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Estimating the Intangible Benefits of Hosting the 2016 Olympic and Paralympic

Games for Potential Bid Cities:

Berlin, Chicago, and

San Francisco

Von der Deutschen Sporthochschule Köln

zur Erlangung des akademischen Grades

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### Erklärung

Hierdurch erkläre ich, dass ich die ‘Leitlinien guter wissenschaftlicher Praxis’ der Deutschen Sporthochschule Köln in der aktuellen Fassung eingehalten habe.”



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Kevin Heisey

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## **LIST OF ABBREVIATIONS**

BIF	Bid Intensity Factor
CBA	Cost-benefit Analysis
CGE	Computable General Equilibrium
CVM	Contingent Valuation Method
DOSB	German Olympic Sports Confederation
ESPN	Entertainment and Sports Programming Network
FIFA	Fédération Internationale de Football Association
GDP	Gross Domestic Product
HCCM	Heteroscedasticity Consistent Covariance Matrix
IAAF	International Association of Athletics Federations
IF	International Federation
IPC	International Paralympic Committee
IOC	International Olympic Committee
MLB	Major League Baseball
MPCL	Marginal Propensity to Consume Locally
MSA	Metropolitan Statistical Area

NHL	National Hockey League
NFL	National Football League
NOAA	National Oceanic and Atmospheric Association
NOC	National Olympic Committee
NSW	New South Wales
OCOG	Organizing Committee of the Olympic Games
OLS	Ordinary Least Squares
SARS	Severe Acute Respiratory Syndrome
SOCOG	Sydney Organizing Committee for the Olympic Games
TOP	The Olympic Partner Programme
UEFA	Union of European Football Associations
UK	United Kingdom
US	United States of America
USOC	United States Olympic Committee
WTA	Willingness-to-accept
WTP	Willingness-to-pay
WTV	Willingness-to-volunteer

# **CHAPTER 1**

## **INTRODUCTION**

### **PROBLEM STATEMENT**

A few days after the closing ceremony of the 2000 Paralympic Games, in an opinion piece written in support of public funding for the Sydney Festival, an annual arts festival held in Sydney Australia, New South Wales (NSW) Premier Bob Carr wrote, “One of the many lessons of the Olympics was that a great public festival, and that is essentially what the Olympics and Paralympics were, can unite and energize an entire community.” He also noted that the Games were a celebration of “our achievements, character and history.” The benefits Carr described in his piece, a united and energized citizenry and a celebration of achievements, character, and history are all intangible benefits. While they do indeed exist and are inarguably quite significant, efforts to measure the intangible benefit of hosting the Olympic and Paralympic Games<sup>1</sup> have been relatively rare.

Carr is not alone in his assessment of what hosting an Olympic Festival brings Barney, Wenn, and Martyn (2002) write that the expectations of an Olympic host city are; global awareness, economic gain, citizen morale, and pride of identification. Awareness, morale, and pride are all examples of intangible effects. The fundamental principles of Olympism are essentially a list of intangible intrinsic benefits associated with the Games; balancing body, will, and mind, the joy of effort, the value of a good example, promotion of a peaceful society and preservation of human dignity (International Olympic Committee, Olympic Charter 2007, page

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<sup>1</sup> Since the 1988 Seoul Games and the 1992 Albertville Games the Olympics and the Paralympics have taken place the same year and at the same venues. For brevity, references to Olympic and Olympics include the Paralympics throughout this work.

11). Despite the significance of the intangible effects of hosting the Olympics, the vast majority of the research to this point has focused on the direct, tangible economic benefit of hosting the Olympics. While ex-ante studies often promise great gains in income and employment, ex-post studies have consistently shown that those benefits fail to materialize, leading Baade and Matheson (2002) to compare bidding to host the Olympics with hopes of gaining economic benefits to fool's gold. But a focus on the tangible economic benefits of hosting the Games captures only a part of the picture. In the Carr piece cited above, he writes that festivals "are, and should be, programmed to lose money" and that "no festival can operate without public subsidy." If a surplus is made on the budget, according to Carr, it is a bonus. Clearly Carr's views represent those of many public officials who feel that there are intangible benefits to be gained from hosting the Olympics and that those benefits justify significant outlays of public expenditure.

The intangible benefits associated with hosting the Olympic Games have two key qualities; they are considered non-market and public goods. Non-market goods are not bought, sold, or traded in a market. Public goods have the properties of nondiminishability and nonexcludability. Nondiminishability is a property where one person's consumption of a good has no effect on the amount that is available for others to consume. Nonexcludability means that it is impossible or prohibitively expensive to exclude non-payers from consuming the good (Frank 2006). In the current debate over public financing of sports events, facilities, and teams, information and estimates of the non-market, public good value provided are often inadequate or even nonexistent. It is regularly noted that nonmarket, public good estimates are difficult to accurately quantify. However, in the field of environmental and resource economics similar nonmarket values for recreation, or even overall environmental quality, are regularly estimated

with what is regarded by scholars as scientific accuracy using the contingent valuation method (CVM). There is a clear need to estimate the intangible benefit of hosting the Olympics and the CVM is a tool particularly suited to this task.

Assessing the public interest in hosting the 2016 Olympic Games for the potential host cities is determined here by using the CVM to determine residents' willingness-to-pay (WTP) in monetary donations or willingness-to-volunteer (WTV) in time to bring the 2016 Olympics to their respective cities. These results lead to insight into whether, in the face of the large expenditures and financial guarantees required of Olympic host cities, the intangible benefits expected by the host cities are sufficient to justify public support.

A survey of estimates of the costs of recent Olympic Festivals reveals how expensive hosting the Games has become. The 2004 Athens Olympics were originally estimated to have cost \$5.9 billion to Greece but according to estimates by the Greek government immediately following the Games, the costs had grown to \$11.6 billion and were likely to end up at \$14.6 billion (Quinn, 2004). For Beijing 2008, \$1.91 billion was spent on sport venues, \$1.625 billion was spent on Games operation, and \$41.1 billion was spent on municipal infrastructure (Beijing 2008 press conference, August 2008). .

According to the Olympic Charter, the ultimate financial responsibility and risk falls on the host city. From the Bye Law to rule 34, "Each candidate city shall provide financial guarantees as required by the International Olympic Committee (IOC) Executive Board, which will determine whether such guarantees shall be issued by the city itself, or by any other competent local, regional or national public authorities, or by any third parties" (International Olympic Committee, Olympic Charter 2007, page 74) Rule 37 states that "the NOC (National

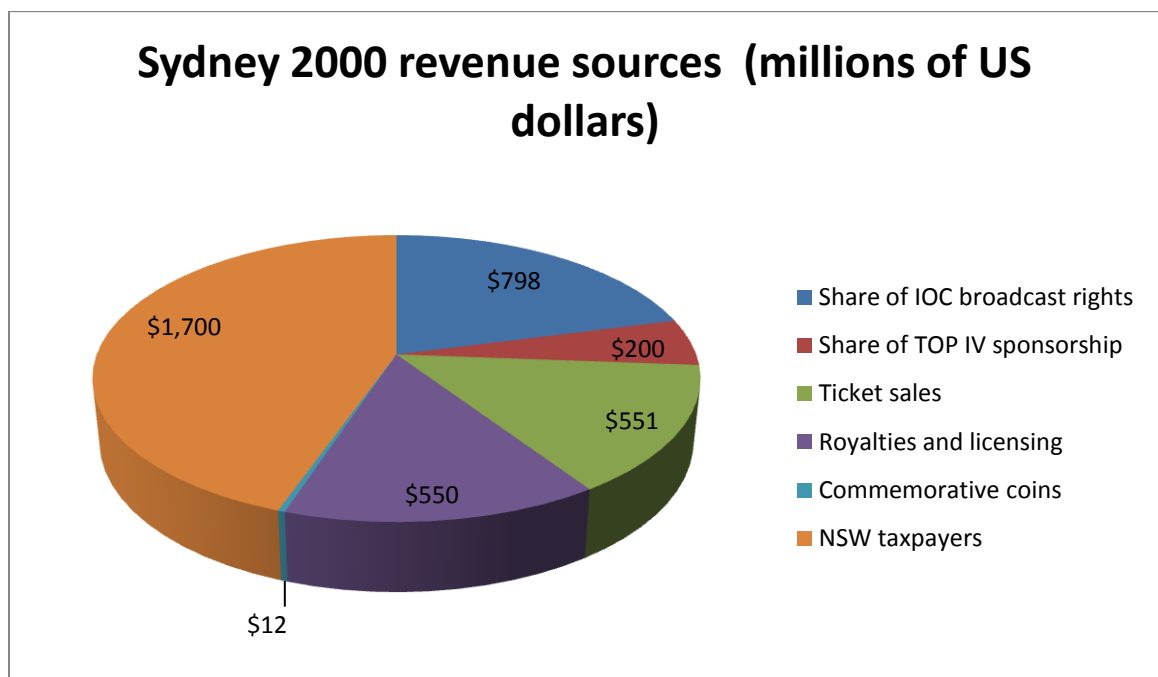
Olympic Committee), the OCOG (Organizing Committee of the Olympic Games) and the host city are jointly and severally liable for all commitments entered into individually or collectively concerning the organization and staging of the Olympic Games, excluding the financial responsibility...*which shall be entirely assumed jointly and severally by the host city and the OCOG*...The IOC shall have no financial responsibility whatsoever in respect of the organization and staging of the Olympic Games” (International Olympic Committee, Olympic Charter 2007, page 76) (emphasis by author).

The motivation and purpose of measuring the intangible benefits of hosting the Olympics can be understood through an explanation of how the Games are financed and the role of public spending and financial guarantees. In Figure 1, the revenue sources for the Sydney 2000 Olympic Games are summarized. The primary revenue sources were the Sydney Organizing Committee for the Olympic Games’ (SOCOG) share of the IOC broadcast rights deal (\$798 million) and its share of The Olympic Partner Programme (TOP IV) sponsor dollars (\$200 million). Ticket sales to Olympic spectators generated \$551 million and another \$550 million was generated in domestic royalties and licensing fees. The final private revenue source, reminiscent of earlier Olympiads was \$12 million raised through a commemorative Olympic coin program (Barney, Wenn, and Martin, 2002). This left the NSW taxpayers to pick up a \$1.7 billion tab according to an interim estimate by the state’s Olympic Coordinating Authority. Clearly, the Games generate a great deal of revenue, but they are not self sufficient and require large public subsidies.

What do local governments and taxpayers get in return for their financial commitments? Primarily they receive the intangible benefits of pride, unity and celebration that go along with hosting a global festival. Other intangible benefits that may be important to the residents and



officials of host cities are building the city's brand through an improved image of the city as a tourist destination or global center of commerce, increased motivation for residents to become active in athletic pursuits thus reducing health care costs, increased awareness and understanding of other cultures and of the issues regarding people with disabilities and the value of adaptive sport. The main focus of this study is to estimate the monetary value of the perceived anticipated intangible benefit experienced by residents of potential Olympic host cities. Once the intangible value is estimated, we have a better understanding of the appropriateness of the levels of public spending and financial guarantees devoted to the Olympics by host cities and a truer knowledge of the entire economic benefit of hosting the Games. Or, in light of NSW premier Carr's statements noted above, does the intangible benefit created by the festival justify the public support?



*Figure 1.1 (source: Barney, Wenn, and Martyn, Selling the Five Rings, 2002)*

To summarize, many of the core purposes for holding and hosting the Olympic Games are intangible in nature. These intangible elements constitute a significant part, if not the major part, of the benefit associated with hosting the Olympic Games. Much of the existing research has focused almost exclusively on estimating the tangible benefits of hosting the Olympics, either as an ex-ante prediction of increased incomes and jobs, or ex-post examinations that find little lasting tangible benefit. While the intangible benefits are often acknowledged in these studies, they are usually written off as too difficult to assess. In the field of environmental economics, intangible benefits have been estimated using a variety of methods for several decades. Sport economists need to adopt these tools for the estimation of the intangible benefits associates with sports. In this dissertation, the intangible benefit of potentially hosting the Olympic Games for three prospective bid cities is estimated. Focusing on three different cities allows for comparisons and understanding how estimates of intangible benefits can best be carried out.

## **RESEARCH QUESTIONS**

The research in this dissertation is conducted to answer the question, what is the public interest in hosting the summer Olympic Games and how does it vary from city-to-city due to cultural, political, and economic considerations? The comparison is between the cities of Berlin, Germany and Chicago and San Francisco from the United States of America (US). The cities were selected because each expressed interest in pursuing a bid to host the 2016 Olympic Games prior to the official IOC bid city applicant stage and for logistical reasons. Prior to the applicant city stage of the bid process many cities actively take the first steps in pursuit of an Olympic bid. In the US, Chicago, Houston, Los Angeles, Philadelphia, San Diego, and San Francisco all took preliminary steps in the bid process. In Germany, Berlin and Hamburg officials expressed

interest in hosting the 2016 Games. By the time the United States Olympic Committee (USOC) met in April of 2007 to decide on an applicant city to put forward, only Chicago and Los Angeles remained and Chicago was selected (Macur, 2007). The German Olympic Sports Confederation (DOSB) decided not to put forth any applicant cities despite the interest shown by Berlin and Hamburg. They felt that the IOC was unlikely to select another European city for the 2016 Games following the 2012 Games in London (“German leaders endorse Munich 2018 winter Olympics bid,” 2007).

The timing of the data collection was such that residents of each city could realistically envision a successful bid for the 2016 Games, but the formal process had not progressed far enough so that residents would think their city had a good chance. Data was collected in Berlin during February 2007, in Chicago during September 2007, and in San Francisco during the November 2006 through January 2007 time period. Chicago was formally an applicant city before data was collected there, but the candidate cities were not determined until June 4, 2008. This allowed for both relevant comparisons and decreased the potential influence of public relations campaigns on residents or strategic behavior by respondents. It is a context that allows for relevant comparisons between potential host cities to address the question above.

Bidding to host the Olympics has become a high stakes game. In contrast to the 1970's and 1980's when very few cities were interested in hosting the Olympics, or in the case of the 1984 Olympics only one city, today more than a dozen cities initially vie for the opportunity. Cities including Havana, Istanbul, Madrid, Moscow, Paris, and Rio De Janeiro have bid multiple times in the last decade. A successful bid requires the support of both the host city's general public and more importantly government support and resources. Host governments commit large sums of money primarily on sport facilities and infrastructure hoping to benefit from hosting the

Games. The Beijing Organizing Committee for the 2008 Olympic and Paralympic Games estimated in 2001 that it would spend U.S. \$14.257 billion in capital investments on venues and non-sports infrastructure. Of that money, \$50 million would come from the Chinese government, \$50 million would come from the local government and \$180 million would come from a special lottery. Games organizers, bid proponents and local governments often publicly justify this expenditure with hopes and promises of a tangible economic windfall backed up by professionally prepared, ex-ante economic impact studies.

Despite the optimism, ex-post studies of the economic impact of hosting the Olympics have found meager and short-lived economic impacts (Baade and Matheson, 2002). Owen (2005) wrote, “to date there has not been a study of an Olympics or other large-scale sporting event that has found empirical evidence of significant economic impacts such as increases in household income.” The economic question then is, not only why do major cities and countries vie to host the games, but also why do cities repeatedly do this? If there is truly no major economic benefit, why would governments put enormous resources behind their Olympic bids? One could argue that small but influential groups who stand to benefit from the Games are setting the agendas in these cities. However, the general public consistently widely supports these efforts (Preuss and Solberg, 2006). There are clearly difficulties in measuring economic impact and much of it could be related to failing to formally consider the intangible benefits of hosting the Games. Several economists have categorized common mistakes made in the optimistic ex-ante impact studies (Crompton, 1995; Owen, 2005). But if ex-post studies find little or no economic impact of hosting the Olympic Games and cities continue to vie for them, the standard measures of economic impact must be reexamined. In the literature review that follows in Chapter 2, the literature on measuring the economic impact of hosting mega-sport

events and sport in general is thoroughly summarized to put this current study in an appropriate context. Mega-events are defined by Andranovich, Burbank, and Heying (2001) as “a category of events so spectacular that they are recognized around the world as a peak event, worthy of everyone’s attention.”

The paradox of the increased popularity of Olympic bids in recent years despite the dire conclusions of ex-post economic impact studies supports using a revealed preference assumption as a starting point to identifying the magnitude of the intangible benefits that are missing from these studies. The revealed preference assumption maintains that the observed outcome is an equilibrium state and an outcome reflecting consistent consumer behavior (Mas Colell, Whinston and Green, 1995). Making that assumption, the fact that dozens of diverse cities from countries around the globe continually bid to host the Olympic Games over the last several decades (essentially since the advent of globalized mass broadcasting and sponsor involvement that characterize the modern Olympics) implies they value hosting the Games over alternate uses of their resources. To imply that the cities who vie for the Games are foolish and in some cases are making repeated foolish efforts is an unsatisfactory explanation. Mitchell and Carson (1989) state that observed/direct methods represent the optimal conditions for determining the value of goods, with the most optimal method being a public referendum. While there have been no public referenda to approve Olympic bids, observed public support for bids in bid cities typically runs quite high as noted above. Considering the ex-post studies of the tangible benefits of hosting the Olympics, the behavior of officials in cities that repeatedly pursue hosting the Olympics, and the general support among the public that these efforts appear to enjoy, the significant intangible benefits to hosting the Olympics likely outweigh the costs for many cities. If economists hope to accurately characterize and predict the economic impact of hosting the

Olympic Games, they must broaden their view to include more than the currency that is injected and flows through the host's economy, and improve methods, such as the cost-benefit approach, that accurately estimate the the total costs and benefits, including intangible ones, that are generated by hosting the Games.

## **IMPORTANCE AND CONTRIBUTION OF THE DISSERTATION**

This study is the first to use the same CVM approach in a relatively simultaneous manner to estimate the intangible benefits of hosting the same event three potential host cities across two continents and countries. It is the second, after Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008), to estimate the intangible benefit anticipated by residents of a potential Olympic host city and one of the few, but increasing in number, studies that use the CVM to estimate the intangible benefits associated with sport in general (Barget and Gouget, 2008; Heyne, Maennig, and Suessmuth, 2007; Mondello, Johnson, and Whitehead, 2007; Owen, 2006; Johnson, Groothuis, and Whitehead, 2001; Johnson and Whitehead, 2001). It is also the first to use the WTV time as a hypothetical payment vehicle in a sport context. This has implications for potential comparisons of CVM results and studies across a variety of economies and the potential for using volunteer data as a proxy for estimating the value of the intangible benefits associated with hosting the Olympics. Use of WTV is of particular relevance because of the prominent and accepted role of volunteer labor in the modern Olympic Games. Also additional data was collected to determine some of the factors that influence respondents' willingness-to-contribute to the Olympic hosting effort and the relationship between related variables.

As noted above, this study is unique in its use of WTV time as a CVM payment vehicle. Volunteer efforts have been part of the modern Olympic Movement ever since the Games in 1896 but the role of volunteers in the Olympic Games has expanded greatly since taking on a prominent role in the 1980 Winter Games in Lake Placid (Moreno, de Moragas, and Paniagua, 1999). Approximately 6,700 volunteers worked at the 1980 Lake Placid Winter Games, nearly 30,000 were employed at the 1984 Los Angeles Olympics, over 60,000 were used at the 1996 Atlanta Games (Moreno, de Moragas, and Paniagua, 1999) and about 556,000 people applied for approximately 100,000 volunteer positions for the 2008 Beijing Games (“Number of Olympic Volunteers Keeps Rising,” 2008). Using WTV time as a payment vehicle in a CVM survey is not an abstract exercise since it is commonplace to use volunteers to bring the Olympic Games. Additionally, data for the number of volunteer applicants, the number of volunteers and the hours worked by volunteers are a potential source of proxy measures that might be used in future studies to estimate the intangible benefits anticipated by the residents of a host city and nation.

The examination of the cultural differences in the three cities as it relates to citizens’ WTP or WTV to host the Olympics focuses primarily on rough measurements of the contemporary sport culture. Residents were asked about how much time they typically spend following sport and what their favorite sport to follow is. The Olympics are primarily a spectator sport for the residents of the host city, though they also have many opportunities to be participants in the operation of the Games. Given the resources and opportunities in carrying out this research, it was deemed appropriate to focus on the spectator aspect of the sport culture of the three cities. Residents were also asked if they thought they would attend the Olympic Games, how much money they would spend on their Olympic experience, and how much they would spend on Olympic souvenirs and merchandise if their city were to host the Games. This

data, combined with respondents' WTP and WTV data, leads to enlightenment regarding how the local culture of resident spectator sport affects the benefits they perceive from hosting the Olympics and how much they are willing to support the Olympic hosting effort.

The prime political focus here is on local politics and the historic relationship between sport and local government support and how that differs between the cities under investigation. Key considerations are if they have hosted major sport events in the past, government support for major sport facility construction, political relations with existing sport enterprises, and prior experiences in bidding for the Olympics or other major events. In democracies it is ideally the case that local politicians and the positions they hold are reflective of those of the residents they represent (Held, 2006), however it is also possible that the influence of key leaders can shape the attitudes and perceptions of the residents. In either case this relationship between local political leaders, their constituents, and the support of sport is key background to understand differences between the different populaces' perception of benefit of hosting the Olympics.

