

# Going for the Gold: The Economics of the Olympics

Robert A. Baade and Victor A. Matheson

**I**n summer 2016, the eyes of the world will turn to Rio de Janeiro as it hosts the Games of the XXXI Olympiad, better known as the Summer Olympics. Unfortunately, the price tag of well over \$10 billion for the event is adding to the already considerable strain on government budgets in Brazil. Faced with a nasty recession, cuts in public services, and rising unemployment, throngs of Brazilians have turned out to protest what is seen as wasteful spending and a misallocation of resources on the Olympics. Throw in the growing threat of the Zika virus and Brazil may end up with larger crowds of agitators protesting the government than of sports fans cheering on the athletes. But are these complaints about Olympic spending justified? The quadrennial Summer Olympic Games is one of the world's premier sporting events, with over 10,000 athletes representing 204 countries, 300 individual events in 28 different sports, over 10 million tickets sold to spectators, and a worldwide television audience in the billions. On a somewhat smaller scale, the most recent Winter Olympic Games held in 2014 in Sochi, Russia, welcomed nearly 3,000 athletes from 88 countries to compete in 98 events in 15 disciplines while generating large revenues and massive television ratings.

While most viewers tune in to watch the competition among the athletes, the battle among cities to be selected to host these events can be just as fierce. Although bidding cities have numerous reasons for wanting to host, none seems more prevalent than the desire for an economic windfall. In this paper, we explore the costs and

■ *Robert A. Baade is A. B. Dick Professor of Economics, Lake Forest College, Lake Forest, Illinois. Victor A. Matheson is Professor of Economics, College of the Holy Cross, Worcester, Massachusetts. Their email addresses are baade@mx.lakeforest.edu and vmatheso@holycross.edu.*

† For supplementary materials such as appendices, datasets, and author disclosure statements, see the article page at

<http://dx.doi.org/10.1257/jep.30.2.201>

doi=10.1257/jep.30.2.201

benefits of hosting the Olympic Games. On the cost side, there are three major categories: general infrastructure such as transportation and housing to accommodate athletes and fans; specific sports infrastructure required for competition venues; and operational costs, including general administration as well as the opening and closing ceremony and security. Three major categories of benefits also exist: the short-run benefits of tourist spending during the Games; the long-run benefits or the “Olympic legacy” which might include improvements in infrastructure and increased trade, foreign investment, or tourism after the Games; and intangible benefits such as the “feel-good effect” or civic pride.

Each of these costs and benefits will be addressed in turn, but 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. Furthermore, the cost–benefit proposition is worse for cities in developing countries than for those in the industrialized world. In closing, we discuss why what looks like an increasingly poor investment decision on the part of cities still receives significant bidding interest and whether changes in the bidding process of the International Olympic Committee (IOC) will improve outcomes for potential hosts.

## **The Costs of Hosting the Olympics**

The modern Summer Olympic Games date back to 1896, and the Winter Games commenced in 1924. The host cities are selected roughly seven years before the event through an open-bidding process. The host cities are responsible for the entire bill for organizing the event, although the International Olympic Committee typically provides some funds to help defray the costs. Historically, host cities have come almost exclusively from rich, industrialized nations. Between 1896 and 1998, over 90 percent of all host cities came from Western Europe, the United States, or Canada, Australia, and Japan. Only Mexico City, Moscow, and Seoul—hosts of the 1968, 1980, and 1988 Summer Games, respectively—and Sarajevo, host of the 1984 Winter Games, bucked this trend.

More recently, the International Olympic Committee has encouraged bids from developing countries and has awarded the games on multiple occasions to cities outside the regions that had traditionally served as hosts. The 2008 Summer Games were hosted by Beijing, China, which will in turn host the Winter Olympics in 2022. The 2016 Summer Olympics will be held in Rio de Janeiro, Brazil, the first time the event has taken place in South America. The 2014 Winter Olympics were in Sochi, Russia, with PyeongChang, South Korea, to follow in 2018.

As seen in Table 1, the composition of countries submitting formal bids has also changed dramatically in recent decades. Only 18 percent of the bids submitted for the Summer Games prior to 2000 came from the developing world or the former Soviet sphere of influence. Since that time, however, over half of all bids have come from this group, including applications by Istanbul, Bangkok, Havana, Doha, and Cape Town, as well as the successful bids from Beijing and Rio de Janeiro. For

*Table 1*  
**Number of Bids for Summer and Winter Olympic Games**

<i>Event</i>	<i>Bidders</i>			<i>Hosts</i>		
	<i>Industrialized countries</i>	<i>Developing countries</i>	<i>Eastern European/ Former Soviet states</i>	<i>Industrialized countries</i>	<i>Developing countries</i>	<i>Eastern European/ Former Soviet states</i>
Summer Olympics:						
1896–1996	71 (82%)	9 (10%)	7 (8%)	20 (87%)	2 (9%)	1 (4%)
2000–2020	23 (49%)	21 (44%)	4 (7%)	4 (67%)	2 (33%)	0 (0%)
Winter Olympics:						
1924–1998	51 (93%)	1 (2%)	3 (5%)	17 (94%)	0 (0%)	1 (6%)
2002–2022	21 (56%)	4 (9%)	12 (34%)	4 (67%)	1 (17%)	1 (17%)

the Winter Olympics, the past decade has witnessed for the first time bids from Kazakhstan, Georgia, China, Slovakia, and Poland.

Bidding for the Olympics is no small undertaking. A key to the bidding process involves a visit by the Evaluation Commission of the International Olympic Committee which assesses the condition of the applicant city. A significant portion of the bidding expense relates to the preparations the applicant city undertakes to impress the Evaluation Commission, and these plans, including detailed architectural renderings, financial estimates, and pre-event marketing, are likely to be extensive since it cannot be known what the preparations of the other applicant cities will be. Chicago, for example, spent at least \$70 million and perhaps over \$100 million on its unsuccessful application to host the 2016 Games (Pletz 2010; Zimbalist 2015). But the costs of the formal bidding process pale in comparison to the expenses a region will incur should it actually be selected by the International Olympic Committee.

