Towards Improved Guidelines for Cost–Benefit Analysis of Sport and Cultural Events*

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Consistent evaluation procedures would be necessary to assess correctly the impacts of sport and cultural events, in particular large events. This paper reviews methodological issues in CBA of sport and cultural events based on what appears as the first attempt to provide guidelines for such analysis: the Framework used by New South Wales Treasury. This framework actually deals with most of the questions that an analyst would have to consider on this issue. Based on this document, we propose various possible amendments, which mostly relate to a fuller consideration of opportunity costs, displacement and other General Equilibrium effects. Many of the methodological issues investigated may have an important impact on the analysis results.

Keywords: cost–benefit analysis, mega events, guidelines for evaluation, sport events, public policy assessment.

1. Introduction

For a long time, sports and cultural events have been perceived as a possible booster to local development. However, in the last decades, criticism and scepticism on their actual benefits are growing in many countries, at least for large events. These criticisms are expressed by the Academia and by the general public. This can be illustrated by the growing number of referendums won by mega event opponents and also by the opposition of many political movements that lead to abandonment of numerous bids like the two latest Roma Olympic bids abandoned following a change in the national or local governments.

In this context, economists are interested in developing assessment methods that would provide reliable guidance for policy decisions. The Input–Output model, the incumbent, has been challenged since the 90s by two alternative paradigms: Computable General Equilibrium and Costs–Benefit Analysis which claim to solve a number of deficiencies of the Input–Output method (Massiani, 2015). These paradigms are still in evolution and, only recently, a consolidation has started taking place. For instance, relating to CGE, a critical review is now available (Massiani, 2018). Relating to

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CBA, considering that it has now been applied to more than forty events, there is now room for reflection on its use, and the availability of well-defined guidelines appears useful.

In this paper, we examine possible guidelines for CBA of events. We elaborate on the document that represents arguably the first guidelines made available by a state or national administration for the application of CBA to event funding: “Application of cost benefit analysis to major events: Framework paper” (New South Wales Treasury 30 April 2014), we comment on its recommendations and provide indications on how these guidelines and, more generally, CBA procedures could be improved. In a few words, the Framework provides a seminal, influential and up-to-date guide to CBA of event funding and thus can provide the relevant basis for a reflection on the topic. The analysis of these Guidelines offers conclusions of much larger scope than the NSW or Australian context, they transfer, *mutatis mutandis*, to other situations and jurisdictions in a context where many countries or regions repeatedly face the question of how much they should spend to support mega events.

This review would be more far-reaching if, additionally to the Framework paper, the evaluation of single projects were available for scrutiny. Despite our best efforts, we could not, at this stage, have access to analyses performed by the NSW Treasury. Yet, we posit that the discussion of the Framework may still be interesting to economists and to the improvement of methods in this area.

Our analysis suggests that the actual costs and benefits calculation, as illustrated by the Framework and as present in many existing studies, can be improved. First, improvements relate to the conceptual consistency of the approach, aiming at a more complete consideration of opportunity costs and “general equilibrium” impacts mostly relating to displacement. We also argue that a proper evaluation framework should consider more carefully additional effects (notoriety, health impacts, etc.) whose exclusion of the analysis tends to reduce its strength, unless their irrelevance is proven or at least discussed. More generally, larger emphasis could be placed on the quantification of the monetary equivalent to be used for evaluation.

To review these issues, Section 2 provides information on the existing CBA literature and how the Framework fits into it. The paper successively follows the structure of the Framework paper: part 3 deals with costs, while, part 4 considers benefits. A conclusion section discusses the findings.

2. The Evaluation Framework and CBA of Events

2.1. CBA of Events is a Flourishing Field

CBA is becoming a challenger of the well-established Input–Output method and of the other challenger, CGE (Massiani, 2018). The literature on CBA of events, if defined broadly, now counts more than fifty papers and reports. Box 1 lists such documents. In this list, we identify a core literature of forty documents that arguably are real cost–benefit analysis. In doing this selection, we filter out, for instance:

- papers that are not publicly available or, at least, of which we could not obtain a copy. To ensure a large coverage of the literature, we contacted the authors. In some cases, the author answered he could not provide a copy of the paper (an unfortunate circumstance we guess for scientific publication);
- papers that arguably do not perform a CBA. For instance, they do not compute a Net (Present) Value, or do not consider surplus, or externality, or sometimes only perform a Cash Flow Analysis or a financial analysis, with a much narrower scope than CBA;
- master thesis, as they normally are submitted to less scrutiny from the scientists, compared with other forms of communication.

Such additional material is however provided in Box 1, under adequate headers, for readers’ convenience.

Additional to these studies, the field of events evaluation is receiving increasing interest from the economists (Nooij *et al.*, 2013; de Nooij, 2014; Mitchell & Stewart, 2015). Generally, the question at the centre of the interest is how much potential host countries should be willing to spend for hosting events.