When gauging the benefits associated with hosting the Olympic Games by WTP measures, the major economic concern is that the various populations will have different wealth levels and thus varying levels of means to pay. Individuals' WTP is bounded by the amount of money they have, which is called their budget constraint. Respondents from a city with a lower per capita income would be expected, all other things equal, to have a lower WTP because of their lower wealth. Because results are being compared across three different cities with three different income levels in this study it is prudent to account for the differences in economic standing among the residents of Berlin, Chicago, and San Francisco. The differences are accounted for by randomly segmenting the groups of respondents and asking one group how



much they would be WTP in monetary terms and the second group how much time they would be WTV if their efforts would bring the Olympics to their home city.

According to standard micro-economic labor theory (see Chapter 4 for a thorough explanation), labor and leisure are traded off when an individual decides how much labor to provide. If an individual has a higher earning capacity, then leisure is in effect more expensive. If she chooses to spend an hour in leisure, she is foregoing greater earnings than someone with a lower earning capacity. For her, relative to others, money is relatively cheaper and time is more precious. In the opposite case, for an individual with a lower earning capacity leisure is cheaper because he does not have to forego as much in earnings to spend an extra hour in leisure. For him, relative to others, leisure is relatively cheaper but money is more precious. There is another effect at play as well. If leisure is a normal good (a normal good is one that people buy more of when their income level increases), the individual with the higher earning capacity can afford to “purchase” or spend more time in leisure. The former effect is known as the substitution effect and the latter known as the wealth effect.

One of the purposes of this work is to gather evidence to determine whether the substitution effect or the wealth effect dominate in this context. If the substitution effect dominates, it is expected that people from higher income countries would have relatively higher WTP in money terms and lower WTV in time. For lower income countries, the opposite would hold. If the substitution effect does in fact dominate, then an index that weights countries’ WTP and WTV relative to their incomes can be used as a measure of intensity of support that is unbiased by the different income levels. However, if the wealth effect dominates, indicating that people from higher income countries have higher WTV because they can afford to spend more time volunteering, then it is difficult to derive a straightforward measure that allows CVM results

to be used as appropriate comparisons of intensity of support among cities with different average income levels.

Using WTV as a payment method for a subset of the respondent group is a unique application of the CVM to the Olympic host city context. In addition to testing if the wealth effect or substitution effect dominates in the labor for leisure tradeoff decision for the various respondent groups, WTV results can also be compared to WTP results to see if the WTP in terms of money or hours of time are significantly different. By assigning a monetary value to the average respondent's time, based on income information gathered, it can be tested if the method with which respondent's are asked to "pay" for the benefits they receive in the hypothetical market in the CVM scenario influences the amount, either in monetary terms, or hours expressed as a monetary value, they are willing to pay.

## **THE CVM**

The CVM has been used primarily in environmental and natural resource economics to measure the non-market value associated with environmental and recreational goods. The CVM is a stated preference technique, meaning that respondents are typically given questionnaires or interviewed in an effort to determine their WTP for a benefit that is not traded in a market. Its first use is traced by Hanemann (1992) back to a 1958 study by the US National Park Service funded study of the value of outdoor recreation generated by the Delaware River Basin in the eastern US. Use of the CVM to estimate the intangible value of environmental amenities exploded in the US in the 1980s. By the early 1990s the CVM was regularly used in US courts to assess damages of large scale pollution under the US Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Ward and Duffield 1992) with the most

noteworthy case being the settlement of the natural resources damage claim for the Exxon Valdez oil spill off the coast of Alaska. In recent years applications of the CVM to estimate intangible benefits has spread far beyond the field of environmental and natural resource economics. Dickie and Gerking (1996) used the CVM to study individuals' WTP to avoid skin cancer. *The Journal of Applied Social Psychology*, *The Journal of Risk and Uncertainty*, *Applied Economics*, *The Journal of Legal Studies*, *Urban Studies*, and *Sociological Methodology* are all among the many peer reviewed journals that have included articles relating to contingent valuation ("Recent Literature on Contingent Valuation Methods", 2001).

This method is well suited for the task at hand, which is to estimate the intangible benefit related to hosting the Olympic Games anticipated by local residents of potential host cities. Much like the outdoor enthusiast may experience improved economic well-being or benefit from a clean lake nearby, even though she does not directly have to pay to use the lake for boating, fishing, swimming, or just to enjoy the view, local residents of an Olympic host city might experience improvements to their economic well-being that go far beyond measurable improvements to their incomes or wealth. The finding that residents do experience substantial intangible benefit when their city hosts the Olympics and estimates that quantify that benefit lead to more accurate assessments of the true economic impact of hosting the Games as well as provide a justification for the expenditure of public monies on these efforts. Advantages of using the CVM in the context of this study are that residents generally understand the hypothetical good to be valued: the experience of their city hosting the Olympics, relative to their understanding of environmental amenities that are more commonly the focus of CVM studies. Residents of Chicago, Berlin, and San Francisco should all be familiar with what to expect if their city hosts the Olympics as opposed to other CVM studies that might require residents to

understand obscure measures of air quality and to estimate how graduated changes in air quality affect their lives and how much monetary value they place on those changes. Additionally, the payment methods used in the hypothetical markets in this study, WTP in monetary terms and WTV in time, are used by the Olympic Movement to finance and provide labor for Olympic hosts. While the nature of the CVM can often be abstract in an environmental context, in the context of a study of hosting the Olympics, often debated issues of how the hypothetical market is framed, what payment vehicle is used, or how the respondents' WTP is elicited are relatively straightforward.

A CVM study was done to estimate the intangible benefits of hosting the London Olympics in 2012 (Atkinson, Mourato, Szymanski, and Ozdemiroglu, 2008) and it is reasonable to believe that these studies will be more common in the future. It is normal practice for potential Olympic hosts to present survey evidence gauging public support for their efforts as part of the bid process. It is a natural extension, though not necessarily an appropriate one, to use the aggregate WTP of a bid city (which is the ultimate product of a CVM study) as a measure of intensity of public support. As the Olympic Movement progresses into the 21<sup>st</sup> century, it has become an aim of the IOC to combat “gigantism” of the Games and make hosting the Olympics more affordable so developing countries have a greater opportunity to put together successful bids (Kennett, 2005). It is inappropriate to use comparisons of the WTP of residents of countries with different economic conditions as measures of intensity of support because of the budget constraint issue. WTV is introduced in this study as a potential solution to this problem.

## **STRUCTURE OF THE DISSERTATION**

The chapters in this dissertation are organized as follows. Chapter 2 contains a literature review of the methods used to measure the economic impacts of sports in general and the Olympics in particular as well as the issues and controversies surrounding economic impact studies and their use. Studies and approaches to measuring the intangible benefits of sport are reviewed as well to provide a context for this study. Chapter 3 provides relevant background information on the Olympic host selection process and the three cities studied here. In Chapter 4, the theoretical foundations for this dissertation are presented and the methods used to carry out the study are presented in Chapter 5. The results are presented in Chapter 6 with discussion of key results in Chapter 7.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **INTRODUCTION**

The research in this dissertation is meant as an extension of the general approach to measuring the economic impact of sport events, facilities, or clubs. The following review of the related literature from the last several decades sets the context for that extension. The recent academic study of the economic impact of sport coincides with the United States' sport facility building boom that began in the 1990s. Howard and Crompton (2003) dubbed this the "Fully Loaded Era" of facility construction as the typical professional team sport facility evolved from a basic multipurpose facility to a specialized deluxe elaborate palace. During the last two decades virtually every major sport franchise in the US constructed a new facility or substantially upgraded an old one. New facilities were not built because the old ones were physically obsolete, but because they were commercially obsolete. The modern facilities were built with new revenue generating amenities such as restaurants, luxury suites, wider concourses and shopping areas. \$13.14 billion was invested in facilities for top level US professional sports between 1995 and 2003 with the government paying roughly 64% of the bill (Howard and Crompton, 2003). In many cases government assistance was contingent on voter approval and the economic impact analysis was born of the political campaigns to approve taxpayer financing for sport facilities. While the primary focus of this dissertation is to estimate the intangible economic benefits of the Olympic Games, similar principles are used to measure the economic impact of a sport facility, the existence of a franchise or club, and mega-events such as the

Olympics. Since this focus on economic impacts was spurred by the facility building boom in the US, much of the literature deals with the economic impact of new facilities or the impact of a sport franchise to its local economy. Academic interest appears to have been a response to numerous inflated economic impact estimates commissioned by proponents of new public facility spending. While the North American focus has been primarily on professional leagues, facilities, and teams, in Europe many cities have adopted strategies to host major international events. Because of this the focus of most European economic impact studies has been on major events and the conclusions often differ.

The primary methodology used in the economic impact studies is a macroeconomic, national income accounting approach where new expenditures generated by the facility are estimated and quantified and a multiplier effect is considered. Fundamentally it involves estimating the additional spending brought into the economy that can be attributed to the existence of the facility and then estimating how the effects of the spending are multiplied through the economy. The purpose of the economic impact analysis is to provide a justification for public spending on sport. Applying the same sort of analysis to sport franchises themselves and one-off events was a natural extension.

A more appropriate approach to measuring the economic impact of the Olympics is a cost-benefit analysis (CBA) approach, such as that described in Boardman, Greenberg, Vining, and Weimar (2006). This approach attempts to identify all of the effects of a proposed project, such as hosting the Olympics, and express them in monetary terms. This approach is more commonly applied to sport by European researchers and includes the measurement of intangible benefits that is the aim of this dissertation.

The work in this dissertation expands on the traditional accounting analysis, in the spirit of the CBA approach, by quantifying the intangible, non-market benefits of hosting the Olympic Games. The consensus among North American economists is that public spending on sport events is not justified by the amount of additional money attracted to the economy by the event. They have found in ex-post studies that actual impacts have been relatively small or even negative and much of the North American literature addresses reasons for the discrepancy between ex-ante and ex-post economic impact studies.

On the other hand, the European consensus is that major events do result in significant economic impacts. While European economists agree with their North American counterparts regarding ex-ante exaggerations of economic impact by event boosters, there are many ex-post analyses based on primary data from events that show significant economic gains (Barget and Gougnet, 2007; Preuss, Kurscheidt, and Schuette, 2007; Gratton and Taylor, 2000; UK Sport, 1997).

Comprehensive estimates of all effects, including intangible impacts, provide a more accurate picture of the overall impact of an event. Indeed many of the authors who are skeptical of the overall net economic benefit of sport express that intangible impacts may be enough to justify public spending on sport and the major purpose of this dissertation is to measure the intangible benefits using the CVM. To first provide the appropriate context, the traditional approach to economic impact studies is reviewed through the literature. The literature review follows a progression from the general study of the economic impact of events, differences between the North American and European perspectives on this issue, more specific approaches to estimating the economic impact of sport mega-events, particularly the Olympics, and finally to a review of the literature on the CVM and how it has been applied to sport as well as other



measures of intangible benefit. The literature review below is structured as follows; in the first section, *the economic impact of sports*, the general sport economic impact literature is examined including differences between the North American and European perspectives; *the economic impact of sport mega-events*, addresses Olympic and FIFA World Cup specific studies related to recent Olympic Games and bids; *estimates of consumer surplus in sport*, examines the literature behind the CVM that is used for this study, and surveys other attempts to measure consumer surplus of sport franchises, facilities, and events.

### **SPORTS ECONOMIC IMPACT STUDIES: COMMON MISAPPLICATIONS**

As mentioned above, a flurry of academic literature assessing the economic impact of sport events grew out of the United States' sport facility boom that began in the 1990's. Much of the literature seems to have been generated as a response to inflated economic impact studies publicized by supporters of public spending on sport projects. There is little, if any, disagreement among scholars that the tangible economic impacts of sport were being overstated and that often the measurable economic impact of sport is very small in relation to the general economy. Noll and Zimbalist's 1997 book, "Sports, Jobs, and Taxes: The Economic Impact of Sports Teams and Stadiums," is a collection of fifteen essays on the topic by many of the top sport economists including Baade, Rosentraub, Quirk and Fort. The underlying theme in these essays is that the economic case for the public subsidy of stadiums cannot credibly be based on the benefits to the local economy as measured by jobs, income, and investment (Noll and Zimbalist 1997). Both Baade (1996) and Rosentraub (1999) liken the public subsidies for sports to welfare transfers in the tens and hundreds of millions of dollars from the taxpayers to the wealthy athletes and far wealthier owners of sport franchises. They feel that public officials and

taxpayers are taken in by the promises of economic benefits that never materialize and that the primary beneficiaries of the public subsidies are the athletes and owners.

There have been a variety of methods used by neutral academics to confirm the economic impacts of sport which concluded that sport's impact on incomes and the macro-economy is relatively small or insignificant. Baade and Dye (1990) used a regression analysis of nine U.S. cities that gained a new stadium and/or a new professional baseball or football franchise between 1965 and 1983, to see if the existence of the new facility or franchise had a significant impact on the overall local economy. Controlling for population growth and overall trend they found generally that the presence of a new franchise or stadium had an uncertain impact on local incomes and an uncertain, perhaps even negative, impact on local development. Coates and Humphreys (1999, 2001) conducted a similar, though more broad, study covering the period from 1969-1994 and found evidence that existence and entry of sport into a community led to decreases in per capita income. They also tested whether local economies were hurt by the absence of sport during player strikes and lockouts in professional sports and found no evidence to support professional sport being missed by its local economies when it gets shut down for significant periods during labor disputes.

Coates and Humphreys (2003), and many others, cite that no retrospective economic impact study to date has confirmed the optimistic predictions of ex-ante studies. They list four potential explanations as to why the economic impact of sport is not as significant as ex-ante studies indicate. First, studies often count local spending in the impacts of sport when local spending typically substitutes for or crowds out spending that would have occurred without the sport event. Second, the existence of the sport could distract local workers from their jobs and reduce productivity. Third, public spending on sport may have caused the community to forego

other important, highly productive public expenditure. Fourth, unlike other enterprises, the money spent on professional sport goes to a small number of affluent individuals who typically do not live full-time in the local area and spend a smaller portion of their income locally than the typical worker.

Most professionally commissioned (as opposed to academic) economic impact studies are difficult to review because they are difficult to find. These economic impact analyses are usually conducted for a very specific purpose, often to generate support for public expenditure on a facility or event. The results are released and cited in the media and in public relations campaigns and the actual studies disappear (Howard and Crompton 2003, Hudson 2001). But, as mentioned above, the consensus among academic economists is that these economic impact studies overstate the benefits of the event or facility. Besides the obvious incentives for supporters of a project to overstate the economic impact, the main technical reasons for the exaggerations are summed up in Crompton's (1995) categorization of typical misapplications of commonly accepted practices and Hudson's (2001) review of a few of the offending studies.

Crompton (1995) identified both commonly accepted practices in conducting economic impact studies and typical misapplications that in practice lead to inflated economic impact numbers. Hudson (2001) studied 13 previously conducted economic impact studies, 12 of which were commissioned by pro-subsidy groups or governments interested in carrying out the subsidies, to see how well commonly accepted practices were adhered to. For his sample, Hudson selected studies that were available, as mentioned above studies usually disappear after their conclusions are publicized, that estimated the economic impact of a professional sports team, and that followed the typical economic impact study approach of estimating an initial

direct expenditure impact and determining how it circulates through the local economy.

Examples of commonly accepted practices along with Hudson's findings follow.

### **Failing to distinguish between net and gross expenditures**

The accepted practice is to count net as opposed to gross expenditures, with net expenditures defined as additional spending generated by the project. Many studies aggregate all of the spending associated with the event without distinguishing if the spending would have occurred regardless of whether the event occurred or not. This is a misapplication because much of the spending associated with a sport event merely shifts spending patterns within the economy. US television coverage of the 2008 Union of European Football Associations (UEFA) European Championships on the Entertainment and Sports Programming Network (ESPN) network included a report from a German city on a weekend evening when the German national team was playing. A movie theater owner replaced the movies with broadcasts of the match explaining that everyone in the city would be following the match and if he played the movies, the theater would be empty. If he did not change his program, the sport event would have resulted in a loss of income for the theater owner. Should the theater owner count any revenue he generated from the football fans as a windfall from the European tournament? He should count it only if it surpasses what he would normally earn by showing movies. If the revenue is similar to a normal, weekend movie night, then the tournament had no effect on his business, due to his strategic move to show the match rather than movies. However, if the revenue generated by the football fans is less than what he normally receives on a weekend night, while playing football did generate spending, we would have to say the impact of the tournament on his business was negative. It resulted in a net shift of spending away from his theater. This is a relevant example because economists agree that spending on the sport event by residents living

within the economy is just a shift in spending that is made out of local consumers' recreation and leisure budgets. In the ESPN report, the football telecast drew people together in the bars and public areas to watch the match while spending money on food and drink, but the movie theaters, shops, and restaurants and bars without televisions were empty when they normally would be bustling. So the event shifted spending among recreation and leisure options within the economy.

Though it often is counted, spending by locals should not be included in the initial economic impact generated by an event. But proper application of accepted economic impact study practices is not just a matter of defining whether spending was made by a visitor or not. The reason for a visitor's trip must also be determined. If a visitor is in the area on business or holiday whether or not the event would have occurred, he or she should be treated as if they were a local resident with the assumption that any of their spending related to the event is recreation spending that would have occurred in any case. Ideally, a proper economic impact study accounts for various categories of people such as those who extended a trip, those who would have visited the city next week but switched to this week because of the event, those who left the city to avoid the event, etc. (Preuss, 2004).

The misapplication of this principle can obviously lead to significant exaggerations in the overall economic impact of an event especially considering that each exaggerated dollar above the net increases in spending that is counted is then multiplied by a multiplier, which is described below. The majority of the studies examined by Hudson (2001) clearly used gross spending rather than net spending figures. To be clear, the existence of the event in the area will shift spending within the economy rather than bring new money into the economy and result in economic winners and losers. This may account for part of the motive behind some Games

boosters and interest groups supporting the event. They can improve their economic situation by diverting spending to themselves and away from others in the economy even though the diversion of spending and change in activity will have no net impact on the economy as a whole.

Baade and Matheson (2002) note that most economic impact studies fail to explore how the spending of residents is effected by hosting the event and that the failure can be a significant oversight. Preuss, Kurscheidt, and Schütte (2007) were able to use survey results from [www.lastminute.de](http://www.lastminute.de) that estimated 1% of Germans considered leaving the country during the 2006 Fédération Internationale de Football Association (FIFA) World Cup, an example of estimating runaways by surveying residents before or after the event. Runaways are residents of the area who leave because of the event. The fact that large majorities of residents support bids in potential host cities (Preuss and Solberg, 2006) and that Atkinson, Mourato, Szymanski, and Ozdemiroglu (2008) found little evidence for negative WTP in their London study indicate that the number of runaways is likely quite low in an Olympic context. It seems that very few people are typically leaving and large majorities in all three cities in this study indicated that they would spend money on attending the Games and purchasing souvenirs, so there is little evidence that local residents actually restrict spending or spend elsewhere as a result of an event being hosted in their home city. However, if their spending is more likely to leak from the economy during the event than it would otherwise, that would be a negative effect on net direct spending and it is possible if they are more likely to make purchases from people who are not permanent members of the community.

## **Inaccurate cost determination**

Related to the misapplication of counting gross spending instead of net increases to spending is failing to subtract or account for some or even all of the costs involved. When determining economic costs in the typical cost-benefit analysis, it is important to consider the opportunity costs. If the government devotes \$50 million in taxpayer money to building Olympic facilities, then the next best option the money could have been used for, which could be anything from building a school to a tax reduction, is foregone and must be considered as a cost. Any number of alternative structures might have been built with the money creating a similar impact (Hudson 2001). It is often likely that alternative structures could actually have a larger economic impact in that they might align better with the local economy and have a longer useful life than an Olympic sport facility. Baade and Matheson (2002) characterize much of the spending on facilities as spending that is “alien” to the host economy, in that without the Olympics it would not have occurred and that the facilities serve little purpose beyond the Games. According to the Baade and Matheson, it is misleading to attribute government capital spending on Olympic facilities and infrastructure as new economic benefits arising from hosting the Olympics without considering what the next best option for that spending would be. Failure to do so, at best, overstates the net benefit of hosting the Games and at worst represents a net cost as a benefit.

Also, external costs imposed on residents as a result of the new sport facility, club, or event must be considered. These might include increased traffic, noise, or litter. Much like counting gross spending rather than net increases to spending, failing to account for the costs of the event leads to an exaggerated initial impact that is then multiplied (as explained below).

Neither opportunity costs nor external costs were addressed or accounted for in any of the 13 impact studies analyzed by Hudson.

### **Failing to choose an appropriate multiplier**

The choice of a multiplier can have a profound impact on an economic impact study's result as the initial injection of money into the economy is multiplied by a factor to determine an overall impact. In practice, multipliers are often borrowed from other studies due to the expense and complexity of calculating them. Study authors may cite a range of "realistic" multipliers which result in an estimate of a range of potential overall economic impact numbers which can lead to news reports such as "project will result in up to \$XXX of economic benefit for the local economy!"