A first set of major expenses involves general infrastructure to accommodate the anticipated wave of tourists and athletes that descend upon the chosen city. The International Olympic Committee requires that the host city for the Summer Games have a minimum of 40,000 hotel rooms available for spectators and an Olympic Village capable of housing 15,000 athletes and officials. In addition, the city needs to have both internal and external transportation facilities that can get tourists to the city itself and then to the individual sports venues within the region. Hotel capacity alone can be a major challenge. Rio de Janeiro, already one of the most popular tourist destinations in South America, still required the construction of over 15,000 new hotel rooms for the 2016 Summer Games. While investment in the hospitality industry can in theory pay long-term dividends once the Games are over, heavy expenditures to meet a two-week period of peak demand may result in severe overcapacity once the event is over. For example, following the 1994 Winter Olympics in Lillehammer, Norway, 40 percent of the town's full-service hotels went bankrupt (Teiglund 1999).

The Olympics also require spending on specialized sports infrastructure. Because of the somewhat obscure nature of many of the events, most cities do not

have the facilities in place to host all of the competitions, especially if large spectator viewing areas are desired. Even modern cities in high-income countries may need to build or expand an existing velodrome, natatorium, ski-jumping complex, or speed skating oval. Furthermore, modern football and soccer stadiums are generally incompatible with a full-size Olympic track, because including space for such a track would cause an undesirably large separation between the fans and the playing field. For this reason, Boston's failed bid to host the 2024 Summer Games had proposed \$400 million to build an entirely new stadium for the track and field events, despite the presence of four large existing outdoor sports stadiums in the area.

Once the facilities are in place, the Games require spending for operations including event management, the opening and closing ceremonies, and security. The Olympics have long been a target for terrorists and have suffered deadly attacks in both 1972 in Munich and 1996 in Atlanta. In the era of post-September 11, 2001, security costs have escalated rapidly. Security costs for Sydney's Games in 2000 totaled \$250 million, while four years later in Athens, security expenditures topped \$1.6 billion, four times the initial budget, and have stayed near this figure for the past decade (Matheson 2013).

An accurate financial accounting of Olympic expenditures in various cities is hard to find for multiple reasons. It can be difficult to disentangle spending on Olympic building projects from planned infrastructure improvements that might not be attributable directly to the games. Moreover, concerns about cost overruns or corruption may prompt officials to limit the release of accurate data. The true final cost of the 1998 Nagano Winter Olympics will never be known, because the host committee ordered a portion of the event's financial records to be burned (Jordan and Sullivan 1999). While we keep these concerns in mind, Table 2 shows some cost estimates for recent Olympic Games as provided by the International Olympic Committee, host committees, and various academic or public media sources with spending on sports infrastructure and general infrastructure broken out where possible.

Finally, it is important to note the Olympics have consistently produced final costs that exceeded their original budgets. From 1968 to 2012, every single Olympic Games ended up costing more than originally estimated. The median Games were 150 percent over the original budget, with the worst offenders—Montreal 1976 and Sarajevo 1984—exceeding initial estimates by more than ten-fold (Flyvbjerg and Stewart 2012). The 2012 London organizers originally won the bid in 2005 with a cost estimate of £2.4 billion, which was revised upwards within two years to £9.3 billion. Then, when the final costs came in at a mere £8.77 billion, the organizers laughably claimed the event had come in under budget (BBC 2013).

## **The Short-Run Benefits of Hosting the Olympics**

Although the costs of hosting can be daunting, the local Organizing Committees for the Olympic Games point to both a short-run boost from the construction phase preceding the event as well as tourism bumps during the Games and the long-run

Table 2  
**Costs of Hosting Recent Olympic Games**

	<i>Type of spending</i>	<i>Spending (billions, 2015\$)</i>	<i>Source</i>
<b>Summer Olympics</b>			
Seoul, 1988	Sports infrastructure	\$2.067	Preuss (2004, Table 7.8 and Figure 9.1)
	General infrastructure	\$3.523	
	<b>Total cost</b>	<b>\$ 6.503</b>	
Barcelona, 1992	Sports infrastructure	\$1.485	Preuss (2004)
	General infrastructure	\$12.457	
	<b>Total cost</b>	<b>\$16.409</b>	
Atlanta, 1996	Sports infrastructure	\$.765	Preuss (2004)
	General infrastructure	\$.959	
	<b>Total cost</b>	<b>\$3.576</b>	
Sydney, 2000	Sports infrastructure	\$1.761	Preuss (2004)
	General infrastructure	\$1.817	
	<b>Total cost</b>	<b>\$6.926</b>	
Athens, 2004	<b>Total cost</b>	<b>\$13.800 (est.)</b>	Tagaris (2014)
Beijing, 2008	Sports infrastructure	\$2.315	Preuss (2004)
	<b>Total cost (est.)</b>	<b>\$45.000 (est.)</b>	Fowler and Meichtry (2008)
London, 2012	<b>Total cost</b>	<b>\$11.401</b>	BBC (2012b)
Rio 2016	<b>Total cost</b>	<b>\$11.100 (est.)</b>	Leme (2015)
<b>Winter Olympics</b>			
Nagano, 1998	<b>Total cost</b>	<b>\$15.250</b>	Longman (1998); <i>The Economist</i> (1998)
Salt Lake City, 2002	<b>Total cost</b>	<b>\$2.500 (approx.)</b>	US GAO (2001)
Torino, 2006	<b>Total cost</b>	<b>\$4.350 (approx.)</b>	Payne (2008); Flyvbjerg and Stewart (2012)
Vancouver, 2010	Sports infrastructure	\$.715	VanWynsberghe (2011)
	General infrastructure	\$3.497	
	<b>Total cost</b>	<b>\$7.556</b>	
Sochi, 2014	Sports infrastructure	\$6.700 (est.)	Farhi (2014)
	<b>Total cost</b>	<b>\$51.000 (est.)</b>	

legacy effect of the Games as an economic justification for hosting these events. In addition, the Olympics do generate significant sponsor, ticketing, licensing, and media revenues that can be used to offset the costs of staging the event.

Table 3 shows data on revenues generated by the International Olympic Committee and the organizing committees for the Vancouver and London Games from the most recent IOC four-year budget cycle. In theory, the revenues generated from the Games can be divided up any way the organizers see fit, but ultimately the IOC exercises complete control over the event and can share as much or as little of largesse as they deem fit subject to the constraint of finding

*Table 3*  
**Direct Revenues and Hosting Costs from Olympic Games**  
 (\$ millions)

	<i>IOC 2009–12</i>	<i>Vancouver 2010 organizing committee</i>	<i>London 2012 organizing committee</i>
<b>Revenue source</b>			
Broadcast rights	\$2,723	\$414	\$713
International sponsors	\$475	\$175 (est.)	\$300 (est.)
Domestic sponsors	\$0	\$688	\$1,150
Ticketing	\$0	\$250	\$988
Licensing	\$0	\$51	\$119
<b>Total</b>	<b>\$3,198</b>	<b>\$1,578</b>	<b>\$3,270</b>
<b>Hosting costs</b>			
	-	\$7,556	\$11,401

*Source:* IOC (2014b).