Box 1: Existing events' CBA studies (event, event year, author)**CBA studies**

- 1 Vancouver 2010 Olympics, 2010, Shaffer et al
- 2 Vancouver 2010 Olympics, 2010, McHugh
- 3 V8 car race, 2000-2001, ACT Auditor General
- 4 Pan-American Junior Athletic Championships Windsor, 2005, Taks, et al
- 5 Pan-American Junior Athletic Championships Windsor, 2005, De Nooij
- 6 Olympic Games Netherlands bid, 2028, De Nooij
- 7 EURO in Poland and Ukraine, 2012, Humphreys e Prokopowicz.
- 8 Australian Grand Prix, 2011 e 2012 (2013-2015), Economists at Large
- 9 FIFA World Cup Netherlands bid, 2018, de Nooij et al.
- 10 Australia Formula 1 Grand Prix, 2005, Applied Economics
- 11 Ourense Rally, 2010, Sanchez-Fernandez, Barajas
- 12 Roma Olympics bid, 2024, Open economics
- 13 FIFA World Cup (Australia), 2022, Access Economics PTY Limited
- 14 Campeonato de Tenis femenino ITF Sevilla, 2006, Ramirez Hurtado et al
- 15 Commonwealth Games, 2002, Cambridge Policy Consultants
- 16 London Olympics, 2012, ARUP
- 17 Torino bob infrastructure, 2006, Bottero e Mondini
- 18 Frankfurt Rhein Olympics, 2012, Preuss
- 19 Football World Cup in Germany, 2006, Rahmann, & Kurscheidt
- 20 Football World Cup in Germany, 2006, Kurscheidt
- 21 Football World Cup in Germany, 2006, Kurscheidt
- 22 Olympic bid Calgary, 2026, ErnstYoung
- 23 Athen Olympics, 2004, Papanikos & Patsouratis
- 24 18 events in New Zealand (MBIE, 2013), NZ Treasury
- 25 Bathurst 1000, 2014, Hicks et al.
- 26 16 events in Tasmania, 2015, Tasmanian Audit office
- 27 Coupe du monde de Rugby, 2007, Barget Gouguet
- 28 Rotterdam World Exhibition, 2025, SOE
- 29 Olympics bids in NL, 2028, Blok
- 30 WM 2018 in NL, 2018, Meerwaarde, et al
- 31 2028 Olympics in NL, 2028, Stolwijk et al
- 32 World football cup, 2018, SEO
- 33 2018 World cup in NL, 2018, Nooij et al
- 34 World championship Gymnastic, 2006, Sport Event
- 35 Berlin 2000, 2000, Maennig
- 36 Munich 2018 Winter Olympics bid, 2018, Preuß
- 37 Berlin 2000 Olympic bid, 2000, Ewers
- 38 Hamburg Olympic bid, 2004, Maennig
- 39 Berlin Olympic bid, 2000, Maennig
- 40 Berlin Olympic bid, 2004, Maennig

Box 1. (Continued)**CBA studies of a fictitious event**

Fictive international event, fictitious event, Késenne

Existing CBA that are not available (we could not contact the author, or the author did not answer or said he does not have a copy)

- Athens Olympic, 2004, Panagiotis
- Event in Kosten-Nutzen-Analyse von Sport-Events, Késenne.
- Landesgartenschau Freiburg, 1986, Dallman
- Sydney Olympics, 2000, Cashman and Hughes
- Event in "Cost-benefit analysis of sport events," Késenne.
- WM NL bid, 2006, Rahmann, et al.
- Graz Winter Olympics, 2002, Steiner e Thöni

Arguably not CBA (does not compute a Net Value, does not consider surplus or externalities)

- South Africa WC bid, 2003, Grant Thornton
- Sochi Winter Olympics, 2014, Pilipenko
- Olympic bid NL, 2028, de Nooij
- Euro NL + BE, 2000, Oldenboom
- World Paddle Tour, 2013, Jiménez-Naranjo, et al
- Open Swimming Championship, 2015, Sánchez-Fernández et al
- Beijing Olympics, 2008, Owen
- Euro in Nordic Countries, 2008, Oldenboom et al

Master thesis

- Sydney Olympics, 2000, Keim
- UEFA EURO bid in Italy, 2016, Lotti
- FIFA World Cup South Africa, 2010, Gomes Menezes
- EURO in Sweden and Denmark, 2024, Af Mads Sørensen
- Ice hockey world championship, 2015, Halasová
- Nordic ski championship in Falun, 2015, Biedrzycki and Remigiusz
- Olympic Games, NA, Badia-Bellinger, Jose
- Olympic Games, NA, Mobilian, Zachary

2.2. The Framework Paper

In the context of growing interest for CBA of events, some administrations felt the necessity to provide guidance for its application. This is the case for the New South Wales Treasury's Framework Paper (30 April 2014). This document is not in itself the sole text providing indications for practitioners: other contributions can be found in:

- reports, issued mostly by Australian institutions (Industry Commission, 1996; Victorian Auditor General Office, 2007), that devote space on the various evaluation methods available and provide some methodological recommendations;
- audits on the public funding of events in various jurisdiction like Tasmania (2016) and New Zealand (MBIE, 2013);

- a recent guideline written for the Dutch sport council (Schenk *et al.*, 2018, in dutch) that gathers many recommendations on how CBA should be applied to events;
- some general reflections on the application of CBA to events can also be found in early, German speaking, literature on CBA applied to sport events (Thöni, 1984; Maennig, 1991).

It is no surprise that this growing interest led to the formulation of proper guidelines, as part of the assessment activity of Treasuries and other administrations. This is the case for instance in Queensland that operates state Guidelines (unfortunately, we could not obtain a copy of this document at this stage of our research).

This is the case as well in New South Wales, whose Framework paper represents a valid benchmark for reflecting on the state of the practice:

- it is effective as New South Wales is likely to spend hundreds of millions AU\$ every year to finance events,
- it elaborates on a tradition of Australian economic evaluation of events that is probably the most advanced in the world,
- it provides a good coverage of the various costs and benefits entailed by events,
- it was until very recently the only official guideline open to scrutiny.

The Framework paper on large events is embodied in a larger evaluation framework. “NSW Government Economic Appraisal Guidelines” (NSW Treasury, 2007 and subsequent updates). A possible explanation for the need of a specific document for events is that these are specific economic activities: they rely largely on local population enjoyment for the event (local population surplus, if one uses the terminology of economics) and on injection of expenditures by the consumers coming from other territories, raising the question of how this injection should be considered consistently (should a multiplier be applied?). Both these features make these questions quite specific and, in turn, make specific guidelines appropriate.