There are several methods used to calculate multipliers and Hudson (2001) cites two; first an economic-export based calculation and second, calculating multipliers based on an input-output analysis. In using an economic based calculation, researchers would estimate a marginal propensity for residents to consume locally and pay local tax on the additional income they received due to the injection of money in the local economy. For each extra dollar a local resident receives, a portion will be spent locally on consumption and local taxes, the rest is assumed to leak out of the local economy. If, for example, 40% of each dollar generated by the sport event is spent locally (on consumption and taxes) the multiplier will equal  $1/(1-0.4)$  or 1.67 implying that each extra dollar that the sport event initially attracts into the economy will result in an overall increase of \$1.67 to the local income.



In the example, the 40% represents the marginal propensity to consume (MPC) additional income. The formula determining the multiplier is below.

$$(2.1) \textit{Expenditure multiplier} = 1/(1 - MPC)$$

Using the input-output method requires a detailed model of the sectors of the local economy and the linkages between sectors. Input-output analysis provides both a multiplier for the macro-economy being examined and industry specific multipliers as well that reveal how individual sectors of the economy are affected by the initial impact. In the US, the Department of Commerce maintains input-output models for each state and more recently the Minnesota IMPLAN Group maintains input-output models down to the postal code level. Use of independently derived input-output models to generate multipliers does take researcher discretion out of the mix to some degree and typically results in a more accurate, justifiable multiplier.

Misapplication of a multiplier can greatly exaggerate the economic impact of a sport facility, club or event but the average journalist, voter and even many public officials fails to look beyond the bottom line, total economic impact figure reported in the headlines. UK Sport, which conducts economic impact studies of all international sport events hosted in the United Kingdom (UK) takes the approach that the multiplier describes the defined local economy rather than the event and foregoes applying a multiplier to the initial economic impacts they measure (U.K. Sport, 1997). An example that illustrates why the UK Sport approach makes sense is Watkins Glen International, a motor sports road course in Watkins Glen, New York. The track has been in existence for 60 years and today hosts three main motor sport events every summer

drawing over 100,000 fans who are typically visiting from somewhere else and who stay for several days (DePerno, Han, Heisey, and Bahng, 2008). It cannot be argued that the facility itself attracts significant amounts of spending to the area and has for years. However, the town of Watkins Glen is very small, with a population of 2,146, and very few people live in the local area according to the 2000 U.S. Census. Surrounding Schuyler County only has 19,000 residents including those in Watkins Glen. The size of the local economy remains small despite the money being generated by the track. Here is a case where the local economy is small and unable to capture much of the spending generated by the major sport events that take place there. Does that mean the races at Watkins Glen do not generate significant economic activity? They do, but most of that spending passes through the local economy, which would likely be represented by a multiplier smaller than one, with much of it ending up with the track owners, International Speedway Corporation, which is headquartered in Florida, and its stockholders. For Watkins Glen and Schuyler County officials, a properly done economic impact study would have value, but only in helping devise strategies related to capturing and retaining more of the money that is passing through their economy.

Taking into account that the multiplier varies with the size of the host economy as illustrated in the example above, in the thirteen studies examined by Hudson, four used multipliers of 2.5 or greater with two using multipliers of 3.3, while most researches find a multiplier of 2.5 at the high end of acceptability (Mulkey, 1978). Various methods of determining a multiplier were used, but a significant number of studies clearly used an inflated number.

## **Improper definition of geographic area under consideration**

It is important to define the appropriate geographic area under consideration and adhere to that definition throughout the study. This is a key in two considerations. First, when categorizing people as visitors or residents, there has to be a geographic designation to make the proper determination. Second, when determining the appropriate multiplier and how money initially generated moves through the economy, there has to be a specific geographic designation to determine if money is remaining in or leaking out of the local economy. Note that the smaller the geographic area under consideration is, the greater the number of people that can be considered visitors is. But the smaller the local economy is defined for purposes of determining a multiplier, the greater amount of money will leak into the larger, outside economy. Studies have been carried out that purposely exaggerate the economic impact by defining the geographic area small when categorizing local consumers, but large when determining the multiplier and overall economic impact. Indeed, Crompton (1995) cites a study of the Commonwealth Games in Canada where the relevant geography was defined in precisely that manner.

## **Summary of Hudson's results**

The common misapplications catalogued by Crompton (1995) are shown by Hudson (2001) to be commonly used in practice. This is particularly troubling since Hudson's (2001) survey was limited to the economic impact studies that were available several years after they occurred. As noted above, after the headlines and the news reports, impact studies tend to disappear and conveniently avoid impartial investigation. Even economic impact studies that properly apply the principles that are generally accepted among economists can be subject to the selective, and deceptive, release of figures by those who commissioned the study. A researcher can accurately

categorize gross and net spending generated by the event and the commissioners of the study can publicly release gross spending figures described in a way that is technically accurate, but deceptive to the general public. All of the misapplications in the examples above, when combined together can give an entirely misleading and grossly exaggerated picture of the economic impact of an event. Much of the literature on this topic is concerned with describing accurate methodology, pointing out where it is flawed, and describing the consequences of misapplying accepted methods.

While most of the debate has been on the quantification of the tangible economic benefits of sport, the consensus on the intangible benefits is that they exist and are possibly quite significant but difficult to measure. Indeed, Noll and Zimbalist (1997) state that while they and others find little evidence to support the claims of increased incomes or jobs due to sport, “the range of potential economic effects is far broader: it encompasses regional and national wealth, as well as *the welfare of sports fans* and the distribution of income” (emphasis mine). In this dissertation I focus away from the debate, which for all intents and purposes is settled, on sport’s tangible effect on local economies in terms of increasing income and jobs and toward the effects on the welfare of local residents and how it would be affected by their home city hosting the Olympic Games.

## **DIFFERENCES IN EUROPEAN AND NORTH AMERICAN PERSPECTIVES**

There is a difference between the North American and European perspectives on the economic impact of sport. While all agree that ex-ante economic impact studies commissioned by boosters often exaggerate economic benefits primarily due to the misapplications noted

above, European researchers have typically found significant net benefits associated with events. Whereas the ex-post studies done by the North American economists were done at a broad, macroeconomic level and did not use primary data, there are a number of studies from Europe that do use primary data (Barget and Gouguet, 2007; Preuss, Kurscheidt, and Schuette, 2007; UK Sport, 1997) and conclude that there are substantial economic benefits derived from sport. While North American economists tend to be skeptical of the economic benefit of sport on host communities, European researchers are much more sanguine on the topic. The difference in perspective may be largely attributed to the nature of the sport being considered. While North American researchers primarily focus on facilities, and franchises in professional leagues with closed membership, the European focus is on public strategies built around hosting major events. Much of the net tangible benefit is often attributed to spending by visitors to the event and major international events are much more likely to draw visitors to an area than a permanently based professional sports franchise. As stated in Gratton, Shibli, and Coleman (2006), “it is not so evident that European style hosting of major sports events is not economically beneficial to host cities.”

Gratton, Shibli, and Coleman (2006) reviewed ten economic impact studies of international events conducted by UK Sport. All of the studies were conducted using the same methodology that avoided the common misapplications cited above. Of the ten events, five led to additional expenditures of more than £1.45 million. They found that most events drew a greater number of visiting rather than local spectators and that spectator driven events had the highest economic impacts. Using the narrow, accounting based approach and avoiding the common misapplications detailed above, the UK events studied produced significant monetary benefits.

There are more European studies that take a comprehensive CBA approach to measuring the benefits of hosting a sport event. Clegg (2005) and Barget and Gougnet (2007) cited below estimate tangible net economic inflows as well as intangible benefits associated with the London 2012 Olympics and the 2007 Rugby World Cup respectively. Gratton, Shibli, and Coleman (2006) advocate a 'balanced scorecard' approach that considers such benefits as enhanced image, increased participation in sport, and other legacy benefits. Preuss (2007) categorizes soft and hard structures that can be changed (improved) by hosting an event in a way that leaves lasting benefit or legacy. Soft structures are knowledge, network, and cultural goods structures and hard structures are the physical infrastructure that is upgraded to host an event. While all economists acknowledge the existence of economic benefits associated with sport that go beyond tangible increases in new money into an economy, the European approach more systematically attempts to categorize and measure all of the benefits.

## **THE ECONOMIC IMPACT OF SPORT MEGA-EVENTS**

There are several studies that assess the tangible economic impact of sports mega-events including the Olympic Games, FIFA World Cup, and the National Football League (NFL) Super Bowl. Preuss (2004) takes on the ambitious task of attempting relevant comparisons of summer Olympic Games from 1972 to 2008. Some of the unique and fascinating facets of studying the effects of Olympic Games are that they occur infrequently in different parts of the world. Each event occurs in a somewhat unique economic, political and social climate. Preuss tries to isolate macroeconomic effects by converting and standardizing data so relevant comparisons across Games can be made. The scope of his book traces a fascinating time in Olympic (and sport)

history that captures the onset of Olympic gigantism. Between 1972 and 2008, the Olympics have evolved from an event that formerly used stamp, coin, and lottery programs as the primary sources of funding, to the 1984 Games which only Los Angeles was interested in hosting and only on their terms, to today's climate with many aspiring Olympic host cities and the inspiration for this dissertation. In the last two decades, bidding to host the Olympic Games has become a never ending business without break in the calendar. As soon as London was selected to host the 2012 Games in 2005, cities were positioning themselves for the 2016 bid to be decided in 2009. Indeed, a project such as this dissertation would have been hardly possible twenty years ago as it would have been difficult to find three cities that were seriously considering hosting the Olympics. Preuss' work tells the story of this evolution of the Games through the framework of the accepted economic analysis, cost-benefit framework, while noting the limited nature of describing the economic, social, political and marketing impact of the Games if one looks solely at the tangible costs and benefits.

An important contribution of Preuss (2004) is that he stresses that in every Olympics since 1972 the OCOG has ended up with an operational surplus. This is contrary to the public perception that some Olympic Games have been financial disasters for their host cities. He makes the important distinction between operational budgets and capital investments. In cases where host cities have experienced financial troubles it has been due to capital investments in infrastructure. In many cases these capital investments are intended for use in the decades that follow the Olympics. To attribute their entire cost to the two-to-three weeks of an Olympic festival is inappropriate.

Matheson (2006), Owen (2005) and Porter (1999) examine the Olympics and other mega-events, such as the FIFA World Cup and the Super Bowl in the U.S., using the same type of analysis as

the above general economic impact analysis of sport. Matheson (2006) writes that to host Olympic Games that meet modern IOC standards and have adequate security, it is a virtual necessity to rely on significant taxpayer subsidies. Because of the necessity of subsidies, the dynamic exists that supporters of the event will exaggerate its potential economic impact. As evidence of the ad hoc nature of ex-ante impact studies he cites difficult to believe conclusions, such as the \$24.8 billion projected economic impact of the 2002 FIFA World Cup on the co-host nation Japan, disparate estimates of the same event, and the “missing study syndrome” mentioned above. Matheson cites the same methodological misapplications noted above for the exaggerations; measuring gross and not net spending, not accounting for leakages, ignoring costs and inflated estimates of multipliers. He compares several ex-ante with ex-post estimates of economic impact studies as evidence that ex-ante studies greatly overstate minimal or non-existent tangible benefits. I borrow from and add to his tables summarizing many of the studies, focusing solely on Olympic studies for the purposes of this paper.



*Table 2.1: Ex-ante Olympic economic impact studies*

<b>Event</b>		<b>Year of Games</b>		<b>Impact</b>		<b>Author</b>
Atlanta		1996		\$5.1 billion 77,000 jobs		Humphreys and Plummer
Sydney		2000		\$6.3 billion 100,000 jobs		Arthur Andersen
Vancouver		2010		\$10.7 billion (Canadian) 244,000 jobs		B.C. Ministry of competition, science and enterprise and InterVISTAS consulting
Houston (bid)		2012		\$4.3 billion		Airola and Craig
Washington- Baltimore (bid)		2012		\$5.3 billion		Fuller and Clinch
Los Angeles (bid)		2016		\$7 billion 68,000 jobs		Economics Research Associates

*Table 2.2: Ex-post Olympic economic impact studies*

<b>Event</b>		<b>Year</b>		<b>Impact</b>		<b>Author</b>
Los Angeles (summer)		1984		5,043 jobs		Baade and Matheson
Atlanta (summer)		1996		293,000 jobs		Hotchkiss, Moore, and Zobay
Atlanta (summer)		1996		3,500-42,000 jobs		Baade and Matheson

Porter (1999) previously addressed the ex-ante projections of mega-events by studying the annual Super Bowl in the US. He used ex-post regression analysis to test for increases in sales during the expected impact of the Super Bowls and found that little, if any, of the expected additional sales were generated. Porter's conclusion is that the sales generated by the event merely substituted for sales that would have occurred in any case. In the situations where sales were greater, they were still far less than projected and could likely be accounted for by higher prices during the event. Unless there is excess capacity in the city, sales generated by mega-events can substitute for and crowd out normal sales. This is a salient point that is often overlooked by cities considering hosting mega-events. It is crucial to consider how much excess capacity exists when making projections of net tangible economic benefits. In the profiles of the cities studied below, Berlin, Chicago, and San Francisco all regularly draw tourists and visitors without the Olympics. How many more tourists can they accommodate? The capacity would seem to be a ceiling for realistic influx of tourist spending numbers.

Baade and Matheson (2002) used an econometric study of 57 Metropolitan Statistical Areas (MSAs) in the United States over a period that included both the 1984 and 1996 Olympic Games in the U.S. to estimate employment growth in the MSAs as an ex-post test for evidence of a positive effect on employment of the Los Angeles and Atlanta Games. They found no significant effect on employment from the Olympics. Any jobs that were created were transitory in nature and there may have even been long-term job loss due to the Olympics. They attribute the potential long-term disadvantages to the fact that public expenditures on the Olympics might represent expenditures on an alien industry that does not fit well with the rest of the economy. They argue that public expenditures are most effectively suited to projects that complement the existing economy. The Olympic Games, by their nature, are so large and unique that they do not complement the existing economy as well as alternative expenditures might. They estimated a short-term transitory employment effect that had no significant long-term consequences in Los Angeles after the 1984 Games and that hosting the Olympics in 1996 diverted Atlanta from a higher growth path than it would have achieved otherwise. It must be noted that both the 1984 Los Angeles Games and the 1996 Atlanta Games were atypical in terms of facility and infrastructure investment when compared to other Olympic Games (Preuss, 2004) so Baade and Matheson's (2002) results may not be good indicators of the economic impact of other Olympic Games. Preuss (2006) illustrates that the overall economic impact of a specific Olympic Games depend greatly on the structure the city needs for further development. Compared to other Olympic hosts, he states that because Los Angeles and Atlanta did not gain new structures, they did not experience the long-term benefits that other cities have.

Matheson (2006) and Preuss (2004) acknowledge the importance of intangible benefits. Preuss lists the motivation of the population to take part in sport, thus improving national health,

potential new political relations, enhanced national and local pride, deeper understanding of disability leading to improvement in the lives of disabled citizens and unique public relations opportunities as some of the intangible benefits of hosting the Olympics. Matheson cites difficulties in measures and studies such as that by Carlino and Coulson (2004) that attempt to measure intangible benefits using compensating differentials (discussed below). While Matheson (2006) seems dismissive of the prospect of successfully measuring intangible benefits, Preuss cautions that ignoring intangible (and other) effects when expressing the economic impact of Olympic Games leads to a result with very limited meaning.

### **ESTIMATES OF CONSUMER SURPLUS IN SPORT**

Several studies that estimate intangible benefits of sport are surveyed below. One by Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) uses the CVM to estimate the intangible benefits to the residents of the United Kingdom of hosting the 2012 summer Olympic Games. Barget and Gouguet (2007) use the CVM as part of a measure of social utility in a comprehensive study of the impact of the 2007 Rugby World Cup in France. A study of the 2006 FIFA World Cup by Heyne, Maennig, and Suessmuth (2007) uses ex-ante and ex-post CVM surveys to estimate the monetary value of the experience of hosting the event to the residents of Germany. Mondello, Johnson, and Whitehead (2007) studied the intangible benefit of the NFL's Jacksonville Jaguars and a hypothetical NBA franchise to the city of Jacksonville, Florida. Owen (2006) used a standard CVM application to estimate the intangible value of the major professional sports franchises in the United States states of Michigan and Minnesota. Two of the original applications of the CVM to sport, Johnson, Groothuis, and Whitehead (2001) and

Johnson and Whitehead (2000), studies of US college and pro sport franchises and facilities are also surveyed. Finally, two studies are reviewed that utilize alternative methods to estimate consumer surplus, Carlino and Coulson (1989) which used compensating differentials to estimate the benefits to a city of hosting an NFL team and Irani (1997) which used demand curve estimates and price data to estimate consumer surplus associated with Major League Baseball (MLB) facilities.

The United Kingdom (UK) Department for Culture, Media, and Sport conducted a comprehensive economic analysis of London's bid to host the 2012 Olympic and Paralympic games. Presented by Madeleine Clegg at the 5<sup>th</sup> annual International Association of Sports Economists in 2005, this study is the first that included a contingent valuation estimate of consumer surplus for the United Kingdom as a whole. The overall study is broken into three parts and conducted by three separate entities. There is a macroeconomic study of the net tangible impact conducted by Blake (2005), a CVM study estimating the intangible net benefits that UK citizens would derive from hosting the Olympic Games was done by EFTEC consultancy firm. This study and data later appear in Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008). Also, Price Waterhouse Coopers was contracted to examine an array of other factors such as environmental and health effects. The end result was a meta-impact study that included tangible benefits, intangible benefits, and other effects.

The net tangible study was done using standard methods. Total net additional expenditures were estimated and a computable general equilibrium (CGE) module was used to determine the multiplier effect and to predict the impact on specific sectors of the economy. The CGE model was used to calculate the UK and London 2012 GDP first without the Olympics and then with the Olympics with the difference being the net benefit. Blake estimates that from 2005

to 2016, the London GDP will be £5.9 billion greater and the UK GDP will be £1.9 billion greater as a result of hosting the Olympics. This indicates that significant resources will be drawn from around the UK to London because of the Olympics, but that the entire country will see a net gain in GDP. The study estimates that the major portion of extra income for London will occur in the years leading up to the Olympics with a £3.4 billion increase in GDP from 2005 to 2011. The overall UK economy will see the greatest net increase in GDP during the event in 2012 with over half of the total £1.9 billion increase being accounted for in the Olympic year. This is consistent with Preuss' (2004) description of a gradual build up of economic activity in preparation for the event, then a large spike during the Olympic year that recedes after the Games.

EFTEC economic consultancy conducted the CVM study by conducting interviews with 588 residents in London, 94 in Manchester, and 91 in Glasgow. The strategy was to focus on London residents but to also get a useful sample of those outside of London. The hypothetical payment method was an increase in Council Tax over a ten year period, ostensibly to capture the benefit before, during, and after the Games. Researchers took pains to thoroughly detail the benefits and the costs and explain the opportunity cost of hosting the Olympics to respondents. They also reminded the respondents that they have a budget constraint and avoided potential “starting point” bias by using open ended responses. They found that 80% of the residents, both Londoners and others, supported the Olympic bid. Londoners were willing to pay an average of £22 per year for 10 years and those outside of London were willing to pay an average of £12 per year for 10 years. Aggregating the WTP numbers to get an overall estimate of consumer surplus, they estimated a £3.2 billion increase in consumer surplus for the residents of the UK as a result of hosting the Olympic Games.

The CVM is a natural fit for estimating consumer surplus gains associated with the Olympics or any other popular sport event. As described above, the CVM originated in environmental and natural resource economics where it might not be clear to respondents what they are trying to evaluate. Many people are not familiar with how to assess environmental goods such as air or water quality nor do they readily understand measures of changes in levels and what they mean. There are also people who feel a strong sense of stewardship over the environment. These people might feel that a price cannot be put on a stream, protected forest, or an endangered species. In that context, researchers are justifiably concerned with trying to help respondents make informed responses without introducing bias into the process. EFTEC appears to have followed the standard environmental economics procedure. It is argued here that many of the potential biases and concerns related to applying the CVM in the environmental economics context are not significant issues in the sports economics context and especially in studies related to the Olympic Games.

Taking the time to explain the benefits, costs, opportunity costs, and budget constraints properly virtually requires the researcher to use personal interviews to gather data. Whether in person or by phone, these are far and away the most expensive methods for conducting a CVM study. Adding that information into a survey by post, an email survey, or a public intercept survey would likely reduce the response rate as potential respondents decide that the task is too large for them to bother and the researcher could not be sure if the respondent read the background information or not. While that background information is often crucial when studying the benefit of increased air quality or decreased noise pollution, the Olympic Games are one of the most widely known events in the world. Respondents already have long-held personal understanding about what the costs and benefits of staging the Olympics are and even if that

personal understanding is not entirely accurate it is unlikely to be changed during the course of responding to a CVM survey.