*Notes:* Table 3 shows data on revenues generated by the International Olympic Committee and the organizing committees for the Vancouver and London Games over the 2009–2012, the most recent IOC budget cycle. It also shows hosting costs for the Vancouver and London Games.

a city willing to host the event. Most recently, television rights have represented nearly half of total revenues with the IOC sharing less than 30 percent of the total with the local Organizing Committees. Revenues from international sponsors are split between the International Olympic Committee and the Organizing Committees, while ticket revenue, domestic sponsorships, and licensing fees are kept by the host city. Obviously, the IOC could provide more generous subsidies to cities in order to defray the costs of hosting their tournaments, and international sports governing bodies, including the IOC, are often known for their lavish expenses. However, in the case of the London and Vancouver Games, the direct revenues generated by the games represented only a fraction of the total costs of hosting the event and would not have come close to covering the total costs even if the IOC had committed all revenue streams to the host committees, so one must rely on other sources of benefits to provide an economic justification for the events.

Any large public works project such as the Olympics can lead to a short-run increase in economic activity in the run-up to the opening, depending on the level of slack in a region's labor and capital markets, and act as a form of an expansionary fiscal policy. It is perhaps telling to note that at the same time David Cameron's government in the United Kingdom was promoting the supposed expansionary effects of fiscal austerity in the wake of the Great Recession, the same government was touting the stimulative effects of increased government spending on London's Olympic preparations (Mullholland 2012). However, unless policymakers can predict recessions years ahead of time—given that the International Olympic Committee awards the Games seven years in advance—using the Olympics to pull a country out of recession would rest more on dumb luck rather than prudent planning. Otherwise,

the spending involved with the Games is as likely to redistribute spending in an economy near full employment as it is to lift an economy out of recession. Indeed, unless unemployment is high, employment gains in construction are not an important economic benefit since they come at the cost of employment losses in other industries.

That being said, various economic impact studies done in advance of the Olympic Games have often produced large estimates of economic gains. An InterVISTAS Consulting (2002) report on the 2010 Vancouver Winter Olympics predicted \$10.7 billion (Canadian) in new economic output and 244,000 jobs compared to \$4.8 billion (in 2002 dollars) and 35,000 job-years predicted in Salt Lake City eight years earlier by the state government of Utah (IOC 2010). The 1996 Atlanta Games were predicted to generate 77,026 jobs and \$5.142 billion (in 1996 dollars) in economic activity, while the London Olympics promised £1.936 billion in economic activity and an additional 8,164 full-time equivalent jobs created (Humphreys and Plummer 1995; Blake 2005).

The variation alone in these estimates suggests some reason for concern about their accuracy; indeed, these before-the-Games predictions are rarely matched by reality when economists look back at the data. Table 4 shows academic studies of various Olympic Games. Overwhelmingly, the studies show actual economic impacts that are either near-zero or a fraction of that predicted prior to the event. Nearly all of the analyses follow the same pattern. Researchers collect any type of regional economic data that is readily available such as employment, personal income, GDP, tax collections, or tourism figures, and then analyze the data before, during, and after the Olympics in search of any changes that occur either during the event or in the preparation stages. The observed changes in economic variables are then compared to the predictions made by the Olympic organizers prior to the event.

For example, as noted previously, the Utah state government predicted the 2002 Winter Olympics would generate 35,000 job-years, concentrated primarily in the year of the event itself. Baumann, Engelhardt, and Matheson (2012) examine monthly employment overall as well as in a variety of specific industries such as retail trade and leisure between 1990 and 2009 in Utah using employment in several adjacent states to control for regional employment trends around the time of the Olympics. They find no identifiable increase in employment either before or after the Olympics, and while they find a statistically significant bump in employment during the actual Games, the increase was 4,000 to 7,000 jobs, or roughly one-quarter to one-tenth the number claimed by Utah officials. Considering that the federal government spent \$342 million directly on the 2002 Olympics and at least another \$1.1 billion on infrastructure improvements leading up the Games, this amounts to about \$300,000 in federal government spending per job created. Other studies listed in Table 4 find similar outcomes. Indeed, these results lend credence to a common rule-of-thumb often used by economists who study mega-events: If one wishes to know the true economic impact of an event, take whatever numbers the promoters are touting and move the decimal point one place to the left.

Table 4

**Academic Studies of the Economic Impact of the Olympic Games**

<i>Study</i>	<i>Event</i>	<i>Results</i>
Baade and Matheson (2002)	1984 Summer Games (Los Angeles) and 1996 Summer Games (Atlanta)	5,043 new jobs in Los Angeles. Between 3,467 and 42,448 new jobs in Atlanta.
Jasmand and Maennig (2008)	1972 Summer Games (Munich)	No impact on employment in host regions. Positive impact on income.
Porter and Fletcher (2008)	1996 Summer Games (Atlanta) and 2002 Winter Games (Salt Lake City)	No impact on taxable sales, hotel occupancy, or airport usage. Significant increase in hotel prices.
Baade, Baumann, and Matheson (2010)	2002 Winter Games (Salt Lake City)	Taxable sales in restaurants and hotels up by \$70.6 million but taxable sales at general merchandisers down by \$167.4 million.
Giesecke and Madden (2011)	2000 Summer Games (Sydney)	Household consumption in Australia reduced by \$2.1 billion.
Baumann, Engelhardt, and Matheson (2012)	2002 Winter Games (Salt Lake City)	Increase in employment of 4,000–7,000 jobs for one year compared to predictions of 35,000 full-time equivalent job-years.
Hotchkiss, Moore, and Zobay (2003)	1996 Summer Games (Atlanta)	Increase in employment of 293,000 jobs. Increase in employment growth rate by 0.2%.
Feddersen and Maennig (2013)	1996 Summer Games (Atlanta)	29,000 jobs added during month of Olympics only.

These results beg the question: Why do before-the-Games economic impact studies rarely stand up to after-the-Games scrutiny? One obvious answer is that economic impact studies are often commissioned by groups who have a vested interest in their outcome, and these groups choose firms that are likely to produce a favorable result. Estimates can be easily manipulated by making unrealistic assumptions about costs and benefits. The resulting claim of a large economic windfall may be used to curry public favor or to justify a large taxpayer subsidy.