The general structure of the evaluation Framework is quite simple and legible. It considers the following:

- as benefits, four surpluses relating to two categories of effects:
 - the increased surplus of workers, capital owner and State, that derive from the expenditure of additional interstate visitors and
 - the surplus of local population attending the event;
- as costs:
 - public funding,
 - when relevant, externalities.

Thus, the CBA Framework provides an interesting, publicly available, informed, real-world example of how administrations can provide guidance for the CBA of events. In the next section, we showcase this document and propose improvements to its recommendations or, more generally, to methodologies used in this area. We review in turn benefits and costs.

3. Economic Benefits

Relating to benefits, we first discuss how the various surpluses are accounted for and we then highlight the need to include a range of benefits not currently contemplated by the Framework.

3.1. Benefits Mostly Consists in Surplus Increase

The Framework considers four types of surplus belonging to two categories:

- 1 local visitors’ surplus. This relates to the surplus the local population obtains when it redirects budget from other expenditures to event-related expenditures.

- 2 Surplus to local economic agents triggered by additional expenditures from interstate visitors. This relates to factor remuneration (in the wording of the Framework: “labour surplus,” “business operating surplus”) and administrations’ revenues (“Government revenue and assets”). This results from the extra economic activity generated by additional money flowing into the local economy.

We review in turn these different surplus.

3.1.1. Local Visitors’ Surplus

The surplus of local population attending the event is among the benefits considered in the framework. Our view is that the surplus should be computed, net of the surplus normally displaced from alternative (or counterfactual) consumption.

A Raison d’être of Events: Consumers’ surplus could be considered the *raison d’être* of many small-scale events (for larger events, tourism benefits are usually another important motivation). The Framework rightfully recognises the role of local consumers’ surplus among event benefits, but does not provide quantitative elements on this point.

The surplus can represent a sizeable share of mega event benefits. For instance, in Tasmania, an audit of event funding found positive outcome for most events (Tasmania Auditor General Office, 2016). Closer inspection suggests that this is mostly due to the very large value assumed for consumer surplus: for each ten AU\$ spent at events, consumers enjoy more than seven AU\$ benefits. It thus appears that the estimated consumer surplus can be driving the results.

While the conceptual framework of including local consumers surplus is, in our view, correct (for a discussion, see Barget and Gouguet (2007)), two points deserve further investigation.

First, the question of the correct quantification of this surplus should be addressed. The Framework provides no quantification method. Other guidelines provide highly diverging quantification: 70% of visitors’ expenditures in an Audit from Tasmanian General Auditor (2016) but only 20% for a similar audit made by the New Zealand Treasury (MBIE 2013). Other available quantifications exhibits strong variations: 10.8% of sales expenditures used in Victoria (2007) and Canberra (2002) for a formula one Grand prix (and 10\$ for participants to the side events), 50% of visitors expenditures for the athletics championship in Windsor (Taks *et al.*, 2011) and for car races in Bathurst (Hicks *et al.*, 2014). Most of these authors recognise that their own quantification is a guesstimate. Providing a reliable estimate of this important element of the result certainly would be important.

Second, one may question whether a unique surplus ratio should be used for various events considered in a jurisdiction.

The easiest part, an empirical one, relates to the specificities of local population preferences, which may be different from one region to another. For instance, in France, Rugby is much more popular in the southern part of the country, so that the surplus could be much higher for competitions held there compared with other parts of the country.

A harder part is that consumer surplus/expenditure ratios do not necessarily equate across events. Actually, in standard microeconomic analysis, this ratio does not equate for conventional goods neither: equilibrium conditions imply that the ratio of marginal utility equates to the ratio of prices, but this does not imply in turn that the surplus represents a fixed proportion of expenditures on various goods or group of goods. An additional difficulty is that events are provided in discrete, often 0–1, quantities, so that one can decide whether or not to attend an event but cannot decide how much of a given “event” good he wants to consume. Moreover, events are differentiated goods in their nature, so that the demand curve for each event can be different (have a different height and a different slope). It would thus seem reasonable to look for event-specific surplus ratio, even if this could be perceived as unequitable as it would favour some activities over others.

These complexities suggest that further investigation is necessary. For realism, the surplus should be calculated based on demand functions calibrated on observed market situations. Table 1 provides indication on some consumer benefits evaluation methods and on their results when applied to a set

Table 1. *Willingness to Pay Estimate for a Set of Sport Events*

Event	Purpose	Methodology	Result	Discussion
Giro d'Italia, in Genderland (de Boer <i>et al.</i> , 2018)	Quantify the ex-ante and ex-post-WTP for hosting the start of Italian Giro in the Netherlands	CVM: based on panel data, stated choice methods	Ex-ante WTP = 3.58 € Ex-post-WTP = 4.45 €	<ul style="list-style-type: none"> Post-event WTP is increased by 24% compared with pre-event WTP Some residents would be willing to pay for not holding the event "crowding effect" need further research
Borlänge Peace & Love music festival 2012 (Heldt & Mortazavi, 2016)	Estimates the demand curve and WTP for the event	Compares Stated Choice Experiment (SCE) and Transport Cost Method (TCM)	<p>Consumer Surplus</p> <ul style="list-style-type: none"> TCM: between twenty-seven and eighty-nine mln SEK SCE: 24.2 mln SEK (95% confidence interval: 17–31.4 mln SEK) 	
German basketball competition (Kaiser <i>et al.</i> , 2018)	Quantify spectators' preferences for tickets and their willingness to pay (WTP)	Two German basketball clubs (750 spectators' online surveys). Four spectator segments depending on preferences for opposing teams, seat categories, and WTP	<ul style="list-style-type: none"> Price-sensitive: WTP = 26 € (club 1), 19 € (club 2) Price-performance oriented: WTPmax = 33 € (club 1 and 2) Seat-quality oriented: WTPmax = 40 € (club 1), 33 € (club 2) Top game oriented: WTP = 40 € or more (club 1 and 2) 	<ul style="list-style-type: none"> Spectator preferences are heterogeneous Pricing strategies that omit it are distorted

of examples. Further investigation on this issue goes beyond the scope of the present paper but this point certainly deserves attention in the elaboration of future guidelines.

