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**How much will this event benefit our
economy? A checklist for Economic Impact
Assessment and application to Milan 2015
International Exhibition**

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Summary

Policy makers, policy advisers and the general public usually see events as beneficial to the economy of the host city. Such belief is supported by numerous economic impact studies that usually exhibit large positive impacts. However, research has identified potential methodological issues in economic impact studies that may result in misleading policy recommendations. Yet, no systematic and operational presentation of such potential flaws is available. To fill in this gap, this article proposes a checklist based on 7 criteria and applies them to Milano 2015. This application supports the cognitive value of our proposed checklist and suggests that the claims based on existing studies are highly discussible.

Key words: Input Output Analysis, Check list, economic impact assessment

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1. Introduction

Cities around the world regularly compete to host major national or international events like Olympics, International exhibitions, European Capital of Culture and so on. This participation is motivated by the prospective benefits in terms of image, community spirit, and not last, economic impacts. While it finally withdrew from the competition, Boston, was initially supported, as were other 2014 Olympics bid participants, by positive economic prospects (*'Boston Olympics will bring millions, study says'* (Arsenault, 2015)). As in this case, many of the expectations of economic benefits rely on so-called Economic Impact Studies, which are predominantly based on the Input-Output paradigm and normally produce 'large', in any meaning, 'numbers' in favour of the events.

Yet, investigations by many scientists has shed into light risks of improper methodological practices in such studies. Anomalies range from the omission of substitution effects, to the use inappropriate IO matrices with inflated technical coefficients when based on larger areas (e.g. nation) than the one used for application (e.g. region). Other anomalies may relate to excessive confidence on initial costs and incomes estimates, or to improper claims on the prescriptive value of economic impact studies outcome. Despite repeated warnings, such improper use of IO calculation continue to parse economic impact studies.

It thus appears useful to provide practitioners and policy advisors, with criteria to evaluate the adequacy of economic impact studies. The core of our proposal resides in a check lists that considers a series of criteria that an economic impact studies should respect. It can be implemented internally, in the production process of economic analysis, or externally as a tool to monitor third part studies. To our best knowledge, no such tool is available. We posit that check lists, provided they are conceived in a way that supports, rather to substitute to, reflection, can enhance the quality of economic impact assessment and the policy recommendations that result thereof.

In order to introduce our proposed criteria, section 2 discusses why claims about the economic impacts of mega events may easily be flawed and we show that a checklist, as used in other complex tasks like, for instance, engineering, can help reduce these flaws. Section 3 discusses a set of 7 criteria further decomposed, for major precision, in sub criteria and elementary criteria. Section 4 provides an example of implementation of the checklist to studies made for the last mega-events hosted in Italy: Milano 2015 International Exhibition and, for comparison purpose, Torino 2006 Olympics.

2. Economic impact assessment would benefit from reasonableness checking criteria

In this section, we exemplify critical aspects of economic impact studies as shown by economic analysis. We also show that properly conceived checklists can improve the scientific validity of economic impact assessments.

Mega event evaluation are at risk of misuse

In this section, we recall how economists have shown that economic impact assessment is prone to errors (Zimbalist, 2015) (Porter, 1999). In the worst case, economic impact assessments are viewed as 'large number' generators used to gain support in favour of events organisers and interest groups linked to them. The question of the real intentions behind economic impact assessments is however beyond the scope of this paper and we will focus on more objective aspects. A lighter version of these critics correspond to the 'anything goes' nature of input-output impact calculation: any expenditure, at least with methods usually implemented, will have a positive impact on the economy. In other words, economic impact will always say yes, and there is no wise advice that can be obtained from an advisor who always says yes (Ponti, 2006). In another fashion, other researchers claim that economic impact studies have no prescriptive value (Matheson, 2008) : an increase of production in a given area cannot be associated unambiguously with an increase of welfare, when no consideration is made for externalities and the opportunity costs of resources.

Yet, one may doubt that these latter components of welfare may suffice to invert the positive conclusions based on increased added value which routinely reach billions of euro or dollars. The point however is that researchers also have demonstrated that, in themselves, these large figures may be highly inflated. Matheson claims that some improper methodologies may distort economic impact quantification 'by up to a factor of 10' (Matheson, 2008). Most of the related concerns deal with substitution effects, although they labelled in varying terms (deadweight, crowding out) by economists. Typically, researchers express concern about the consideration of local visitors' expenditures in the impact, while such expenditures should not or, at least, not entirely be considered as a source of extra activity for the area of interest. Other researchers also stress that public investment for the event (typically in infrastructures) substitute to other uses of budgetary expenditures (Oxford Economics, 2012)¹. Thus, the actual impact on the economic system should be net of the loss of activity resulting from reduced expenditures in other sectors of the economy. The epidermic objection that 'this money would not have been spent without the event'; is usually unsupported and does not seem consistent with budgetary practices in most developed economies. Ultimately, if the claim is that the money

¹ Although this latest reference states the 'The results do not consider the opportunity cost of public funds, which could be used to finance other projects or lower the tax burden. Whilst this is a common criticism of economic impact analysis, speculating on what the funds could have been used for involves conjecture.' (Oxford Economics, 2012)

would not have been spent without the event, this overarching assumption should be explicit and carefully motivated.

These examples do not imply that all potential mistakes systematically generate overestimates of the benefits. True, the institutional context, in which these studies see the light, is such that overestimates would be, even in good faith, gratefully welcome. However, a check-list does not have to take an a priori view, whether positive or negative, but should be as neutral as possible and consider equally methodological issues whether they generate over or underestimation.

In conclusion on this point, some concerns appear on the risks of improper implementation of IO analysis that could inflate or reduce the estimated impacts. It then appears necessary to provide some guidance for IO analysis and for users of such analysis wanting to assess their validity. Our view is that such guidance could take the form of a checklist as discussed in the next subsection.

Check-list is a useful tool to support complex tasks, provided it supports, rather than substitute to, reflection

Checklists, together with guidelines and reasonableness checking manuals are among the tools that provide operational guidance for professionals. Some readers may already be convinced of this point, and may want to proceed to the next section.