Even when a highly positive estimate of Olympic benefits is not the explicit goal of an economic impact study, the methodology used in most studies is flawed in a way that biases the economic impact upwards. First, economic impact studies often ignore the “substitution effect” that occurs when local residents shift their spending from other goods in the local economy to the Olympics. If the study counts the purchase of a ticket by a local resident to an Olympic event without accounting for what would have been purchased in the absence of the Games, the impact of the Olympics will be overstated. For this reason, economists studying the effect

of sporting events on local economies often advocate eliminating expenditures by local residents entirely.

Second, the “crowding out effect” occurs when the crowds and congestion associated with a mega-event dissuades other regular tourists or business travelers from visiting the host region. Even when the number of out-of-town Olympics spectators is large, hotel rooms in the host city may normally be nearly full so that the net increase in visitor arrivals to the region is likely to be much smaller and perhaps even negative. For example, the UK Office for National Statistics (2015) reported that the number of international visitors to the country fell to 6,174,000 visitors in July and August 2012, the months of the Olympics, from 6,568,000 the year before, and some popular shows in London’s theater district actually shut down during the Games. Similarly, Beijing reported a 30 percent drop in international visitors and a 39 percent drop in hotel occupancy during the month of the 2008 Games compared to the previous year. Utah ski resorts noted a 9.9 percent fall in skier days in the 2001–02 season during which the Salt Lake City Winter Games occurred, compared to the previous year along with a drop in taxable sales collections at these locations (Zimbalist 2015; Baade, Baumann, and Matheson 2010). Taxable sales and skier visits rebounded the following season, after the departure of the Olympic fans and athletes. Other host cities that have experienced an increase in visitors during the Olympics still routinely report net increases in tourism that are significantly below expectations—and typically lower than the number of identified ticket buyers. American baseball player Yogi Berra’s famous quip, “Nobody goes there anymore. It’s too crowded,” may apply here.

The third main failing of standard before-the-fact economic impact analysis is the problem of choosing an appropriate multiplier for expenditures. Clearly some level of tourist spending will recirculate in the economy as local businesses and workers re-spend a portion of any Olympic windfall that comes their way. At a very basic level, standard macroeconomic analysis suggests that the expenditure multiplier will be

$$\Delta Y / \Delta \text{spending} = \Delta Y / \text{Olympic spending} = 1 / (1 - \text{marginal propensity to consume}),$$

so that a \$1 increase in spending due to the Olympics will result in  $1 / (1 - \text{MPC})$  extra dollars in total output for the host city. While every city and industry is different, it is common to see multipliers of roughly 2 applied to visitor spending, so that an initial increase in direct spending leads to a similar level of indirect spending and a doubling of the total economic impact.

Several tools can be used to potentially produce more precise economic impact estimates including the Regional Input-Output Multiplier System (RIMS II) provided by the US Bureau of Economic Analysis and Impact for PLANning (IMPLAN), a commercially available software package. Both models use input-output tables for specific industries grounded in interindustry relationships within regions based upon an economic area’s normal production patterns. But as Matheson (2009) notes: “During an event like the Olympics, however, the economy within a region

may be anything but normal, and therefore, these same inter-industry relationships may not hold. Since there is no reason to believe that the usual economic multipliers are the same during mega-events, any economic analyses based upon these multipliers may, therefore, be highly inaccurate.”

The hotel industry offers case in point. Even critics of the Olympics like Porter and Fletcher (2008) concede that the Olympics typically cause a substantial increase in room rates. The wages paid to a hotel’s desk clerks and room cleaners, however, are likely to remain roughly unchanged. As a hotel’s revenue increases without a corresponding increase in labor costs, the return to capital rises while the return to labor falls as a percent of revenues. To the extent that hotels (as well as chain restaurants, car rental agencies, airlines, and similar firms) are nationally or internationally owned, this increase in corporate profits doesn’t stick in the host city but instead leaves the area in which the profits were earned. In effect, due to these increased leakages, the MPC in the host city falls, thus reducing the multiplier effect during mega-events.

Replacing input-output models with computable general equilibrium (CGE) models that account for capacity constraints, displacement, expenditure shifting, price changes, and changing economic conditions can lead to improved estimates for the economic impact of the Olympics, although the use of these models is a much more difficult undertaking. As one example, Giesecke and Madden (2011) carried out a retrospective examination of the 2000 Sydney Olympics using a CGE model. They found a *reduction* in total consumption for Australia of \$2.1 billion; in contrast, before-the-Games estimates that didn’t account for the degree of slack in labor markets and assumed no displacement of international tourism predicted increases in consumption of \$2.5 billion over the same period.

While spending directly associated with the Olympics is typically insufficient to cover the costs of staging the Games, short-run intangible benefits must also be considered. Host cities frequently experience a “feel-good effect” both in the run-up to and in the wake of mega-events. For example, 80 percent of respondents surveyed by the BBC (2012) immediately after the 2012 Olympics reported that the event “made them more proud to be British.” Several studies have attempted to quantify the intangible benefits of the Olympics through the use of contingent valuation methodology, which constructs a set of survey questions that are designed to elicit the monetary value people place on whether certain events occur or do not occur. Using this approach, both Atkinson, Mourato, Szymanski, and Ozdemiroglu (2008) and Walton, Longo, and Dawson (2008) undertook sophisticated contingent valuation surveys using best practices for the 2012 London Olympics and found that persons both within London and throughout the United Kingdom expressed a willingness to pay to host the Games over and above any costs associated with actually attending any of the events. The total intangible value identified to UK residents in the studies was approximately £2 billion (or roughly \$3.4 billion at the exchange rates at the time of the study). This amount is clearly substantial, but it is well below the cost of hosting the Games.

Given the expenses associated with specialized venues and event operations, especially security, it is difficult for the revenues directly generated by the

Olympics or the surrounding tourism to cover the cost of the event. Allowing for a “feel-good effect” doesn’t close the gap, either. Thus, an economic justification for the Olympics must rest on including additional benefits from the long-run legacy of the Games.

## **The Long-Run Benefits of Hosting the Olympics**

The arguments that the Olympics bring long-term benefits fall into several categories. First, the Games might leave a legacy of sporting facilities that can be used by future generations. Second, investments in general infrastructure can provide long-run returns and improve the livability of host cities. Third, the media attention surrounding the Games can serve as an advertising campaign that serves to promote the area as a destination for future tourism. Finally, the Olympics can promote foreign direct investment and increased international trade, as the Olympics causes investors and companies worldwide to become familiar with the area.

