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Hosting mega-sporting events: cost, economic impact, and legacy

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Introduction

From an economic standpoint, when hosting a multiple sports mega-event such as the Olympics, Universiade, Commonwealth Games, Jeux de la Francophonie, etc....

... three major dimensions must be checked and analysed:

- . The cost and the issue of cost overruns.
- . The economic (and social) impact of the event and its ex ante and ex post estimation.
- . The (more recent concern of the) legacy left after the event.

Of course, all the three dimensions are very much influenced by political decision making (that I won't talk about), and the below-suggested recommendations are only derived from economic analysis and economists' common sense.

1. The cost of hosting a mega-sporting event: could we avoid cost overruns?

Distinguish *ex ante* cost (candidature file) and *ex post* cost (after the closing ceremony).

The bigger the event hosted, the higher the cost:

Ex post: Beijing Olympics 2008: 35bn\$, 0.8% GDP, Vancouver 2010: 5bn€ Sochi 2014: 50bn\$, 2%, > 2018 GDP of 120 countries (Azerbaijan, Tunisia, Zimbabwe, etc.), Rio de Janeiro 2016*: 33bn\$ Pyeongchang* 2018: 10.5bn€.

FIFA World Cup 2010 = 5,6bn\$; 2014 = 11bn\$; 2018 = 19,4bn\$.

Euro football 2016: 1,2bn€ (+ 2bn€ stadia).

Trend: cost inflation (increasing ‘gigantism’ of the events?).

Cost components:

Cost in the OCOG budget: organisation (preparation & operational costs), some sporting equipment and infrastructures.

Beyond OCOG budget: sporting and non-sporting infrastructures.

Table 1: Ex ante (announced) budget for the Paris 2024 Summer Olympics (in 2015)

Cost (in bn €)	Amount	Financing	Amount
Organisation	3.2	IOC	1.8
Sporting equipment	1.7	Private funding (TV, sponsors)	1.4
Non sporting infrastructures	1.3	Public expenditures	3.0
Total	6.2	Total	6.2

Major issue: cost overruns when *ex post* cost > *ex ante* cost (1).

Example: Olympics cost overruns (Tables 2, 3, 4 below) where (1) is nearly always verified (with the 1984 Los Angeles exception).

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 (6 bidders)	Overall cost in 1990: \$2021m	Investment cost: \$1324m00 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: \$151 lm	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	Total cost: \$ 51bn	

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

Table 4: Ex ante and ex post cost: Summer Olympics since 1984
(in billion 2014 euros)

