right before the IOC votes, the Australian Olympic Committee had offered \$65,000 to two IOC members, representatives of Kenya and Uganda. A peak in corrupting the bid has been reached with Salt Lake City Olympics (Maennig, 2002 & 2005) so that the rules of the Games allocation have been emended. Unveiling naked corruption has triggered a reform of the IOC (Chappelet and Kübler-Mabbott, 2008) and the exclusion of several IOC members such as Augustin Arroyo

---

<sup>17</sup> S. Cypel, Londres l'a emporté grâce à un lobbying efficace auprès du CIO, sensible à ses promesses, *Le Monde*, 8 juillet 2005 (London has won thanks to an efficient lobbying by the IOC which is sensitive to its promises).

(Ecuador), Zein el-Abdin Gadir (Sudan), Sergio Santander Fantini (Chile), Jean-Claude Ganga (Congo), Lamine Keita (Mali), Paul Wallwork (Samoa) in 1999 while the infamous Kim Un-yong (South Korea), a former IOC deputy president, has been blamed in 1999 and eventually resigned in 2005, under strong pressure. In fact, illicit embezzlements and bribes had already occurred in 1991 when Nagano won the bid over Salt Lake City for the 1998 Winter Olympics. At nearly the same date, some suspicions have weighed on Robert Helmick, a former president of the swimming International Federation and the architect of Atlanta victory for 1996. According to Chappelet and Kübler-Mabbott, Seoul winning the bid over Nagano for the 1988 Summer Games had also been plagued with special favours granted to some IOC members<sup>18</sup>.

However, to end up with a less pessimistic note, it must be noticed that in the most recent bids (namely for the 2018 Winter Olympics), the IOC attempts to fight the cost underestimation. Each and every investment has to be mentioned and financing has to be secured. Calculations are both in US\$ and local currency and the IOC asks a decent position of bidding cities for miscellaneous and unexpected costs. The outcome of such IOC effort in terms of alleviating the winner's curse remains to be seen in the future.

## **Conclusion**

It is not feasible to verify the winner's curse as an outcome of *all* Summer Olympics and Winter Olympics bids. However, cost overruns, project revisions, delayed completion, financial deficit and debt are so much widespread that it is enough to conclude that the winner's curse is more the rule than the exception. In particular, cost overruns are observed most Games sampled in this chapter. The only host city which at first sight was absolutely not cursed, Los Angeles 1984, is precisely the only one which had not to overbid rival cities, because it was the only one candidate right after the financial mess of Montreal 1976.

From this derives a policy recommendation: to avoid cost overruns and other bad consequences of the winner's curse, there should no longer be an allocation of the Olympics through auctioning. If someone would materialise such recommendation, the suggested practical reform is to fix once and for all a site for the Olympics (from time to time the Greek city of Olympia is mentioned as the proper site), which will avoid any auctioning, overbidding and winner's curse. However, it is not the interest of the IOC to have just one

---

<sup>18</sup> Bribing an IOC member may pertain to other sporting mega-events than the Olympics. The press recently alleged that Issa Hayatou, the Cameroon's IOC member, took \$1.5 million bribe to vote for Qatar to host the 2022 FIFA World Cup.

candidate or always the same (Olympia) since the bid winner – host city – being cursed, and paying the bill for providing magnificent but expensive Games, is the easiest means for the IOC not to pay the actual price for having its sports mega-event hosted.

#### References:

- Akerlof G. (1970), The Market for Lemons: Qualitative Uncertainty and the Market Mechanism, *Quarterly Journal of Economics*, 89, 488-500.
- Allmers S. & W. Maennig (2009), South Africa: Economic Scope and Limits, in N.J. Rao & A.S. Sidoya, eds., *Economics of Sports*, Ifcai University Press, 186-213.
- Andreff W. (1991), dir., *Les effets d'entraînement des Jeux Olympiques d'Albertville: Retombées socio-économiques et innovations dans le domaine du sport en région Rhône Alpes*, PPSH 15, CNRS, Lyon & Grenoble.
- Andreff W. (1993), *La crise des économies socialistes. La rupture d'un système*, Grenoble : Presses Universitaires de Grenoble.
- Andreff W. (2000), Privatisation and Corporate Governance in Transition Countries: Beyond the Principal-Agent Model, in: E.F. Rosenbaum, F. Bönker, H.-J. Wagener, eds., *Privatization, Corporate Governance and the Emergence of Markets*, London : Macmillan, 123-38.
- Andreff W. (2003), Twenty Lessons from the Experience of Privatisation in Transition Economies, in: Y. Kalyuzhnova, W. Andreff, eds., *Privatization and Structural Change in Transition Economies*, London : Palgrave, 29-59.
- Baade R. & V. Matheson (2001), Home Run or Wild Pitch? Assessing the Economic Impact of MLB' All Star Game, *Journal of Sports Economics*, 2, 307-27.
- Barget E. & J.-J. Gougnet (2010), *Evènements sportifs. Impacts économique et social*, Bruxelles: De Boeck.
- Bauer T. (1978), Investment Cycles in Planned Economies, *Acta Oeconomica*, 21, 243-60.
- Burton R. & N. O'Reilly (2009), Consider Intangibles when Weighing Olympic Host City Benefits, *Sports Business Journal*, September, 7-13.
- Capen E., R. Clapp & W. Campbell (1971), Competitive Bidding in High-risk Situations, *Journal of Petroleum Technology*, 23, 641-53.
- Chappelet J.-L. (2002), *From Lake Placid to Salt Lake City: The Incredible Growth of the Olympic Winter Games since 1980*, IDHEAP, Lausanne.
- Chappelet J.-L. & B. Kübler-Mabbott (2008), *The International Olympic Committee and the Olympic System*, Abingdon: Routledge.
- Cassing J. & R.W. Douglas (1980), Implications of the Auction Mechanism in Baseball's Free Agent Draft, *Southern Economic Journal*, 47, 110-21.
- De Rendinger A. (2006), *Jeux perdus. Paris 2012., pari gâché*, Paris: Fayard.