A positive legacy of sporting facilities is the least promising of these claims. Academic studies of sports facilities on host communities are nearly unanimous in finding little or no economic benefits associated with stadiums and arenas (Coates and Humphreys 2008). Furthermore, due to the nature of the sporting events sponsored by the Olympics, host cities are often left with specialized sports infrastructure that has little use beyond the Games, so that in addition to the initial construction costs, cities may be faced with heavy long-term expenses for the maintenance of “white elephants.” Many of the venues from the Athens Games in 2004 have fallen into disrepair. Beijing’s iconic “Bird’s Nest” Stadium has rarely been used since 2008 and has been partially converted into apartments, while the swimming facility next door dubbed the “Water Cube” was repurposed as an indoor water park at a cost exceeding \$50 million (Farrar 2010). The Stadium at Queen Elizabeth Olympic Park in London, the site for most of the track and field events as well as the opening and closing ceremonies in 2012, was designed to be converted into a soccer stadium for local club West Ham United in order to avoid the “white elephant” problem. Before the Games, the stadium had an original price tag of £280 million. Cost overruns led to a final construction cost of £429 million, and then the conversion cost to remove the track and prepare the facility to accommodate soccer matches topped £272 million, of which the local club is paying only £15 million (Sky Sports 2015).

General infrastructure improvements clearly have the potential for better returns. The athletes’ villages in both Atlanta and Los Angeles were converted into new dormitories for local universities in their respective cities, and Utah wound up with expanded highways between its major population center in Salt Lake City and the popular ski resorts in the mountains to its east. But here, too, a caveat is in order. It is often argued that the Olympics can serve as a catalyst for urban redevelopment and to generate the political will required to undertake needed infrastructure investments. However, there is no reason to believe that the investments required to host the Olympics will provide higher returns than alternative infrastructure projects that

could have been carried out instead. Also, while the firm deadlines provided by the Olympics may constrain cities to follow projects through to timely completion, the same deadlines may raise costs due to time pressures and labor constraints.

The Olympics can serve to “put a city on the map” as a tourist destination. In 1990, Barcelona was the 13th most popular tourist destination in Europe with fewer than half the number of bed nights as its neighboring rival, Madrid. Following the 1992 Summer Olympics that also highlighted many nonsports venues in the region, the city experienced the fastest growth in tourism among large European cities, so that by 2010 the city was the fifth most popular destination on the continent and had eclipsed Madrid in bed nights (Zimbalist 2015). Similarly, ski resorts in Utah experienced a 20.4 percent increase in skier visits between the year before the Salt Lake City Games in 2000–01 and 2014–15, outpacing Colorado’s 8.0 percent growth over the same period.

However, the results in Salt Lake City and Barcelona have not been replicated in other host cities. The explanation for their success may be that both of these locations can be seen as “hidden gems,” locations that are highly attractive to tourists but that had been previously passed over for their better-known neighbors in Colorado and Madrid. This strategy won’t necessarily work for many other potential host cities. Lillehammer, Norway, the venue for the Winter Games in 1994, offered few attractions to tourists outside of the Olympic events and was therefore unattractive to tourists after the Games left town. By 1997, the increase in international guest-nights in Lillehammer was only 8 percent higher than the increase in foreign tourism in Norway overall (Tieglund 1999). Similarly, the 1988 Calgary Winter Olympics significantly raised international awareness of the city, but without a lasting ability to attract tourists, the enhanced image of the city rapidly faded (Richie and Smith 1991). Conversely, London, with over 18 million international visitors per year, was already the most popular tourist destination in the world prior to the 2012 Olympics, and it was never likely that the event would raise its already impressive profile. The success of the Olympics in developing a city as a tourist destination should not be rejected out of hand, but neither is it a surefire way to ensure a steady stream of visitors after the closing ceremonies.

A final economic justification for hosting the Olympics is that the Games can serve as positive signal to businesses and consumers about the future state of the economy. Using regression analysis of time-series panel data, Rose and Spiegel (2011) examine exports from 196 countries and territories between 1950 and 2006 and find that countries that host the Olympics experience an increase in exports of over 20 percent. Using a similar methodology, Brückner and Pappa (2015) examine consumption, investment, and output data over a similar time frame and range of countries and discover that all three measures of economic activity rise significantly around the time that the host country makes its initial bid as well as two to five years before the event actually takes place. On the surface, these results appear to vindicate the massive expenditures that are routinely incurred when hosting the Games. However, the same studies also show that unsuccessfully bidding for the Olympics appears to have similar effects on these economic variables.

There are several possible explanations for these surprising results. Rose and Spiegel (2011) suggest that it is not the event itself or the resulting tourism or advertising that increases exports, but rather that the very act of bidding serves as a credible signal that a country is committing itself to trade liberalization that will permanently increase trade flows. Brückner and Pappa (2015) theorize that the announcement of a bid for the Olympics represents a news shock predicting increases in future government investment.

While signaling and news shocks may be important drivers of modern economies, it is a bit hard to swallow the claim that the mere act of a single city within a country bidding for the right to throw a three-week party seven years in the future can result in enormous nationwide increases in trade, investment, and income. A more plausible answer is that countries are not randomly chosen to bid for the Games, but rather that bidding nations are almost exclusively drawn from a set of countries with sound economies and bright prospects for the future—a clear case of selection bias. To test for spurious correlation, Maennig and Richter (2012) and Langer, Maennig, and Richter (2015) note that when bidding countries are appropriately compared with countries that are otherwise similar but did not bid for the Games using propensity matching techniques, the significant Olympic effects on trade, consumption, investment, and income all disappear. Again, the long-run benefits of hosting the Games prove to be elusive.

### **Why Do Countries Continue To Host?**

If the Olympic Games tend to offer only a low chance of providing host cities with positive net benefits, why do cities keep lining up to host these events? At least three possibilities arise. First, even if the overall effect of holding the Games is typically negative, large projects will still create winners and losers. Boston's ultimately unsuccessful bid to host the 2024 Summer Games was spearheaded by leaders in the heavy construction and hospitality industries, the two sectors of the economy that stood the most to gain from the city hosting the Olympics.