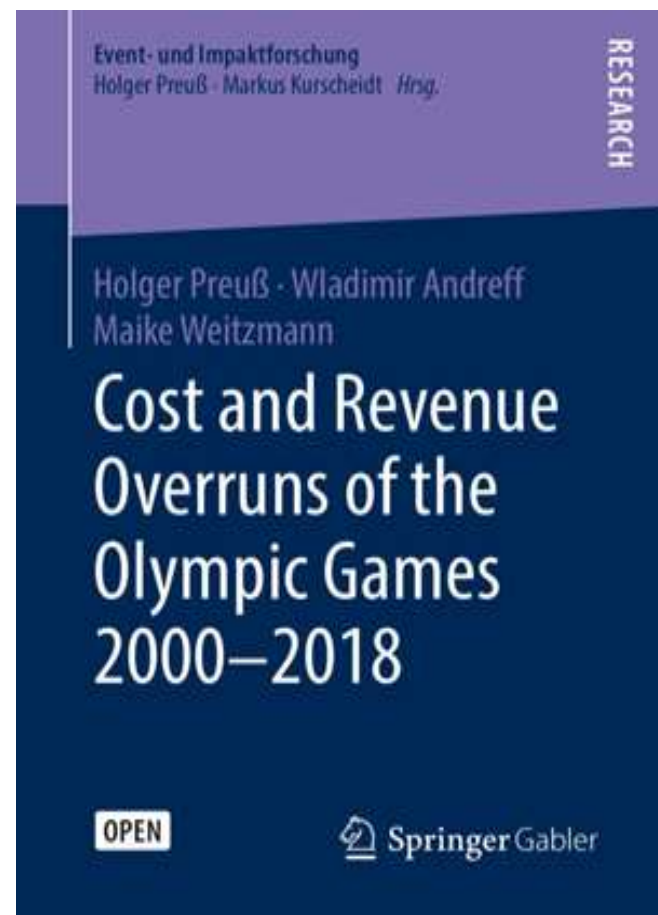
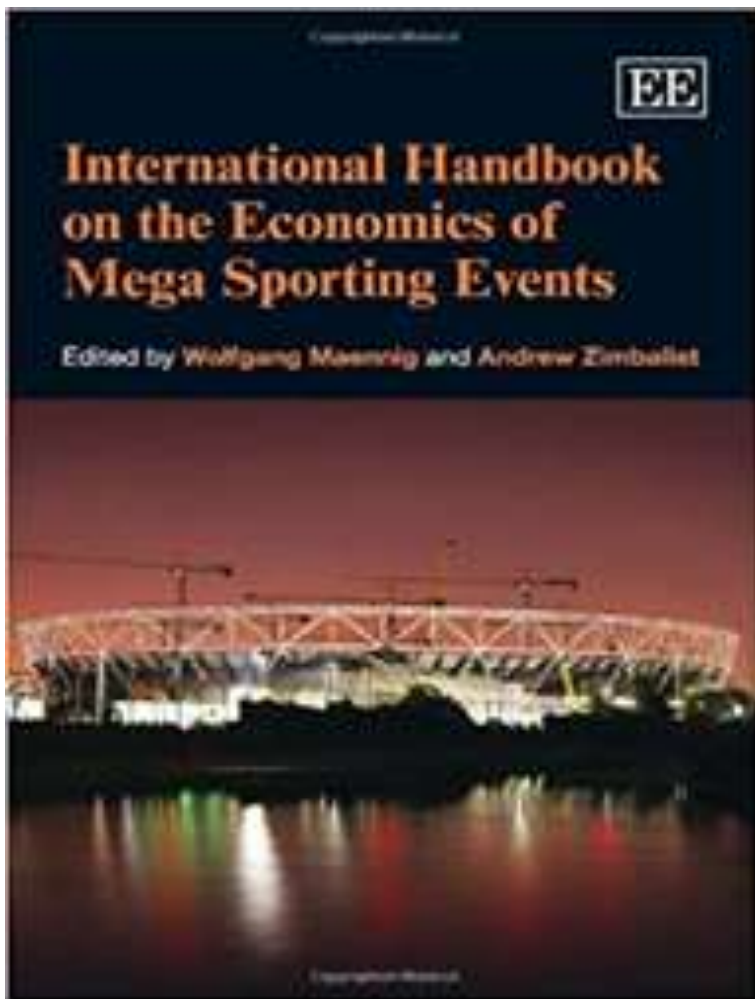
Host city year	Number of candidates	Ex ante cost candidature file	Ex post cost end of the Games	Overrun rate in %
Los Angeles 1984	1	1,6*	1,6*	0%
Seoul 1988	2	4.0	8,3	108%
Barcelona 1992	6	3,9	10.0	156%
Atlanta 1996	6	2,5	3,3	32%
Sydney 2000	5	2,8	5,4	93%
Athens 2004	5	5,3	11,1	109%
Beujing 2008	5	2,6	32.0	1130%
London 2012	5	4,8	10,9	127%
Rio de Janeiro 2016	4	9,5*	16,5**	74%
expected in 2016***			33.0	247%

* in billion current dollars.

** actual cost in 2014.

*** estimation in August 2012.

W. Andreff, The winner's curse: why is the cost of mega-sporting events so often underestimated? in: **Wolfgang Maennig & Andrew Zimbalist, *International Handbook on the Economics of Mega Sporting Events*, Edward Elgar, 2012.**



How explain cost overruns?