Some, (to be honest, only a few of them are available), **guidelines** have been issued in the area of event economic impact assessments (Nicolas, 2007). These provide useful indications for professionals, but their realm could be limited considering two elements. First, their authority often derives from their endorsement by some administration or some professional organisation. This can be a strength, but also a weakness in that, badly intentioned analysts could just argue that they guidelines provided, say, in Scotland, may not apply south of the Adrian wall. Also, this means that the prescriptive power of these guidelines are contingent to the support of the authority that issued them, a support that is not guaranteed in the medium to long term. The second limitation is that they do not have the immediateness of checklists that can provide, with minimal time requirement, an evaluation. It then appears legitimate to propose, additional to existing guidelines, other tools to assist in the delivery of proper economic impact assessments. Checklists also differ from **reasonableness checkings**, in use in various fields like transport planning. The former usually provides quantifications that can be used to check the outcome of a given analysis. Such quantitative landmarks could be useful for economic impact assessment, but they are beyond the scope of this article, and the question on whether economic impact assessment is a sufficiently consolidated area to allow for such approach is still an open one. As a partial conclusion to these considerations, there appears to be room for well-designed checklists in our area of interest.

This hypothesis is confirmed by a number of evidences that indicate efficiency of checklists in a number of fields, many of whom originated in human factor psychology or ergonomics (Drury, 2006). In a scientific essay, properly dedicated to checklists, Gawande, states that no matter how expert you may be, well-designed check lists can improve outcomes and provide evidence of efficiency for the simplest instructions (he quotes a 'wash your hand' instruction in surgery context (Gawande, 2009)). Mc Caulingh argues: '*The use of checklists is a primitive yet remarkably effective strategy for ensuring accuracy in complex tasks*' (McLaughlin, 2010). One may however wonder whether such successful outcomes may transfer outside of the surgery activity (Haynes, et al., 2009) (not to mention the iconic aeronautics example (Degani & Wiener, 1990). Actually, such transfer may not be adequate (surgery checking takes place in operational context with very limited time available for correcting actions; surgery operations typically imply various operators with very varied level of professional competencies. Both these conditions do not hold in typical economic impact studies professional contexts). Yet, other fields of human activity, which are more comparable to our, have successfully implemented checklists procedures. For instance, Chang et al have quantified the benefits of checklist for building engineering (Chang, Du, & Shen, 2012). It thus appears that checklist can be fruitful for assisting the proper implementation of economic impact analysis.

Yet beneficial for our topics, **checklists come with different flavours** that may be more or less adequate for our purpose. For instance, some check-lists are based on '*if, ... then do*' logic. Others, which may more closely adhere to the checklist literal meaning, merely check whether some conditions are verified, irrespective of possible counteractions. We argue that '*if .. then do*' checklists are more frequent and adequate in operational fields where quick action is necessary (e.g. surgery). This may not be appropriate for economic impact assessment that usually allows for more time for reflection.

Eventually, one should ask himself **what is a useful checklist**. Actually, guidelines for checklist design are available, although very few, to our best knowledge, in peer reviewed contents. Katherine Radeka published 'A Checklist for Designing a Checklist' (Radeka). Eventually, the only limitation one may see in checklist is the risk of mechanist use of checklists. These should be a support for reflection and not a substitute for it. By chance, in a way, the kind of errors that take place in economic impact assessment usually relate to complex issues, conceptual misconceptions, where mechanical corrections are unlikely. Moreover, there can be more 'mechanism' in the production process that governs 'unchecked' economic analysis than in the application of checklists. For instance, a typical sequence: 'I define a stimulus vector, I build an IO matrix, I use matrix calculation to compute the impact, I present the result', leaves little room to methodological reflection apart from some statistical and national accounting issues in the construction of the matrix. It thus appears that properly defined checklists,

designed to invite for reflection and not to substitute for it, are beneficial for the quality of policy recommendations that relate to hosting mega events.

As a conclusion for this section, it appears that many economic impact studies are at risk of providing flawed outcome, and a checklists, as long as applied as a support, rather than as a substitute for, reflection provide useful tool to make these outcome more appropriate.

3. Criteria to check the validity of Economic Impact assessments

In this section, we present a set of criteria to assess the validity of economic impact assessments. We discard extrinsic conditions (e.g. independence of the study from the organisers, or experience of the analysts or balanced records of the analysts - those that would always find that events are beneficial may be treated with more caution than others) and focus on intrinsic conditions, that fully rest on the proper features of the analysis itself without consideration of the conditions in which it has been produced.

We present 7 macro-criteria, and a decomposition at a more detailed level, that, to our view, are relevant to evaluate the quality of an economic impact analysis. Table 1 provides a synthetic presentation of these criteria. These criteria mostly refer to scientific features, sometimes in a large conception (Mules, 1998) considering for instance 'transparency' that is a scientific but also an ethic-politic requirement.

Transparent

A first criterion relates to how much a study is transparent. This may sound like a subjective criteria, there are however a number of parameters that can be used to measure this transparency.

First, the **calculation should documented** ('in due time', we may add as we know from some studies that were made available months after their results were published in the newspaper). A parameter for checking such feature relates to whether the documentation allows replication of calculations. In some cases, the replicability condition may be quite ambitious. We are aware of some economic impact studies that were performed using Computable General Equilibrium, which are typically complex models (Giesecke & Madden, 2007). Even in such situations, it is, however possible and necessary that the analyst provides a full description of the model even as working notes.

Second, the **analysis should explicit key assumptions**. Based on numerous findings in mega event economics, particularly crucial assumptions relate to substitution effects of private (how much of local visitors consumption is additional, rather than substituted to other consumptions) and public expenditures (Baade, Baumann, & Matheson, 2005). Such assumptions are such as to change the outcomes by an order of magnitude (Matheson, 2008). Therefore, it is necessary that studies make explicit how they dealt with such fundamental assumptions.