Opportunity Costs Again: Displaced Surplus: The valuation of visitors' surplus is only one side of the medal. Here again, opportunity costs, in the strict meaning of alternative use of resources, should be considered for the computation of consumer surplus. Indeed, when local visitors spend money in local events, they divert spending from other alternative uses. A reasonable assumption,¹ usually applied in a General Equilibrium setting, is that they redirect expenditures from other consumptions. In all cases, the alternative use of income should be considered. This reduced alternative consumption will reduce surplus. Such a reduction should be deducted from the surplus on the event.

The question however is harder than it seems. A reviewer notes that the willingness to pay for the event may capture the displaced surplus on alternative consumption. On the one side, we are aware of a literature that generally warns against the aggregation of surpluses across markets (McHugh, 2006 illustrates this in the field of event CBA; Boardman *et al.*, 2006 discuss it more generally) while it is current practice in other fields of economics like CGE. Our view is that the willingness to pay for a chosen good includes the displaced expenditure on other goods, but surplus is by definition what exceeds expenditure: renouncing x dollars of alternative consumption means renouncing to an additional surplus, on top of x , on this expenditure. We thus conclude that the WTP for events is not sufficient to represent the loss of counterfactual surplus.

Whatever the position taken by future guidelines on this point, it should at least be explicit and open to discussion.

Thus, if one wants to compute the change in surplus resulting from an event, it would be desirable to identify which consumptions are reduced when substituted by event-related expenditures. From a practical point of view, one may want to use a realistic demand system. An interesting option, that is both parsimonious and provides a demand system responding to a series of requisites, consists in PADS as introduced by Almon (1996) and already used in the CGE assessment of an event: Euro 2012 (Borowski *et al.*, 2011). But this approach would be convincing only if the available demand systems were calibrated on real events. But in most countries (this may include NSW or Australia as a whole), existing household expenditure models are not calibrated on conditions that would make an "event shock" measurable (in other words, it is impossible to simulate the impact of an event if the model is not calibrated on data that include a similar event) and, thus, they do not provide a realistic representation of substitution effects generated by the event. Overcoming this problem seems difficult: usually, event-related consumptions are not singled out in typical household expenditure surveys, and even if they were, one cannot guarantee that substitution patterns of a set of events used for calibration could apply to other events.

In this context, one often has to rely on workable, presumptive, solutions. For instance, one can assume that event-related expenditures substitute other leisure expenditures. Careful readers may see looming in at the horizon the daring prospect that benefits of an event are computed based on a single value and the opportunity cost, "*reduced benefits*," valued with the same number. This would obviously occur only as a consequence of the analyst's difficulty in grasping the uniqueness of each event situation or at least the difference between the average value of event consumption surplus and the value of "*non-event*" consumption surplus. Such difference may be difficult to measure. More investigation may be needed on this point, elaborating on existing literature relating to various Willingness to Pay and surplus measurement techniques.

To conclude on the visitors' surplus, future guidelines should consider the objection that there is a reduction of surplus on other alternative consumptions. While this point is controversial and prone

¹The alternative assumption, that this expenditure substitutes savings, has received little if any empirical support in economic analysis. Additionally, in this assumption, one would need to consider a shadow cost of reduced savings.

to misunderstanding, our view is that the willingness to pay for the event only captures the displaced expenditure and not the corresponding surplus.

3.1.2. *Producer and Labour Surplus*

Apart from local visitors' consumer surplus, the paper considers three categories of extra benefits, namely:

- producer surplus,
- labour surplus,
- government revenues.

All these surpluses result from the increased economic activity generated by additional spending in the considered economy.

This notion of additional spending excludes, rightfully to our view, local population expenditures, as this expenditure is fundamentally a shift rather than an increase in consumption, as routinely acknowledged in the event literature (Siegfried & Zimbalist, 2002; Felsenstein & Fleischer, 2003; Baade & Matheson, 2004; Crompton, 2006; Barclay, 2009). To expand on this, this assumption is a simplification. First, as illustrated by Preuss (2004), part of local population expenditures is additional and part of tourist expenditures is not. Second, a properly calibrated demand system would measure the real shift in consumption and compute the economic impact based on the differences in the local population consumption vectors (with or without the event). Some evidences support this statement: Alan and his co-authors measure the impact of football competitions in Scotland and find that the shift of consumption of local consumption has some effect on the trade balance (Allan *et al.*, 2007). Such an impact would however be one order of magnitude smaller (or could become negative) compared with the result of an IO model – an approach that has long been dominant in event impact studies – where all local expenditure was erroneously considered as additional demand (Massiani, 2015). So, the assumption that the change in local population consumption does not generate extra Value Added is a simplification but it provides a much less approximate estimate than the alternative assumption of assuming it is fully additional.

If one accepts the above simplifying assumption, the Framework paper calculation is based, in our best understanding, on a fixed proportion of consumer expenditures that generate firms' profit, workers' and government's surplus. Each of these components results from the multiplication of an increase in Added Value with a coefficient. The key objective, thus, is to measure increased economic activity and corresponding Added Value. An important question is, should one consider some multiplier to represent the indirect and induced effect of increased demand?

The current Framework does not implement multipliers. Actually, multipliers do not fit within the overarching CBA guidelines (TPP 07-05) in use in New South Wales (NSW Treasury, 2007 and successive updates) and may not do so as well in other countries/states. New South Wales overarching Framework indicates for instance that the application of multipliers to compute gross output may conduct to double counting (p. 12). We are also aware that the question of multiplier is a critical one and that multipliers are prone to misuse. We are also aware of many discussions in Australia on this topic. In a seminar, B. Layman's used an expression that seems to gather much of the discussion on the topic: stating that CBA were "under pressure from multipliers" (Layman, 2004).