Occasional (exogenous) causes: bad luck, hazard, mismanagement, bribery, corruption (resulting from weak governance) ... cannot occur all the time.

IOC 'explanation' (or excuse): the fault of host city's (region's) local politicians who take advantage of hosting the Games to launch (overshoot) too many new investment projects; possible though debatable.

Explanation derived from economic theory (auction theory): the *winner's curse*.

Richard Thaler (1994) has demonstrated that:

in any auction or auction-like setting where the value of the auctioned object is uncertain but will turn out to be the same for all bidders, the party who overestimates the value is likely to outbid the competitors and win the contest.

The IOC organises an auction-like process among candidate cities, that will overbid each other, in view to obtaining the best Olympics project in a 7 year deadline.

Among the bidders, the most optimistic will overestimate the value (underestimate the costs, overestimate the benefits) of hosting the Games, will the most aggressively bid, and win the bid, but will yield financial loss: the winner is cursed! The more bidders, the more cursed is the winner.

The most magnificent ('fantabulous', fantastic) Games project will win – making the IOC happy – while the voted (by IOC members) host city will bear a cost overrun starting 7 years before the Games so that the announced (underestimated) ex ante cost will, step by step, reach the actual cost (ex post).

Tables 2, 3, 4 confirm. Even the LA 1984 exception confirms the theory either, since LA was the unique candidate (no bid, no auction) for 1984 (in 1977, after the 1976 Montreal financial disaster). LA again unique candidate for 2028! No cost overrun expected in 2028.

Cost overrun does not necessarily translate into a (OCOG, host city) financial deficit because a revenue overrun may emerge as checked in Preuss-Andreff-Weitzmann for all the 2000-2018 Games. The cursed host city muddles through finding additional (not initially forecast) finance – Tab 1 excerpt from Preuss et al.

Tab. 1: Total Cost and Revenue Overruns respectively Underruns from Olympic Games

Olympic Games	Sydney 2000	Athens 2004	Beijing 2008	London 2012	Rio 2016
OCOG Revenue	72%	51%	8%	50%	0%
OCOG Expenditure	51%	30%	4%	48%	0%
Non-OCOG	56%	29%	N/A	43%	-23%

Tab. 2: Total Cost and Revenue Overruns respectively Underruns from Olympic Winter Games

Olympic Winter Games	Salt Lake City 2002	Turin 2006	Vancouver 2010	Sochi 2014	Pyeongchang 2018
OCOG Revenue	119%	N.A.	12%	-11%	39%
OCOG Expenditure	114%	58%	12%	-6%	38%
Non-OCOG	21%	20%	13%	178%	-26%

Recommendations

A/ To *mega-sporting event organisers* (to the IOC in October 2017): pertains also to FISU (International University Sports Federation), FIFA, UEFA, etc.

Either alleviate the consequences of awarding the event through an auction:

. Infrastructures that can be dismantled from one Olympics site and moved to the next one.

. Restricting the auction to those (biggest) cities where required sporting equipment and infrastructures are available (no chance for developing, emerging countries).

. Lowering the IOC prerequisites in terms of sporting equipments, infrastructures, ceremonies, size of delegations, = downsizing the Games (the only option for developing countries).

. Rotation sequence of the bid winner across the continents (implicit FIFA World Cup option) or regions. Still cost overruns (Table 7 : FIFA WC)