The same likely holds regarding reminding respondents of their budget constraint. If a study is concerned with the value respondents place on taking measures to ensure the survival of polar bears, some people are likely to overstate what they are able to pay because of a strong emotional attachment or a moral sense of obligation. While the essence of the Olympics is excitement and emotion, there is no evidence to indicate that respondents feel so obligated to have their city or country host the Olympics that they have to be reminded that they have limited resources with which to support a bid. In the EFTEC, study a large majority of respondents supported the London Olympics, but it is doubtful if their support was of the nature that many felt a strong, moral obligation to make sure that London hosts the Olympics in 2012 or that disaster would follow if they failed to win the bid. Neither the existence of the Olympic Games nor London hinges on London winning the bid and the long-term future for either will likely be relatively unaffected by whether or not the Games are held in London in 2012. This is a very different characteristic when compared to environmental amenities. If, for example, a protected wetlands is destroyed in development, that is usually a permanent change that has long-term consequences.

Taking the same kind of pains that environmental economists do when eliciting WTP estimates from survey respondents is not just inefficient, but could possibly introduce bias into the results. During personal interviews respondents often look for interviewer cues and try to accommodate the interviewer. They are also more likely to give answers that they think are more socially acceptable. Additionally, when interviewers take pains to give background information to respondents there is a tendency for listeners to gravitate toward the first item



mentioned. For example, if the interviewer mentions costs first, the respondent will give more weight to the costs than they would have if benefits were mentioned first. Surowiecki (2004) claims that people often give too much consideration to information that is provided to them in situations that call for them to make a judgment. He cites, as an example, a classroom experiment to illustrate the effect. Students were first asked to estimate the number of jelly beans in a jar. As is the normal case with these experiments, and the theme of Surowiecki's book, the average estimate was very accurate, within 3% of the actual total and only one individual was more accurate than the group's average. When students were asked to guess the number of jelly beans but given relevant background information such as reminders that the jar is plastic, not glass, and that there was air space at the top of the jar, the group's average estimate was off by 15%. The result indicates that the additional information, though accurate and potentially relevant, introduced biases into what was a straightforward estimation of the number of jelly beans in a jar. This indicates a trade-off that is relevant to most CVM studies, but should not apply to estimating the intangible value of hosting the Olympic Games. In most CVM studies concerning environmental issues the benefit of giving respondents background information describing the good in question, how it is measured, and what different levels of that good can mean, outweighs the cost of potentially introducing bias. In studies concerning the Olympic Games, the balance of that tradeoff reverses. The residents of any city big enough to consider hosting an Olympic Games know enough about what a large event entails that anything a researcher might try to provide as background information is more likely to introduce a biased answer than produce an accurate one.

The EFTEC researchers cited a desire to capture the consumer surplus before, during, and after the Games. It is questionable whether that can be done in a meaningful way. The

consensus in the CVM literature is to use a payment method that “commits” the respondent to paying the amount. The distinction is made between voluntary and enforceable payment methods with the notion that people will overstate a voluntary amount. Again, this is likely more of an issue with other amenities and, indeed, Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) found no statistical difference between forced and voluntary hypothetical payment vehicles. The WTP and consumer surplus numbers were not reported as before, during, and after figures like the tangible improvements to GDP were. It is hard to see how a researcher would elicit when consumer surplus is enjoyed in any meaningful way or how a respondent could quantify that. The questions and the interviewing process would likely be far too confusing. In effect, interviewers would be asking, “how much would you be willing-to-pay in extra Council Tax in 2005 if it would bring the Olympics to London?” The respondent would think about it, give a figure, and the next question would be, “how much would you be willing-to-pay in extra Council Tax in 2006 if it would bring the Olympics to London?” And so on. If that is a workable approach, why would the time period be limited? If respondents could reasonably discern different feelings of benefit between 6 years out, 4 years out, and 3 years after, why not keep asking until they say they would not be willing to pay any more?

Despite the technical issues with how the study was described, the results appear to be in line with what one would expect, with the entire country’s intangible benefit being 1.7 times greater than the country’s tangible increase in GDP. As noted above, the consensus is that the intangible economic benefit definitely exists and is most likely significant and perhaps outweighs the tangible benefits. These results are consistent with that notion.

Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) used the CVM described above as the basis for their publication. Their description of the study includes face-to-face interviews

with 602 London residents, 152 residents of Glasgow and 151 residents of Manchester. They also describe focus groups and extensive field pilots in the development of the study, which yielded results that support the methodological approach taken in this dissertation. The ultimate estimate of the intangible benefit for the entire UK of just below £2 billion (from above) compares to the planned public expenditure at that time of £2.375 billion, not quite enough to justify the public spending solely by intangible benefit, but fairly close to it.

As argued throughout this paper, the CVM is particularly suited to studies of the intangible benefits of the Olympics primarily because the general public, especially in a city that is a potential Olympic host, is very aware of what the Olympics entail relative to other applications of the CVM. For many CVM studies, the goods being valued are abstract and unfamiliar, the Olympics are well known and in large cities the costs and benefits of hosting a large event with significant visitors are also relatively well known. In practice, this means that the CVM approach and survey instrument used can be much more straightforward than in other contexts. Atkinson, Mourato, Szymanski, and Ozdemiroglu's (2008) focus groups and field pilots support this notion. They found among their interviewees a generalized awareness and familiarity with the Olympic Games, how they operate, and what type of intangible effect they generate.

They also addressed the potential for negative WTP. Negative WTP is the equivalent of WTP to preserve the status quo. In reality, some portion of the citizenry demonstrates a negative WTP as is evidenced by groups such as London's Taxpayers' Alliance, which hosts a 2012 Watchdog website (<http://tpa.typepad.com/2012/>). If people are willing to spend time, energy, and resources opposing the Games, the amount they spend can be construed as their WTP to preserve the status quo. Given the significant majorities of the public who typically support the

Olympic Games, the approach taken in this dissertation is to assume that any negative WTP is quite low and fairly insignificant. Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) tested for negative WTP among their focus groups and in their field pilots and found no evidence for it. People who did not support the Olympics simply did not support the Olympics and they were not willing to pay anything in support of the Games. The intensity of their non-support did not rise to the level of indicating a WTP to preserve the status quo.

The hypothetical payment method used by Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) was a payment card consisting of increased council tax levels for London residents. A payment card asks respondents how much they would be WTP and provides a list of options, such as £0-£10, £11-£20 etc. While the approach and how the options are ordered can potentially produce bias by suggesting seemingly appropriate answers, in practice it typically leads to more reliable results since respondents are notoriously poor at answering open-ended WTP questions (Whitehead, 2000). Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) used the same payment card approach but replaced the tax increase with a willingness-to-donate to bring the Olympics to London for respondents outside of the host city. This was an appropriate approach because while it is conceivable that a London council tax could be used to help pay for the Olympics, it is not realistic that Glasgow and Manchester council taxes would be raised for Olympics in London. Voluntary donation payment mechanisms are often avoided because they are believed to provide incentive structure for respondents to overstate their WTP although Champ (2002) notes that voluntary payment mechanisms are useful in the proper context. Through piloting of the survey in Glasgow and Manchester they were able to confirm the credibility of the voluntary payment mechanism. Voluntary donations as a payment mechanism are used out of necessity in this dissertation. In comparing the WTP in terms of

money or time, there is not an appropriate enforced payment mechanism, such as tax payments, to use to enforce volunteering of time. Also, when comparing WTP across cities, it is likely that a voluntary donation payment method provides a stronger basis for comparison. The evidence against using a voluntary payment method is inconsistent and it is doubtful that in a hypothetical context the enforcement behind a hypothetical tax encourages respondents to be any more thoughtful than they would be when considering a hypothetical donation. Also, by using a hypothetical tax, researchers introduce a situation where the respondent is more likely to provide not her WTP but the amount she thinks it is appropriate for everyone else to pay.

In addition to the CVM estimate of intangible benefits, Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) asked focus groups to list potential intangible benefits and costs and asked respondents to rank them in order of significance. This was an effective method to introduce relevant background information to the respondents without introducing bias and it also provides evidence to assess how aware respondents are of the intangible costs and benefits. The rankings were different between the three cities, but in London respondents ranked the intangible benefits in descending order; motivating/inspiring children, Uniting people/feel good factor/national pride, legacy of sports facilities, environmental improvements, improving awareness of disability, promoting healthy living, and cultural/social events. The intangible costs were ranked in order of significance as; transport delays, increased safety and security risks, crowding, local disruption during construction, increased risk of petty theft, and excessive media coverage.

Barget and Gouguet (2008) conducted a comprehensive study of the 2007 Rugby World Cup for the host French government using a cost-benefit analysis that included estimating net social utility. For the entire nation, they estimated a direct, tangible economic impact of greater

than €538 million and a net social profit greater than €113 million. In measuring social benefits they categorized consumer surplus as a measure of use value and used the CVM to estimate non-use values. They also measured specific impacts for regions within the nation, counting French nationals who visited different regions as regional visitors bringing fresh money to the regional economy. The Barget and Gougnet (2008) study is an example of the comprehensive approach advocated here. To get an accurate assessment of the impact an event has, far more than the amount of fresh money injected into the economy must be estimated. Residents' increases in consumer surplus and non-use value as well as enhanced image and tourist legacy must be considered. In France, the 2007 Rugby World Cup contributed to a 30.3% increase in registered rugby participation across the nation, so there was also the benefit of sport development in addition to other benefits. While the study authors lament the lack of funding to undertake these valuable, comprehensive impact studies, note that there are methods like the CVM that allow for estimates of intangible benefits and as methods and technology improves it will likely become increasingly more feasible to conduct comprehensive studies.

Heyne, Maennig, and Suessmuth (2007) used CVM surveys of 500 German residents before (March 2006) and after (October 2006) the FIFA World Cup hosted by Germany in June and July of 2006. They found that the number of people willing to make voluntary contributions and the average amount people were willing to contribute increased significantly between the first and second surveys. They then took the approach that the increase in WTP corresponded to the monetary value of the experience of hosting the event. Projecting those increases over the total population, Heyne, Maennig, and Suessmuth (2007) estimate the value of the experience to be €495 million. This was an original approach to the CVM and yielded interesting results.

Mondello, Johnson, and Whitehead (2007) used the CVM to separately estimate the intangible value of the NFL's Jacksonville Jaguars and a hypothetical NBA franchise to the city of Jacksonville, Florida. Jacksonville is a city with only one major sport franchise and they hoped to capture the value of the team making the city a "major league city." Their estimated values of \$36.5 million for the Jaguars and \$22.8 million for the hypothetical NBA team are significant, but far below the amounts of public subsidies typically given to major professional sports teams in the U.S.

Owen (2006) used a straightforward CVM approach with an open-ended WTP question that did not specify a payment vehicle to estimate the intangible benefit of the professional sports franchises in Michigan and Minnesota. He found the intangible benefit to be significant, but not enough to justify the level of public subsidy common to professional sports teams in the U.S. Owen's conclusion regarding the value of franchises matches this paper's regarding the value of hosting the Olympics in that the focus on traditional economic impact studies misses the true source of value teams have for cities as public goods.

Johnson, Groothuis, and Whitehead (2001) and Johnson and Whitehead (2000) were the first to apply the CVM to estimating the intangible value of sport and the theory and methods in these two studies were used as a guideline for this dissertation. In the 2001 study they use the CVM to estimate the use and non-use value of the Pittsburgh Penguins National Hockey League (NHL) franchise to the residents of the city of Pittsburgh. Mail surveys were sent to 900 Pittsburgh addresses, of which 293 were returned and 200 mail-in surveys were placed on the windshields of automobiles in the parking lot during a Penguins game at the Pittsburgh Civic Center of which 16 were returned. Respondents were asked about their behavior regarding the team; were they a fan, did they attend games, did they celebrate during the most recent

championship seasons, etc., and their WTP in annual increased taxes for the city to take over the team and keep it in Pittsburgh. The franchise was going through a bankruptcy process and the researchers felt that this was a plausible scenario and a good opportunity to estimate the public good value of the team alone, and not the team and a new arena, since building a new arena was never mentioned during the bankruptcy procedure. The result was that the Penguins provided a stream of annual benefits to city residents between \$1.9 million and \$5.3 million per year. The net present value of that stream of benefits was then calculated as between \$23.5 million and \$66 million, with the non-use or public good portion of that benefit being between \$17.2 million and \$48.3 million. Since the response rate to the systematically placed mail surveys was 35.6%, the upper bound assumed that the respondents were representative of the general population and average WTP was aggregated over the entire population. The lower bound assumed that non-respondents gained zero benefit from the franchise and aggregated the average WTP over 35.6% of the population. The results show that even at the highest end of the estimate, the public good value of the franchise is not high enough to justify a complete public subsidy on a hockey arena that might typically cost \$180 million-to-\$220 million.

The Pittsburgh study and hypothetical scenario is more in line with the abstractness often seen in CVM studies and serves to illustrate by contrast the strong fit between the CVM and the public good value of the Olympic Games. The hypothetical scenario of the city taking ownership of a private sports team is a novel idea in the U.S. and some respondents, even though they might be Penguin supporters, could feel that the city shouldn't be in the business of directly providing major league professional sport. The researchers did give respondents a chance to explain their WTP decision on the survey, but there was nothing reported regarding the responses. Additionally, even the residents who would like to see the franchise remain in the



city might be wary about taking over a bankrupt team. Finally, as the authors mention, they found that the Penguins generated a significant amount of public good value though not enough to completely justify the typical public spending on a new facility, though it was much closer to the actual value of the team. They note that the NHL in general was the least popular of the four major U.S. sports at that time. Many cities have a professional hockey and basketball franchise, or in Los Angeles a hockey and two basketball franchises, sharing the same arena, so this result indicates that taxpayer spending on an arena that housed an NBA team or both an NHL and NBA team might be justifiable on a public good basis.

Johnson and Whitehead's (2000) first CVM study related to sport used methodology similar to their study of the Pittsburgh Penguins above to assess the intangible benefits of two proposed sport projects in Lexington, Kentucky in the US. Lexington is home of the University of Kentucky and its popular college basketball team, the Kentucky Wildcats, and a minor league professional baseball team. At the time of the study, there were proposals for a new basketball arena for the college costing at least \$100 million and a \$10-\$12 million baseball stadium for the local minor league team. This study is the first published study to use the CVM to assess the intangible benefits of sports but it is interesting in the larger context of the economic impact of sport debate and the use of the CVM. More so than professional sports properties which have been known to relocate to other areas, college sports are virtually indistinguishable from their geographic location. The University of Kentucky is publicly operated by the state of Kentucky as its largest research institution. Its basketball team is for the students of the university and is followed closely by the residents of the state whose tax payments finance the entire institution. Part of the value of a new sport facility in a professional context in North America is that it will likely ensure that the facility's professional tenant will remain in the area. This aspect of value

does not exist with a college team. As long as the team exists, it will stay in the same location and it already is owned by the taxpayers. So the WTP estimate for a new facility might be biased downward because residents do not feel the threat that the team might move and they own it, indirectly as taxpayers, anyway. The minor league stadium issue is relevant to the U.S. facility boom of recent decades because many smaller cities are publicly subsidizing the construction of new minor league facilities.

Johnson and Whitehead (2000) estimated that a new basketball facility would generate \$1.12-to-\$2.2 million in public good benefit expressed as the net present value of the benefit over the expected life of the facility in Fayette County, where Lexington is. That would justify only a small portion of the \$100 million plus needed for a new arena. However, since the arena was proposed as a local project and residents of the entire state are fans of Kentucky basketball, perhaps a larger portion of the intangible benefits of the new facility would be enjoyed by people around the state and state subsidies would be justified. It would be an interesting follow-up study to see how much people's WTP for a facility or event derive from the notion that they are competing to "win" the facility or event or competing to retain their team. The intangible value generated by the minor league facility was estimated to be only \$371,000. Clearly, minor league sports which are rarely televised, rarely in the headlines of the local sports pages, and are of very little casual interest even to most of the local area's residents do not generate enough intangible benefit to justify any significant subsidy.

Several alternative approaches have been used to try to estimate intangible benefits and consumer surplus in sport. Alexander, Kern, and Neill (2000) and Irani (1997) used demand curve estimates to calculate consumer surplus associated with U.S. professional sport franchises and MLB franchises respectively. Carlino and Coulson (1989) used compensating wage and rent

differentials to calculate the public good value associated with NFL teams. Alexander, Kern, and Neill (2000) used ticket sales data to calculate the price elasticity of demand for tickets for the various major professional teams. From the price elasticity of demand they estimated a demand curve and the consumer surplus generated by the teams enjoyed by fans who attend the games. They theorized that the consumer surplus enjoyed by those attending the games plus the public good benefit enjoyed by others, could justify public expenditure on sport. They found that in most cases, consumer surplus alone is enough to justify public expenditure on the smaller arenas that house professional basketball and hockey, but only in a few rare cases is it significant enough to justify a publicly subsidized larger baseball or football stadium. For the cases where subsidies are not justified by consumer surplus, they took the difference between the typical public subsidy amount and the total consumer surplus enjoyed and used that as a benchmark public benefit figure. This suggests the need for methods like the CVM to estimate the public good benefit to compare with the benchmark figures.

Irani (1997) used a similar demand based method. He used MLB ticket sales data and regression analysis to estimate choke prices for each club. The choke price is the price at which the quantity demanded is zero and it is represented graphically by the intercept of the price axis on a demand schedule. By integrating along the prices between the choke price and equilibrium price, Irani was able to estimate the consumer surplus enjoyed by fans who attended the games. He found the consumer surplus to be significant.

Carlino and Coulson (1989) used a compensating wage and rent differential to estimate the public good benefit enjoyed by the residents of a city that hosts an NFL franchise. They found that residents of cities that had an NFL franchise were paid a lower average wage and paid higher average rents than residents of cities without NFL franchises. This result was then

interpreted as residents being willing to work for lower wages and pay higher rents to live in a city that has an NFL franchise. Assuming no differences in other attributes, the differentials can be aggregated over the residents and used as an estimate of the public good benefit of the franchise to the city's residents. Interpreted another way, however, lower wages and higher rents might indicate that the existence of a football franchise and public subsidies to the franchise might displace more productive businesses and uses of public money resulting in a weaker overall economic situation for local residents.

Because of the global nature of the Olympics, the CVM is the most appropriate method for estimating its intangible benefits. A compensating differentials approach is feasible, but the economies of large cities, and those that host the Olympics are typically among the world's largest, are so complicated that a long-term compensating differential finding, that people accept lower wages and are willing to pay more to live in cities that once hosted the Olympics, would not be very reliable. As for a short-term study that might compare wages and rents during the Olympic period with a base period, increased demand for labor and housing would be so significant that it would likely dominate all other effects making it difficult to estimate compensating differentials. Consumer surplus could be estimated for the attendees with the Alexander, Kern, and Neill (2000) and Irani (1997) approaches, but many of the attendees are from outside of the local economy. The most direct and scientifically accepted way to estimate the intangible benefits of the Olympics is the CVM which is well suited to this application and focuses directly on the host city and country residents and how they benefit from the Games.

## CONCLUSION

The review of the literature above provides the context for this study. Public subsidies are virtually required of Olympic host cities and therefore economic analysis is critical to determine whether subsidies are justified or not. The problem calls for an estimation of the entire economic benefit provided by hosting the Olympic Games. The genesis of the literature comes from examination of seemingly exaggerated claims of tangible economic impact associated with hosting the Olympics. On the surface, since there is a great deal of economic activity and money involved, it seems to the untrained eye that hosting the Olympics is a major boost to the host city's economy. However, economists are famously trained to keep in mind the saying "there is no such thing as a free lunch" a favorite rejoinder from Nobel laureate Milton Friedman (Friedman 1975). After exploring in depth, where the money is coming from, where it is going, what the economic activity associated with the Games replaces, and what other options were available, the consensus among economists is that the tangible economic benefits of hosting the Olympic Games are transitory and small relative to the overall economy. Much has been written that examines and criticizes the numerous optimistic ex-ante studies that portray the Olympics as a gold mine for the host city. While it is always acknowledged that the intangible benefits of hosting the Olympics are likely quite large and perhaps large enough to justify massive expenditures, methods to accurately examine the entire economic picture are only recently being developed and put into practice. If anything in sport generates massive intangible benefits, it is likely that international sporting mega-events do.

## **CHAPTER 3**

### **2016 IOC HOST SELECTION PROCESS AND CITY PROFILES**

#### **INTRODUCTION**

The cities of Berlin, Chicago and San Francisco were selected for this study for logistic and strategic reasons. A key purpose of this study is to compare results of similar studies conducted in different environments. This allows for cross cultural comparisons and exploration of the robustness of the CVM approach. A brief background and description of each city, including the extent they engaged in the bidding process for the 2016 Olympic and Paralympic Games, follows below. It is important to note factors that may help explain any differences in results as well as factors that one might expect to result in differences that did not. The chapter begins with a description of the process used by the IOC to select the host city. One of the aims in conducting the study was to select cities whose residents, at the time of the survey, could realistically envision hosting the Olympics. At the same time it was important that the bidding process had not progressed too far along so as to unduly influence the respondents.

In empirical and experimental CVM research it is consistently the case that individuals weigh losses more heavily than comparable gains (Knetsch and Sinden, 1984). This is known alternatively as loss aversion, the endowment effect, or status quo bias (Hanemann, 1999). As the bid process progresses and residents of cities recognize that hosting the Olympics is becoming closer to a reality, they might start to feel that it will happen, which can distort WTP responses. Also, since a main aim of this study is to compare across different potential Olympic bid cities, logistically this is easier done earlier in the process when the number of potential bid cities is higher. With that in mind, a key part of the background and description of each city is

how far along they went in the bidding process and when data was gathered in relation to the overall timeline. Following the description of the IOC host city selection process, background and description is provided for each of the cities studied.

