

Referee Report: “Evaluating the Economic Impacts of Calgary’s Olympic Bid” (The Conference Board of Canada and “Calgary 2026 Olympic and Paralympic Winter Games Economic Impact Analysis” (Deloitte)

Brad R. Humphreys, PhD
Professor, West Virginia University, Department of Economics

22 June 2017

This report provides the City of Calgary with an independent evaluation of two “economic impact” studies assessing the potential economic consequences of Calgary hosting the 2026 Winter Olympic Games. In preparing the report I have carefully and thoroughly read these two reports and consulted additional published academic research on this topic.

The City of Calgary commissioned these reports to provide information needed to determine whether or not to pursue a bid to host the 2026 Winter Olympic Games. After reading these reports, I find substantial limitations to both these reports in terms of the information they provide, and recommend strongly that these reports be given relatively little weight when reaching a conclusion about the relative merits of hosting the 2026 Games. Below, I discuss in detail four specific, substantial limitations to these two reports.

False Forecast Precision

Both reports contain many economic forecasts. They attempt to assess what the overall economic impact of events taking place years in the future will have on the local and national economy. Technically, both reports contain numerous point estimates of future economic “impacts.” By “point estimates” I mean specific numbers. For example: “we estimate that the Games will contribute nearly \$2.7B to Canada’s GDP, of which over \$1.9B will be in contribution to labour income” (Deloitte report, page 4); and “In total, the Calgary 2026 Winter Olympics are expected to generate \$4 billion in spending from tourism, Infrastructure investments and the costs associated with security and operations.” (Conference Board report, page *i*.)

Again, the numbers in both reports are forecasts of future economic outcomes that will take place years from now. It is well established in the economic forecasting literature that point estimates like these are not useful for informing decision making. To be useful in decision making, forecasts should convey how much uncertainty is associated with the forecast. Both reports make no attempt to convey the degree of uncertainty associated with these forecasts. Instead, they state precise numbers, which conveys a degree of precision that simply does not exist.

Forecasts of future economic outcomes are random variables. Random variables are described by statistical distributions, not by specific numbers. A statement like “the 2026 Games will generate \$4 billion in spending” is wrong by definition. There is a 0% probability that exactly \$4 billion in economic impact will be generated by the Games. Making such claims does not provide any useful information for decision makers. At minimum, a useful forecast should contain a confidence interval. By a confidence interval, I mean a statement like “we are 95% confident that the Calgary 2026 Winter Olympics will generate between \$1 and \$10 billion in spending.” Neither reports contains such a statement, anywhere.

Everyone uses forecasts to make decisions every day. When you go to work in the morning, you need to decide what kind of coat to wear, whether or not you need an umbrella, etc. Useful weather forecasts come with explicit information about the level of confidence associated with the forecast; they say “there is a 20% chance of rain this afternoon” not “it will rain 0.5cm this afternoon” (a point estimate). An 80% chance of rain this afternoon means “better take an umbrella” while a 10% chance of rain may lead to a different decision.

Both reports contain many, many point estimates, sometimes modified by vague terms like “about” or “we estimate” that do nothing to convey how much uncertainty comes with these forecasts. Example: “we expect a net increase in out-of-province visits of about 288,000” (Conference Board report page *ii*.) “*About*” conveys no useful information about forecast uncertainty for decision makers.

Extreme caution should be exercised when making decisions based on forecasts with no information about the associated forecast uncertainty. Bear this in mind when reading the reports: it is virtually certain that every one of the specific numeric forecasts contained in the report is wrong. I am 99% certain that none of the specific forecasts in these two reports will turn out to be exactly right should Calgary host the 2026 Games. Absent any explicit information about the forecast uncertainty, I cannot make any assessment about whether these forecasts are reasonable or not. There is simply not enough information provided to determine the size of the forecast errors associated with the numbers in these reports.