Table 7 : Ex ante and ex post cost of the FIFA World Cup, 1998-2018

FIFA World Cup in:	Ex ante cost	Ex post cost
France 1998	OrgC 1995: 1.6 bn F stadia: 2.4 bn F	OrgC: 2.4 bn F InvC: 4.3 bn F stadia: 3.1 bn F
Japan & South Korea 2002	Japan OrgC: 530 m € Korea OrgC: 395 m € InfraC Korea: 2.6 bn \$ stadia Korea: 1.3 bn \$ stadia Japan: 4.6 bn \$	InfraC: 5.6 bn \$ stadia Korea: 2 bn \$ stadia Japan: 5 bn \$
Germany 2006	OrgC: 430 m € InfraC: 1.6 bn € stadia 2003: 1.4 bn € Total cost: 3.7 bn €	OrgC: 450 m € InfraC: 3.7 bn € stadia: 1.5 bn € Total cost: 8 (10) bn €
South Africa 2010	InvC: 2.3 bn R 2003; 17.4 bn R 2007; 30.3 bn R 2010	InvC: 39.3 bn R, municipal Inv included

Brazil 2014	InvC: 8.2 bn \$ 2010; 14.5 bn \$ 2012; 16 bn \$ 2013; 26 bn \$ 2014 stadia: 1.5 bn \$ 2010; Maracana renovation: 288 m € 3.9 bn \$ 2013 Total cost 2007: 12 bn \$	InvC: 33 bn € Maracana achieved: 449 m € Total cost 2014: 45 bn \$
Russia 2018	InvC: 11 bn \$ 2010; 19 bn \$ 2012; 22 bn \$ 2013; 27 bn \$ 2014	Expected InvC: 43 bn \$ 2018
Qatar 2022	Total cost: 150 bn \$	Expect. total cost 2014: 200bn\$

OrgC: organisational cost; InC: investment cost; InfraC: infrastructure cost

bn: billion; m: million; F: French franc; R: rand

Source: update of Andreff (2013c) preliminary data collection from various sources, primarily the press.

Or changing the awarding mode (process): no auction

- . Fix once and for all a Summer Olympics site (Olympia, 1996?); idem for the Winter Games.
- . Distribution of the different Olympics sports contests across different competing candidate cities/countries (UEFA Euro 2020 solution). The price to pay: low local economic impact (but at low cost).

Options with absolutely *no* chance of *cost overruns*:

- . Allocation through a lottery across all potential (risk averse) candidate cities.
- . Discretionary authoritative IOC choice of a city (the most costly option for the IOC, then compelled to cover the overall cost of the Games).

B/ **Recommendations** to *host cities*

- . Create (convene) an independent external auditing body in charge of supervising the event's accounting and finance, costs and revenues, cost overruns, bribery, corruption (ex: Paris 2024, annual report by *Cour des Comptes*, the external audit of French public expenditures).
- . Avoid cost underestimation and benefit overestimation (at the candidature stage ... and after).
- . Look for additional revenue sources over 7 years (new sponsors, etc.).
- . Avoid leaving any deficit that will fall down on to local taxpayers.
- . Check local population willingness to host (local referendum) or, better, willingness to pay for hosting the event (ex: Sochi 2014, Master thesis in 2013).

2. The economic impact of hosting a mega-sporting event

. Given its high cost, after 1976 each candidate/host city was requested to exhibit that hosting the Olympics will trigger a significant economic (social) impact ... likely (supposed) to compensate for the cost (or even more) => requested impact studies.

. **Economic impact** = **value added** to an economic territory by the fact of hosting a sporting event compared to the counterfactual «not hosting the event» ('as if' situation); *ex ante* and/or *ex post* estimation (calculation) of the impact.

. Three methodological tools for an impact study: CGEM - Computable General Equilibrium Model (thousands variables and equations), Leontief multiplier (matricial calculation) and most often used Keynesian multiplier k such as:

$$Y = k \cdot X^* = \frac{1}{1-e+m} \cdot X^* \quad (1)$$

e : marginal propension to locally spend (consume), endogenous to Y,

m : marginal propension to import (endogenous imports, depend on income variations),

Y: income (national, local),

X*: autonomous exogenous expenditure (or **initial injection**) independent from income variations (ex: new investment, public expenditures, exports, IOC money inflow).

If $k = 1$: no value added, no impact (just an initial injection from the IOC, FISU, etc.)

If $k > 1$: some value is **added** to the territory's economy; if $k < 1$: some waste of the initial injection (ex: injected money drifting into corruption).