## **IOC HOST CITY SELECTION PROCESS**

The Olympic movement formally consists of the IOC, the NOCs, which are organizations responsible for the Olympic movement in their respective countries, and the OCOG, which is formed in the host city once the bid is awarded and disbanded upon submitting its final report to the IOC one year after the Games it hosted have concluded. The formal, 2016 selection process was launched by the IOC in May of 2007 when it invited the 203 NOCs to submit the names of cities within their jurisdiction as applicants to host the 2016 summer Olympic and Paralympic Games.

The process is carried out in two phases. In phase 1, the cities put forth by the NOCs; Baku (Azerbaijan), Chicago (US), Doha (Qatar), Madrid (Spain), Prague (Czech Republic), Rio de Janeiro (Brazil) and Tokyo (Japan), were considered applicant cities (IOC News, 2007, September 14). The cities were required to submit answers to a 163 page questionnaire covering 17 themes and submit guarantees from third parties related to those themes. The questions and guarantees cover such concerns as commitment to Olympic vision and values, whether the city can provide adequate lodging, the scheduling of other main events that might conflict with the Games, financial backing, legal framework, and protection of Olympic marks. The candidature packages were studied by the IOC Executive Board; which is a subset of the

IOC consisting of the president, four vice presidents and 10 other members elected by the larger membership, who determined the final candidate cities.

*Table 3.1: IOC timeline for 2016 Olympic host city selection: Phase 1*

<b>Important dates</b>	<b>IOC action</b>
13 September 2007	NOCs submit applicant city names to the IOC
14 January 2008	Application file and guarantee letters due
January-June 2008	IOC examines replies
June 2008	IOC announces acceptance of candidate cities

In phase 2, the candidate cities; Chicago, Tokyo, Rio de Janeiro, and Madrid (IOC News, 2008, June 4), submit an in-depth description of their Olympic project, known as their candidature file and they each host a visit from the IOC Evaluation Commission. For the 2014 Winter Olympic bid process, the Evaluation Commission consisted of 12 members from the IOC, International Sport Federations (IF)s, NOCs, athletes, the International Paralympic Committee (IPC) and advisors (117<sup>th</sup> IOC session “Role and composition of the Evaluation Commission,”). The Evaluation Commission publishes a report, including a detailed technical assessment for each city, one month prior to the election of the host city. The purpose of the published report and technical assessment is for the review of IOC members who elect the host city (IOC News, 2007, May 16).



*Table 3.2: IOC timeline for 2016 Olympic host city selection: Phase 2*

<b>Important dates</b>	<b>IOC action</b>
8-24 August 2008	Olympic Observer Programme- Beijing 2008
12 February 2009	Candidature file submissions due
April-May 2009	IOC Evaluation Commission candidate city visits
One month prior to the host city election	IOC Evaluation Commission Report released
2 October 2009	Election of the host city in Copenhagen, Denmark

Of the cities chosen for this study, only Chicago got as far as being involved in the formal IOC host selection process for 2016, becoming one of the final four candidate cities as of this writing. However, according to the website [www.GamesBids.com](http://www.GamesBids.com), a site with the purpose of “keeping readers independently informed and up-to-date with information about the Olympic Bid process and candidate city bids from around the world,” at least 12 cities were actively preparing bids that were cancelled before the formal bidding process and 7 others started the process but never got beyond the planning stages (2016 Olympic Games Bids). Of the cities studied here, San Francisco cancelled the bid it formally prepared as part of the USOC, the country’s NOC, process for determining an applicant city to put forward to the IOC and Berlin expressed interest in hosting the Games but never got out of the planning stages as the city set its sights on a potential 2020 bid.

## **USOC 2016 selection process**

Following the failure of New York City's bid for the 2012 Olympics, where the bid fell apart when the planned west side Manhattan Olympic stadium failed to win approval just prior to the final selection, the USOC implemented a formal, rigorous process to decide whether to put a city forward in the applicant stage for 2016 and if so which city.

During the first stage of the process the USOC requested preliminary bid plans that encompassed 15 themes from interested cities. Chicago, Houston, Los Angeles, Philadelphia, and San Francisco all were interested in putting forth a bid and submitted preliminary plans to the USOC. At the same time the committee polled the international Olympic community. Forty eight IOC members and 52 international sport leaders were asked two questions. First, was the time right for a United States city to serve as an Olympic host? Second, which of the interested cities might have the best chance to win the bid (Hersh, 2006)? Houston and Philadelphia were eliminated from consideration by the USOC during this process.

For the next stage of the process, and prior to the final vote of the 11 member committee, cities were required to submit a detailed financial plan, have an Olympic stadium built or construction plans for a new stadium approved, and to submit guarantees from the bid city governments to cover potential shortfalls in funds. Prior to the vote, each city gave a 40 minute presentation before the committee to make its case (Macur, 2007). The final decision was between Chicago and Los Angeles. San Francisco was unable to get an Olympic stadium plan approved and abruptly withdrew from the process.

## **German Olympic Sports Federation (DOSB) 2016 selection process**

Similar to the United States, Germany's recent attempts to host the summer Olympics and Paralympics were marked with failure. For the 2012 bid, a Leipzig/Rostock joint effort fell apart when the leader of the bid, Dirk Thärichen, resigned over allegations of mishandling of funds and past involvement with the former East German secret police, Stasi. The chairman of Rostock's publicly run Olympic marketing committee was also dogged by allegations of involvement with Stasi as well as financial irregularities. Berlin made a prior effort to host the 2000 Olympics, but finished 4<sup>th</sup> in the voting among the 5 finalist cities due to the inadequate infrastructure that was a legacy of Cold War era Berlin ("German officials tout Munich as 2018 Winter Olympics location," 2007). Wary of the recent failed bids, the DOSB, led by President Thomas Bach, also serving as an IOC vice president, declined to submit an applicant city for the 2016 bid although both Berlin and Hamburg expressed interest.

## **PROFILES OF CITIES**

### **Berlin**

The city of Berlin, Germany is the fourth most populous city in Europe. It has hosted both the Summer Olympics (1936) and the FIFA World Cup (1974 and 2006). The city is home to the Berlin Olympic Stadium, the O<sub>2</sub> World Arena that opened in 2008, and the Berlin Fan Mile, an area starting at the Brandenburg gate that has been dedicated to fans gathering for public viewing of football matches during the 2006 FIFA World Cup and the 2008 UEFA Championship. Berlin is also home to five major professional sport clubs competing in football,

basketball, handball, ice hockey and volleyball. Additionally, the annual Berlin marathon is one of five marathons that make up a series of major global marathons each year<sup>2</sup>

Berlin is an interesting city in relation to the revealed preference nature of the theory described in the introductory chapter. While the 1936 Olympic Games themselves are probably too far in the past to be very relevant to current attitudes toward hosting the 2016 Olympics, the legacy from 1936 is still a significant part of the city and its history. Additionally, the experience, which was not positive as explained above, of bidding to host the 2000 Olympic Games is recent enough that it should still be in peoples' minds. Additionally, prior to the September 1993 selection of the 2000 Olympic host city a small but significant and active anti-Olympic movement arose in Berlin (Kinzer, 1993). While one of the Olympic opponents' key concerns was that the city would needlessly take on financial commitments at a time when German unification was already creating enormous public finance burdens, remnants of that opposition could still exist today.

Also, there is Berlin's experience with the FIFA World Cup. In 1974 the Berlin Olympic stadium hosted three World Cup matches and in 2006 it hosted six matches, including the championship finale between the Italian and French sides. It appears a legacy of the 2006 FIFA World Cup is the Berlin Fan Mile which was Germany's top tourist attraction in 2006 drawing 9,000,000 people over the course of the month-long tournament besting the 6,000,000 people who visited Munich for Oktoberfest (Berlin fan mile beats Oktoberfest in popularity contest, 2006). Berlin continued the tradition of the fan mile for public viewing of the semi-final matches and the final of the UEFA Euro 2008 championship. Fortunately for the Berlin fans, the German side made it to the final match in 2008 and the area was filled to capacity, with more

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<sup>2</sup> Boston, Chicago, London, and New York host the other four major international marathons.

than 500,000 fans, for both the German matches and drew several hundred thousand for the Spain versus Russia semi-final match and a congratulatory welcome home to the German national team following the tournament

In preparation for the 2006 World Cup, the German government spent an estimated \$7.7 trillion on facilities and infrastructure, a figure that includes projects such as Berlin's new \$900 million multi-level main train station which began years before the World Cup was even awarded to Germany (Drew, 2006). Nearly \$300 million was spent modernizing the Berlin Olympic stadium as part of \$7.2 billion spent by the German government building or refurbishing 12 stadiums nationwide (Landler, 2005). With all of these recent investments and upgrades, the residents of Berlin are familiar with the large outlay of taxpayer money that is required to host a global mega-sport event and the results and consequences of that spending.

There were other items of interest related to investment in sport and the Berlin residents at the time of the survey for this study. The O<sub>2</sub> World arena, a privately financed modern 17,000 seat sport and entertainment center was in the process of being finished for its 2008 opening. O<sub>2</sub> World was paid for and is owned by Anschutz Entertainment Group (Meza, 2006). Additionally, Berlin is scheduled to host the 12<sup>th</sup> International Association of Athletics Federations (IAAF) championships in 2009.

*Table 3.3: Berlin Data*

Population	3.4 million 5 million Berlin-Brandenburg Metro Area <sup>3</sup>
Annual per capita income (2005)	€23,292 <sup>4</sup>
Mega-events hosted	1936 Summer Olympics 1974 FIFA World Cup 2006 FIFA World Cup (Final match)
Professional sports	Hertha BSC Berlin-football ALBA Berlin-basketball Füchse Berlin-handball Eisbären Berlin-ice hockey SCC Berlin-volleyball
Date surveyed	January 2007

According to the predominant view among sport economists that the economic benefit of hosting a mega-event may not be worth the public spending, Berlin officials should be reluctant to host a mega-event after spending so much money in 2006 FIFA World Cup preparations. Instead city officials, led by Mayor Klaus Wowereit, were enthusiastic about vying for the 2016 Games and when it failed to work out, they immediately set their sights on 2020. Wowereit has been a strong advocate of bringing sport events to the city, or in the case of the public viewing Berlin Fan Mile, using massive screen telecasts of sports events elsewhere to draw people to Berlin. Perhaps he and others are interested in personal or political gain and pursue bids that will

<sup>3</sup> Indicators for larger urban zones 1999-2003, Eurostat

<sup>4</sup> Regional GDP per inhabitant in the EU 27, Eurostat

benefit them at the expense of the public. Barring that explanation, Berlin officials clearly feel that hosting mega-sport events is beneficial to their city.

Berlin is an interesting case. Given the Olympic bid experience in 2000 and recent experience with the 2006 FIFA World Cup, if hosting a mega-event is a losing economic proposition, why does the city want to do it again? The answer could be that the hard to measure, intangible benefits are what make hosting attractive. What is the monetary value of the nation seeing German Chancellor Angela Merkel, less than a year after a contentious election and political struggle over a divided government in 2005, jump, shout, cheer, and groan along with the citizen/fans as the German side competed in the 2006 FIFA World Cup? Politicians all around the globe and throughout history go to all sorts of lengths to achieve close identification with the citizens they represent. There are few modes as effective as an international sport competition in achieving that goal and many of the other events that can engender unity, such as a common reaction to tragedy, are not desirable occurrences. What is the value of the reinforcement of the message that despite political differences in Germany, all citizens are German and have their nation in common? What is the monetary value of the social and political benefits? General answers to these questions and estimation of these intangible benefits are sought in this study.

For three weeks during the 2006 FIFA World Cup Germans were singing “Berlin, Berlin, wir fahren nach Berlin”<sup>5</sup>? It was a very effective instance of valuable, spontaneous grass roots marketing for the city that arose completely in the context of the sport event. The message is that going to Berlin is the goal and it’s the place where we want to be, even though the reference

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<sup>5</sup> It translates into “Berlin, Berlin we are going to Berlin” as in the German team will make it to the championship match in Berlin. This chant could be heard regularly in the streets of Germany during the 2006 FIFA World Cup especially after German victories.

is primarily about football, some of that resonates as a positive association with the city of Berlin, and who is delivering the message? Is it a paid spokesperson? Is it a professionally produced advertisement? No, it is something the football fans and the people came up with to cheer on the national side. Who is more credible in delivering a message than the popular voice? Marketing firms and advertising agencies are constantly looking for unique, authentic ways to deliver a message. Because of Berlin hosting the final championship match in the 2006 FIFA World Cup, for four weeks Germans were singing about Berlin and that it was the place they wanted to be. It is difficult to imagine a city gaining that magnitude of benefit outside of a sport mega-event.

Finally, consider the fan mile, even if the majority of the crowds were local residents who stood and watched matches for free, what was gained economically? If Berlin residents support hosting another mega-event, it is because they think the party atmosphere is worth the effort and expenditure. Think of the phenomenon described in Surowiecki's (2004) "The Wisdom of Crowds." Just as consumers do not derive and carry around print outs of utility functions when they shop, but they shop in a way that economists can describe with a utility function and in a way that can be defined as rational by an economist based on a utility function, the citizens of Berlin and their estimates of their WTP to host an Olympic event should be a credible quantification of the value of all the potential sources of consumer surplus.

The survey of Berlin residents took place in February of 2007, eight months after the 2006 FIFA World Cup and several months before the DOSB officially ruled out putting Berlin forward as an applicant city. The timing was important for purposes noted in introduction to this chapter. The scenario of Berlin putting forward a bid to host the Olympics was realistic, but it was not close enough to being reality that potential biases such as loss aversion, the endowment



effect, and status quo bias <sup>6</sup> (Hanemann, 1999) or citizens being affected by public relations campaigns in favor of or against hosting the Olympics should not have affected responses to the survey.

Compared to Chicago and San Francisco, Berlin has more historic experience with hosting mega-sport events including the recently successful 2006 FIFA World Cup, the 1974 World Cup and the legacy of the 1936 Olympics. Berlin residents should be cognizant of the benefits, costs, and risks of hosting mega-events. The successful 2006 World Cup could increase Berlin residents' perceived value of hosting the 2016 Olympics and make it higher compared to the other cities. The history of a negative bid experience and significant organized opposition to an Olympic bid in 1993 might lower residents' perceived benefit, especially compared to Chicago which experienced no recent negative experiences nor appears to have any significant public opposition to hosting the 2016 Games. Finally, Berlin residents have the lowest per capita income compared to the other cities. All things being equal, this should result in lower WTP, but should also have interesting effects on residents' WTV their time to support a 2016 Olympic bid.

## **Chicago**

Chicago is the third largest city in the United States and the fourth richest city in the world. Out of the three cities studied, Chicago is the only one that was nominated as an applicant city by its NOC as a potential host of the 2016 Olympic Games and was named as one of the four candidate cities, along with Tokyo, Rio de Janeiro, and Madrid, to make it to the final round of the bidding process (IOC News, 2008, June 4). With the bid, it appears that Chicago officials are attempting to reestablish the city's past reputation as a global city. In the late 19<sup>th</sup>

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<sup>6</sup> These effects describe the phenomenon that people are generally less willing to pay for something that they feel they already own or have and their expressed willingness-to-accept increases.

and early 20<sup>th</sup> centuries, Chicago hosted the World's Columbian Exposition in 1893 (also known as the Chicago World's Fair) and the 1933 World's Fair. The city was originally selected as the host for the third Olympic Games in 1904 that were subsequently moved to St. Louis due to the failure of initial fund raising efforts (Barney, 1992). Chicago was one of the host cities, and held the opening match, for the 1994 FIFA World Cup and is the regular home to seven major professional sports clubs in North American football, soccer, baseball, basketball, and hockey. In July of 2006 Chicago was host to the Gay Games VII, an international sport festival that included over 1,200 competitors in over 30 sports (<http://www.gaygameschicago.org>). Like Berlin, Chicago hosts one of the five major world marathons each year. The city's 42 kilometer lake front draws over 25 million visitors annually for sport, cultural, and recreation activities (Chicago 2016, 2007). Chicago was also one of several U.S. cities under final consideration to host the 1952 (Helsinki) and 1956 (Stockholm) Olympic Games, but they failed to get more than one vote each time (Gamesbids.com, Past Olympic host city election results).

While hosting the 1994 FIFA World Cup did not require major investment in facilities, Chicago residents are familiar with large public subsidies of sport facilities. Chicago, like most cities in the U.S., has invested significant amounts of public money in sport facilities over the last several decades. According to Siegfried and Zimbalist (2006) "since 1990 more than 100 of the 122 premier level professional baseball, football, basketball and ice hockey teams have built or substantially renovated the facilities in which they play. Together more than US\$25 billion has been or will be spent on these facilities between 1990 and 2010. Billions more have been spent on minor league and university stadiums and arenas." The baseball stadium that is home to the MLB's Chicago White Sox, U.S. Cellular Field (formerly New Comiskey Park), opened in 1991 and was constructed entirely with taxpayer money at a cost of \$167 million (Munsey, P.

and Suppes, C., 2007). The largest and oldest stadium, Soldier Field, originally built in 1924 primarily as the home of the Chicago Bears of the National Football League, but is also a facility that hosted five FIFA World Cup matches in 1994, was essentially destroyed and rebuilt on the same piece of land with some original architectural features preserved. The stadium reopened in 2003 and the cost of the remodeling was \$375 million which, similar to U.S. Cellular Field, was 100% taxpayer financed (Munsey, P. and Suppes, C., 2008). Bridgeview, a suburb of Chicago, financed, built, and owns Toyota Park, the home stadium of Major League Soccer's Chicago Fire. The 20,000 seat stadium cost \$95 million to build and was financed by the sale of municipal bonds (Fire stadium is Toyota Park, 2006).<sup>7</sup>

Chicago residents have experience using their tax dollars to invest in new sport facilities and living with the result. While the city does not have direct experience with hosting a mega-sports event in recent decades, officials and residents have been willing to invest large sums of money in sport facilities for their existing clubs. As cited in the literature review, similar to the economic impact of mega-events, the tangible impact of long-term stadiums and the existence of major sport franchises is typically overstated and is often considered very minimal. However, Chicago officials and citizens have been willing to, and have experience with, investing public money in sports. Furthering their investment in sport by pursuing a role as the host of the 2016 Olympic Games does not necessarily indicate that Chicagoans are miscalculating the benefits derived from major investments in sport, it may confirm that they feel like they benefited from previous investments.

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<sup>7</sup> Returns paid on municipal bonds are not taxed in the U.S. to encourage investment in cities.

*Table 3.4: Chicago Data*

Population	2.8 million 9.5 million metropolitan area <sup>8</sup>
Annual per capita income (2006)	\$41,591 <sup>9</sup>
Mega events hosted	1893 World's Fair 1933 World's Fair 1994 FIFA World Cup (Opening match)
Professional sports	Chicago Bears-American football Chicago Cubs and White Sox-baseball Chicago Bulls and Sky- basketball Chicago Blackhawks- ice hockey Chicago Fire- football
Date surveyed	September 2007

Residents were surveyed for this study in September of 2007, several months after the city was put forward by the USOC as an applicant city, but well before the IOC's decision to include Chicago among the final four candidate cities. According to an April 2007 survey by Zogby International that was commissioned by the USOC, 92% of Chicago residents were aware of the bid effort (Chicago 2016, 2007). Anecdotal evidence from administering surveys and speaking to the respondents indicated that the overwhelming majority of respondents were aware of the bid, but few were aware of details such as the status of the bid, the IOC process, or the competing cities.

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<sup>8</sup> U.S. Census Bureau, estimate 2007

<sup>9</sup> U.S. Department of Commerce, Bureau of Economic Analysis

## **San Francisco**

San Francisco is interesting for reasons unlike Berlin and Chicago. While the cosmopolitan, coastal city is stunningly beautiful and the fourth most popular destination city for foreign tourists in the U.S. drawing 2,270,000 foreign tourists in 2007 (U.S. Department of Commerce, 2008), local citizens have not embraced the modern US sport practice of large public subsidies for its professional sport teams' facilities. San Francisco is one of the few major US cities that has not heavily subsidized its major sport franchises over the last several decades.

The MSA containing San Francisco is known as the San Francisco, Oakland, Fremont MSA, but it is part of a sprawling urban area that stretches from San Benito County in the south to Marin County in the north, a geographic area much larger than most in the world and the other metropolitan areas in the study (see Figure 3.1). The trend in the San Francisco Bay area is for population growth and newer professional sport opportunities to occur in the city of San Jose in the heart of the high-tech corridor known as Silicon Valley. In recent decades San Jose has surpassed San Francisco as the most populous city in the region.

*Figure 3.1 Map of California counties- the San Francisco Bay area Metropolitan Statistical area stretches over 100 miles from San Benito county in the south to Marin county in the north, a much larger metropolitan area by distance than most cities.*



San Francisco and Oakland each host MLB and NFL teams and Oakland is home to an NBA team. These are the traditional professional sports in the U.S. and all of the teams have long histories in San Francisco and Oakland, though the NFL's San Francisco 49ers are planning to construct a new facility in San Jose and will play their home games there.