Second, economic concerns may only play a small role in a country's decision whether or not to stage the Olympics. The desire to host the Games may be driven by the egos of a country's leaders or as a demonstration of a country's political and economic power. It is difficult to explain Russia's \$51 billion expenditure on the 2014 Sochi Games or China's \$45 billion investment in the 2008 Beijing Summer Olympics otherwise. In countries where the government is not accountable to voters or taxpayers, it is quite possible for the government to engage in wasteful spending that enriches a small group of private industrialists or government leaders without repercussions. In the bidding for the 2022 Winter Olympics, four of the cities in liberal western democracies that initially indicated interest in staging the Games—Oslo, Stockholm, Krakow, and Munich—withdrawed from the bidding after local voters expressed opposition to the bids, leaving the International Olympic Committee to choose which autocratic regime would hold the event: Beijing, China,

or Almaty, Kazakhstan. In the bidding for the 2024 Summer Olympics, both Boston and Hamburg withdrew their bids in the face of public opposition.

Finally, it is possible to ascribe a portion of the economic failings of the Olympics to the “winner’s curse,” the result in auction theory that when parties are bidding on an asset of uncertain value (like rights to offshore oil leasing tracts), the winner will tend to be the bidder who is most prone to overestimating the value of the asset—which means that the winner is likely to be systematically disappointed (for an overview of the “winner’s curse,” see Thaler 1988). The 1970s witnessed a decline in enthusiasm among cities willing to host the Games. In 1972, voters in Denver, after having been initially awarded the 1976 Winter Olympics, rejected a \$5 million bond referendum that would have been used to finance the Games, requiring the International Olympic Committee to rescind its offer. Following the financial debacle of the 1976 Montreal Olympics, by the time it came to award the 1984 Summer Games, Los Angeles was the only bidder. Given the resulting bargaining position, the Los Angeles Organizing Committee was able to dictate the terms of bid to the International Olympic Committee. For example, it insisted on utilizing the area’s existing sports infrastructure, including the 60-year old Los Angeles Coliseum for the premier track and field events as well as the opening and closing ceremonies, and the heavy use of corporate sponsors to finance the Games. The focus on restraining costs resulted in total expenditures for the Games of a “mere” \$546 million (\$1,244 million in 2015 dollars), less than one-quarter of that spent by Montreal eight years earlier. The 1984 Los Angeles event managed to become one of the only profitable Games in Olympic history, with a final profit of \$232.5 million (Walker 2014).

When Los Angeles had shown the possibility of profits from the Games, it led multiple cities to enter the bidding process, each hoping to cash in on the potential Olympic windfall. However, this crop of new entrants meant that bargaining power shifted back to the International Olympic Committee. No longer could cities design bids based solely on expected revenues and the expenses necessary to stage the event. Instead, applicant cities needed to consider how to beat competing bids from other potential hosts. Not only did the competition among cities to host create a bidding environment prone to corruption, but it became commonplace for bidders to attempt to impress the International Olympic Committee with spectacular new architectural monuments like Beijing’s Bird’s Nest or the £269 million London Aquatics Centre. The estimated cost of the new, ultra-modern National Olympic Stadium in Tokyo, planned as the centerpiece of the 2020 Games, eventually rose to \$2.02 billion—which for perspective was nearly twice the cost, even after accounting for inflation, of the entire 1984 Los Angeles Games—before public outcry led to a massive redesign (Ripley and Hume 2015).

## **Solutions to the Economic Viability Problem**

The Olympic Games as currently conducted are not economically viable for most cities. The most important reasons include infrastructure costs relating to the

venues hosting the events; the monopoly rents that flow to the International Olympic Committee; poor management; corruption; and the specter of unreasonable and unrealizable economic expectations for the host city and nation. Concerns about costs are nothing new. Even Salt Lake City's \$1.9 billion in expenditures in 2002 (\$2.5 billion in 2015 dollars), which seem almost quaint by today's standards, raised concerns among organizers. Then-President of the International Olympic Committee, Jacques Rogge, expressed the "need to streamline costs and scale down the Games so the host cities are not limited to wealthy metropolises.... The scale of the Games is a threat to their quality," he said. "In a way, they risk becoming a victim of their own success" (as quoted in Roberts 2002).

Costs of staging the Games have skyrocketed in the years since those comments were made. The Olympics have reached a tipping point where the majority of potential host nations and cities in the industrialized, democratic West have come to the realization that hosting is more likely to drain rather than to enhance financial resources. Even before Boston and Hamburg's withdrawals as applicant cities for the 2024 Summer Olympic Games, and even before only two applicant cities emerged as contenders for the 2022 Winter Olympic Games, the International Olympic Committee had been considering major changes to its strategic vision. Its *Olympic Agenda 2020*, which was unanimously passed at the IOC's 127th Session in Monaco in December 2014, included 40 recommendations for reform, many of which promoted increased economic sustainability for host cities.

The recommendations provide at least some semblance of solutions to the problems relating to the economic viability of the Olympic Games. Specifically, they propose to: 1) shape the bidding process as an invitation; 2) evaluate bid cities by assessing key opportunities and risks; 3) reduce the cost of bidding; 4) include sustainability in all aspects of the Olympic Games; 5) include sustainability within the Olympic Movement's daily operations; and 6) reduce the cost and reinforce the flexibility of Olympic Games management (IOC 2014a). In addition, *Olympic Agenda 2020* seeks to reduce corruption by increasing transparency.

Recommendations, of course, must be translated into action. The International Olympic Committee has yet to complete a full bidding cycle under their new guidelines, but some cities are taking its recommendation seriously. Los Angeles, which emerged as the US bid city for 2024 following Boston's exit, has proposed using existing college dormitories at UCLA and the University of Southern California for athlete housing during the Games, thus eliminating over \$1 billion in costs for an athletes' village from their original plans. Of course, if the IOC again finds itself lured into selecting the city with the fanciest accommodations for athletes (and, of course, for IOC executives), the most glamorous new stadiums, and the most elaborate ceremonies over simpler but more economically rational bids like what may be emerging in Los Angeles, then the clear signal will be that it is business as usual for the Olympics. Furthermore, blame for such an outcome should not be directed solely at the International Olympic Committee. Managing expectations is critical. Promising that hosting the Olympics will provide a significant boost to a host city and nation's economy is very likely to result in disappointment. Host cities

and nations have to be more proactive, rather than permitting economic interests who stand to benefit from the Games to serve as the primary spokespersons for economic impact. Officials from national Organizing Committees should do more hands-on-management to ensure that the promises of vested interests are reasonable and achievable.