Or without mathematics:

Impact = Injection (initial expenditures) + Direct effects + Indirect effects + Induced effects = **Injection x Regional Multiplier**.

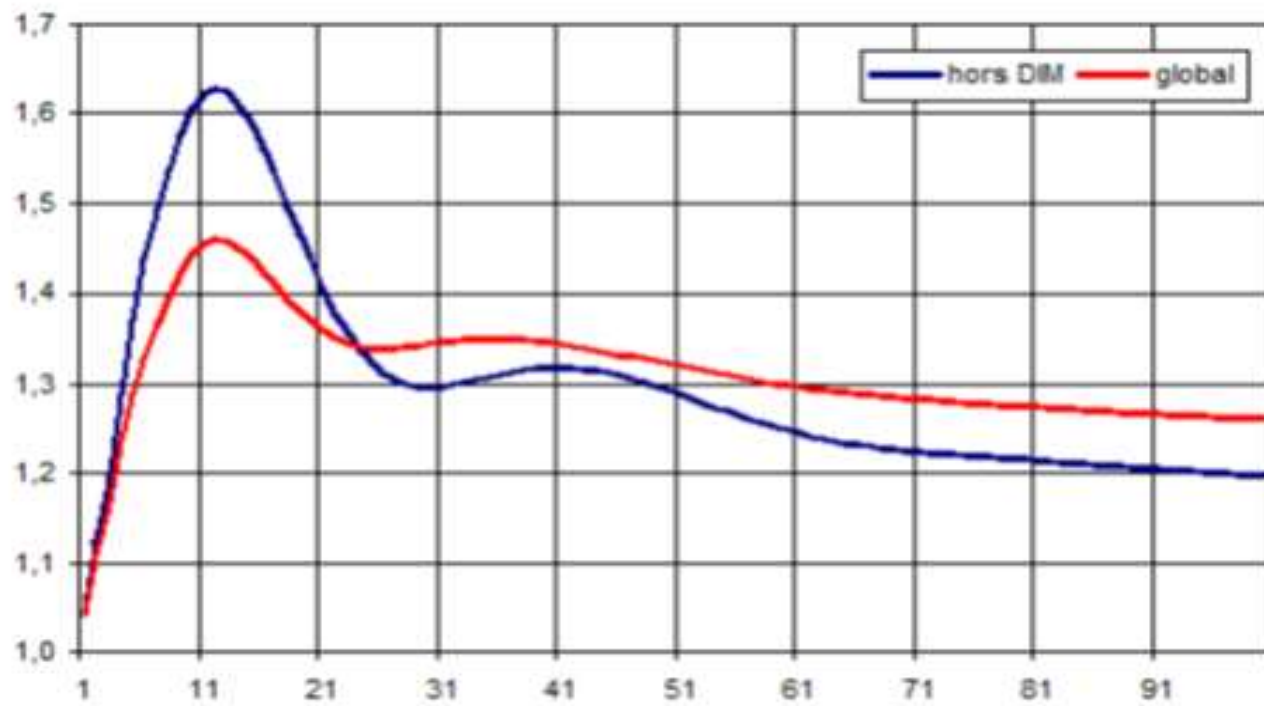
Many methodological tricks (willing or unwilling mistakes) first with estimating the initial injection:

. Wrong delineation of the relevant geo-economic area of the impact. If macro, the impact is often negligible ($< 0.1\%$ GDP), if micro (entreprise level), overestimation. Better: Hosting locality, region (Ekaterinburg area: 2023 Universiade).

Double-counting to be checked and avoided (obvious impact overestimation).

- . Substitution effect: do not count the residents' expenditures on the event.
- . Crowding-out effect: best example, Athens Olympics 2004.
- . Leaks: required imports, other outflows of money from the region (linked to the event) are to be deduced from the impact.
- . Initial injection: a concept that fits with taking on board neither the opportunity cost of hosting the event nor its positive or negative external effects (externalities).
- . Last methodological issue: which value for the multiplier (summing up all the direct, indirect and induced effects)? Often $k > 2$ in impact studies; too high.