The emerging sports in the larger Bay area, such as the National Hockey League, which only in recent decades introduced franchises in the western US from its traditional base in the northeast US and Canadian, are locating in San Jose. The NHL, MLS, National Lacrosse League, and Arena Football League, each newer sport leagues that have been emerging in popularity across the country have all located franchises in San Jose instead of San Francisco.

*Table 3.5: San Francisco data*

Population	764,976 7.2 million metropolitan area <sup>10</sup>
Annual per capita income	\$57,747 <sup>11</sup>
Mega events hosted	1939-40 World's Fair
Professional sports	San Francisco 49ers-American football San Francisco Giants- baseball
Date surveyed	November 2006-January 2007

Among the sport franchises that are located in the San Francisco/Oakland area, only the San Francisco Giants play in a modern, fully loaded sport facility. All of the other facilities were

<sup>10</sup> U.S. Census Bureau

<sup>11</sup> U.S. Department of Commerce, Bureau of Economic Analysis

built in the 1960s. This is unique among U.S. cities where due to the construction boom in recent decades the vast majority of major professional sport franchises play in newly constructed, state-of-the art, facilities.

San Francisco's one modern facility, AT&T Park, is the home of the MLB's San Francisco Giants. The history of how that stadium came to be is an example of the relationship between the San Francisco and Bay area tax payers and sport. After finally succeeding in a political battle that lasted over a decade to build a new baseball stadium in San Francisco, Peter Magowan, the baseball team's owner said, "Nothing comes easily in San Francisco. It's a skeptical, fragmented city. It took 20 years to decide to build the Golden Gate Bridge" (Lipsyte, 1996).

The Giants moved from New York City to San Francisco to start the 1958 baseball season as part of MLB's expansion to the California coast. Candlestick Park was built for the club and opened in 1960. It was immediately clear that the stadium was not well suited for baseball. Its location overlooking San Francisco Bay was subject to swirling winds, cold temperatures and frequent fog in the summer. The conditions made it difficult to both play and watch baseball and the club started considering a new location relatively soon after it opened.

In efforts to build a new stadium using public funds, the club and its supporters lost four different voter referenda between 1987 and 1992 and had a stadium financing agreement with the city of San Francisco thwarted by a voter uprising. In November of 1987, voters narrowly defeated a proposal for public financing of a stadium in downtown San Francisco (Chass, 1987). Two years later, in November of 1989, the team's effort at another referendum to approve public financing for a downtown stadium was narrowly defeated with the help of an earthquake. The



Giants were finishing a successful season by making it to the championship World Series against their neighbors from across the bay, the Oakland A's. The World Series is typically played during the last part of October and elections are normally held during the beginning of November. There are several examples where baseball clubs have been able to turn the enthusiasm generated by a successful season into a successful stadium referendum result, such as the San Diego Padres who won a facility finance referendum immediately after appearing in the World Series in 1998 (Fried, Shapiro, and DeSchrive, 2008). In mid-October 1989, it appeared that public opinion was in favor of a new stadium for the Giants. However, while the teams were warming up for the third game of the best-of-seven game series, the Loma Pietra earthquake struck and delayed the competition for ten days. With the focus of the public jarred toward rebuilding after the earthquake, the stadium referendum failed narrowly by 2,000 votes or less than 1% of the total (Reed, 1989).

After being defeated twice in three years the Giants turned to and were welcomed by the officials of the nearby rapidly growing communities in the San Jose/Santa Clara area. However the voters again proved to be a tough sell. In November of 1990, Santa Clara voters rejected a 1% tax on utilities that would have financed a 30% public, 70% privately financed stadium by a narrow margin (Hardie, 1990). The team then turned to the voters in the city of San Jose for a June 1992 special referendum. Proponents often feel they have a better chance in a special, rather than general election. The idea is that turn out will be lower and only those who are passionate about the issue will vote. The hope is that the supporters of the team will make it to the polls while many of the general voters, with little interest in sport, will stay away. Unfortunately for the Giants, they were rejected again by the San Jose voters, this time by a margin of 55%-to-45% (Bodley, 1992).

The potential move of the Giants to San Jose in 1992 produced one of the most often cited examples in the study of the economic impact of sports. San Francisco, the city that was presumed to be losing the team, commissioned an economic impact study that estimated the team's overall annual contribution to the local economy to be \$3.1 million. The city of San Jose, whose officials were trying to lure the team to their city, commissioned an economic impact study that estimated the same team would contribute between \$50 million and \$100 million annually to the local economy (Hudson, 2001). This wide disparity in estimates of the impact of the same franchise, staying in the same league, but moving 65 kilometers to the south in the same economic region is an illustration of how fluid estimates of the tangible economic impact of sport can be.

The history described above is unique in major American sports and is relevant to the issue of how residents of San Francisco might view and value hosting the Olympics. As it turned out, the Giants eventually did get their new stadium in a prime location in San Francisco, but the deal was not done until 1996. After the 1992 referendum the Giants ownership had come to an agreement to move the franchise across the country to St. Petersburg, Florida. San Francisco city officials, fearing the loss of a local sports institution, reached an agreement to entice the team to stay by renewing the team's lease with its old stadium for a \$1 annual payment to the city. The previous lease arrangement required the team to pay the city 5% of ticket revenue which would normally amount to between \$1 million and \$2 million annually. However, a citizen's group organized and began a petition drive to bring the new lease up for approval by referendum. The city and team scrapped the new deal and reverted to the old one to avoid yet another referendum ("Giant's success pays dividends,"1993).

The team finally won public approval for a new stadium in March of 1996. This time the team arranged its own financing of a waterfront stadium in the city of San Francisco. The voters had to approve a city zoning exemption regarding building height restrictions along the waterfront. The vote tallied about 67% in favor of the exemption and cleared the way for the current AT&T Park (Sports, people, and stadiums; Replacing Candlestick Park 1996). In the midst of a nationwide MLB stadium boom fueled by public subsidies, AT&T Park (which opened in 2000 as SBC Park and was also known as Pac Bell Park) was the first privately financed baseball stadium built in the United States since 1962.

There have been three San Francisco Olympic bid efforts in recent decades as the bid committees have banked on the area's natural beauty, high-tech image and its links to international tourism to bring the Olympic Games to the city. San Francisco was also one of 10 global finalists in the contest to host the 1956 (Stockholm) Olympic Games in an earlier process that included six different U.S. cities (Gamesbids.com, Past Olympic host city election results). The bid received zero votes in the first round of consideration. More recently, difficulties characteristic of the Giants stadium effort have plagued San Francisco's Olympic bid efforts.

For decades, the San Francisco 49ers of the NFL shared Candlestick Park with the Giants and like the baseball team they also spent decades trying to move to a modern facility. While the conditions at the stadium in autumn are ideal for football, the seating is contoured and constructed for baseball. As their NFL competitors started building and moving in to state-of-the-art massive revenue generating facilities, the 49ers hoped to arrange one of their own.

In the summer and fall of 2006, San Francisco's 2016 Olympic bid committee was working with the NFL team in hopes of constructing a new stadium that would serve as both the

Olympic stadium and the new home to the 49ers. The partnership seemed a natural in lieu of the difficulties the Giants faced in building a new stadium. The partnership would broaden public support for the stadium with its dual purpose. The 49ers would be more likely to get the approval they desired by tying their efforts to the Olympic bid and San Francisco 2016 committee would have a better chance to get the approval they desired because of the future benefit to the area's long-time football club.

In November of 2006, the bid effort fell apart in the middle of a visit by a USOC bid evaluation delegation when the 49ers announced that they would not be partnering with San Francisco 2016 and would be pursuing a new stadium in San Jose (Warner, 2006). The announcement abruptly ended the Olympic hopes for San Francisco 2016, especially after the embarrassment of New York City's bid to host the 2012 Olympics. New York City made it as one of the candidate cities but had no firm stadium plans prior to the final decision and the New York City bid was eliminated early in the voting eventually won by London. The USOC was not about to submit a city that did not have plans for an Olympic stadium set (Lieber Steeg, 2006). The surprise announcement by the 49ers had an effect on this study since it came just as data collection was getting under way. There was no way to anticipate the development and no way to directly gauge the effect of the announcement on resident's responses. It could have dampened enthusiasm among the residents or perhaps engendered support as residents tried to reinforce their support in an effort to save a potential bid.

San Francisco's most successful Olympic bid effort was for the 2012 games. The bid was defeated in 2002 when the USOC decided on New York City as the applicant city for 2012. The San Francisco 2012 committee put forth a plan highlighted by very little investment in facilities or infrastructure. They hoped to take advantage of existing facilities, keep the costs

low, and projected the event generating a \$409 million surplus (Sandomir, 2002). The weakness of the bid was that in order to keep facility costs low, the Olympics would have to be held over a wide area. It would have been the San Francisco Olympics only in name as events would be held in Sacramento, Monterey, Marin County, San Jose, and the Olympic Stadium and village were planned for Palo Alto. Given the region's history with major sport financing, the prospect of coordinating an Olympic effort with numerous local governments rather than one city was something the USOC was wise to avoid.

San Francisco's previous effort, a bid to host the 1996 Olympic Games, ended more abruptly than its 2016 bid, if that is possible. The city's mayor Art Agnos refused to sign the financial guarantee required by the IOC a few days prior to a meeting between the San Francisco 1996 bid committee and the USOC. Agnos felt the committee did not give him enough notice to make such an important decision. He is quoted as saying, "for me to be responding to handwritten letters that give me 72 hours to make a decision involving millions and millions of city dollars would be irresponsible," in his justification for not giving the city's guarantee (Olympics, 1988).

San Francisco is a cosmopolitan city with a strong international reputation and ideal climate and geography to host a summer Olympiad, hence the frequent efforts in recent decades to try to bring the Olympics to San Francisco. However, the political history is one of ambivalence toward professional spectator sport and a reluctance to embrace the massive financial commitment that comes with hosting the Olympics. Additionally, the failure in recent decades to put together a strong enough bid to represent the US as an applicant city might have dampened any effect the sudden announcement of the 2016 bid failure had on the survey respondents for this study. Compared to Chicago, who was putting forth their first Olympic bid

in recent history, San Francisco residents might understand the long odds that their city's bid faced when it is still bidding to be an applicant city, nearly three years away from the final IOC selection of the 2016 host.

## **CONCLUSION**

The narrative for each of the three cities in this study might be; Berlin desired to host the Games, but in conjunction with the DOSB the city was not willing to take the risk of paying for a failed bid. City officials appeared to indicate that they would be willing to choose hosting the Games over the costs involved. Berlin's cost might be advantageous and lower than other potential host cities due to recent and ongoing infrastructure and facility improvements, especially those made in preparation for the 2006 FIFA World Cup, but the prospect of consecutive Olympic Games being hosted in Europe made a Berlin bid for 2016 unlikely from the start.

For Chicago, one of the four candidate cities as this is written, they have made their choice clear. The intangible benefits are potentially enormous for city residents and its officials, especially if US President Barack Obama becomes a transformational figure on the world stage. Obama used Chicago as a launching pad for his political career and resides a few blocks from the proposed Olympic stadium. A successful Chicago Olympic bid offers the possibility that a successful Obama presidency would be capped by the 2016 Olympic Games in the closing months of Obama's second and final term. If that were to happen it might completely transform the image of Chicago from a brass knuckles politics, working class town, to a global city that gave the world a global leader who came from global origins, since Obama was born to a mother

from Kansas, a Kenyan father, and grew up in Indonesia and Hawaii. The potential intangible value of that image transformation is enormous.

In San Francisco, certain influential decision makers are willing to spend the public's money on hosting the Games, but there was a lack of overall coordination and it is questionable if the choice to pursue a bid was representative of the public will. A stadium was not approved and therefore San Francisco withdrew from USOC consideration. Some money was spent on the initial bid stages, but ultimately the city's choice revealed that they would rather retain the total costs of the Games, than host the Games. A representative democracy is more likely to yield this result. While individuals can benefit a great deal from heading the effort to host the Olympics and therefore often lead efforts to host the Games, for example both Peter Uebberoth, head of the 1984 Los Angeles OCOG and Mitt Romney, President and chief executive officer of the 2002 Salt Lake City OCOG, became viable candidates for president of the US on the heels of their Olympic successes, the voters ideally have the final say as they ultimately support or reject the required public financial commitment that is necessary to host the Olympics. Given San Francisco voters' reluctance to help finance major sport facilities, perhaps they may not have enthusiastically supported publicly financing an Olympic Games.

Considering the relevant background of these three cities leads to some hypotheses about the intangible benefit residents would enjoy from hosting and their WTP to host the Olympic Games. The after-effect and glow of Germany's successful hosting of the 2006 FIFA World Cup and Berlin's successful role in the tournament should have a positive effect on respondent's WTP and consumer surplus. If people felt they benefited greatly from the World Cup, it is likely that they would expect to benefit from and be willing to pay to host another mega-event. Also, Berlin has seen a great deal of infrastructure improvement since reunification and its residents

should be quite used to public money being used on significant upgrades to sport facilities and infrastructure. Compared to the U.S. cities, German sport fans have a greater appreciation for the traditional Olympic sports. Respondents in all cities were asked to identify their favorite sport and after soccer, Berlin respondents' favorites were spread fairly evenly among 47 total sports, in contrast to 30 mentioned by San Franciscans and 24 mentioned by Chicagoans. However, since Berlin residents have the lowest per capita income among the three cities, their WTP should be tempered by their lower income. It is interesting to study the relationship between volunteering and income. Does lower income imply a greater WTV or can only those with high income afford to spend the time volunteering and not earning money? That is a key question of this dissertation. Finally, Berlin has a history of significant protests of its bid to host the 2000 Olympics (Kinzer, 1993). With that bid occurring so soon after German reunification, the opposition may have been related to citizens' preference to focus resources on the reunification efforts. If the opposition was to hosting the Olympics in general, some of it likely remains after thirteen years and would be reflected in less support and lower WTP among Berlin residents.

While Chicago residents have traditionally supported public investment in sport facilities, they might be more nervous than people in Berlin about hosting an international mega-sports event. Additionally, the most popular sports among Chicago residents are baseball and North American football, which are not Olympic sports in 2016. Chicago sports fans might enjoy less consumer surplus if they feel hosting the Olympics will interfere with their enjoyment of their traditional sports. It can reasonably be expected that the WTP of Chicago's residents might be the highest because of their traditional support of sports, their general perceived enthusiasm



toward hosting the Games and lack of the negative experiences associated with Berlin and San Francisco's previous failed bids, and their relatively high income.

San Francisco's residents might be the least supportive and have the lowest WTP among the residents of the three cities. This is largely based on San Francisco's history of contentious sport funding efforts and the fact that the public investment and effort required to host the Olympic Games dwarfs what is required to build a stadium. However, the per capita income is highest in San Francisco among the three cities and its climate is more welcoming to those who participate in sport rather than observe sports. In the U.S., active athletes might have more appreciation for and put more value in the Olympics than the fans who are primarily following traditional US spectator sports.

The IOC host selection process and the timing of that process were keys to the design of this study. Each city had expressed interest in putting forth an Olympic bid and each could possibly be named host of the 2016 Olympics when data collection started. In San Francisco a surprise announcement in effect ended the city's bid during the time data was being collected. At the time, the public still could have perceived a slight possibility that a last minute stadium agreement could renew USOC consideration of San Francisco as an applicant city. But anyone familiar with the process recognized that the bid had no chance since the USOC indicated that it wanted to avoid a replay of the New York City 2012 bid, where lack of a solid stadium plan hurt the bid and was an embarrassment to the entire US Olympic movement. Data collection in Chicago occurred several months after the city's bid was put forth by the USOC during the applicant stage and several months before the determination of candidate cities, a designation Chicago achieved.

It is also important to consider the history, background, and the sport environment for each city. In this chapter the focus was on describing the unique aspects of each city and its history as it relates to the study at hand to include hosting and the results of prior bids to host international sport events and the overall experience with sport and willingness to support sport with public money in the past. This provides an important context with which to compare the outcomes and understand the results for each city.

## **CHAPTER 4**

### **ECONOMIC THEORY**

#### **INTRODUCTION**

Hosting an event of the magnitude of the Olympics requires large investments of public money. For example the London 2012 Olympics will draw on billions of dollars from the Olympic Delivery Authority (a public sector body created to deliver new venues and infrastructure of the Games), UK National Lottery funds, the UK Department for Culture, Media, and Sport, The Greater London Authority, and the London Development Agency (London 2012). Even if public expenditures are kept low, the IOC requires commitments from potential host cities that guarantee coverage of any financial shortfalls that may arise. Sound public policy requires a cost-benefit analysis, at the very least, before committing to such significant spending agreements. As is clear from the literature review above, the majority of the research related to the economics of the Olympic Games addresses the costs and benefits of hosting the Games. In general, ex-ante economic impact analyses are conducted by supporters of the Games and promise economic largess (Airola and Craig, 2000; Fuller and Clinch, 2000; Humphreys and Plummer, 1995). The ex-post studies, however, find little if any economic benefit (Baade and Matheson, 2002; and Hotchkiss, Moore, and Zobay, 2003). This dissertation sets out to expand on what is typically considered the economic impact of hosting the Games by estimating the intangible benefits. There are two main reasons estimating and including intangible benefits in a cost-benefit analysis of the Games are needed, first, to try to explain the enthusiasm that has grown in recent decades among the world's cities to be Olympic hosts, and second, to more

thoroughly and accurately estimate and categorize the total cost-benefit situation related to hosting the Olympics.

In this chapter, the commonly accepted economic impact theory and practice as it applies to mega-sport events is explained. This provides the context for the ex-post impact study reports noted in Chapter 2 and a CBA approach that includes intangible benefit estimates. Next, a microeconomic framework regarding many bidders for one good that gives a theoretical foundation and possible explanation of the results in the literature is discussed. A revealed preference approach is then used that highlights the too narrow scope in most of the existing economic impact studies of the Olympics.

The large and increasing number of potential host cities eager to subsidize hosting the Olympic Games is a catalyst for this dissertation. If the consensus among economists is that the economic benefits of hosting the Olympics do not justify the public expenditure, but the world's largest cities continue to vie for Olympic glory, the consensus is either faulty or taking too narrow of a view. The consensus may be sound in regard to the narrow view of accounting for tangible benefits, but expanded efforts are needed to quantify other, intangible benefits that are being overlooked or going unmeasured. The most appropriate approach is a CBA approach which considers the total benefit of hosting the Olympics, both tangible and intangible. In this dissertation the CVM is used to estimate the anticipated intangible benefits to host city residents of hosting the Olympic Games. The theory behind the CVM is described and finally a description of the labor supply theory that is the basis for the WTP and WTV comparisons that are unique to this study and are examined as a potential basis for standardized comparisons between competing bid cities with different economies.

## **MACROECONOMIC THEORY OF THE ECONOMIC IMPACT OF MEGA-SPORT EVENTS**

The macroeconomic theory behind the economic impact of mega-sport events is straightforward. The existence of the event potentially generates new money in the economy in the form of spending on capital projects (facilities and infrastructure) and the spending by all of the visitors drawn to the city because of the Games. Broadcasters, sponsors, athletes, IOC and NOC officials, dignitaries, and especially tourists, will come to the city and spend money locally on consumer goods and activities during their stays. In an economic sense, the host city along with the Olympic community (the LOCOG, NOC's, IF's, and IOC) is creating an export good for the rest of the world to consume. The local economy benefits directly from the influx of tourists to the city. The city also benefits to the extent that the international media and technology resources needed to stage the Olympics use local resources, particularly employees, in carrying out their task. This initial injection of money is widely considered as the primary or direct economic impact of the Games.

The initial expenditure leads to increased income throughout the economy and subsequent rounds of spending that generate indirect and induced impacts, also known as indirect impacts. While estimating the initial impact is in theory a simple matter of accurately measuring the relevant new spending and costs, a multiplier is used to estimate the indirect effect. Three types of multipliers are generally used; a sales multiplier, a household income multiplier, and an employment multiplier (Crompton 1995). The appropriate magnitude of multiplier is often borrowed from other studies, but can be estimated by using a Leontief input/output approach or a computable general equilibrium (CGE) model approach. Both input/output models and CGE models describe the local economy, its sectors and how changes in spending will work through

the economy. Estimating overall net economic impact is then a matter of calculating the direct impact and using the appropriate multiplier to estimate the indirect impact with the sum of the direct and indirect impacts being an overall economic impact number.

### **National income accounting identities**

The generally accepted approach to estimating the tangible economic impact of a sport mega-event is based on an income accounting approach. As an example the description of the national income accounting approach and national income accounting identities in Dornbusch, Fischer, and Startz, (2003) will be loosely followed. While the traditional terminology is “national” income accounting, the same approach holds for any geographically defined economy.