Table 1 – check list items

Criteria
Sub criteria
Elementary criteria

Transparent
Sufficiently detailed methodology easily available in due time
Calculations replicable
Key assumptions explicit, especially regarding substitution effect relating to :
Private expenditures: Local visitor expenditures, time switchers, etc
Public expenditures: investment and running of the mega-events

Informed
Accumulated scientific knowledge recognized
Considered substantially, not only formally

Critic
Initial cost evaluation checked against risks of increase
Forecast of visitors number based on a rigorous methodology

Realistic
Reallocation of expenditures treated differently than injection of resources
Public expenditure substitute for Alternative use of infrastructure expenditure reasonably considered
private expenditure (locals) at least partly substitute for other local expenditures
Estimate of <i>ex post</i> effect rests on:
Data independent from event organisers
Verifiable and replicable methodology
Adequate number of case studies
Evolution of <i>ex post</i> flow of tourism recognizes pessimistic evaluations provided by econometric estimates
Evolution of Foreign Direct Investment recognizes pessimistic evaluations provided by econometric estimates
Considers whether infrastructures partly built without the event (or if realization just accelerated by the event)

Balanced
Legacy is considered both for benefits (infrastructure, image...) and losses (debts and maintenance costs, etc)
Same level of detail for costs and benefits

Conceptually coherent
Allows economic benefits reduced when costs increase
Recognizes explicitly lack of prescriptive value of economic impact analysis
Costs defined without significant omission (accounting for security, taxes exemptions, etc.)
Absence of double counting
Proper distinction between production as added value and other possible measures of economic activity

Territorially and temporally coherent
Choice of area of analysis
Choice of area explicitly discussed,
Area of interest coherent with territorial level financing event (if not, implications made explicit.)
IO matrix congruent with the territorial level where applied
Leakages allowed at each stage, including first one.
Temporally consistent
Indication on how the ‘age’ of the matrix can impact the results
Absence of claims on temporal distribution of benefits when IO used

Territorially and temporally coherent

An additional criterion relates to the spatial and temporal consistency of the analysis.

Territorial consistency

First, **the area of interest should be clearly defined and the implication of this choice** should be discussed. This seems an obvious requirement, but some studies fail to do so. Crompton considers the example of Victoria 1994 Commonwealth Games:

'A major problem with the study is that it provides no formal definition of the region on whose economy the impact of the Games is supposed to occur. Is it the City of Victoria or the Province of British Columbia? The study appeared to measure visitors with respect to Victoria, thus counting the residents of British Columbia from outside of Victoria as visitors. [the consultants were defining visitors with respect to the city. Yet they measured economic impact [...] on the province of British Columbia, in which Victoria is a small part.]' (Centre for South Australian Economic Studies, 1992)

Apart from explicating the area of interest, **some consistency is necessary between the area of interest and the territorial level actually financing** the event. Consider an International Exhibition where the nation is ultimately providing financial guaranty to the licensing organisation. In this case, an analysis that computes only the regional effects will probably miss the point: it could be that the region economics will benefit from the event, but the main question is whether it will come with some net costs or with some net benefits for the larger community financing the event. Obviously, providing 'regional' results could still be interesting, **but the limitations resulting from such a choice should be explicit.**

Another issue of spatial consistency relates to the **ex abrupto transfer of multipliers** from one territorial context to another. Meta analysis can help in measuring how multipliers change considering various factors (size of the economy, exposure to imports, ...), and provide a valid alternative to the costly set up of local matrices. In other cases, the rough transfer of multipliers can be an expedient but it will suffer from limitations.

Temporal consistency

Space is not everything, time matters as well. This has two particular implications.

The first one is that matrix will usually be based on a few years before the time horizon of the study. This is even truer when one considers ex ante study that may be achieved 8-10 years before the event and usually use matrices that are

already a few years old. This situation is unescapable. Analysts should however reflect about its implications for their results and provide the readers with fair information on this.

The second aspects relate to the atemporality of the multiplier. By construction, an IO multiplier considers effects of a change in the activating vector up to the end of times (the multiplier is obtained by summing a mathematical series up to infinity). Unless proper consideration of the speed of diffusion of these effects is made, it becomes at least discussible **to make claims about the time distribution of the benefits.**

Critical

A set of criteria relates to how much the authors of the study proceed with sufficient awareness of the main distortions that usually affect such studies. This applies especially to ***ex ante underestimate of costs and overestimates of revenues***² (Althues & Maier, 2002). The issue is both conceptual, with many 'hidden costs' not properly accounted for in many analysis (this aspect is more adequately included in the 'conceptually consistent' criteria) but also practical, with recurrent errors in cost estimates of infrastructures and operating costs of given items.

Andreff compares *ex ante* and *ex post* costs of staging the games, pointing out a staggering increase that exceeds 100% in several cases (Moscow 1980, Calgary 1988, Albertville 1992) (Andreff, 2012),. Flyjberg and COWI propose an upward correction of initial costs (Flyvbjerg & COWI, 2004,).

The other side of the **coin relates to revenues estimates.** Revenues derive from ticketing and results from fares and patronage assumptions. Arguably, the accuracy of visitors' revenues depend on the type of event considered. International exhibitions often exhibit strong overestimates of visitors, while sport events can more often rely on predictable frequentation patterns.

To summarize, the economic impact assessment should not be naïve: **costs assumptions have to be checked against risks of underestimate, and income assumption against those of overestimates.**

Informed

Estimates should be informed, meaning that pre-existing research should be considered

Reference to existing literature should be present. Showing up with a large bibliography is an easy task. But omitting to provide references to existing work is not a valid alternative. Factually, the analysis should reference its sources and **consider existing scientific results.**

² For example, 'most league-sponsored economic impact studies (...) often completely ignore the costs of hosting such an event' (Matheson, 2008) or 'While on paper the 2002 Winter Olympics in Salt Lake City made a profit, the cost figures did not include millions of dollars of additional security provided by the U.S. Department of Defense at no cost to the local organizing committee' (Baade, Baumann, & Matheson, 2005)

This requirement is not formal but rather substantial. Contents of the literature should be considered for their stakes. If the literature insists on considering substitution effects, it is not sufficient to include related references in bibliography. It is instead necessary **to consider substantially how such knowledge** should impact the computation.

Realistic

A fourth criteria is **realism**. It can be declined in several subcriteria.

Substitution effects

A first condition relates to the fact that expenditure made for the event does not appear *ex nihilo*, but would have been used alternatively had the event not taken place. This deals with public as well as private expenditure. In our terminology, reallocation of resources (for instance when public expenditures crowds other budget out, or reduces private consumption through taxation) should be dealt with differently than injection.