In France, INSEE with a macroeconomic model (MESANGE) assesses it – on average for any investment – to be 1.6 (= max) one year after the expenditure, then falling to 1.3, 1.2 7 years later ... and tends toward 1 (when all effects are exhausted): see graph below.



Overall: most impact studies **overestimate** the economic impact of hosting mega-sporting events (in tune with the winner's curse analysis above).

Most professional economists are critical about impact studies, but ...

... remain unheard by (candidate cities) decision makers who are very much eager to obtain a study exhibiting a positive economic impact from hosting the targeted sports event, and are ready to pay a significant amount of money for getting such conclusion.

Cognizant of this purpose, consulting companies are used to exaggerate positive economic spillovers... in view of being selected again in the future as a consultant by other candidate cities (conflict of interests).

Some economists (Kesenne) suggest to forget impact studies ...

... while our Observatory is in charge of: 1/ supervising their methodology to avoid aforementioned tricks; 2/ requiring both an ex ante and an ex post study for each (same) sporting event hosted.

Our prerequisite n°2 has become an OECD recommendation to its member countries since 2018.

Table 8: The ex post economic impact of the Euro 2016
(million €)

Total economic impact	1221,8
Net injection Organisation	476,8
Net injection Tourism	500,6
Keynesian Multiplier	1,25
Employment (full time equivalent) created	102600
Recettes fiscales additionnelles	74

CDES et Kénéo (2016).

Impact of stadia construction excluded (since excluded from the costs)

Table 9: Ex ante economic impact of Paris 2024 Olympics

(million €)

From 2017 to 2034	Pink scenario	Central scenario	Grey scenario
Total economic impact	10,73	8,144	5,277
Employment (FTE) total	246,913	188,59	119,303
Impact Construction	1,809	1,336	970
Employment (FTE) Construction	40,171	29,668	21,54
Impact Organisation	5,394	3,968	2,871
Employment (FTE) Organisation	108,613	79,879	57,81
Impact Tourism	3,527	2,841	1,436
Employment (FTE) Tourism	98,129	79,043	39,953
Keynesian Multiplier	2.0	1.5	1.1
Inflation rate	1.0	1.3	1.5
Other estimations:			
IOC contribution		1,5	
Additional tax revenues		340	
Tickets for sale		1,200,000	
Exoected TV viewers		3,500,000	

Source: CDES (2016).

. Moreover the calculated impact is not directly comparable with costs.

. Economists do prefer cost-benefit analysis (CBA) rather than impact studies, that is:

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

R_k : (revenues + positive externalities) created by the investment project k ,

C_k : (costs + negative externalities) of the investment project k ,

a : a discount rate,

B_k : net economic benefit (or loss) for the society (territory) of the project k .

Worth investing in the sport event project 1 if and only if: $B_1 \geq 0$

and:

$B_1 > B_2 > B_3 > \dots > B_n$ (alternative projects 2, 3, ..., n).

If 1 chosen, B_2 is the *opportunity cost* of 1 (the potential benefit 'lost' on 2).

Ex: if 2 = hosting the FIFA World Cup in Rio versus 1 = building 5 new hospitals in Rio (Romario), forget hosting the Cup and build up the 5 hospitals.

. Moreover, the outcome of a CBA may be disappointing, a loss ($B1 < 0$) or a social benefit lower than expected. Ex: 2007 Rugby World Cup hosted in France:
Ex ante impact: bn 8 €; ex post impact: mn 590 €; B = mn 113 €.

. Very few CBAs achieved on mega-sporting events due to:

a/ It requires more sophisticated tools than impact studies (and professional economists' skills): contingent evaluation of the economic surplus, willingness to pay, transportation cost assessment, use and non-use value, substitution markets (ex: protection expenditures against pollution), hedonic prices, monetisation of non monetary effects.

b/ It must be achieved over the whole life cycle of the project (Olympics: from 7 years before to about 25 years after – the life time of a stadium).

c/ CBA is thus more expensive than an impact study.

d/ No city mayor (decision maker) is interested in the net final outcome of his decision 25 years later, in particular if social loss (only economists are).