Neither should you. One prudent way to interpret these numbers is to assume that the actual realized benefits could be substantially lower, and the actual realized costs could be substantially higher. In other words, assume the worst and hope for the best. But also bear in mind that, in this case, forecast errors have asymmetric costs. Over estimates of the economic benefits has dire consequences; under estimates do not.

Use of Improper Methods

Both reports rely on regional input-output models (“IO models”) to generate estimates of the overall economic impact of hosting the 2026 Games. While IO models have certain uses in regional economic analysis, they also have well-known, widely understood limitations for assessing the economic impact of mega sporting events. Careful, credible analysis of the economic benefits and costs of sporting events like that published in reputable peer-reviewed journals **never** use this method.

The classic academic study addressing why IO models are not suitable for estimating the economic impact of sports events was published in 1995, more than 20 years ago (Crompton, John “Economic Impact Analysis of sports Facilities and Events: Eleven Sources of Misapplication” *Journal of Sport Management*, volume 9. Pp. 14-35). This paper is widely cited (more than 680 Google Scholar citations) and had an enormous impact on methods used to assess the economic impact of sports events. Crompton argues that IO models cannot be used to assess the economic impact of an event like the 2026 Winter Olympic Games.

Despite this strong warning, consultants continue to use IO models to estimate the economic impact of sports events. Most of the eleven factors identified by Crompton that contribute to the inaccuracy of IO models in this setting can be found in these reports. I will not elaborate on the details, but have attached a copy of Crompton’s paper to my report for any interested readers. I

simply point out that the primary methodological approach used by both these reports has been widely discredited for decades in the scholarly literature on methods for assessing the economic impact of sporting events.

In addition, IO models make very strong assumptions about how hosting the Games will affect the local economy in order to estimate economic impacts. IO models assume no changes will occur in the way individual residents and local businesses will make decisions if Calgary hosts the Winter Games. For example, the Conference Board report states: “industries are assumed to maintain their current market share of domestically produced commodities ...” (page 59), which means that the composition of local businesses will be unaffected by hosting the Games.

IO models assume that more money flows through the local economy, but no fundamental changes occur in how economic decisions are made. This assumption is unrealistic. Residents and businesses will likely think differently about Calgary’s future if awarded to rights to host the Games, which will change the way decisions are made and businesses operate in a difficult to predict way. These changes will likely affect the economic impact of hosting the Games, but the results generated by IO models will not reflect these changes. This makes the forecasts generated by IO models unreliable.

Confusing Costs and Benefits

Both reports use the terms “economic impact” and “expenditure” extensively and document a wide variety of “economic impacts” of the games. This is a well-known approach for ignoring the key economic decision faced in Calgary: will the overall economic benefits associated with hosting the 2026 Games exceed the overall economic costs. Hosting the Games will lead to economic costs, and will also generate economic benefits. Economic decisions compare the expected total economic costs of some event to the expected total economic benefits and proceed if the expected total economic benefits exceed the expected total economic costs.

Both reports take the approach of calling everything an “impact” or a type of “expenditure” and dodging the issue of identifying costs and benefits. This simply encourages muddled economic thinking and poor decision making.

Here is a specific example. Both reports address the “expenditure” on security along with “expenditure” by tourists, placing these economic activities on equal footing. For example, the Conference Board report Chapter Summary on page xi states: “Hosting the games will generate total expenditures of \$4.0 billion, including infrastructure investments, operating and security expenses and spending by tourists.” Security spending is clearly an economic cost. If Calgary does not host the Games, this “expenditure” will not take place and a cost will not be incurred. Some tourist spending is an economic benefit, if it would not have occurred absent the Games. These unrelated concepts should not be placed on the same footing. This occurs throughout the reports.

The Deloitte report is even worse: “Security Spending Impacts: Accounting for the direct and indirect economic impacts, we estimate that security will contribute \$515M to Canada’s GDP, of which \$459M will be in contribution to labour income. We estimate that security for the Games will generate 7,456 person years of employment across Canada.” (page 4) Again, providing security for the Games is clearly an economic cost, because if the Games are awarded to another

host, this money will not be spent. This passage implies that this money “contributes” to the economy, and should be treated as an economic benefit.