More in detail, as far as **public expenditure is concerned**, the opportunity cost of expenditure (or any equivalent concept) should be considered as the cost of the foregone use of public expenditure. For example, a study of London 2012 Summer Olympics honestly recognizes that *'the results do not consider the opportunity cost of public funds, which could be used to finance other projects or lower the tax burden.'* The report continues: *'Whilst this is a common criticism of economic impact analysis, speculating on what the funds could have been used for involves conjecture'* (Oxford Economics, 2012). We argue that this *mea culpa* is one of the most pronounced expressions of care for this issue and that, as our analysis of Milan 2015 will show, such effects are usually omitted without even mentioning.

As far as **private expenditure is concerned**, one should consider that the expenditure of locals should not be considered, at least entirely, as additional as it represents an alternative use of money inside to the analysed system. Nevertheless, *'[this is] frequently ignored because when expenditures by local residents are omitted, the economic impact numbers become unacceptably small to those commissioning the assessments'* (Crompton J., 2006). Elaborating on this, various situations have been classified based, for instance, on the useful distinction of Preuss (Figure 1): *'Visitor expenditures should be net of 'time-switchers' and 'casuals'* (Baade, Baumann, & Matheson, 2005) See also (Baade & Dye, 1990) and (Baade R. A., 1987). Preuss identifies several behavioural responses to the mega events. For instance time-switchers, (*'visitors who had been planning to visit the study area but changed the timing of their visit to attend the event'*), casuals, extensioners, Olympians and home stayers should be considered as additional. Instead, *avoiders, runaways and changers* should not as they correspond to an alternative use of money inside the investigated area.

Figure 1



Consequentialism

Another aspect of realism relates to how much a given infrastructure **can really be considered a consequence of the event**. Would the city have built a subway line had the event not taken place? Or, was it just accelerated? If so, the vector of additional expenditures should not consider all infrastructures but only an acceleration of some of them – a tough task though. Notwithstanding these difficulties, the main point is that full attribution of the infrastructure to the event, together with lacking consideration of substitution effects, can cause large errors in economic impact assessment.

Comprehensiveness

Another aspect of realism **relates to the inclusion of induced effects**, as distinct from indirect effects. In some applications of Input-Output only intersectoral effects are considered. This sometimes relates to the fact that a table of intersectoral flows is more readily available to the economists than the wider representation of the economy necessary to convey induced effect. In the real world, money flows to wages (and final consumption) and government budgets (and expenditures). A computation that would fail to consider these effects would be distorted (and would underestimate the event impact). Additionally the way in which such effects are computed should be clearly documented. We are aware of several studies who claim they consider induced effects but do not mention how they performed this, or just refer to an intersectoral table, a dataset that in itself would not make such estimate possible.

Reasonableness

A last aspect of realism deals with a **proper evaluation of ex post effects**. It is actually easy to lose contact with reality when considering all the potential benefits of an event and the lists of such benefits is potentially infinite. Actually, it is probably legitimate, that analysts consider a wide array of

potential effects, it is however problematic when such effects are not considered based on rigorous assessment. This implies that the analysis should rely on independent data, on a verifiable and replicable methodology and on a sufficiently large and non-distorted selection of cases. This relates, in particular, to:

- *Ex post* flow of tourism: evidence based research has put into light that events rarely have the effects generally expected (Fourie & Santana-Gallego, 2011);
- Foreign Direct Investment: here again recent research (Jakobsen, Solberg, Halvorsen, & Jakobsen, 2013) indicate very limited outcomes : *'staging the Olympics has virtually no effect on FDI inflows, whereas hosting a major, nationwide football tournament might have a small positive impact on foreign investment, particularly in the years leading up to the event.'*

Balanced

A second condition of consistency relates **to the balanced treatment of costs and benefits**. For instance, considering infrastructure heritage or image benefits is legitimate, but, on the other side, one should consider interest on debts, maintenance costs, and other possible deadweight of the event.

Conceptually Coherent

Being conceptually coherent is a basic requisite for any economic analysis. Applied to economic impact assessment it materializes in a few critical criteria.

A first aspect is that **Economic Impact Assessment does not have a prescriptive value and should not pretend the contrary**. A positive economic impact does not mean the event is 'good' for the economy *'they [IO models] attempt to measure changes in output, not welfare'* (Abelson, 2011). In order to show that an event is, in some meaning, 'good' for the economy one would need to take into consideration the opportunity costs of resources and the event's externality. Absent such considerations, the increase in transactions shown by many Economic Impact Assessments is not adequate to deliver prescriptive conclusion such as 'it is good for the economy'. Normative instruments like CBA could show instead a different picture (McHugh, 2006). While this limitation is unescapable when dealing with Economic Impact Assessment, failing to explicit it is improper.

Another condition for consistency relates to the relationship between **costs and the outcome of the Economic Impact Analysis**. In many improper economic impact analyses, especially the ones that do not adequately operate a criterion of substitution, the main variables of interests are a positive function of expenditures. However if a given infrastructure is obtained for a larger cost, it may be

beneficial, depending on some specific contractual agreement, for the company in charge of its construction, but it is not beneficial for society. The resources used to cover extra costs are diverted from other socially desirable uses of public expenditures, so that the impact on economic activity is dubious while the loss of other benefits are certain. A basic requirement for a proper Economic Impact Assessment is that the variables of interest are not an increasing function of the considered costs.

A third condition relates to the **sufficient coverage of costs used in the analysis**. A potential confusion arises between the (operating and investing) budget of the organizing committee (or any specific body in charge of the event) and the total costs of the event, which entail a number of specific expenditures like security (Baade, Baumann, & Matheson, 2005) and tax exemptions). It is then necessary that a number of auxiliary costs are properly included in the analysis.

A fourth criteria relates to **the absence of double counting**. We are aware of one economic impact study that examines how an increase in GDP influences the creation of new business units. The creation of extra business is then used as an input to calculate extra added value. But there is little doubt that this just adds to the economic activity something that was already accounted for. Checking for the lack of double counting is a daunting task: double counting comes in many various forms and can even take the heavenly form or partial double counting. While this can be object of more profound examination, we let this to future work, but assume it is wise to include this criterion among our checklists.

A fifth criterion relates to the clear differentiation **between production (added value) and other metrics** (typically: sales). Sales are not a valid measure of economic activity. We are aware of various studies where the presented results confuse sales and added value (for instance some of them use the word 'production' for something that is roughly the double of 'added value', without specifying what they call 'production').