Recommendations

- 1/ Do not trust too much economic impact studies provided by remunerated business consultants (conflict of interests).
- 2/ Check aforementioned methodological tricks and the potential impact (benefit) overestimation. Better: create a body (Observatory?) to do the job.
- 3/ Follow OECD recommendation even though Russia is not a member.
- 4/ More generally, do not be too much optimistic about actual (not overestimated) economic impact. Most American economists have checked that the multiplier is close to 1 (no or weak impact), even below 1 (negative impact). European economists less pessimistic, but higher than 1.3/1.5 a multiplier is dubious.
- 5/ Even the IOC is not as confident in the economic impact as before, the reason why it switched the focus on to the legacy of the Games.

3. Which legacy left by hosting a mega-sporting event?

Following the 1992 Albertville and 1994 Lillehammer ecological disasters, since 2000 the IOC requires from candidate cities a file about the ecological legacy of hosting the Games and its contribution to sustainable development (energy saving, collective transportation system, minimising waste and scraps, preserving biodiversity, cleaning Games pollution ex post, etc.).

Since 2004, the legacy dimension is involved with a specific chapter in each candidate city's application file.

Ex: in the Paris 2024 candidature file:

a/ Environment: carbone imprint, bio food on Olympic sites, recycling scraps, 73% people located less than 30 minutes from Olympic sites, greens, 100% renewable energies, new swimming sites (on the Seine river), air quality.

b/ Inclusive society and solidarity: promoting women/men parity, family lodgings, improving the image and attractiveness of Seine-Saint-Denis suburbs, social and professional insertion of the youth, favouring access of small-medium sized enterprises to Olympics markets/outlets, 100% equipments accessible to handicapped persons, accompanying athlete professional reconversion.

c/ A better society by means of sport: (2017-18) academic year of Olympism, innovative educational methods on sport values, + 20% registered young sport participants, 70.000 voluntary workers + 80.000 civil servants involved, attract 10 million more French people to physical activity.

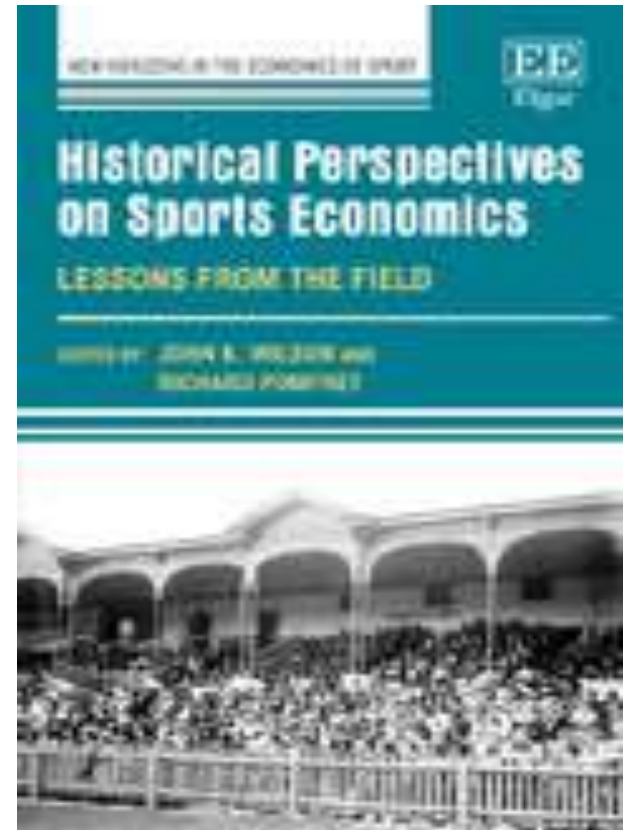
No clear standardised methodology to measure the legacy so far (economists advocate that the above CBA will fit well).