Hosting the Games clearly involves both economic costs and economic benefits. The individuals responsible for making a decision about going forward with a bid need to think carefully about the expected costs and expected benefits. Both reports do not provide guidance for this decision. Instead, they both confuse the issue by using phrases like “impacts” and expenditure that blur this key distinction.

“Cherry Picking” the Peer-Reviewed Academic Evidence

Both reports rely on extensive citations to peer-reviewed research to bolster their forecasts. This provides a false sense of confirmation, implying that the findings in these reports are buttressed by peer-reviewed research in the scholarly literature. After reading the reports, I find the scholarly literature cited in both to be highly selective, primarily citing papers published in peer-reviewed academic journals with favorable conclusions and omitting papers with unfavorable results, or mis-characterizing these results. This provides a skewed picture of the support for the forecasts made in these reports in the scholarly literature.

The Deloitte report is especially biased in this respect, primarily citing other past economic impact studies, reporting results from working papers that did not appear in the final published version of the paper, and omitting any mention of papers that reach different conclusions.

The Deloitte report cites a paper that reports evidence that hosting the Olympic Games will increase Canada’s international trade by about 30% [Rose, A. K., & Spiegel, M. M. (2011). The Olympic effect. *The Economic Journal*, 121(553), 652-677]. The Deloitte report fails to discuss the follow-on literature that disputes the result in the Rose and Spiegel paper. For example, a paper published the following year [Maennig, W., & Richter, F. (2012). Exports and Olympic Games: Is there a signal effect?. *Journal of Sports Economics*, 13(6), 635-641] convincingly demonstrates that the earlier Rose and Spiegel paper suffers from methodological problems that, when corrected, show no evidence of a relationship between hosting the Olympic Games and trade. At minimum, a balanced assessment of the literature on this topic should have been presented.

The Deloitte report also cites estimates from a working paper that claims hosting the EURO 1996 football tournament in England “boosted the nation’s happiness by the equivalent of £165 for every person.” (page 31, under Civic Pride). The relevant peer-reviewed paper published in an academic journal [Kavetsos, G., & Szymanski, S. (2010). National well-being and international sports events. *Journal of Economic Psychology*, 31(2), 158-171] contains no such statement, indicating that this claim was not found credible in the peer review process and was removed before publication.

The Conference Board report references a recent paper by Bruckner and Pappa [Brückner, M., & Pappa, E. (2015). News shocks in the data: Olympic Games and their macroeconomic effects. *Journal of Money, Credit and Banking*, 47(7), 1339-1367.] at several points in the literature review: footnote 7, page vi, footnote 10, page vi, and footnote 12, page vii. This paper is cited to provide evidence from peer-reviewed academic journals of substantial positive economic impacts in the Pre-Games Phase and the During-the-Games Phase. Example:

“Bruckner and Pappa’s panel data study found positive effects on output and private consumption up to six years after the end of the Olympic Games. However, they find that the ex post effects of hosting the Games are of relatively minor importance compared to the ex ante

effects. Nonetheless, they find that hosting the Olympics was associated with permanently higher levels of GDP per capita and private consumption.” (page viii)

The results in the paper by Bruckner and Pappa (BP) has been challenged by recent research in peer reviewed scholarly journals. In particular, a recent paper published in the *Journal of Sports Economics* disputes the results in BP [Langer, V. C., Maennig, W., & Richter, F. (2017). The Olympic Games as a News Shock: Macroeconomic Implications. *Journal of Sports Economics*, in press]. This paper is sharply critical of the BP results. The conclusions of Langer et al. state:

“On the basis of the BP’s results, policy makers might be misguided to believe that organizing the Olympic Games is one of the most efficient approaches to fiscal spending, inducing multiplier effects of incomparable size. Their results risk that policy makers (and public opinion) will feel assured by beliefs brought forward by the usual ex ante “impact studies” on the Olympic Games, promising trillions of additional GDP, hundreds of thousands of additional jobs, a self-financing of the Olympic Games (secured by multiplier effects), and so on. Although there might be positive reasons to bid for the Olympic Games, our results provide a warning that the hopes for income effects should not be part of rational motivations.”