Discussion: objectivity and mechanism

With these criteria defined, a proper analysis of the validity of studies about the benefits of the events can be performed. We recognize that some of these criteria may not result in a straightforward evaluation. Some readers of preliminary release of this analysis pointed out that the implementation of some criteria left too much room to subjectivity. We are not convinced that the opposition between objective and subjective is the right key to discuss this topic, but we reckon that some criteria are of deterministic nature (they are fulfilled or they are not, this may apply to the 'documentation is publicly available') while others may give more room to discretionary evaluation. We posit that this situation should not be considered as a limitation of the proposed checks. The reason is that

restricting the checks to criteria that are prone to determinist assessment will reduce the effectiveness of the checks. Strikingly, one can note that many of the claims contained in Economic Impact Assessments are very 'subjective' in that they rely on a very personal use of few available evidences, if any. Suppose the following example:

For Expo 2015, CERTeT reports: *'We considered a growth rate directly related to the event of 10% per year, compatible with what happened in cities who hosted international events and with congress industry similar to the Milanese one'*³ which finally roughly transfer results from a single case (Barcelona) without quoting sources of the data. It is fair to say that the quoted example does not correspond to a fully objective calculation in that it leaves large room to the analyst (how many and which reference cases will be chosen, how the differences between the reference case and the application case will be considered). It would then be problematic to exclude 'discretionary' evaluation criteria and to accept similar subjectivity in the analysis.

Eventually, there is room for discussion about the correct way to evaluate criteria when no sufficient information is made available by the author of the study. On the one side, one should consider that missing to provide sufficient information is not similar to failure. But, on the other side, a precautionary principle and incentive to good documentation practice, is too consider that results that do not exhibit sufficient credentials of rigorous application, should be treated like inappropriate. How to deal with such situation probably deserve discussion among economists.

4. Application to Expo Milan 2015 economic impact assessment

In this section, we implement our checklist to case studies, namely the ex-ante economic impact assessment of latest mega events in Italy: Milano 2015 and, for comparison, Torino 2006 winter Olympics. We first present the documents that substantiate the economic impact claims about the events, and successively the outcome of our checks.

Four ex ante studies about two mega events in Italy

As Olympics and International Exhibitions are well known events and their features are available elsewhere we do not provide a description of these events. We rather focus on the economic impact studies that materialises in 3 studies for Milan and one study for Turin 2006 Olympics. The material available for each of them are presented in Table 2.

³ 'Si è considerato un tasso di crescita direttamente attribuibile del 10% l'anno, compatibile con quanto avvenuto in città che hanno ospitato eventi internazionali e con un mercato congressuale simile a quello Milanese' (Airoldi, Cini, Morri, Quaini, & Senn, 2010)

Table 2 - Sources of information used for Italian mega event impact studies evaluation⁴

Event	Study	Available documents
Milano 2015	<i>Dossier de candidature</i> 2007. Made by candidature committee. Economic section mainly contributed by CERTeT, Bocconi University.	<ul style="list-style-type: none"> • <i>Comitato di candidatura. (2007). Dossier di Candidatura Expo 2015 (Comitato di candidatura, 2007)</i>
	2010 CERTeT Study	<ul style="list-style-type: none"> • <i>'L'impatto di EXPO 2015 nell'economia italiana'. 24 Nov. 2010, 7 p. available online (Airoldi, Cini, Morri, Quaini, & Senn, 2010)</i> • <i>'Expo Milano 2015 l'impatto sull'economia italiana'. 5 p. containing the main results and available online. (CERTeT, 2010)</i> • <i>'L'impatto di expo 2015 sull'economia italiana, I risultati dell'analisi d'impatto'. Nov. 2010. 16 p. technical memo obtained at our request. (CERTeT, 24 Nov. 2010)</i>
	2013 Dell'Acqua et al Made by : Dell'Acqua et al For: Milan chamber of commerce and Expo 2015 S.p.A.	<ul style="list-style-type: none"> • <i>'L'indotto di Expo 2015. Analisi d'impatto economico'. 20 Dec. 2013, PowerPoint presentation. ((Dell'Acqua, Morri, & Quaini, L'indotto di Expo 2015. Analisi di impatto economico, ottobre 2013) 33 slides with 3 containing methodological considerations.</i> • <i>L'indotto di Expo 2015, Un'analisi di impatto economico, a cura di, Dell'Acqua, Q. Morri, G. Quaini E., Milano, Oct.. 2013, 102 p. ((Dell'Acqua, Morri, & Quaini, ottobre 2013) Provided at our request by the authors in Jan. 2015.</i>
Torino 2006	2005 Unione Industriale Torino study Made by a group of researchers from various institutions (Rome University, Cofindustria) For : Industrial Union of Turin	<ul style="list-style-type: none"> • <i>Unione Industriale Torino. (2005). Valutazione degli effetti economici dei Giochi Olimpici Invernali di Torino 2006. Torino: Unione Industriale Torino. (Unione Industriale Torino, 2005)</i> • <i>Fachin, S., & Venanzoni, G. (2002). IDEM: an Integrated Demographic and Economic Model of Italy. CONSIP S.p.A. (Fachin & Venanzoni, 2002)</i>

⁴ Another existing document is: Dell'Acqua, A., Etro, L. L., (2008), 'Expo Milano 2015. Un'analisi di impatto economico per il Sistema Paese ed i settori industriali italiani', SDA Bocconi School of Management, Milan, Research report. This does not appear to be publicly available.

These various documents share some similarities. The main one is that they have been committed by organizing authorities. There are also some differences. The bidding dossier is different from others in a key aspect in that it is more openly a lobbyist document. It could then be a too easy task to shed light on its deficiencies, some of which could be considered forgivable (you may not want to provide a full documentation of your calculation when they are made to win the bid). We posit however that, including this study as well is relevant; after all, talking about taxpayers' money, one may require that bidding also is based on a rigorous claims.

Checking claims of mega events case studies in Italy: many criteria are not respected

In this section, we provide an example of application of economic impact studies on four studies. The full results are presented in appendix. We make use of a five levels verbal evaluation (no, a few, partly, mostly, yes). This evaluation could easily be converted in a 5 level numeric scale.

