

Integrating Cost Benefit Analysis with Economic Impact Analysis to evaluate government assistance for staging regional events: The Case of Mount Panorama Motor Racing Circuit Bathurst Australia

By

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Abstract: This paper reviews a range of views about the appropriate mix of CBA and EIA in economic efficacy assessment and concludes that they all have significant shortcomings. The paper goes on to argue that integrating EIA with CBA rather than treating them separately is the most appropriate way to assess at least when considering government funding towards the staging of special events in a regional setting. The integrated methodology is illustrated using the example of the Mount Panorama Motor Racing Circuit at Bathurst Australia.

Key Words: Economic Impact Analysis, Cost Benefit Analysis, Motor Racing

Introduction

Governments around the world provide funding to support the staging of sporting and cultural events. These events can be major such as the Olympics or World Cups of various sports such as soccer, rugby and netball usually staged in capital cities. They can also be smaller national or regional events usually supported by state or local governments. The objectives of this support include prestige, entertainment and increased economic activity.

Australian governments also sometimes provide financial assistance for the staging of events including in regional centres. The objectives of this support are to enrich the cultural/entertainment experience for the residents in these centres and to stimulate the local economy in terms of economic growth, employment and household income.

The initial justification for the government intervention is that there is some form of market failure which means that the event would not be staged or staged at a sub-optimal level without the intervention. The market failure is typically explained in terms that the stager of the event cannot capture a sufficient share of the event's value to make the event viable from the stager's point of view. Market failure is a necessary justification for the government intervention but it is not sufficient justification. In addition it is normally expected that the intervention passes a test of economic efficacy.

Economic efficacy can be assessed by one of or both of two separate techniques Cost Benefit Analysis (CBA) and Economic Impact Analysis (EIA). Some argue that the two techniques are complementary while others argue strongly for the primacy of CBA over EIA. A weakness of EIA is that no account is

taken of the cost of the support. On the other hand when the objective of financial assistance is in large part local economic growth it seems remiss to rely only on the CBA result. When both techniques are used the results can be ambiguous with one technique indicating a positive outcome and the other a negative outcome.

This paper reviews a range of views about the appropriate mix of CBA and EIA in economic efficacy assessment and concludes that they all have significant shortcomings. The paper goes on to argue that integrating EIA with CBA rather than treating them separately is the most appropriate way to assess, at least when considering government funding towards the staging of special events in a regional setting. This approach was first used by Hicks et al (2014) and is expanded upon in this paper. The integrated methodology is illustrated using the example of the Mount Panorama Motor Racing Circuit at Bathurst Australia.

Literature Review

The EIA/CBA Debate

Abelson (2011) along with many other writers sees CBA as the primary technique to assess the efficacy of government support for special events. He argues much efficacy assessment is faulty with the analysis based on poorly defined policy objectives and a flawed evaluation technique. He considers four main possible objectives: (1) maximising the net welfare benefits to existing local households, (2) maximising gross regional product (GRP), (3) maximising net income of existing local households (4) maximising local employment. He argues that public policy should only pursue (1) with the other three being second best. Net welfare according to Abelson is assessed by CBA where all the costs and all the benefits are assembled at a general level of magnitude. He concludes that unless the government support for a special event does pass the CBA test it cannot be justified on economic efficacy grounds. Thus Abelson's view is that CBA is the appropriate evaluation technique with EIA a second best technique.

Fleurbay (2009), who is cited by Abelson, has a less extreme view when he concludes *that we do not, as yet, have a unique consensual measure of welfare*. With some reservations he concedes that income and expenditure may be a relevant part of the full welfare picture. Hence he leaves open the possibility that there may be some significant role for EIA in efficacy assessment. This view is acknowledged by Dwyer and Forsyth (2009) who use both techniques in their assessment of the Melbourne Grand Prix. They use the CBA to measure

the extent of net social benefit and EIA to measure the level of economic activity including the wider flow-on effects that the event generates. That is the CBA picks up the consumer surplus of local residents as well as non-price effects such as noise and traffic congestion. In turn the EIA picks up increased GRP, income and employment of local businesses and households. From this they conclude along with Mules and Dwyer (2005) that EIA and CBA are complementary techniques with each covering the issues the other fails to address. Using two techniques raises the possibility of an ambiguous answer and this is precisely the finding of Dwyer and Forsyth (2009). The CBA indicates the Grand Prix to be a poor investment of public funds but the EIA indicates a highly positive outcome.