A reasonable prediction on including multipliers is that it will increase the impacts and hence the estimated benefits of an event. This is apparently so, but it depends on the whole computation, depending on whether one considers a second possible correction: the translation of gross production impacts in Added Value impacts. In many applications, analysts initially measure the impact of expenditure through additional spending or gross production rather than Added Value (this is not the case in the NSW Framework). In this situation, two corrections should be implemented: the application of a multiplier and the conversion of Gross Production in Added Value. When these two computations are applied, the net impact on Added Value could be lower than the initial net increase in demand. An ironic economist could note that many economic impact studies deploy a lot of energy to basically multiply by two or so the direct impact and subsequently divide the resulting gross

production by two or so in order to compute the impact on Added Value (this holds as long as the analyst resist the pressure to use assumptions that increase the “multiplier” value).

Considering these elements, we posit there is room for a neutral approach to this question:

- intersectoral linkages exist in the economy, thus it is fair that they are accounted for in evaluation;
- leakages also exist. Properly quantified multipliers can take this into consideration, sometimes up to the point where multipliers become dividers;
- if some resource constraints are binding, the mechanical application of multipliers may not be adequate. This however regards a limited number of situations, mostly very large events. In such cases, the whole calculation chain has to be reconsidered, with the possibility to use General Equilibrium calculation as a possible conceptual and computational framework.

Our conclusion is that an approach consistent with the above described features would be to apply a multiplier, to convert the resulting Gross Production impact in Value Added and to compute factor's additional remuneration from the resulting increase in Added Value. Some of these operations would increase the result, some others would reduce it compared with the current practice. Yet, on the whole, they would provide a more consistent and more convincing quantification of the event impacts. A further advantage would be to provide realistic insights about the distribution of events impacts on various sectors, an information that would be inaccessible without the use of an IO matrix and corresponding multipliers.

Once the analyst has decided how to treat multipliers effects, another question is how the surplus of the various actors should be considered. We review in succession these different components starting from producer surplus.

Producer Surplus: The Framework paper proposes to consider the increase in producer surplus, broadly defined as increased operating surplus, resulting from the interstate visitors' extra consumption.

This point does not raise conceptual issues, and its validity relies on the availability of accurate estimates of the different variables present in the framework: “rate of operating profit,” “share of capital revenue accruing to local agents” and on paying attention to the deceiving simplicity of the notion of operating surplus that can indeed be defined in several ways (for instance, is it before or after payment of interest?)

Labour Surplus: Theoretically, the benefit of workers may consist in increased hourly wages or in increased working hours. The Framework apparently considers only the second aspect (the first one would be probably suit to very large events): in this setting, the workers benefit consists of two variables:

- 1 number of additional jobs, for instance expressed in *Full-Time Equivalent*;
- 2 unit value of labour surplus.

On the first point, Mohring recalls that the additional employment should be considered net of the employment that would have been achieved in the economy if the resources used for the project had been used for something else (Mohring, 1993). He concludes that the employment impact is most likely zero. The Framework paper seems to implement this as it considers only employment created by additional interstate visitors' expenditures.

On the second point, different benefits or costs should be considered:

- 1 benefit of increased income for additional employed persons, or, more broadly, the corresponding increase in consumer surplus;
- 2 opportunity and disutility cost of working time;
- 3 the benefit of increased social participation, sometimes referred as the reduction of the unemployment stigma;
- 4 possible other consequences in terms of health or well-being.

On point 1, the Framework paper limits the benefits to wages, which appear restrictive compared with the real benefits of increased wages. More realistically, wages are spent and thus generate consumer surplus.

On point 2, the Framework paper recognises that “information on willingness to accept may not be available.” This seems to allow the omission of such factor, while it could actually represent a sizeable number (Hicks *et al.*, 2014).

On points 3 and 4, the Framework paper is silent, while various contributions (Knabe & Rätzl, 2011) indicate this can be an important part of the benefits of increased employment.

Proper consideration of these different components could increase the validity of an event’s assessment. On this point, there is growing interest in the CBA community towards the proper inclusion of employment impacts (Masur & Posner, 2012). This opens the door to a more exhaustive and, arguably, more convincing and consistent computation of CBA results. In many situations, the analysts provide Net Present Value results and employment impacts as two components of the evaluation outcomes. But this can create confusion: the readers may be tempted to consider these two components as benefits that need to be added by some mental process. Normally, this would not be correct, as these impacts may well overlap. When the NPV includes some benefits from increased economic activity, a situation that is more frequent in mega event evaluation than in other fields of CBA, the Net Present Value will include some benefits deriving from increased Labour. For instance, in the Framework paper, labour surplus, defined as additional workers remuneration, possibly net of opportunity costs is included in the NPV calculation. So, any benefits of larger employment cannot sum up with Net Present Value. This would result in double counting.

A possible solution could be to isolate the contribution of job increase benefits in the NPV. In this respect, Figure 1 illustrates two possible presentations of the results of a CBA. On the upper part, we reproduce a conventional presentation of Economic evaluation outcome. As previously said, the limitation of this presentation is that both quantifications partly add but partly overlap: part of the

1.a : conventional presentation

- Net Present Value: 120 Million AU\$
- Employment impact: 2000 Full Time Equivalent

1.b : possible presentation

Benefits : 350 mln AU\$

Costs : 230 mln AU\$

Note: values and size of the costs and benefits are purely illustrative.

Figure 1. Possible Presentations of Employment Benefits in CBA.