In some cases, a criterion is not applicable to a given study (for instance Dell'Acqua et al. 2013 study does not consider the impact of infrastructure expenditures, so it is meaningless to check how substitution effects in infrastructure spending is respected). A more critical situation is when the verification of a given criteria is not possible based on the available documents. This situation is denoted with n.a. (non-available) assessment. For the evaluation of third part studies, it is reasonable that uncertainty should be treated as a non-conformity '(as long as I am not sure that a criteria has been respected I should treat it as if it was wrong)'. This precautionary principle should 'contaminate' self-evaluation as well: *'if I did not clarify that this criteria has been respected, it is still doubtful'*.

5. Conclusion

In this paper, we have reviewed how the implementation of a checklist can assist analysts, policy advisors and a wider public in evaluating the correctness of a given economic impact studies. Our analysis suggests that checklist can be efficient to assist in the economic impact assessment.

In this context, based on the evidence gathered by economic analysis in the last decades, we have identified key requirements relating to the analysis being:

1. Transparent
2. Informed
3. Critic
4. Realistic

5. Balanced
6. Conceptually coherent
7. Territorially and temporally consistent

In an application to four studies made for recent mega events in Italy the checklist appear as a valid tool to make possible limitations of studies apparent. Although the analysis of these four studies conducts to a strongly negative evaluation, most of the criteria failing, this is not in itself a proof of general misconduct in economic assessment of mega events.

The proposed tool can give rise to future developments following various directions. First, a more consolidated and inclusive definition of criteria could be searched. The definition of the criteria could be based on expert consultation. Another extension would be to assign weights to the various criteria. At a present stage, an arithmetic summation of the scores for the different criteria would only provide a coarse quantification of their validity. For instance, a simple (unweighted) summation (assigning values (0; 1; 2; 3; 4) to the 5 levels of the verbal scale and an equal weight for each elementary criteria) of the scores of the 4 Italian studies considered in this paper would produce very **low validity scores ranging from 6 to 15 % of validity**. While we are aware that this metrics is imperfect, as it considers all criteria of equal importance, we consider these low score are informative of issues in the practice of economic impact analysis.

On the contrary, one could reasonably argue that not all criteria have the same weight and that one should rather employ weighted aggregation techniques. This aggregation of criteria as well could benefit from consultation of experts. An important issue about aggregation, is how it should allow for veto criteria (but candidates for such veto would be numerous as virtually any non-conformity could dramatically reduce the validity of the study) and for non-linear effects or non-compensation. These extensions would certainly increase the validity of the proposed methodology. We reckon however, that before such extensions are made, our proposed method should be shared with the community of persons involved in the evaluation of mega-events.

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1. Appendix

Table 3 – check list for Turin 2006 and Milan 2015 economic impact studies

Evaluation levels: no, few, partly, mostly, yes. ; n.a : non available, n.r.: Not relevant

Criteria Sub criteria Elementary criteria	Milano 2015			TO 2006
	Dossier di candidatura (2007) ⁵	CERTeT (2010)	Dell'Acqua et al (2013)	Union Ind. di Torino (2005)
Transparent				
Sufficiently detailed methodology easily available in due time	few	few ⁶	No ⁷	Yes
Calculations replicable	few	Partly ⁸	Partly ⁹	Partly ¹⁰
Key assumptions explicit, especially regarding substitution effect relating to :				
Private expenditures: Local visitor expenditures, time switchers, etc	n.r. ¹¹	Partly ¹²	No ¹³	No
Public expenditures: investment and running of the mega-events	No	No ¹⁴	No ¹⁵	No

⁵ Non-conformity of the bidding dossier with our criteria should be considered taking into consideration the lobbyist nature of this document. In this analysis, we may therefore be less detailed about this document than about the others.

⁶ A 16 p. methodological memo has been sent to us at our request. It clarifies some of the calculations.

⁷ A methodology of 102 pages has been communicated at our request one year after publication of the results and after several requests from a collaborator of ours. In between times, some claims produced by the study had been widely quoted in the media.

⁸ For instance, the Input-Output matrix is not discussed. The indication 'tav.I/O 2005 Italia' may not be sufficient to warrant replicability.

⁹ Matrix calculation is described in details (cap. 7.3) although the matrix itself is not documented. But other parts of the computation are not sufficiently described so as to allow for replication (for instance increased entrepreneurship and creation of new companies (*l'imprenditorialità incrementale e la creazione di nuove imprese*) is based on a model that is only partly documented p. 62. The key factor of the number of additional companies relating to an increase in GDP is not provided, although the reader may try to deduce it from other information present in the dossier.

¹⁰ Apart from the study, a 15 pages description is available. This document does not appear sufficient to warrant the replicability of computations. One could however object that the replicability condition can be verified with varying levels of requirements based on the very complexity of a given model.

¹¹ Bidding dossier does not consider visitors' expenditures.

¹² The study considers a percentage of presence in Lombardy or in Milan for which 'motivation of trip is Expo'. This information is provided by a poll, but the precise way by which this information has been collected, and the precise question phrasing, is not available.

¹³ Dossier p. 14. No indication is presented on the subtraction of the substitute part of the local visitors.

Informed				
Accumulated scientific knowledge recognized	No	No ¹⁶	Yes	No
Considered substantially, not only formally	No	n.r.	No ¹⁷	No
Critic				
Initial cost evaluation checked against risks of increase	No	No	No	No
Forecast of visitors number based on a rigorous methodology	Partly	Partly ¹⁸	Partly ¹⁹	n.a. ²⁰
Realistic				
Reallocation of expenditures treated differently than injection of resources				
Public expenditure substitute for Alternative use of infrastructure expenditure reasonably considered ²¹	No	No	No	No
Private expenditure (locals) at least partly substitute for other local expenditures	No	No	No	No

¹⁴ The whole public expenditure is treated as additional for the economic system considered.

¹⁵ The public vs. private nature of certain expenditures is partly a matter of opinion. Still, the whole public expenditure is treated as additional for the various study areas considered.

¹⁶ No reference is made to scientific publications. The Dossier refers to a 'recent study' Clark G. *'Home to big ideas: The Impact of Major Events on Inward Investment. London 2012 and The Thames Gateway'*, but this study has been made for a group of real estate investors and cannot be classified as scientific publication.