In part to address this ambiguity Dwyer and Forsyth (2009) refer to the model by Burgan and Mules (2001) which is based on demand and supply curves for tourism services. In their model government support for the event shifts the demand curve for tourism services to the right thereby increasing consumer surplus, producer surplus and incomes to workers in the tourism services industry. Dwyer and Forsyth go on to outline a number of issues that need to be addressed in this model before reconciliation of the CBA and EIA results can be achieved. The issues include the exclusion of non-local consumers and producers, the existence of unemployed or under-employed local labour, price effects particularly on labour, a reservation wage, the appropriate technique input output analysis (I-O) or computable general equilibrium modelling (CGE) and the acknowledgement of other costs and benefits such as enhanced trade, business development and environmental effects. Unfortunately Dwyer and Forsyth do not provide an outline of how this model can be applied in practice so we are left with the possibility of ambiguous results when the two techniques are applied together.

Hicks et al (2014) reviewed multi-criteria models (sometimes called goal programming) as a way to address the different policy objectives assessed by CBA and EIA. However the models require the subjective assigning of penalty weights to determine the relative cost of deviating from each given goal so they do not have the objectivity achieved by Abelson's emphasis on CBA assessment.

Hicks et al (2014) proposed a slightly different model to integrate CBA and EIA than the Burgan and Mules (2001) model. Hicks et al applied this model to a Western Research Institute (WRI) study (2009) of Mount Panorama Motor Racing Circuit in Bathurst Australia. Hicks et al did integrate the study's EIA results into a CBA so their paper did provide a comprehensive and objective measure of the economic efficacy of government support for the event. However in the Hicks et al paper the integrated model is not fully developed and the theoretical underpinnings of the model and the method to apply the model in practice are discussed only briefly. So like the Burgan and Mules (2001) paper and the Mules and Dwyer (2009) paper the Hicks et al (2014) paper does not provide a blue print for integrating CBA and EIA to assess the economic efficacy of government support for an event.

The Input-Output/ Computable General Equilibrium Debate

Dwyer and Forsyth (2009) argue strongly that EIA should be conducted with Computable General Equilibrium (CGE) modelling and not Input-Output (I-O) modelling. The major criticism of traditional I-O models is their rigid assumptions which exclude price changes and factor restraints, the exclusion of industry interactive effects and the assumption of constant proportions between inputs and outputs. A consequence of these assumptions is that I-O tends to exaggerate the economic impact of events. CGE, on the other hand, is not based on these assumptions and is therefore considered much more accurate for EIA assessments.

For smaller regional events, however, CGE may not be the most suitable or even feasible modelling technique. Abelson (2011) points out that the results of using a CGE model for a regional event can vary greatly depending on the assumptions used in the model to replace the rigid I-O assumptions. Abelson also questions the appropriateness of a CGE model when measuring, for example, the impact of \$20 to \$30 million dollars of expenditure over one week in a state economy of \$200 to \$300 billion. His concerns are the complexity of CGE models with their thousands of equations, the fact that CGE models are designed to measure longer run impacts such as trade reforms, the limitations on data at state and sub-state level and the cost and expertise to build and use these models.

Abelson's concerns refer to state wide impacts such as the impact on the New South Wales economy. His concerns are many times more pertinent for impacts at a sub-state level, for example where a local council in a regional centre of 40,000 people is considering contributing to the staging of a local event. In this example an appropriate CGE model is too expensive for the council to fund and would be based on a host of unsubstantiated assumptions thereby producing very variable estimates of impacts.

A solution is to use the non-linear I-O model developed by West and Gamage (2001). In this model marginal input propensities replace average input propensities with the former estimated econometrically from officially collected data. The method largely eliminates the overestimation inherent in the traditional I-O model and omits the adjustments to assumptions in CGE modelling that are not relevant to small area studies. A further benefit of the non-linear I-O model is that with far fewer equations it is much simpler and cheaper to construct than a CGE model. The Mount Panorama study on which the Hicks et al paper is based utilises a non-linear I-O model.

The Super Cheap Auto Bathurst 1000

Bathurst is a regional city with a population of 44 thousand located 200 kilometres west of Sydney Australia. Bathurst has the iconic Mount Panorama Motor racing circuit which hosts four major motor sports events and a range of much smaller events. There is market failure for these events in that any single event promoter cannot capture all of the benefits of race circuit upgrades and maintenance. Consequently Bathurst Regional Council (BRC) conducts both current and capital spending on maintenance and upgrading of the circuit. BRC does receive revenue from the event promoters and from the state and federal governments but this is less than BRC expenditure. Information on promoter and other government payments to the BRC are not available.