Note: Values and Size of the Costs and Benefits are Purely Illustrative.

employment gains is already included in the NPV. But once the various employment-related costs and benefits are distinguished, employment effects can be included in the NPV calculation. Yet, they may need to be displayed, as the policy-maker needs information on this aspect. The lower panel provides a way to meet these conflicting needs, where the employment impacts are identified as a separate category, but in a way that consistently adds with other benefits.

To conclude on this, provided double counting is avoided and job benefits are computed net of displacement effects, it is legitimate that employment benefits are considered in CBA. It becomes then fundamental that they are integrated in the computation and presentation of the results in a way that is consistent both with the need of theoretical consistency and with the need to fit with information requirements of the policy-maker.

In this section, we have reviewed the different benefits present in the Framework paper, and it appears that the consideration of some benefits could be improved:

- quantification of the monetary equivalent of various benefits,
- proper consideration of substitution effects and opportunity costs would be useful,
- adequate computation and presentation of job creation benefits.

These, however, deal only with the benefits that are listed in the Framework paper. Yet, one can argue that other benefits should be included as well.

3.1.3. Other Possible Benefits

Apart from the impacts quoted in the Framework paper, some other, likely positive, impacts of major events could be considered. This relates for instance to indirect health benefits, branding impact and infrastructure legacy. Actually, a legitimate question is where one can stop, being as exhaustive as possible but not excessively speculative and avoiding double counting.

3.1.4. Sponsoring and Related Incomes

When a large event takes place, some sponsoring resources may come from outside of the investigated territory. In this case, another additional flow of resources will reach the economy. The consideration previously made on the inclusion of multiplier effects and increased Added Value apply here as well.

3.1.5. Indirect Health and Life Satisfaction Benefits from Sports Event

An argument in favour of sport events is that they foster sport practice and, indirectly, health. In this context, an assessment guideline could take one of the two following positions:

- quantifying the corresponding net benefits;
- motivating the absence of these benefits based on empirical evidences.

As Table 2 illustrates that the evidence of a positive impact of events on health is limited. This emerges most clearly from meta-analysis such as in McCartney *et al.* (2010). This tentative conclusion seems however to leave room for some extra investigation that goes beyond the scope of the present article.

3.1.6. Branding and Advertising

Events increase the media exposure of the hosting location; this can lead to some benefits. Usually analysts do not directly estimate the corresponding benefits but, whenever they want to include them, compute the equivalent expenditure that would have been necessary to generate the same media exposure. This is based on a series of assumptions: for instance, avoided expenditure (the amount of media budget that is saved thanks to the promotion provided by the event) is a valid estimate of welfare effects only if the marginal benefits of promotion are equal to its marginal cost.

Our analysis however suggests that the literature on CBA and branding are not connected. There may be no better solution at this stage than using the “Advertising Equivalent Value (AEV)” or to motivate its absence. A critical consideration is that the promotion of a given destination can be

Table 2. *Health and Quality of Life Benefits of Events*

Author	Purpose	Methodology	Result	Discussion
McCartney <i>et al.</i> (2010)	Impact of events on the health of the local community	Literature review	There is not sufficient proof to confirm a positive impact on the health of local population	"the data did not indicate clear negative or positive health impacts of major multi-sport events on host populations"
MacAuley (2015)	Examine the health-related physical activity in host nation	Descriptive and quantitative analysis	Hosting the Olympics certainly accelerated developments in sport and exercise medicine	"Our review found insufficient evidence to confirm or refute expectations about the health or socioeconomic benefits for the host population of previous major multi-sport event"
Pfitzner and Koenigstorfer (2016)	Evaluate the impact of mega events on life satisfaction	Analyse four aspect: <ul style="list-style-type: none"> • Physical • Social • Psychological • Environmental 	No direct correlation between sport event and positive impact on the quality of life	"There was no positive effect of the hosting of the mega-sport event on the four quality of life domains of the panel members"
Potwarka and Leatherdale (2016)	Researches a cascade effect of the athletes' performance	Apply their analysis to several distinct geographical areas.	There are no relevant elements that could prove the inexistence of the trickle-down effects	Some trickle-down effect occur but they are localised in specific sites (close to Olympic venues)
de Sousa-Mast <i>et al.</i> (2017)	Look for correlation between hosting an event and physical activity	PARA (Physical Activity Resource Assessment) and QI (Quality Indicator)	Positive correlation between variable PA (Physical Activity) and neighbourhood features	Policy should focus on the quality of spaces available for Physical Activity

detrimental to other destinations in the same jurisdiction. Then, the benefit of increased exposure for the whole jurisdiction could be lower than thought otherwise. Another critical point is that AEV has little scientific credit, so that it may constitute a weak source for justifying public expenditures.

3.1.7. *Infrastructure Legacy, Cost or Benefit*

Another possible benefit or cost of an event consists in the infrastructure legacy. Some Cost–Benefit Analyses shows how the infrastructural legacy can be important. When the organisation of an event entails the building of an infrastructure, its residual value, whether positive or negative, should be considered.

As far as events scrutinised in the Framework are concerned, infrastructure spending will often be limited. But in some peculiar cases, it may not be so. Thus, a robust approach to infrastructure legacy is necessary. Such procedure should consider that legacy can have a positive or a negative value. In some cases, often labelled as white elephants, the infrastructure will not be used anymore, so its legacy value could be null, or negative if some maintenance expenditures occur or if there is a stigma associated with the abandonment of the infrastructure.

On the other side, when some infrastructures are used for years, their future costs and benefits should be present in the analysis. In some cases, the event requires a sport venue whose future use is quite speculative. But we can also raise doubts on transport infrastructure as well: for instance, in many papers, a transport infrastructure is built for the event, but its ex-post-costs and benefits are not considered (A.C.T. Auditor-General's Office, 2002; Shaffer et al., 2003; Humphreys & Prokopowicz, 2007).