¹⁷ The critics formulated by existing scientific literature on mega events is barely present, and, when present, it does not impact reasoning (see for instance the use of Baade and Matheson works, quoted as 'Baarde and Matheson', which lost all its critic aspects as the ones on substitution effects).

¹⁸ The estimate of Italian visitors is based on a survey, without consideration of how interviewed people declaration should be corrected due their nature of statement. For most of the areas of origin of the visitors, the estimate is substantially based on a doubling of visits, calculation that is not supported.

¹⁹ The study refers to a survey ('a survey made by Bain Italy for Expo 2015 Spa'; 'un'indagine svolta da Bain Italia su incarico di Expo 2015 S.p.A' p.14; 'corrected in February 2013 based on the results of a new survey made in December 2012 by Eurisko'; 'corrette nel febbraio 2013 sulla base dei risultati della nuova indagine svolta nel dicembre 2012 da Eurisko' p. 15) does not provide sufficient details to allow for an analysis.

²⁰ Visitors forecast is usually easier for Olympics than for International Exhibitions.

²¹ None of the studies expresses interrogations on the origin (and alternative use) of the funds used, while these questions receive increasing attention from economic analysis (Zimbalist 2015).

Realistic (continued)

Estimate of *ex post* effect rests on:

Data independent from event organisers	n. a.	Yes	Yes	n. a.
Verifiable and replicable methodology	No	Yes ²²	No ²³	n. a.
Adequate number of case studies	No	No ²⁴	No ²⁵	n. r.
Evolution of <i>ex post</i> flow of tourism recognizes pessimistic evaluations provided in literature	n. r. ²⁶	few ²⁷	No ²⁸	n. r.
Evolution of Foreign Direct Investment recognizes pessimistic evaluations provided in literature	n. r.	No ²⁹	No ³⁰	n. r.
Considers whether infrastructures partly built without the event (or if realization just accelerated) ^{31, 32}	No ³³	No ³⁴	n. r.	No ³⁵

²² Some features of the computation of FDI (see for instance p.12) are exposed in a very simple manner, but this can relate more closely to the real simplicity of the underlying model than to a lack of documentation.

²³ The effect on Foreign Direct Investment is based on ‘historical data linked to the dynamic of FDI in Italy and in the areas of interest of the Expo’ (*benchmark storici legati alla dinamica degli IDE in Italia e nelle aree interessate da Expo nello specifico*, p. 64) but the corresponding data are not made available. Relating to touristic flows, discussed essentially in pp. 17 and 64, the study does not provide precise information on how 1 billion stays have been obtained, other than referring to a 2008 study by the same authors, which is not publicly available. The research by (Fourie & Santana-Gallego, 2011) that consolidate observations on touristic flows between 200 countries is not quoted. It would however be excessively severe to blame the author of Milan study for this omission, as the publication was very recent.

²⁴ The estimate of *ex post* touristic impact on Milan only refers to the case of Turin (p. 10-11). The impact on congress tourism is based only on Barcelona and, very marginally, Sydney.

²⁵ For instance, the impact on *ex post* tourism only refers to the Turin case (p. 17). A study of 2008 by the same authors could contain extra information but it does not seem available to the public.

²⁶ The discussion on *post event* touristic flow (p. 126) is barely substantial and does not produce a quantification, but in any case these effects are not included in the impact study.

²⁷ One may refer, for instance, to the discussion on the number of congress participants, a discussion that seems highly speculative ‘we considered a growth rate directly related at 10% per year, compatible with what happened in cities who hosted international events with a congress market similar to the one in Milan’ p. 6. In reality, the estimate is based, although with claims of being prudential, only on the case of Barcelona, whose figures are provided without quoting their sources.

²⁸ p. 64: the quantification of *ex post* flows does not appear justified ‘based on the estimates contained in the analysis, such effects should generate an additional production of 1,2 billion euros’. (*In base alle stime contenute nell’analisi tali effetti dovrebbero generare una produzione aggiuntiva di 1,2 Miliardi di euro*). No model is presented that would produce this figure impact or at least would deduce it from other cases. Considerations provided in pages p. 82-84 do not provide further clarification.

²⁹ ‘it is likely, as demonstrated by studies made for other similar events, that an increase in FDI takes place for a few years’ (*è probabile, come dimostrano studi realizzati in previsione di eventi analoghi, che si verifichi un aumento per qualche anno dei flussi d’investimenti diretti esteri (IDE)*’ p. 6). Such studies, however, are not quoted. More pessimistic results obtained in other researches are not considered.

³⁰ The study states ‘based on indications provided by some sources, a 5% increase of ‘Expo induced’ FDI has been estimated’ (*Sulla base di indicazioni tratte da alcune fonti, si è stimato un aumento annuo degli IDE ‘Expo-induced’ del 5%.*) but the corresponding sources are not quoted.

³¹ The study should at least deal consistently with the fact that acceleration in the construction of these infrastructures implies a reduced priority for other infrastructure or an increase in taxation.

³² One can honestly state that none of the considered studies, which deal with infrastructures effectively, considers this question. Considering Turin, it seems implicit and certain for the authors that the expenditures for infrastructures in periods 2001-2004 and 2005-2009 would not have taken place without the Olympics.

³³ It seems, at least implicitly, that the 10,179 billion of infrastructure expenditures (called ‘infrastructural investments not linked to Expo’) would not have been spent at all if Milan would not have organized the Expo.

³⁴ The whole infrastructural expenditures are considered (p. 5)

³⁵ The study refers to ‘construction of infrastructure for the operation of the games and the running of the Turin organizing committee’ (*realizzazione delle opere per lo svolgimento dei Giochi e al funzionamento del TOROC*) and also ‘related infrastructures’ (*opere connesse*) to be constructed in the games area, and to ‘accompanying infrastructure’ (*opere di accompagnamento*). The implicit assumption

Balanced

Legacy is considered both for benefits (infrastructure, image...) and losses (debts and maintenance costs, etc) ³⁶	No	No ³⁷	No ³⁸	n.a.
Same level of detail for costs and benefits. ³⁹	No	No ⁴⁰	No ⁴¹	No

Conceptually coherent

Allows economic benefits reduced when costs increase	No	No	No	No
Recognizes explicitly lack of prescriptive value of economic impact analysis ⁴²	No	No	No	No
Costs defined without significant omission (accounting for security, taxes exemptions, etc.)	No	No ⁴³	No ⁴⁴	No ⁴⁵
Absence of double counting	Yes	Yes	No ⁴⁶	Yes
Proper distinction between production as added value and other possible measures of economic activity	No	No ⁴⁷	No ⁴⁸	Yes

seems to be that none of these infrastructures would have been achieved, even partially, without the Olympics. This assumption is however discussible and, in all cases, should have been discussed by the authors, considering how unlikely it was that, absent the games, no intervention on these infrastructures would have taken place.