Again, the Conference Board report uncritically discusses the results in BP as the final word on scholarly research on the economic impact of hosting the Olympic Games. This is clearly not the case.

The Conference Board report also contains an unbalanced discussion of another recent paper published in a peer reviewed scholarly journal that is sharply critical of claims of economic benefits from hosting the Olympic Games [Baade, R. A., & Matheson, V. A. (2016). Going for the Gold: The economics of the Olympics. *The Journal of Economic Perspectives*, 30(2), 201-218.] The Conference Board report places a rather positive spin on the results in the paper by Baade and Matheson, citing this paper to support the following claim:

“One of the most important arguments used to justify an Olympic bid are the positive long-term economic impacts from hosting the Games. These can include the use of new sporting facilities by future generations, improved livability of host cities because of Olympic infrastructure investment, a rise in tourism thanks to global media coverage, and the promotion of international trade and direct investment in the host city or country as investors and companies become more familiar with the region.” (page vii)

A footnote to this passage references the Baade and Matheson paper. Here is the actual conclusion from the paper by Baade and Matheson:

“... the overwhelming conclusion is that in most cases the Olympics are a money-losing proposition for host cities; they result in positive net benefits only under very specific and unusual circumstances.” (page 202)

Both reports leave the reader with the impression that evidence from peer-reviewed academic journals supports the claims in these two reports. My reading of the scholarly research literature is exactly the opposite. A handful of papers published in peer reviewed academic journals finds evidence of the sort of economic benefits forecasted in the Conference Board and Deloitte reports. These few papers have all been rebutted by other papers published in peer reviewed journals that find the opposite result. The scholarly evidence from peer reviewed journals does not support the existence of large economic benefits like those forecasted by the Conference Board and Deloitte reports.

Final Comments

In my opinion, both reports contain substantial limitations that make them of limited use for making a decision about Calgary moving forward with a bid to host the 2026 Winter Olympic Games. This raises an important related question: is some number more useful than no number when assessing the potential economic impact of hosting the Games? If you rely solely on the forecasts in these reports, the prospects look rosy. The forecasts in both reports predict that hosting the Games will be a great economic benefit to Calgary, Alberta, and Canada. Both predict billions of dollars of “economic impacts” and “expenditure”. You have in your possession some number, backed by glossy reports with seemingly comprehensive approaches using complex methods (IO models). Decision makers in Lillehammer, Athens, Salt Lake City, London, Vancouver, Rio, Tokyo, and other cities moved forward based on similar “evidence.” The Deloitte report cites many past “economic impact studies” that contained similar forecasts.

But the experiences of past host cities is decidedly mixed. The evidence from peer reviewed academic research (as opposed to the skewed review in these reports) does not contain strong evidence supporting the forecasts in these reports, or those in other similar reports produced for past bids. These reports project false certainty about the economic outcome of hosting the Games not borne out by actual past experience.

How can these limitations be addressed? Some clearly cannot. IO models are a poor tool for understanding the economic impact of hosting the Games. Some alternatives exist (see the 2002 paper by John R. Madden cited in the Conference Board report), but even these methods do not come with measures of forecast uncertainty. All that can be done is to treat these IO model generated forecasts with substantial skepticism.

My report contains a number of citations to papers that provide a balanced view of the existing research literature. An excellent resource is the 2016 paper by Baade and Matheson in the *Journal of Economic Perspectives*. This paper is current and comprehensive, and contains citations to other academic research. Economic costs and benefits can be identified with some work. These two reports simply choose not to do this. Careful application of economic principles will help in the identification of economic costs and benefits.