The problem posed by the extraordinary sports facilities costs can be solved through one or a few permanent locations for the Olympic Games. The original home of the Olympics in Greece is sometimes proposed. Alternatively, the IOC could designate, perhaps, four Summer Olympic and three Winter Olympic venues throughout the world that would rotate the staging duties. As yet another alternative, the IOC might award two successive Games to the same host, so that facilities could at least be used twice. Any of these proposals would serve to ensure that Olympic sports venues have a useful life of more than just one three-week event.

The fact that Los Angeles profited from the Olympics in 1984 and Barcelona experienced an economic revival of sorts as a consequence of hosting the Games in 1992 has added currency to claims that the Games can be economically transformative. But hosting the Games has become an increasingly expensive gambit; indeed, as the rules for bidding currently stand, the entire structure of the Olympic Games shouts “potential host beware.” Issues start with the excesses of the bidding process, and are then followed by the construction of expensive and ostentatious sports infrastructure and the expensive opening and closing spectacles. If the commercial dimension of the Games has become too embedded to eliminate, then the costs must be managed better; infrastructure has to be made less expensive and reused; host nations and cities have to play the lead role in defining and achieving reasonable economic outcomes; and corruption has to be targeted through increased transparency and broader involvement. The goal should be that the costs of hosting are matched by benefits that are shared in a way to include ordinary citizens who fund the event through their tax dollars. In the current arrangement, it is often far easier for the athletes to achieve gold than it is for the hosts.

■ *The authors are thankful to Robert Baumann and Andrew Zimbalist for useful discussions in previous projects that have informed much of the analysis here and to Gordon Hanson, Enrico Moretti, Ann Norman, and Timothy Taylor for useful comments on earlier drafts. Responsibility for interpretation of the data, as well as for any errors, is the authors' alone.*

## References

- Atkinson, Giles, Susana Mourato, Stefan Szymanski, and Ece Ozdemiroglu. 2008. "Are We Willing to Pay Enough to 'Back the Bid': Valuing the Intangible Impacts of London's Bid to Host the 2012 Summer Olympic Games." *Urban Studies* 45(2): 419–44.
- Baade, Robert, Robert Baumann, and Victor Matheson. 2010. "Slippery Slope? Assessing the Economic Impact of the 2002 Winter Olympic Games in Salt Lake City, Utah." *Région et Développement* no. 31, pp. 81–91.
- Baade, Robert, and Victor Matheson. 2002. "Bidding for the Olympics: Fool's Gold?" In *Transatlantic Sport: The Comparative Economics of North American and European Sports*, edited by Carlos Pestana Barros, Muradali Ibrahim, and Stefan Szymanski, 127–51. London: Edward Elgar.
- Baumann, Robert, Bryan Engelhardt, and Victor Matheson. 2012. "Employment Effects of the 2002 Winter Olympics in Salt Lake City, Utah." *Journal of Economics and Statistics* 232(3): 308–17.
- Billings, Stephen B., and J. Scott Holladay. 2012. "Should Cities Go for the Gold? The Long-Term Impacts of Hosting the Olympics." *Economic Inquiry* 50(3): 754–72.
- Blake, Adam. 2005. "The Economic Impact of the London 2012 Olympics." Unpublished paper, Christel DeHaan Tourism and Travel Research Institute, Nottingham University Business School, Jubilee Campus.
- British Broadcasting Corporation (BBC). 2012. "Post Olympic Spirits High But May Fizzle Out—Survey." August 14. <http://www.bbc.com/news/uk-19246044>.
- British Broadcasting Corporation (BBC). 2013. "London 2012: Olympics and Paralympics £528m Under Budget." July 19. <http://www.bbc.com/sport/0/olympics/20041426>.
- Brückner, Markus, and Evi Pappa. 2015. "News Shocks in the Data: Olympic Games and Their Macroeconomic Effects." *Journal of Money, Credit and Banking* 47(7): 1339–67.
- Coates, Dennis, and Brad R. Humphreys. 2008. "Do Economists Reach a Conclusion on Subsidies for Sports Franchises, Stadiums, and Mega-Events?" *Econ Journal Watch* 5(3): 294–315.
- Economist*, The. 1998. "Downhill All the Way." February 5. <http://www.economist.com/node/112549>.
- Farhi, Paul. 2014. "Did the Winter Olympics in Sochi Really Cost \$50 billion? A Closer Look at that Figure." *Washington Post*, February 10.
- Farrar, Lara. 2010. "Beijing's Water Cube Now Has Slides, Rides, A Wave Pool and Spa." CNN.com, August 11. <http://travel.cnn.com/explorations/play/beijings-watercube-water-park-now-open-040746>.
- Fedderson, Arne, and Wolfgang Maennig. 2013. "Mega-Events and Sectoral Employment: The Case of the 1996 Olympic Games." *Contemporary Economic Policy* 31(3): 580–603.
- Flyvbjerg, Bent, and Allison Stewart. 2012. "Olympic Proportions: Cost and Cost Overrun at the Olympics 1960–2012." Saïd Business School Working Paper, University of Oxford.
- Fowler, Geoffrey A., and Stacy Meichtry. 2008. "China Counts the Cost of Hosting the Olympics." *Wall Street Journal*, July 16.
- Giesecke, James, and John Madden. 2011. "Modelling the Economic Impacts of the Sydney Olympics in Retrospect—Game Over for the Bonanza Story?" *Economic Papers* 30(2): 218–32.
- Hotchkiss, Julie, Robert Moore, and Stephanie M. Zobay. 2003. "Impact of the 1996 Summer Olympic Games on Employment and Wages in Georgia." *Southern Economic Journal* 69(3): 691–704.
- Humphreys, Jeffrey, and Michael Plummer. 1995. *The Economic Impact on the State of Georgia of Hosting the 1996 Summer Olympic Games*. Selig Center for Economic Growth, University of Georgia.
- International Olympic Committee (IOC). 2010. "Factsheet: Legacies of the Games, Update—January 2010." [http://www.olympic.org/Documents/Reference\\_documents\\_Factsheets/Legacy.pdf](http://www.olympic.org/Documents/Reference_documents_Factsheets/Legacy.pdf).
- International Olympic Committee (IOC). 2014a. "Olympic Agenda 2020: 20 + 20 Recommendations." [http://www.olympic.org/Documents/Olympic\\_Agenda\\_2020/Olympic\\_Agenda\\_2020-20-20\\_Recommendations-ENG.pdf](http://www.olympic.org/Documents/Olympic_Agenda_2020/Olympic_Agenda_2020-20-20_Recommendations-ENG.pdf).
- International Olympic Committee (IOC). 2014b. "Olympic Marketing Fact File." 2014 Edition. [http://www.olympic.org/Documents/IOC\\_Marketing/OLYMPIC\\_MARKETING\\_FACT\\_%20FILE\\_2014.pdf](http://www.olympic.org/Documents/IOC_Marketing/OLYMPIC_MARKETING_FACT_%20FILE_2014.pdf).
- InterVISTAS Consulting. 2002. "The Economic Impact of the 2010 Winter Olympics and Paralympic Games: An Update." British Columbia Ministry of Competition, Science and Enterprise. November, 20. [http://www.intervistas.com/downloads/Economic\\_Impact\\_of\\_Hosting\\_2010\\_Winter\\_Games.pdf](http://www.intervistas.com/downloads/Economic_Impact_of_Hosting_2010_Winter_Games.pdf).
- Jasmand, Stephanie, and Wolfgang Maennig. 2008. "Regional Income and Employment Effects of the 1972 Munich Olympic Summer Games." *Regional Studies* 42(7): 991–1002.