The biggest event is the Super Cheap Auto 1000 (Bathurst 1000) held over a week in October and includes racing of V8 Supercars, Formula Ford, Camera Cup, utilities and touring cars. The Bathurst 1000 celebrated its 50th year in 2012 with attendance figures of 207,000 with 58,000 for the main race on the final day. For that year Bathurst Regional Council (BRC) commissioned the Western Research Institute (WRI) to conduct an EIA of the Bathurst 1000 event. BRC used this EIA and a number of previously commissioned EIAs to

justify BRC funding the maintenance and upgrading the circuit to motor racing standard as well as being part of applications to the State and Federal governments to add to this funding. BRC attributed \$1.6 million AUD to the funding of this event.

Expenditure estimates for the EIA were based on attendance records, an expenditure survey of 828 race spectators and expenditure information provided by the promotor, competitors, media, police, contractors and the BRC. Only expenditure that added to the Bathurst economy was included so payments to the promoter for ticket sales, memorabilia and some camping fees were excluded. WRI constructed a marginal coefficients input-output model of Bathurst economy and applying the expenditure estimates yielded, after flow-on impacts are included, 59.2 million AUDs of output, 25.3 million AUDs of value added impact (VAI), 14.5 million AUD of household income and 255 full-time-equivalent (FTE) employment. The EIA was thus highly positive but no CBA was undertaken.

Integrating EIA into CBA

The EIA for the Bathurst 1000 is from the perspective of the welfare of households and businesses in the BRC area.

The output impact estimated by the EIA includes the bundle of motor race services, visitor accommodation, retail, hospitality, security, and transport provided to race spectators, competitors and others associated with the event by Bathurst businesses and households. The demand curve for this bundle of services and goods is shown by AD on Figure 1. The supply curve for the bundle is FS with aggregate price OC. The value of the output estimated to be 59.2 million AUDs is the area CBGO. The value added impact (VAI) which is the value of the bundle minus that part of the bundle that is made up of imports, including inputs, of goods and services from outside the BRC region 25.3 million AUD and is the area CBEF.

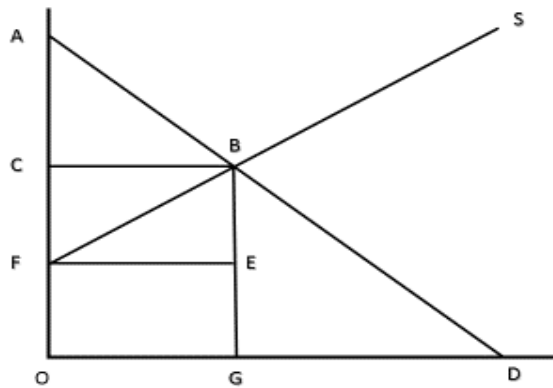


FIGURE 1

A CBA of the event requires a comparison of the cost of the event from the BRC point of view with the net benefits of the event from the residents of the BRC area point of view. The cost to BRC is 1.6 million AUD. The bulk of the benefit of the event to BRC residents is made up of the producer and consumer surplus of the bundle that accrues to BRC residents. These are the area CBF for producer surplus and a proportion of the area ABC for consumer surplus. The proportion of the latter is determined by the number of BRC residents who attend the event as spectators.

The producer surplus for BRC business and labour is embedded in the VAI. The proportion of the VAI that is producer surplus depends on the slope of the supply curve. In practice the more the profits and wages received from the event exceed the return required for BRC business and labour to provide the services and goods the greater proportion of VAI that is producer surplus. In turn it would be expected that the more the required return is exceeded the more positive business and labour would be positive about the event. The producer surplus can be extracted from VAI by one or more of 3 methods. The first is a survey of BRC area businesses and labour concerning profits, prices, wages and costs during the event as compared to those that prevail at other times of the year. The second is to survey the same group concerning the degree of positiveness towards the event. The third is an impressionistic judgement. With this method the proportion of VAI judged to be producer surplus is greater the more positive is business and labour towards the event, the higher are prices and wages during the event as compared to the rest of the year, the greater the local unemployment rate, the greater the employment effect and the lower unemployment benefits.