For an economy assumed to consist of households and firms, the standard income accounting identity is shown in equation (4.1). Assume that households consume, save, or pay taxes with their income and that after tax income is called disposable income. Equation (4.1) is an accounting identity which must hold in equilibrium. The left side of the equation consists of consumption and injections to the economy,  $I, G$ , and  $X$ . Ceteris paribus (holding other factors constant), increases in injections grow the economy. The right side of the equation consists of consumption plus the leakages from the economy,  $S, T$ , and  $M$ . Ceteris paribus, increases in leakages shrink the economy. When the economy is in equilibrium, the injections must equal the leakages.

$$(4.1) \ C + I + G + X = Y = C + S + T + M$$

Where:

$C$ =consumption spending

$I$ =investment spending

$G$ =government expenditure

$X$ =exports

$Y$ =gross domestic product (GDP)

$S$ =savings

$T$ =taxes

$M$ =imports

The individual leakages and injections are related.  $I$  and  $S$  represent the financial system. Households save the portion of their disposable income that they don't consume by depositing it in banks and firms borrow money from banks to invest in productive activity.  $G$  and  $T$  represent the government's budget. The government collects taxes and makes expenditures. If  $G=T$  the government's budget is in balance.  $X$  and  $M$  represent international trade with  $X-M$  representing the trade balance or net exports.

The above identity provides an algebraic model of an economy that can be used to show how hosting the Olympic Games impacts the host economy. It is generally assumed that the Games do not cause a direct change in overall domestic consumption patterns. That is, that domestic spending on consuming the Olympic Games replaces other recreation spending that would have occurred in the economy whether or not the Olympics were hosted. By implication

in this model saving would not be affected either since consumers either consume or save their disposable incomes. The private sector could see an increase in investment. For example, hotels and restaurants might expand or be built in anticipation of Olympic visitors. Olympic related investment could represent additional investment or, like consumption, it could represent shifts in investment spending within the economy with zero net gain. The government sector might create a net injection into the economy with its spending on infrastructure and facilities in preparation for the Games. Although some of this can be a leakage as well if the government imports material or skills in its Olympic preparation efforts. For example, the Republic of South Africa, host of the 2010 FIFA World Cup, had to bring in foreign construction companies to build stadiums for the event (“South Africa: Treasury’s 2010 head calls for skills importation for stadia,” 2007). Payments to the foreign construction firms represent import spending and money leaking from the economy. As noted in the literature review, while government spending occurs because of the Olympics, spending on infrastructure or sport facilities might not be the best use of government spending for increasing the overall economy. The one element of the model where hosting the Olympics unequivocally adds to the local economy is net exports. Visitors’ consumption of the Olympics is considered an export good and during the Olympics, net exports will increase contributing to at least a short-term boost in the local economy.

A typical approach to measuring the direct, tangible economic impact of hosting the Olympics would be based on measuring increases in net exports related to the Olympics, or measuring any net additional money that is injected into the economy from outside because of the Olympics. Additional investment may be considered, but in theory, if the economy is at full capacity, Olympic investment would crowd out normal investment. In many cases the normal, non-Olympic, investment that is crowded out might be more productive in the long-term than



investment in a one-time sport festival. If the economy is operating at less than full capacity, Olympic investment would represent additional investment into the economy and a short-term boost in total economic activity. What is missing from the income accounting approach is consideration of other benefits including the intangible benefits described in the introduction.

### **Multiplier effect**

According to Nobel Prize winning economist Joseph Stiglitz (1997), one of the fundamental insights of income-expenditure analysis is that increased aggregate expenditures have a compound effect on an economy's overall output. The first-round effect of the additional spending is the result of the additional expenditure being distributed to the members of the economy as income, in the form of higher wages, higher interest payments, or higher profits that become income to the firm owners. Wage and interest earners and firm owners can all be represented by households in the economy. This effect will last for several rounds of spending. The impact of the multiplier effect is determined by the marginal propensity of consumers to consume locally (MPCL). That is, the fraction of each additional dollar local residents gain from the overall increase in spending, that they spend within the local economy. If the fraction is high, the multiplier effect will be greater, if it is low, much of the additional spending will quickly leak out of the local economy. The multiplier effect can be represented as in equation (4.2) where 1 represents the initial autonomous expenditure with the following terms representing the subsequent rounds of spending in the multiplier process. For example, if consumers on average spend 80% of each additional dollar they receive, the multiplier will be 5, which means that each additional dollar spent in the economy will create 5 dollars of additional spending.

$$(4.2) \text{ Multiplier} = 1 + MPCL + MPCL^2 + MPCL^3 + \dots + MPCL^\infty$$

*which simplifies to:*

$$(4.3) \text{ Multiplier} = 1/(1-MPCL)$$

The average consumer MPCL is affected by two general factors. First, the defined, geographic size of the local economy is a major consideration. For example, compare different potential definitions of the local economy as a city, MSA, region, state, or country. If the local economy under consideration is defined as the whole country, it is likely that a higher fraction of additional spending will be captured, and less will leak out, and multiplied through the economy. If one is considering a city, the fraction spent locally would be much smaller. This effect is due solely to the size of the area under consideration; the bigger the area, the less likely it is that economic benefits will leak out. The second major affect on a consumer's MPCL is the diversity of the local economy. If there are a wide variety of options to spend within the economy, less of the additional spending will leak from the economy. If there are fewer, relatively poor options to spend in the local economy, residents will be more likely to travel elsewhere for their recreation and shopping. So, even if the defined local economy is small geographically, if it is robust and diverse, residents will be less likely to spend their money on services elsewhere.

What technically leads to the affect of the initial expenditure diminishing over time is the money leaking from the economy. Considering the income accounting identities above, during each round of spending some money will be saved, some paid in taxes, and some spent on

imports and thus money will leak from the economy. The general effects above are concerned with import spending. The more narrowly the economy is defined, the more likely it is that spending is on imports. Conversely, in a diverse economy spending on imports is less likely, all things being equal. In a diverse economy people are more likely to be able to purchase what they want without having to look outside of the home economy.

Economic impact studies of sport events typically cite at least one of the following multipliers; a sales multiplier, a household income multiplier, and an employment multiplier. Crompton (1995) argues that the household income multiplier is the most relevant for economic impact studies of sport on the basis that if the spending impact is used to justify public expenditure, the overall increase in the local residents' income is the most appropriate measure of local benefit. The sales multiplier is usually the highest in magnitude and is therefore often used in ex-ante impact studies that exaggerate economic impact. While sales may increase due to the event, much of the economic activity may pass through the local economy which is not accounted for in the sales multiplier. The sales multiplier is useful when determining tax effects if there is a local sales tax on transactions. In that case, even economic activity that passes through the local economy contributes to the tax revenue, which, if the additional sales are clearly generated by the event, helps offset any public expenditure associated with the event.

The employment multiplier is the least reliable when applied to hosting the Olympic Games. It measures the total change in employment resulting from an initial change in employment in an exporting industry (Miller). In this case, the local economy is exporting the Olympic Games. Problems arise, however, due to the nature of the Olympics as a temporary, short-term event. In a normal context, an exporting firm decides to locate in an economy and the permanent increase in jobs and the extra income ripples through the economy creating additional

jobs in, for example, selling homes, renting movies, providing food and petrol, or recreational opportunities to the new employees or the old residents who now have higher incomes. The Olympics are temporary and nearly all of the new employment associated with them is temporary. In light of the high fixed costs of taking on workers, it may be just as likely that instead of temporarily increasing the overall number of jobs, existing employees work longer hours or simply work harder during the period when the Olympic Games are having their largest employment effect. In all practicality an expected long-term increase in the level of employment is unrealistic for a ‘one-off’ event such as the Olympics.

A variety of methods are used to determine a local economy’s multipliers with the most rigorous options being the use of an input-output model of the economy or of a computable general equilibrium (CGE) economic model. Both of these sophisticated models can be used to calculate how initial impacts flow through and affect the different sectors of the economy. Input-output models are based on a static approach, meaning the parameters of the economy are taken as fixed and Olympic spending is factored in to see how it would affect the economy with everything else being held equal. CGE models incorporate dynamic adjustments into the model of the economy and are more accurate for city and regional economies compared to state and national economies. In practice, the multiplier used for a local economy is often borrowed from related studies in similar sized economies since it is complicated and costly to perform an input-output analysis (UK Sport 1999). As noted in the literature review an inaccurate multiplier is often a source of significant error in calculation and even deliberate distortion in economic impact reports. Partly because of this, Hunter (1988) argues against the use of multipliers at all.

Using a multiplier in the economic impact analysis of an Olympic Games is of limited use, though it can potentially be used by city officials as a framework for strategies to maximize

the benefit of hosting the Games. A detailed CGE model can reveal where leakages are occurring in the local economy and over the course of a seven-year build-up to the Olympics, local officials might be able to adopt strategies to minimize the leakages, increase their multiplier, and thus capture more of the impact of the additional expenditure generated on the local economy.

As noted in the literature review, ex-post studies of the economic impact of the Olympics have consistently shown little-to-no significant tangible economic impact associated with hosting the Games. The implication is that the ex-ante approach using the income accounting framework and multiplier effect is typically misapplied. Common misapplications and errors were explored by Crompton (1995) and Hudson (2001) and are treated in Chapter 2.

## **MICROECONOMIC APPROACHES TO THE OLYMPIC GAMES BID PROCESS**

Two approaches that have a microeconomic theoretical foundation can perhaps explain why ex-post researchers find little or no tangible economic benefit associated with hosting the Olympics. Both approaches deal with bidding agents in an auction for one good. The first shows how potential benefit can be extracted by the seller, in this case the Olympic movement, who could use monopoly power to extract rents from the highest bidder. The second explains why the winning bidder is statistically likely to overestimate the uncertain net benefits of hosting the Olympics and therefore willing to over bid for the Games if bidders fail to consider the “winner’s curse” effect.

## **The IOC as a rent extracting monopolist**

Baade and Matheson (2002) frame the Olympic Games bid process as one where the Olympic family, represented by the IOC, is a rent-seeking monopolist selling a product, the Games, to the highest bidder among the interested cities. In this context where there is one seller and many identical buyers, the monopolist seller is able to extract as much as the entire benefit from the winning bidder. Consider a competition between bidders. Each bidder has the incentive to increase his bid up to the point where the cost of hosting the Games is exactly equal to the benefit he would receive. Any lower bid will result in a net benefit to the bidder, so each would be willing to increase their bids right up to the point where all benefits have been bid away. The IOC, in this context, uses its monopoly position as the universe's sole provider of the Olympic Games to extract rents or benefits from the eventual host city.

Using this approach, one would not expect the winning city to experience any great degree of net benefit from hosting the Olympics. Any net benefit the city might enjoy would be extracted by the IOC by way of financial guarantees, facilities constructed that have little use beyond the Games, or even bribes such as those infamously associated with the Salt Lake City Winter Olympic Games in 2002 (Longman, 2000). Given that in reality the bidding cities are not identical, the winning bidder could still experience net benefits because the winning bid would only have to be greater than the next highest bidder, who would only be willing to pay up to the point where the net benefit was equal to zero. Ideally, the Games would then go to the city that benefits the most from hosting them with much, but not all, of the potential net benefit they could experience being extracted away by the IOC in the bidding process. This could partially explain why the true net economic benefit typically fails to be as high as what is predicted in ex-ante studies. Cities potentially can benefit and thus are interested in hosting the Games, but the

process of many potential hosts bidding for one event can result in much of that potential benefit being extracted by the IOC, acting as a rent-seeking monopolist, in the bidding process.

### **The Winner's Curse**

Another microeconomic approach to examining outcomes of bid situations is known informally as the “Winner’s Curse” effect. In a bidding situation where bids are based on unbiased estimates of uncertain benefits to the bidders, the winning bid often exceeds the true value of the benefits available. An estimate is said to be unbiased if, on average, it is equal to the true value of the benefits received (Frank, 2006). If four candidate cities remained and each had an identical expectation of the distribution of uncertain benefits that it would receive if it were selected as the host of the Games and placed bids based on unbiased estimates of those benefits, the winning bid would be the one at the high end of the distribution of unbiased bids. So, the winner would have a high probability of paying more than the expected benefit of hosting the Games. This could also explain why a host city might experience little net benefit or even a net loss in economic welfare from hosting the Games.

The nature of the Games certainly fits this scenario. The costs are uncertain, let alone the benefits. For example the original budget for the London 2012 Games of £2.375 billion had escalated to over £10 billion by February 2008 (Warner, 2008). With the eyes of the world focused on the Olympics and its host city, the stakes are large, and just as there are the potential benefits of an enhanced image for the city, if things go wrong, the city’s image could be harmed or uncontrollable circumstances might result in reduced beneficial effects. Events like the Olympic Park bombing in Atlanta in 1996 can harm the image of the city, the region, and the country (Levitan-Spaid, 1996). And while tourism in Barcelona doubled and remains at a higher

level since it hosted the 1992 Summer Games, the September 11, 2001 terrorist attacks and the Severe Acute Respiratory Syndrome (SARS) outbreak, both unforeseeable events, are widely thought to have blunted post-Olympic tourism to Sydney, the host of the 2000 Games (Seager, 2004). Bidders are clearly making their bids based on estimates of uncertain costs and benefits which leave them vulnerable to the Winner's curse.

Frank (2006) states that rational bidders will adjust their bids downward to account for the fact that if their unadjusted bid is the highest of a group of unbiased bids, they will likely end up paying more in costs than the eventual benefits justify. Two additional factors come in to play. The fewer the number of bidders, the expected value of the highest estimate decreases and the likelihood of overbidding for the Games diminishes since the expected value of the highest bid is  $N/(N+1)$  of the highest number in the possible distribution of bids where  $N$  is the number of bidders. So if the four candidate cities make unbiased bids that are distributed uniformly on an interval from zero-to-one, the expected value of the highest bid would be  $4/5$  or 0.8. If there were ten bidders, the expected value of the highest bid would be  $10/11$  or 0.91 (the expected value of the benefit of hosting the Olympics would be 0.5 on this scale). The other factor is that estimates and adjustments to account for the winner's curse are likely to be more accurate with repeated, similar trials. The Olympics are a one-of-a-kind, unique event that occur every four years. It is much more difficult to accurately assess the uncertain costs and benefits than it is in other economic contexts. As part of their estimation of benefits, bid cities likely consider the potential intangible benefits of hosting the Games as well as increased tangible economic activity. The intangible benefits are much more difficult to estimate compared to the tangible benefits. The focus here on estimating intangible benefits helps introduce a process that will



allow bid cities to estimate the total benefit they can expect from hosting the Games with more precision.

### **Public choice**

Buchanan and Tullock (1962) devised public choice theory to apply economic principles to political decision making. They propose that it is naïve to think that political officials make decisions for the overall well being of society. Rather, officials make decisions that maximize their own utility. In the case of deciding whether to devote public resources to an Olympic bid, key elected officials might consider that being credited with bringing the Olympic Games could help reelection efforts or lead to political advancement. If it is the case that the Olympic Games do not generate enough economic benefit to justify the public expenditures associated with the Games, it may be due to public officials who are seeking to benefit individually or as a group at the expense of the overall social well being.

### **Revealed preference**

The IOC as monopolist, “winner’s curse,” and public choice theories above support why Olympic host cities might not experience significant economic benefits. The question that remains is “why do former Olympic host cities bid again, and why do other cities who have not hosted the Olympics continue to bid to be host?” It seems that something is missing in the traditional approach to measuring the benefits associated with hosting the Olympics. The economic notion of revealed preference can be used to make the case that economic impact studies focusing solely on tangible impacts are too short sighted and that it is appropriate to include the broader definition of benefits associated with CBA method and best practice estimates of intangible benefits. The consensus, based on ex-post, tangible economic impact

studies, is that the local economic benefits derived from the Olympics do not justify the large public subsidies required of Games hosts. However, observing the behavior of the world's cities, not only are there numerous cities vying to host any given Olympic Games over the last two decades, there are cities who have hosted the Games and have shown interest in hosting again. For example Los Angeles, host of the 1932 and 1984 Games, put together a preliminary bid effort for the 2016 Games (Zinser, 2007). Also, cities who have expended significant resources yet failed in their bids four and eight years earlier return to try again. Currently the cities of Madrid and Rio de Janeiro are candidate cities to host the 2016 Games after being candidate cities to host the 2012 Games as well. There are three potential interpretations of this; first, the cities are acting irrationally, second, influential groups who stand to benefit are influencing cities to act against their best interests, or third, traditional economic impact study practices underestimate a significant level of economic benefit that comes with hosting the Games. The fact that most of the residents of these cities favor the bids indicates that the second interpretation is likely inaccurate. If you assume that the cities do act rationally, and they continue to pursue hosting Olympic Games, then their choices reveal an economic preference and in turn that the decision makers, whether they are politicians or ultimately the people who elect the politicians, feel that the benefit they would experience is worth the cost.

Definition 4.1- Weak Axiom of Revealed Preference:

If  $A$  and  $B$  are both goods that can be feasibly obtained and  $A$  is chosen, then at any prices and income where  $A$  and  $B$  are feasible, the consumer will choose  $A$  over  $B$ .

This axiom indicates two things:

1. People choose what they prefer.
2. Preferences are consistent. Therefore, a single observed choice reveals a stable preference.

If a person chooses a certain bundle of goods while another bundle of goods is affordable, then the first bundle is revealed preferred to the second and it is assumed that the first bundle of goods is always preferred to the second. If the consumer ever purchases the second bundle of goods then it must be the case that the first bundle is unaffordable (Varian, 2006). Define bundle “ $A$ ” as Olympic Games 2016 and bundle “ $B$ ” as the total cost of winning the bid and hosting the Games (which is different for different cities), if a city chooses  $A$  it implies the city gets more benefit from  $A$  than it gets from  $B$ - the cost of winning the bid and hosting the Games, or that the economic benefit enjoyed by hosting the Games is equal to or greater than the cost of hosting the Games (ignoring uncertainty). The benefit or utility of  $A$  is greater than or equal to  $B$ , which implies that the benefit is greater than or equal to the costs and that the benefit minus the cost is greater than or equal to zero. If all of the costs are tangible and the tangible benefits are less than

or equal to the tangible costs (the consensus among economists), then other benefits including the intangible benefits, best estimated by using the CVM, explain the cities' behavior and continued preference to host the Games. In other words, whatever amount they plan to spend, the cities are getting at least that much benefit or they wouldn't spend the money. The amount they are willing to spend is equal to or less than the total economic benefit. In this context the total economic benefit should consist of the direct net spending injections into the local economy, the induced benefits that arise due to the multiplier effect, and the intangible benefits estimated in monetary terms that result from hosting the Olympic Games.

## ECONOMIC THEORY BEHIND THE CVM

The CVM has its basis in the following microeconomic theory which I explain in the Olympic host context borrowing from Whitehead (2000) and Mas-Colell, Whinston, and Green (1995). A representative resident of the Olympic host city, or in this case potential host city, has a utility function that can be represented by equation (4.6). Utility is defined as a function of three goods, the element of the Olympics that is consumed by

Equation (4.6): *Representative resident utility function*

$$u = u(O, i, z)$$

Where:

$O$  = *consumption of Olympics*

$i$  = *net intangible benefits*

$z$  = *composite commodity*

residents, which would be reflected in the money residents spend attending Olympic activities and purchasing souvenirs, the net intangible benefits associated with the Olympics, which as noted by Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) can be the feel good factor or community pride, and a composite commodity of all other consumption goods. The resident

utility function is increasing in each good, meaning they are better off the more they have of each of the three goods. The resident budget constraint can be represented by equation (4.7).

Equation (4.7): *Representative resident budget constraint*

$$Y = z + pO$$

Where:

$Y = \text{income}$

$p = \text{the price of Olympics consumption}$

(the price of the composite good is normalized to equal “1” for simplicity)

The resident maximizes her utility by purchasing as much Olympic consumption and the composite good as she can, given her income constraint.  $i$ , the intangible benefits, are public goods that have no price and are not traded on the market. Solving the resident utility maximization problem yields her indirect utility function, equation (4.8), which expresses her well being as a function of her income, the price of Olympic consumption and the net intangible benefit associated with the Olympics.

Equation (4.8): *Representative resident indirect utility function*

$$u=v(p,i,Y)$$

Where:

*v=indirect utility and is increasing in  $i$  and  $Y$  and decreasing in  $p$*

The resident's optimization problem can be expressed as minimizing her expenditure (equation 4.7) subject to her level of utility for a given income, price level of Olympic consumption, and level of net intangible benefits associated with the Olympics. The result represents her expenditure function, equation (4.9).

Equation (4.9): *Representative resident expenditure function*

$$e=e(p, i, u)$$

Where expenditure is increasing in  $p$  and  $u$  and decreasing in  $i$ .

Interpreting equation (4.9), assuming a fixed, reference level of utility or well being, with the loss of the intangible benefits associated with the Olympics ( $i=0$ ), the expenditures necessary

to maintain the reference level of utility have to increase and WTP can be expressed as the difference between the expenditure function without the Olympics' intangible benefit and the expenditure function with them (see equation 4.10).

Equation (4.10): *Willingness-to-pay (WTP)*

$$WTP = e(p', 0, \bar{u}) - e(p, i, \bar{u})$$

So if the reference level of utility includes the intangible benefit of the Olympics ( $i$ ), and you remove  $i$ , the typical resident will have to spend more money to maintain that reference level of utility. The difference in the amount of expenditure between what she has to spend to maintain the reference utility without the Olympics and what she has to spend on that level of utility that includes her intangible benefit from the Olympics theoretically represents her WTP for the intangible benefits associated with the Olympics. This is the theoretical basis of the CVM, which requires that the researcher sets up a hypothetical market scenario that requires respondents to reveal their WTP. The summation of residents' WTP is then an estimate of the local community's total anticipated intangible benefit of hosting the Olympics.