- Jordan, Mary, and Kevin Sullivan.** 1999. "Nagano Burned Documents Tracing '98 Olympics Bid." *Washington Post*, January 21, p. A1. <http://www.washingtonpost.com/wp-srv/digest/daily/jan99/nagano21.htm>.
- Langer, Viktoria C. E., Wolfgang Maennig, and Felix Richter.** 2015. "News Shocks in the Data: Olympic Games and their Macroeconomic Effects—Reply." Working Paper 52, Hamburg Contemporary Economic Discussions, University of Hamburg.
- Leme, Luisa.** 2015. "Weekly Chart: How Much Will Rio's 2016 Summer Olympics Cost?" *Americas Society/Council of the Americas*, August 5. <http://www.as-coa.org/articles/weekly-chart-how-much-will-rios-2016-summer-olympics-cost>.
- Longman, Jere.** 1998. "Nagano 1998: Seven Days to Go; High Costs and High Expectations." *New York Times*, January 30.
- Maennig, Wolfgang, and Felix Richter.** 2012. "Exports and Olympic Games: Is There a Signal Effect?" *Journal of Sports Economics* 13(6): 635–41.
- Matheson, Victor.** 2009. "Economic Multipliers and Mega-Event Analysis." *International Journal of Sport Finance* 4(1): 63–70.
- Matheson, Victor.** 2013. "Assessing the Infrastructure Impact of Mega-Events in Emerging Economies." In *Infrastructure and Land Policies*, Gregory K. Ingram and Karin L. Brandt, eds., 215–32. Cambridge, MA: Lincoln Land Institute.
- Mullholland, Hélène.** 2012. "David Cameron Claims London 2012 Will Bring £13bn 'Gold for Britain.'" *The Guardian*, July 5.
- Payne, Bob.** 2008. "The Olympics Effect: When the Games Are Over, Which Cities Win Big—And Which Stumbled?" *MSNBC*, August 3. <http://today.msnbc.msn.com//id/26042517#.UBwk104gcsd>.
- Pletz, John.** 2010. "Chicago 2016's Final Tally: \$70.6M Spent on Olympics Effort." *Crain's Chicago Business*, May 17.
- Porter, Philip K., and Deborah Fletcher.** 2008. "The Economic Impact of the Olympic Games: Ex Ante Predictions and Ex Poste Reality." *Journal of Sport Management* 22(4): 470–86.
- Preuss, Holger.** 2004. *The Economics of Staging the Olympic Games*. London: Edward Elgar.
- Ripley, Will, and Tim Hume.** 2015. "Japan Scraps Plans for Controversial 'Bike Helmet' Olympic Stadium." *CNN*, July 17. <http://www.cnn.com/2015/07/17/asia/japan-tokyo-olympic-stadium-scrapped/>.
- Ritchie, J. R. Brent, and Brian H. Smith.** 1991. "The Impact of a Mega-Event on Host Region Awareness: A Longitudinal Study." *Journal of Travel Research* 30(1): 3–10.
- Roberts, Selena.** 2002. "Olympics: Notebook; I.O.C.'s Rogge Steps Into The Cold." *New York Times*, February 4.
- Rose, Andrew K., and Mark M. Spiegel.** 2011. "The Olympic Effect." *Economic Journal* 121(553): 652–77.
- Sky Sports.** 2015. "Olympic Stadium Costs Soar Ahead of West Ham Move." June 19. <http://www.skysports.com/football/news/11685/9890173/olympic-stadium-costs-soar-ahead-of-west-ham-move>.
- Tagaris, Karolina.** 2014. "Ten Years On, Athens 2004 Gives Greece Little to Cheer." *Reuters*, August 7. <http://uk.reuters.com/article/2014/08/07/uk-olympics-greece-idUKKBN0G70Y220140807>.
- Teigland, Jon.** 1999. "Mega-Events and Impacts on Tourism; The Predictions and Realities of the Lillehammer Olympics." *Impact Assessment and Project Appraisal* 17(4): 305–317.
- Thaler, Richard.** 1988. "Anomalies: The Winner's Curse." *Journal of Economic Perspectives* 2(1): 191–202.
- UK Office for National Statistics (ONS).** 2015. *Overseas Travel and Tourism*. Various months. <http://www.ons.gov.uk/ons/rel/ott/overseas-travel-and-tourism-quarterly-release/index.html>.
- US General Accounting Office (GAO).** 2001. "Olympic Games: Costs to Plan and Stage the Games in the United States." Report to the Ranking Minority Member Subcommittee on the Legislative Branch Committee on Appropriations U.S. Senate, November.
- VanWynsberghe, Rob.** 2011. "Olympic Games Impact (OGI) Study for the 2010 Olympic and Paralympic Winter Games: Games-time Report." <http://cfss.sites.olt.ubc.ca/files/2011/10/The-Olympic-Games-Impact-Study-Games-time-Report-2011-11-21.pdf>.
- Walker, Alissa.** 2014. "How L.A.'s 1984 Summer Olympics Became the Most Successful Games Ever." *Gizmodo.com*, February 6. <http://gizmodo.com/how-l-a-s-1984-summer-olympics-became-the-most-success-1516228102>.
- Walton, Harry, Alberto Longo, and Peter Dawson.** 2008. "A Contingent Valuation of the 2012 London Olympic Games: A Regional Perspective." *Journal of Sports Economics* 9(3): 304–17.
- Zimbalist, Andrew.** 2015. *Circus Maximus: The Economic Gamble Behind Hosting the Olympics and the World Cup*. Brookings Institution Press.