The first two methods cannot be conducted ex post. However there is information available concerning the third method. Over the event period accommodation prices at least doubled; for cafes, restaurants and retail the prices rose by 20 percent plus; and workers in the impacted industries worked overtime and frequently at time and a half or double wage rates. BRC area businesses were strongly in favour of hosting the event, the population of BRC area doubled during the staging of the event and the employment effect was quite high. All of this information suggests a higher producer surplus share. On the other hand the low unemployment rate in the BRC region suggests that the producer surplus share is less. On balance therefore it appears that there is a significant producer surplus component in the VAI but a very large producer surplus component unlikely. Based on this information a producer surplus of 5 percent of the VAI estimate seems justifiable. This is not to say that 5 percent is the producer surplus share. Rather 5 percent is a figure that can be reasonably used in the CBA. That is the first component of the benefit in the CBA is 1.27 million AUDs.

Consumers are interested in the bundle of output they receive so consumer surplus is related to the BRC resident's output impact rather than the VAI. Consumers are also interested in services and goods provided by non-BRC area residents such as tickets to the event provided by the promoter.

Overall consumer surplus could comprise 20 percent or more of the value of output of BRC residents. However only 10 percent of race spectators are BRC residents and BRC resident spectators will not purchase accommodation and car hire which makes up 76 percent of spectator purchases of output. This suggests that for BRC residents the consumer surplus for BRC residents' services and goods is approximately 0.48 of 1 percent of the value of output. Thus consumer surplus for services and goods consumed by BRC residents and produced by BRC residents is judged to be 284,000 AUDs.

As previously discussed, services and goods provided by non-BRC residents such as tickets to the event also add to the BRC resident consumer surplus. The 5,800 BRC residents attending the event, like the visiting spectators, are almost fanatical about these races and hence are likely to be prepared to pay well above the official price for tickets and memorabilia. On the other hand the higher the ticket price charged by the promoter the less the consumer surplus. Fifty AUDs of consumer surplus for non-BRC resident services and goods per BRC resident attending the event is therefore judged to be a defensible assessment. Based on this figure this part of consumer surplus is 290,000 AUDs.

Summing the assessed producer surplus and consumer surplus gives the total benefit for the event to be 1.844 million AUD. The cost from the BRC point of view is 1.6 million AUD, so the Benefit/Cost ratio is 1.15 – greater than one. If payment by the promoter for the use of the circuit and payments by other levels of government were included, costs would fall and the Benefit/Cost ratio would rise. Of course other non-price costs and benefits also need to be included such as congestion costs and positive business and social spin-offs to BRC residents.

If the BRC believed that the event was even more profitable to business and labour or the BRC resident spectators valued the event experience even more then there would be the possibility of increasing the proportion assigned to producer or consumer surplus. However such an increase would need to be justified on the basis of a more robust evidence base possibly including some form of survey.

Conclusion

Abelson's concerns that efficacy analyses of government support (or withholding support) for special events often result in misallocation of public funds seem well founded. However the deficiencies of these analyses not only derive from those conducting or commissioning the analyses but also derive from the views about the appropriate use of CBA and EIA in the economic literature. The major benefits of a special event to a community are usually the producer and consumer surplus accruing to local businesses and households. However CBA by itself is not well suited to identifying all of these surpluses including flow-on effects. EIA on the other hand identifies the raw information needed to estimate these surpluses but fails to extract surplus estimates so there is no comparison with cost of government support for the event. Using CBA and EIA separately can lead to an ambiguous result.

This paper outlines a method to extract an appropriate producer and consumer surplus from the EIA which can then be compared to government funding of an event effectively integrating the EIA into a CBA. It is recommended that the greater the share of value added and output from the staging of the event that is judged to be producer and consumer surplus, the greater the resources needed to provide an evidence base to support this judgement. For example if the share is considered likely to be small, impressionistic information may be sufficient to support the judgement. If it is likely that the share is large and a large share is

needed to achieve a benefit/cost ratio greater than one then more substantial information as from a survey may be required.

The method in this paper is specifically designed for consideration of cases of government support for special events such as the Bathurst 1000. However it may also apply to other types of government expenditure where producer and consumer surplus is a large part of the benefit of the project. Possible cases could include transport infrastructure, industry and technology parks and education facilities.

The paper concludes by discussing how the results of this methodology can be used to determine both the appropriate level of government expenditure for an event as well as the required co-payment from the promoter. A further point of discussion is examining means to enhance the evidence base for assessing the percentage of VAI and output impact that constitutes producer and consumer surplus.

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