While highly case specific, this question probably deserves more attention whenever the Framework would be applied to large events that require infrastructure funding.

3.2. Conclusion on Benefits

To conclude on projects benefits, four considerations emerge.

- 1 CBA guidelines in general, and NSW framework in particular, could consider other possible benefits (when applicable: infrastructure legacy, health, branding). If such benefits are negligible, evidence should be provided to support this position. If they are not negligible, guidelines on the corresponding values could be provided.
- 2 More attention could be dedicated to opportunity costs and substitution effects. This relates for instance to the opportunity costs of labour, that is mentioned in the Framework but lacks a quantification. This relates as well to the displaced surplus for local consumers, a substitution effect of its own, that reduces the benefits of the event and is not considered in current framework.
- 3 Employment impacts should be considered and communicated in a way that is theoretically consistent, avoids double counting and provide information necessary for the policy-maker. The current practice of providing employment impacts in addition to Net Present Value is deceiving, as it leaves room to an interpretation in which these employment impacts should be added to NPV. This is definitively a factor of confusion, because some benefits of higher employment are in all cases present in NPV (the increased wages) while others are not.
- 4 There is room for a proper application of multipliers to additional expenditures, notwithstanding the contrast with the general CBA framework in use in the NSW and possibly other jurisdictions. Our view is that when multipliers are correctly taken into consideration, the results would be altered only for large events that generate a lot of tourism but, in all cases, the realism (and face value) of the analysis is increased. This conflicts, understandably, with the dominating practice of CBA and should be done with due attention.

4. Event Costs

We now turn on to the costs. Our analysis suggests that the coverage of costs could be improved: more clarity on which public expenditures are included should be provided. Some more attention should be given to negative externalities (although their magnitude is typically low): eventually, more attention should be dedicated to opportunity costs.

4.1. Cost Exhaustivity and Realism

4.1.1. All Public Costs?

Events usually generate a number of expenditures. It is challenging for the analysts to have a sufficiently wide coverage of these expenditures. This has to be checked with regard to two aspects: 1 – the nature of the expenditure (security, health services) and 2 – the organisations that makes this outlay: often many jurisdiction will be involved.

Regarding the first point, the Framework paper provides a list of eligible costs including organisers' license fee, site preparation and construction costs, operating costs, marketing and overhead administration costs, in kind services. This list is more comprehensive than what is found in many CBA applications, and it can improve the consistency of results.

Regarding the second point, an event can receive a mixed funding coming from a state administration and other local administrations in the territory. How should these extra costs be considered? Our view is that they are, in any case, costs borne by residents of the jurisdiction, with a possible provision for the fraction of these costs that a local government may claim back from Federal funding. In some situations, a project becomes feasible only when state funding is provided, but the NPV becomes negative when these funds are accounted for. Should this project be approved for funding? If it reduces welfare for NSW, should it be subsidised by the government? It seems difficult to back a positive answer to this question.

4.1.2. Realistic Costs?

The risk of cost overruns is well identified in mega events economics, at least for the infrastructure part (Flyvbjerg *et al.*, 2016; Preuss *et al.*, 2019). This relates to the tight schedules that increase costs and provide the contractors with a strong bargaining power.

The Framework does not consider this question. First, the framework deals with mid-size events, sometimes repeated at a regular time interval, where costs can be known in advance sufficiently well. Second, for some events, the public funding may be given, and may not adjust to potential costs overruns.

Whatever the validity of these motivations, more attention to the cost overruns issue would be beneficial in general. At a first level, a screening procedure may select which projects are at risk of cost overruns. At a second level, even if the state funding is given, the Net Present Value of project may change when costs increase, so the funding authority should consider this risk.

Generally, it is difficult to think that a proper risk assessment would not increase the validity of event assessment.

Negative Externalities: The Framework paper makes allowance for negative externalities caused by the event such as “noise, congestion and lost local amenities.” These costs are usually mentioned but rarely quantified in existing CBA applications. Some exceptions can be found in Table 3.

Given the event-specific nature of such externalities, it is difficult to provide general quantitative guidelines. The likely implication, though, is that an evaluator could be tempted to omit such impacts

Table 3. *Negative Externalities in Events CBA*

Article	Result
Formula One Grand Prix: 2000-2001 (A.C.T. Auditor-General's Office, 2002)	Road congestion: <ul style="list-style-type: none"> • 461,000 AU\$ (2000 edition) • 769,000 AU\$ (2001 edition)
Roma 2024 (Open Economics, 2016)	Congestion: 150 Million euro
Manchester, Commonwealth Games 2002 (Cambridge Policy Consultants, 2002)	Transport and traffic: 4.5 Million £

even though they may eventually be important in a given situation. A possibility is to use some screening rules which identify the situations where a more detailed evaluation is necessary. It is possible that, in practice, the service performing the assessment usually proceeds so, possibly in an informal way. In any case, the availability of quantified indications on the likely magnitude of these impacts for a variety of events would certainly be beneficial for proper evaluation.

Opportunity Costs, Again: The framework does not mention opportunity costs of public funding (deadweight loss, marginal cost) as such. However, when State's funds are used, this has to substitute alternative use of some resources. In the most basic assumption, this relates to extra taxation, or alternative use of funds. Borrowing provides another possibility which basically shifts the question in time, although it is reasonably not strictly equivalent, a position endorsed by most macroeconomists, who however reach very diverging conclusions on whether such funding mechanisms increase or decrease the corresponding gains. In the most straightforward assumption, the opportunity cost of funding means that one euro of public funding has a welfare cost larger than one euro.

Various quantifications suggest an extra 20 % opportunity costs (Massiani & Picco, 2013), but precise quantification should be based on the specific features of a given economy. On this point, a CGE model would inherently consider the opportunity costs of such funding (properly so, if it has a welfare measure). This possibility provides extra impulse to look for synergies of CBA with CGE.