- Du Plessis S. & W. Maennig (2009), South Africa 2010 : Initial Dreams and Sobering Economic Perspectives, in U. Pillay, R. Tomlison & O. Bass, eds., *Development and Dreams. The Urban Legacy of the 2010 Football World Cup*, Capetown : HSRC Press, 55-75.
- Dyker D. (1983), *The Process of Investment in the Soviet Union*, Cambridge: Cambridge University Press.
- Elberse A., C. Anthony & J. Callahan (2007), The Vancouver Olympics, Harvard Business, October.
- ESSEC (2007), *Les retombées économiques de la Coupe du Monde de rugby 2007 en France*, Etude pour le Comité d'organisation France 2007, April 27.
- Feddersen A., W. Maennig & P. Zimmermann (2008), The Empirics of Key Factors in the Success of Bids for Olympic Games, *Revue d'Economie Politique*, 118, 171-87.
- Gilberto S. & N. Varaiya (1989), The Winner's Curse and the Bidder Competition in Acquisitions: Evidence from Failed Bank Auctions, *Journal of Finance*, 44, 59-75.
- Gilley O., G. Karels & R. Leone (1986), Uncertainty, Experience and the Winner's Curse in OCS Lease Bidding, *Management Science*, 32, 673-82.
- Hill D. (2009), How Gambling Corruptors Fix Football Matches, *European Sport Management Quarterly*, 9, 411-32.
- Hudson I. (2001), The Use and Misuse of Economic Impact Analysis, *Journal of Sport and Social Issues*, 25, 20-39.
- Johnson B.K., Groothuis P.A., Whitehead J.C. (2001), The Value of Public Goods Generated by a Major League Sports Team, *Journal of Sports Economics*, 2, 6-21.
- Kagel J.H. & D. Levin (2002), *Common Value Auctions and the Winner's Curse*, Princeton: Princeton University Press.
- Késenne S. (2005), Do We Need an Economic Impact Study or a Cost-Benefit Analysis of a Sport Event, *European Sport Management Quarterly*, 5, 133-42.
- Kornaï J. (1980), *The Economics of Shortage*, Amsterdam: North Holland Publishing.
- Kornaï J. & Liptak T. (1965), Two-level Planning, *Econometrica*, 33, 141-69.
- Lange O. (1936, 1937), On the Economic Theory of Socialism, *Review of Economic Studies*, 4 (1, 2), 53-71, 123-42.
- Leeds M. & P. von Allmen (2002), *The Economics of Sports*, Boston: Addison Wesley.
- Levis M. (1990), The Winner's Curse Problem, Interest Costs and the Underpricing of Initial Public Offerings, *Economic Journal*, 100, 76-89.
- Maennig W. (2002), On the Economics of Doping and Corruption, *Journal of Sports Economics*, 3, 61-89.
- Maennig W. (2005), Corruption in International Sports and Sports Management: Forms, Tendencies, Extent and Countermeasures, *European Sport Management Quarterly*, 2, 187-225.
- Malinvaud E. (1967), Decentralized Procedures for Planning, in E. Malinvaud & M.O.L. Bacharach, eds., *Activity Analysis in the Theory of Growth and Planning*, London : MacMillan, 170-208.
- Manove M. (1971), A Model of Soviet-type Economic Planning, *American Economic Review*, 61, 390-406..
- Matheson V. (2009), Economic Multipliers and Mega-Event Analysis, *International Journal of Sport Finance*, 4, 63-70.
- Neuberger E. (1959), The Yugoslav Investment Auctions, *Quarterly Journal of Economics*, 73, 116-30.

- Porter P. (1999), Mega-sports Events as Municipal Investments: A Critique of Impact Analysis, in: J. Fiszal, E. Gustafson & L. Hadley, eds., *Sports Economics: Current Research*, Westport: Praeger, 61-74.
- Rock K. (1986), Why New Issues Are Underpriced, *Journal of Financial Economics*, 15, 187-212.
- Solberg H.A. (2008), Impacts from mega events: What do we know so far?, Trondheim Business School, September 30.
- Solberg H.A. & H. Preuss (2007), Why mega sports events become more expensive than planned, EASM conference presentation.
- Swindell D. & M.S. Rosentraub (2002), Negotiating Games: Cities, Sports, and the Winner's Curse, *Journal of Sport Management*, 16, 18-35.
- Tihi B. (1983), *XIV Zimske Olimpijske Igre kao factor razvoja Sarajevskog regiona, Bosne I Hercegovine I sire zajednice*, Ekonomska Institut, Sarajevo.
- Walker M. & M.J. Mondello (2007), Moving Beyond Economic Impact: A Closer Look at the Contingent Valuation Method, *International Journal of Sport Finance*, 2, 149-60
- Walton H., A. Longo & P. Dawson (2008), A Contingent Evaluation of the 2012 London Olympic Games, *Journal Sports Economics*, 9, 304-17.
- Zimbalist A. (2010), Is It Worth It? Hosting the Olympic Games and Other Mega Sporting Events is an Honor Many Countries Aspire to – But Why?, *Finance & Development*, March.
- Zimbalist A. (2011), Economic Impact of the Olympic Games, in S.N. Durlauf & L.E. Blume, eds., *The New Palgrave Dictionary of Economics Online*.