³⁶ For instance crowding out is neglected only after evaluation that the impacts of such omission are less than those of other benefit considered.

³⁷ Reference to maintaining costs (p. 5) is misleading: they appear as a benefit, not as a cost.

³⁸ Interesting the fact that Crystal Palace is quoted as a '*still tangible and visible*' ('*ancora oggi concrete e visibili*') example of International Exhibition Legacy, forgetting that it was destroyed by fire in 1936! (p. 59)

³⁹ For the various available studies, it would be sufficient to observe that financial costs (interests) are omitted. Moreover, none of the studies considers crowding out, although this aspect may be considered minor. More fundamental is the lack of consideration of opportunity costs of public funds.

⁴⁰ Crowding out is not considered, neither substitution effects.

⁴¹ The study does not deal with annex infrastructures. This could lead to an underestimate of the economic impact. On the other hand, the omission of substitution effects creates an overestimate. It thus appears unclear whether the final result is over or underestimate.

⁴² For instance, a Cost Benefit Analysis could generate a negative outcome event in presence of a positive economic impact (increase in added value).

⁴³ The chosen methodology is not discussed and compared with prescriptive methods proposed in public economy. The lack of prescriptive value of the results is not made explicit.

⁴⁴ idem

⁴⁵ idem

⁴⁶ The study compares how increased GDP affects the constitution of new companies and considers also how increased number of companies in turn increases GDP. The computation could loop for a higher number of times, but two times is already double counting.

⁴⁷ 'Produzione aggiuntiva complessivamente determinata da EXPO Milano 2015 nell'economia italiana, nel periodo 2011-2020, potrà ammontare a più di € 69 Miliardi, cui corrisponde un incremento di valore aggiunto pari a circa € 29 Miliardi.'

⁴⁸ Refer to increased production as something different from increase in added value. Context strongly suggest 'increased production' is used to label change in output.

Territorially and temporally coherent				
Choice of area of analysis	No ⁴⁹	Partly ⁵⁰	Partly ⁵¹	Yes
Choice of area explicitly discussed,	No ⁵²	Yes	Yes	Yes
Area of interest coherent with territorial level financing event (if not, implications made explicit.)				
IO matrix congruent with the territorial level where applied	n.a. ⁵³	No ⁵⁴	Yes ⁵⁵	Yes ⁵⁶
Leakages allowed at each stage, including first one.	n.a.	No ⁵⁷	n. a.	n.a.
Temporally consistent ⁵⁸				
Indication on how the ‘age’ of the matrix can impact the results	No	Few	Few	Few
Absence of claims on temporal distribution of benefits when IO used	Partly ⁵⁹	Yes ⁶⁰	No ⁶¹	Partly ⁶²

⁴⁹ The chapter title refers to Italy and Milan. Some figures are quoted p. 116 without explicit reference to a given area. The readers may later discover (tab. 21.1) that such figures refer to Lombardy. It may just deal with clarity in communication; it does not however help to establish the credibility of the study.

⁵⁰ The study considers national economy and regional (Lombardy) economies economy, but it is sometimes uneasy to tell apart what relates to Lombardy and what relates to Italy. This may, here again, be a matter of expression. This however does not help to establish the reliability of the study.

⁵¹ The study considers Milan Province (an administrative subdivision extending few tens of kilometres outside of Milan), Lombardy and Italy. The territorial coverage allows for various levels of analysis, it is however unclear how impact on the province level can be estimated using a regional intersectoral table (as can be deduced reading p. 99).

⁵² The study does not discuss the study area but implicitly concentrates on the regional level (see p. 119 for instance).

⁵³ At least it is not possible to exclude the use of an unappropriated matrix. The impact is computed at the regional level but the scale of the matrix is not clarified.

⁵⁴ ‘The basis for the impact analysis is the Input-Output matrix for year 2005’ (*‘La base per l’analisi dell’impatto è la Matrice Input Output dell’Italia relativa al 2005’*) (l’impatto di Expo 2015 sull’economia italiana; I risultati dell’analisi d’impatto, Novembre 2010 p. 4.)

⁵⁵ At least if we consider this statement: *‘indirect activation has been estimated based on the Table of Intersectoral Trade relating to the Italian economy for 2005 and to Lombardy for year 2006’* (*‘L’attivazione indiretta è stata stimata sulla base della TEI relativa all’economia italiana al 2005 e alla tavola Lombardia 2006’*) p. 99.

⁵⁶ It is a proper feature of IDEM model to take into consideration, with special attention, the regional nature of the impacts.

⁵⁷ The study recognizes, genuinely, *‘generally (...) it has been assumed that all the inputs in the impact vector are provided by Italian firms’* (*‘Generalmente, (...) si è ipotizzato che tutti gli input indicati nei vettori d’impatto provengano da imprese italiane’*) (L’impatto di expo 2015 sull’economia italiana; I risultati dell’analisi d’impatto, Novembre 2010 p. 8.)

⁵⁸ With some goodwill, one could understand that most of the impacts occur in ‘shortly after’ the impact, but this assumption should at least be explicit and its validity should be discussed.

⁵⁹ Some contrary statements can be found: *‘70,000 new jobs during the timeframe necessary to prepare for Expo Milano 2015.’* chapter 21, p 116.

⁶⁰ Although one can read *‘for precautionary reasons, it has been assumed that all impacts related to Expo Milano 2015 will be exhausted in 2020’* (*‘In via cautelativa, si è supposto che tali effetti imputabili a EXPO Milano 2015 si esauriscano nel 2020’*), this statement is however rather vague, and does not fully justify the assumptions made about the temporal distribution of the effects.

⁶¹ Refer to section 3.3 of the complete report. Starting from p. 22.

⁶² Refer to chapter 3.1 and 3.2 of (Unione Industriale Torino, 2005) that display a temporal distribution of effects.