Conclusion on Costs: A temporary conclusion on costs is that a more exhaustive consideration could be welcome, by including for instance (unless this would be irrelevant in the specific case considered) funding by all local administrations involved and the opportunity costs of public funding.

5. General Conclusions

The NSW framework paper represents one of the first steps towards a consolidated approach to CBA of events. In this context, it is likely that consolidation of the method is still in progress and that the practice benefits from constructive comments and methodological proposals. To assist in this, we propose a number of improvements that could make events evaluation more comprehensive and more consistent². These proposals are, we argue, fruitful not only for the NSW Framework but also for other future guidelines, or more generally for future application of CBA to events.

In this regard, the main proposed improvement relate to:

- 1 Consideration of some other, probably non-negligible, impacts (or, if these effects are thought negligible, providing evidence of their low magnitude).
- 2 Proper implementation of multisectoral multipliers: this change would probably improve the NPV when compared with current practice based on the Framework, but could reduce it in other applications (when the evaluator has erroneously measured the impact with expenditure/gross production rather than Added Value).
- 3 More exhaustive consideration of substitution effects or opportunity costs.
- 4 Improving the rigour of certain indicators (like the B/C ratio as discussed in Rosen & Gayer (2013)).

Each of these areas deserves to be presented more in detail. This is done Table 4, which also provides a preliminary assessment of their likely impacts (positive or negative) on the results of assessments.

²We do not quote here other issues that are not event specific. For instance, the Framework proposes to provide results in terms of Net benefits and Benefit–Costs ratio. The second indicator is however discussible in that it maintains the fiction that one can classify univocally impacts as benefits or costs. We also maintained this fiction for this note in having a “benefit” and a “cost” section, although the contingency of this limit are made apparent in certain points of the text. In reality, there is no univocal way of categorising an impact as a cost reduction or a benefit increase, typically – how should one consider an increase of a negative externality? – or is it a reduction of benefit or is it an increase in cost?. Thus the B/C ratio has something arbitrary (for a more in-depth discussion see Rosen & Gayer, 2013)) that should at least be indicated.

Table 4. *Possible Improvements in CBA and Their Likely Impact on Net Present Value (Compared with Framework Paper or Dominant Practice)*

Possible amendments	Likely impact
• Explicit the cost for various funding administrations (including local administrations) that have standing	– or 0
• Document the value of consumer surplus for event visitors, and compare it with available evidences	unknown
• Deduce the reduction in surplus due to displaced consumption of the local population	–
• Include the surplus generated by extra consumption allowed by increased employment	+
• Apply multiplier effects for the additional expenditure injected in the State's economy (interstate visitors), compute labour surplus, capital owner and Government revenue based on Added Values rather than sales	+ –
• Include various welfare impacts of increased labour	–
◦ opportunity cost of working time	+
◦ reduction of unemployment stigma	+
◦ health and human capital impacts of additional employment	
• Include impact of sporting events on health, or provide the reason why it should be discarded	+
• Include impact of “destination branding,” or provide the reason why it should be discarded	+
• Consider infrastructure legacy when relevant	+ –
• Include evidence based halo effect and non-use value	+

Among these changes, two (the consideration of opportunity costs and multisectoral multipliers), connects with the wider notion of **general equilibrium effects**. This deserves further comment as it is an important issue.

An illustrative simplified view of these effects is displayed Figure 2. The upper part of the graph illustrates the conventional Partial Equilibrium effects. The second part of the graph illustrates the displaced impact, costs and benefits that do not take place anymore in the economy: when expenditures are redirected from counterfactual uses to the policy scenario use, a number of economic effects cease, for instance the surplus on counterfactual use of resources. As a result the net effect of the policy should be computed net of displaced effects.

In this setting, the direct (“partial equilibrium”) impact of an event funding appears as a cost. But considering displacement effects, its real cost is the missed benefit of the alternative use of this fund. For instance, if events are financed through taxation, consumers incur a welfare cost in that they reduce their surplus on private consumption. Similarly, the direct (“partial equilibrium”) benefit of the event is represented by the visitors’ surplus. But this displaces some consumer’s surplus, the counterfactual surplus on displaced consumptions. The actual effect should be computed only net of displacement, or other general equilibrium impacts.

We recognise that this graph is a simplification:

- 1 it only considers two economic items;
- 2 there are other general equilibrium impacts that should be considered.

However, it may help in understanding how displacement effects need to be considered.

Figure 2. Partial and General Equilibrium Accounting of Impacts

We are also aware that there is a long tradition in CBA which shows that under ideal conditions, partial equilibrium impacts would suffice for the analysis. For instance, when all goods are priced at their marginal costs, general equilibrium impacts cancel out, so that partial equilibrium measures are valid. Other conditions are formalised in an abundant literature (Harberger, 1971; Quinet, 1998; Bröcker, 2003; Boardman *et al.*, 2006; Florio & Vignetti, 2009). Our view is that these approaches are consistent, but the conditions they set for partial equilibrium validity are rarely respected in reality. It could be preferred to apply methods that are not dependent on such assumptions.

In this context, General Equilibrium effects could be considered in at least three ways:

- 1 piecewise consideration of various effects: considering one by one various impacts on other markets. This view is illustrated in the present note;
- 2 using shadow prices that replicated General Equilibrium impacts. This is the view taken in the European Union Guidelines.
- 3 using General Equilibrium modelling, arguably a more radical approach compared with the previous ones.

This last approach could take the form of proper CGE models. It also could take the form of a less resource demanding approach, finding suitable modelling techniques that incorporate the main displacements taking place in General Equilibrium. The use of such “simplified” General Equilibrium models is probably the next step in improving current evaluation procedures and to have a high Efficiency/cost ratio in terms of increasing the realism of policy recommendations.

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