A number of debates and controversies about what should be taken on board under the label of legacy. What about a feel good effect? Life satisfaction? Happiness? Signal effect of an open country (to foreign trade, foreign investment) ?

In any case are to be distinguished: tangible versus intangible assets and positive versus negative effects.

A first economic attempt to compare the legacy of hosting the Winter Games in Grenoble 1968 and Albertville 1992 (Andreff 2018 & 2019).

W. Andreff, L'économie des sports d'hiver: des JO de Grenoble 1968 à ceux d'Albertville 1992, in : P. Chaix, dir., *Les Jeux Olympiques de 1924 à 2024: Impacts, retombées économiques et héritage*, L'Harmattan, Paris 2018



W. Andreff, The winter sports industry and Winter Olympics in historical perspective: from Grenoble 1968 to Albertville 1992, in: J.K. Wilson, R. Pomfret, eds., *Historical Perspectives on Sports Economics: Lessons from the Field*, Edward Elgar, Cheltenham, 2019

Grenoble 1968

Positive tangible legacy (primarily «non Olympic»): train station, sports palace, motorway access, telephones, Mayor House, police station, big post office, South hospital, 2 airports, exhibition palace, TV-radio station, House of Culture, Dauphiné Museum, 2 new districts: Malherbe, Olympic village.

Negative tangible externalities = «white elephants». Saint-Nizier and Autrans ski jumps, Alpe d'Huez bobsleigh run, Villard-de-Lans luge run, Grenoble sports Palace then velodrome (Grenoble 6 Days), too much expensive maintenance.

Negative financial legacy: Municipal deficit (mn 86.5F) covered by a state (government) subsidy. Debt to be repaid to CDC (a public bank) over 25 years at a 5.25% rate (for infrastructures), until 1992.

Intangible effects: ex post evaluation (2001 opinion Gallup/Grenoble image associated with): mountain 31%, *Olympics* 12%, *winter sports* 12%, big and nice city 7%, life satisfaction 5%, famous universities 6%, high-tech 5% (the last 2 not due to the Olympics, since 1950).

Albertville 1992

Positive tangible legacy: A430 motorway toward Lyons, express roads, namely toward 4 airports, Trois Vallées crossroad , TGV high speed train, water and electricity infrastructures, telecoms, hospitals and ...

... Chambéry media library, Val d'Isère congress hall, Albertville cultural centre, Brides-les-Bains mayor house, Courchevel airport, Bourget-du-Lac technopole, purification stations, incineration factories (against pollution). Building real estate: +15% in Tarentaise valley.

Used or transformed sporting infrastructures: Albertville ice skating stadium, Olympic hall, ski runs and slalom stadia in Val d'Isère, Méribel, Les Ménuires.

Negative tangible: «White elephants» or in deficit: Brides-les-Bains Olympic village and cable car , Pralognan ice skating hall, Courchevel ski jump, La Plagne bobsleigh run.

Negative financial legacy: «the Games did not pay for the Games», deficit covered by national (75%) and Savoie local (25%) taxpayers+ mn386F state subsidy. Increase of local housing taxation until 2015 to recoup the debt.

Intangible: image and exposure have lasted only 2 years since Lillehammer captured the light as early as 1994. Remains: Albertville as one of the best equipped (in infrastructures) city of such size (20,000 inhabitants).

Recommendations

1/ Take care of the legacy issues as early as possible with the first long run investments in equipment and infrastructure (stadia, tramways, etc.).

2/ Prepare the legacy: check who will use equipments/infrastructures in the future (market study), namely which clubs/athletes will play in the stadium, etc. Which future revenues?

3/ Estimate the future costs of maintaining, refurbishing equipments & infrastructures: will they be covered by revenues expected in 2/ above.

4/ Do not accumulate financial debt (back to the cost issue in 1).