## EMPIRICAL MODELS

Ordinary Least Squares (OLS) models are used to examine the effect of different variables on respondents' WTP to support a 2016 Olympic bid for their home city. For each city there are three measures of WTP to support the Olympic bid. The first is the normal, for a CVM study, willingness to donate money to bring the Olympics to the respondents' home city. The second is WTV time as part of the volunteer force necessary to bid, prepare for and host the Olympics. This was collected in hours, but is also converted to a monetary value based on the per capita GDP for the city where appropriate. For this study, each city's sample was split into two parts, one subset was asked for WTP in monetary donations and the other was asked for WTV in hours of time. The third measure converts WTV into monetary terms and includes it with WTP in monetary donations across the entire sample for each city. For each city three OLS regression models are run, one with each measure of WTP as the dependent variable. The models are described below.

$$\text{Model 1: } WTP_i = \alpha + \beta_1 HRS_i + \beta_2 SPEND_i + \beta_3 MALE_i + \beta_4 INCOME_i + e_i$$

$$\text{Model 2: } WTV_i = \alpha + \beta_1 HRS_i + \beta_2 SPEND_i + \beta_3 MALE_i + \beta_4 INCOME_i + e_i$$

$$\text{Model 3: } WTP/WTV_i = \alpha + \beta_1 HRS_i + \beta_2 SPEND_i + \beta_3 MALE_i + \beta_4 INCOME_i + e_i$$

$WTP_i$  = willingness-to-pay in monetary donations to support the  $i$ th city's Olympic bid

$WTV_i$  = willingness-to-volunteer in hours to support the  $i$ th city's Olympic bid

$WTP/WTV_i$ =a variable that includes both WTP in monetary amounts and WTV expressed in monetary terms with hours converted to money by an hourly rate derived from the  $i$ th city's per capita GDP and assuming a 40 hour work week for 52 weeks per year.

$HRS_i$ =hours spent following sport per week

$SPEND_i$ = the amount respondents indicated as the most they would spend attending the Olympic Games if they were hosted in their home city plus the most they would spend on souvenir items if the Games were hosted in their home city.

$MALE_i$ =a dummy variable measuring gender, it equals 1 for male and 0 for female.

$INCOME_i$ =annual household income.

$e$ =the disturbance term which is assumed to be normally distributed with an expected mean of zero (Kennedy 2003).

Hours spent following sport per week is a measure of fan behavior. It is distinct from hours spent participating in sports. The hypothesis is that the more one spends time following sport, the more supportive she will be of the Olympics. So the prior expectation is that the sign for the coefficient of  $HRS$  should be positive in all models.

The amount respondents would spend if their city hosts the Olympic Games is a measure of the use value of the Olympic Games to these respondents, which is distinct from the non-use value. People can experience direct value from the Olympic Games by taking part as a spectator or purchasing souvenirs. This represents private, tangible, use value where the dependent variables,  $WTP$ ,  $WTV$ , and  $WTP/WTV$  represent public, intangible value. The hypothesis is that

the more use value one expects from the Olympics, the more intangible value he would enjoy as well with examples of intangible value being increased pride and enhanced image of the host city. The prior expectation is that the sign for the coefficient of *SPEND* should be positive in all models.

*MALE* is a dummy variable to determine if there are any gender differences in the intangible benefit residents expect to experience if their home city hosts the Olympic Games. It is not clear how significant gender is and if it is significant, what direction the influence would be. On one hand men are, on average, more avid sports fans than women. Perhaps men are more likely than women to experience intangible benefits from their home city hosting the Olympic Games. On the other hand, the Olympic Games are the premier global showcase for women in sport. While men compete in, and can follow, popular and well publicized professional sports leagues such as baseball, basketball, cricket, North American football, rugby, and soccer, outside of tennis the most popular and well publicized women's competitions are the Olympic Games. Perhaps women's pride in seeing women athletes celebrated on a par with the men at the Olympic Games leads to an experience of greater intangible benefit for women.

*INCOME* is a respondent's annual household income measured in thousands of dollars and is a variable of particular interest for *WTV* as a dependent variable. Part of measuring intangible benefit using the CVM is that people have budget constraints. A reliable CVM study depends on respondents considering their budget when responding to the *WTP* question. One would expect a higher income, indicating a higher means to pay, would lead to a higher *WTP*, all else being equal. But how does it affect *WTV*? Do respondents indicate a higher *WTV* because they do not have enough money but they expect to enjoy significant intangible benefits from the Games so they are willing to work to help their city earn the right to host the Games? Or do high

income respondents, who can afford to take a holiday from their careers to help with the Olympic effort, indicate a higher WTV? This is an important determination that can have implications for estimating expected intangible benefit in this context in low income countries. The prior expectation is that the sign for the coefficient for *INCOME* would be positive for models with *WTP* as the dependent variable, but could be positive or negative depending on if the wealth or substitution effect dominates the relationship between income and WTV.

*Table 4.1: Expected signs of coefficients*

<b>Independent variable</b>	<b>Expected sign</b>
<i>HOURS</i>	>0
<i>SPEND</i>	>0
<i>MALE</i>	???
<i>INCOME</i>	>0 for <i>WTP</i> models ???

Some technical comments and issues with the models below are that the model includes some version of all of the variables that information was collected on in the study except for age. Both income and age were asked rather broadly to avoid discouraging people from sharing information they might feel is too private. As a result, there is a high correlation between the age and income data collected so I chose to use income only to avoid multicollinearity problems with the models. The high correlation between age and income makes intuitive sense for these samples since the very few respondents were outside of working age and in general worker

incomes increase over the course of one's work life. Also, as mentioned previously, income is a key variable in understanding the behavior and economics behind peoples' WTV responses. Cook-Weisberg tests indicated heteroscedastic errors in the data. The models were modified to base tests of significance on the Heteroscedasticity Consistent Covariance Matrix (HCCM) known as HC3 as recommended by Long and Ervin (2000). Additionally, there are quite few zero values for the dependent variables for Berlin and San Francisco where more than half of the respondents were not willing to pay, willing to volunteer or both in support of an Olympic bid. A Tobit censored regression model is often used automatically when there are many zero values for the dependent variable, however when the zero values represent a choice of interest, like they do here, use of the Tobit model is inappropriate. Finally, note that the models with *WTP* and *WTV* as dependent variables include data from the appropriate subsample for the given city. The models with *WTP/WTV* include the entire sample for each city with both *WTP* and *WTV* expressed in comparable monetary terms.

## **LABOR SUPPLY THEORY AND THE VALUE OF A VOLUNTEER'S TIME**

One of the hallmarks of this study is the split sample approach to respondents expressing *WTP* to bring the Olympics to their city in terms of either monetary values or willingness to donate their time. The reasons for this approach are two-fold. First, to see if the average *WTP* in dollar terms differs depending on whether respondents were asked for donations or to volunteer their time. Second, accounting for both *WTP* and *WTV* potentially allows for a valid comparison of residents from different cities and diverse economies around the globe, and

intensity of support comparisons. The description of an individual's labor supply choice that follows is based on Frank's (2006) treatment of the subject.

Assume that a person is endowed with 24 hours in each day and can choose between either work or leisure. Work is defined as something that earns the individual money and leisure is defined as anything else and would include volunteering time in support of an Olympic bid. Assume the individual can choose to work 24 hours at a given wage, choose to spend the entire day in leisure or choose any combination of work and leisure that adds up to 24 hours. The cost of leisure is the foregone earnings from not working.

The law of demand states that, *ceteris paribus*, if the price of a good rises, the quantity demanded of that good will fall. If that holds for an individual's labor leisure choice, as a person's earning power increases, he will choose to increase his time working and decrease his leisure because when his earning power increases, leisure, to him, becomes relatively more expensive. In other words, as leisure becomes relatively more expensive, he substitutes work for leisure and this represents the substitution effect: as a good becomes more expensive, an individual will consume less of that good and he substitutes for that consumption with something that is now relatively cheaper.

If we assume that leisure is a good that an individual will consume more of as his earnings increase, which is a characteristic of a normal good, there is another effect at work. As the individual's wage increases, his leisure becomes more expensive, but he can also afford to "purchase" more leisure with his higher wages. This is known as the wealth effect. In theory, both the wealth effect and the substitution effect are working simultaneously and it is an

empirical question to see which one dominates, which is something that is examined in this dissertation for the residents of the three cities.

The motivation for comparing residents' WTP in money and WTV in time is to address the feasibility of using the CVM as a measure of intensity of preference in comparisons of Olympic bid cities. It is common practice for cities planning on an Olympic bid to commission a public opinion survey to gauge public support for their efforts (Preuss and Solberg, 2006). The results are typically reported in IOC bid documents as either a certain percentage is in favor of the bid, or if a Likert scale (Trochim and Donnelly 2006) is used the percentage who support the bid and the percentage who strongly support the bid are reported. The latter reflects some intensity of support by distinguishing between support and strong support. Given the stated preference nature of the CVM it might be a natural extension to think of CVM WTP results as measures of intensity of preference that can be compared between bid cities. The results of this study imply that residents of Chicago preferred to host the Olympics to a greater degree than those of Berlin and San Francisco because they stated a greater WTP. The anecdotal, intangible feel around the city in comparison to the others was consistent with this outcome as well. Perhaps the CVM results of this study are a fairly accurate representation of each city's intensity of preference regarding hosting the 2016 Games. But what if candidate city Rio de Janeiro were part of the study? Brazil's per capita income is a fraction of that of the other cities, so WTP in money in comparison to other cities would not be a reliable comparison of intensity of preference.

If Olympic supporters are willing to donate the good, money or time, that is relatively cheapest to them to support the bid, then supporters who are wealthy would donate money because for them, money is plentiful and time is scarce, and supporters who are poorer would

donate time because for them, time is relatively plentiful while money is scarce. If this is the case, a weighted average of time and money can be determined that expresses time in its dollar value (opportunity cost) but also accounts for average per capita income of the cities being compared. The following example provides a thorough illustration.

Among the candidate cities bidding to host the 2016 Olympic Games, Chicago is from the country with the highest per capita gross domestic product (GDP) and Rio de Janeiro is from the country with the lowest per capital gross domestic product (GDP). Using the country per capita GDP as a proxy for each city gives the following numbers:

Chicago annual per capita GDP	= \$45,800
Rio de Janeiro annual per capita GDP	= \$9,700

This is a significant difference which certainly makes any WTP totals derived from CVM studies irrelevant as comparisons of intensity of support between these two cities. One would expect that Chicagoans would have a higher WTP solely from the fact that they have a much higher income. Assuming a 40 hour work week, the annual per capita GDP figures can be converted to weekly, hourly, or by the minute numbers in monetary terms.



Chicago hourly per capita GDP (40 hr. work week) = \$22.02

Rio de Janeiro hourly per capita GDP (40 hr. work week) = \$4.66

For the average Chicago resident, the price in dollars of donating an hour of time is much higher than it is for the average Rio de Janeiro resident. Expressing a dollar in terms of the amount of time it takes to earn it results in a dollar being much more expensive for the average Rio de Janeiro resident when compared to the average Chicago resident.

Chicago, length of time it takes to earn \$1 = 2.27 minutes

Rio de Janeiro, length of time it takes to earn \$1 = 12.86 minutes

Because a dollar is relatively expensive and time is relatively cheap in Rio de Janeiro when compared to Chicago, one would expect more WTV relative to WTP there and the opposite in Chicago if the substitution effect dominates. The result is a function of income levels and the fixed nature of time, but it illustrates why WTP figures, even when expressed as a percentage of GDP, are not useful as comparisons of intensity of support between bid cities. A useful measure has to account for differences in absolute GDP and differences in the relative cost of work versus leisure.

A potential measure of intensity of support for a bid is proposed here, a bid intensity factor (BIF) measure that expresses both money and time in dollar terms adjusted by per capita

GDP. WTV is expressed in dollar terms by converting the average hours a resident is willing to volunteer into dollars using the average hourly wage.

$$(4.11) BIF = \frac{[Ave\ WTP + WTV(\$)]}{per\ capita\ GDP\ (weekly)}$$

To illustrate the measure, assume the average WTP and WTV numbers are as follows:

Chicago;      WTP = \$100

WTV = 16 hours

Rio de Janeiro; WTP = \$1

WTV = 20 hours

The numbers in the example reflect a situation where residents of each city are willing to donate more of what they have a comparative advantage in, which is dollars for Chicago and time for Rio de Janeiro.

Possible comparisons based on the numbers given above:

a). WTP as a percentage of weekly GDP:

$$\text{Chicago: } \$100/\$880 = 11.4\%$$

$$\text{Rio de Janeiro: } \$1/\$187 = 00.5\%$$

b). WTP + WTV expressed in \$:

$$\text{Chicago: } \$100 + 16(\$22.02) = \$452.32$$

$$\text{Rio de Janeiro: } \$1 + 20(\$4.67) = \$94.4$$

c). BIF (as expressed above)

$$\text{Chicago: } \$452.32/\$880 = 0.51$$

$$\text{Rio de Janeiro: } \$94.4/\$187 = 0.51$$

Comparison choice “a” is biased toward Chicago because it gives all of the weight to the factor that is cheapest for Chicagoans to expend (and most expensive for Rio de Janeiro residents).

Comparison choice “b” is clearly biased toward Chicago because it fails to account for the substantial income difference. Choice “c”, the BIF measure, accounts for both of these factors and in this example, an average WTP of \$100 and WTV of 16 hours for Chicago reflects an equivalent intensity of support to an average WTP of \$1 and WTV of 20 hours for Rio de Janeiro.

Farquhar and Keller (1989) list three criteria for an effective measure of intensity: 1. the preference procedure must be actionable, 2. the preference procedure must be compatible with the existing structure of the decision problem, and 3. the intensity measure should be unconfounded with other measures present. They directly criticize WTP as a measure of

preference in cases where it is not a compatible procedure, such as, “the measurement of human mortality or morbidity via a monetary attribute can raise strong objections among individuals who view money as inappropriate in this decision context or who simply refuse to make such tradeoffs” and also show concern with additivity problems associated with WTP measures. An example of an additivity problem associated with a WTP measure is that the WTP for overall environmental quality is often less than the WTP for individual elements that contribute to environmental quality. In the Finger Lakes area region of New York there are many large, long, relatively narrow, deep lakes that were carved out by receding glaciers centuries ago. If residents were asked what they would be willing to pay to protect the Finger Lakes, and independently asked what they would be willing to pay to protect each individual lake, if the total WTP for the latter is higher than the former, there is an additivity problem since an unbiased measure would have the aggregate WTP to protect the individual lakes equal to the aggregate WTP to protect the group of lakes. Neither concern exists in this measure. People commonly donate their money and time to efforts to bring the Olympic Games to their cities, and we are considering the Olympics Games as a unique, individual commodity. So the measure that is a weighted average of residents’ willingness to donate money and their willingness to volunteer expressed in monetary terms meets the three criteria set out by Farquhar and Keller in this context.

However, the proposed BIF only works well if the substitution effect dominates the wealth effect in the labor/leisure tradeoffs that individuals make and whether or not they are willing to donate time or money according to its relative expense to them. If the wealth effect dominates and if empirical findings show that poorer people are more likely to donate money because they cannot afford to spend time not working, and wealthy people volunteer more time

because they can afford it, the proposed BIF is unsuitable for comparisons of intensity of preference across cities.

## **CONCLUSION**

Theoretical issues related to this dissertation are discussed in this chapter starting with the macroeconomic/income accounting approach to estimating the benefits of hosting an Olympic Games. Essentially this approach considers the net injections of expenditure into the economy caused by the Olympic Games and how it is magnified through the multiplier effect to create a total tangible economic benefit. Three explanations for why cities might pursue hosting the Olympic Games even if the overall benefit does not justify the investment of public money based in microeconomic theory are considered. First, a framework where the IOC is a monopolist that extracts economic benefits in the form of rents from the eventual host city; second, the “winner’s curse” effect where the highest bid from a group unbiased estimates from identical cities is statistically likely to be higher than the expected value of the good being evaluated; and third, public choice explanation where influential individuals or groups might make decisions based on their well being at the expense of the society as a whole. While the above can explain why cities might be foolish to bid to host the Olympics, it is unsatisfactory in explaining why so many cities do bid to host the Games. A revealed preference approach illustrates that something is lacking in the typical assessments. The conclusion is that often the very relevant and significant category of intangible benefit is not being considered and that a broader scope of benefits should be estimated and included in economic impact studies as is the case with studies using cost-benefit analysis.

The beginning of the chapter provides the context for this dissertation and the remainder of the chapter provides the theoretical underpinnings of the study here. First, the microeconomic theory that provides the basis for the CVM and the empirical models and their hypotheses are described. Finally, the theory of labor supply or individual labor/leisure choice is examined in the context of using WTV as an alternative to or in conjunction with WTP in CVM studies across different cities so that the results can be used to make valid comparisons of residents' intensity of preference. At issue here is whether the empirical data supports a scenario where the substitution effect dominates or wealth effect dominates in individual's labor/leisure choices. A measure of intensity of preference, BIF, is proposed that can be used to compare across cities, but only if the substitution effect dominates in the labor/leisure choice problem.

## **CHAPTER 5**

### **METHODOLOGY**

#### **INTRODUCTION**

The main issue addressed in the research here is the estimation of the intangible, nonmarket benefit associated with hosting the 2016 summer Olympic Games. As mentioned elsewhere, the CVM used widely in estimating the intangible benefit of environmental goods is a particularly good fit for the task at hand. In the early 1980s as the CVM was becoming more widely used, the US Environmental Protection Agency sponsored a workshop on the practice that offered a “state of the art” assessment of the CVM (Cummings, Brookshire, and Schulze 1986). The outcome was a set of conditions to be met for the conduct of a credible CVM study. The operating conditions are; respondent familiarity, choice experience with the commodity, little uncertainty in the valuation exercise, and use of WTP.

There are very few contexts that meet these conditions as well as the “hosting the Olympics” context. Respondent familiarity refers to the familiarity of the survey respondents to the good being evaluated. In general, residents of large cities that are viable candidates to host the Olympics are familiar with the Olympic Games and have an understanding of how their city hosting the Olympics would affect them. Choice experience with the commodity refers to whether the respondents have experience or knowledge of the choice they will be asked to make as part of the study. Here, respondents were asked if they would support their city hosting the Olympics by donating money or volunteering their time. Donating money or volunteering time is a traditional method of supporting the Olympic Games. While respondents may have never donated their money or time to an Olympic effort, if they wanted to actively support an Olympic



effort, these would be two of the first methods of support that would come to mind. Because respondents likely have knowledge of the Olympics and what hosting the Games would mean to them, there is little uncertainty. In this study, respondents were asked to evaluate hosting the Olympic Games on the condition that the bid was guaranteed. There is uncertainty regarding how the Games turn out, but respondents who are familiar with the Olympic Games, and the vast majority are, understand the outcome. The using WTP condition is an early technicality that has become standard practice and is used here. Mitchell and Carson (1989) report that studies that used both WTP and willingness-to-accept (WTA) measures have consistently found that respondents' WTA is much larger, often as much as four times as large or more (Hammack and Brown, 1974) and overstates the intangible benefit, possibly due to an ownership bias.

The CVM approach taken here is drawn from the major works regarding its practice. Mitchell and Carson (1989) is the most comprehensive treatment of technical issues and the practice of the CVM. Cummings, Brookshire, and Schulze (1986) is an earlier assessment of the state of the art of the CVM. Both of these works were referred to in the construction of this study as is noted below. In 1993 the (US) National Oceanic and Atmospheric Administration (NOAA) issued guidelines and recommendations for accepted practices of CVM studies, recommendations that were followed as closely as possible here. Finally, more recent works by Boyle (2003) and Whitehead (2000) summarize the previous CVM work and offer updated practical recommendations. Both works were referred to often in both the conceptual and practical stages of this study.

## THE CVM

### Public Goods, the Olympic Games and the Components of Value

The CVM uses survey questions to elicit people's preferences for public goods by finding out what they would be willing to pay for specified improvements in the provision of those goods (Mitchell and Carson, 1989). In this study, I consider the public good benefit of hosting the Olympic Games. The public nature of the "good," hosting the Olympic Games, is the non-rival aspect of the Olympic experience. That is, one person's consumption of the good has no effect on another's. It is assumed that rather than having respondents evaluating levels of provision of the public good, the question of hosting the Olympics can be understood in the context of two discrete states of the world. State one, the city is the Olympic host. State two, it is not. This is an appealing characteristic of the study. The typical aim of the CVM is to elicit respondents' WTP in dollar amounts. In the context of economic impact studies of hosting the Olympic Games, the subsequent intangible benefit dollar amount estimated can be presented with the estimated net tangible benefits to give a more complete measure of economic impact. It would be deceptive, however, to report the sum of net tangible and intangible benefits as a 'headline' economic impact number without clarification given the traditional nature and use of economic impact studies. Intangible benefit estimates should be reported along with, but clearly separated from, net tangible benefits in a comprehensive study.<sup>12</sup>

The CVM is often used to set up a hypothetical market for public goods, such as clean air or water, that do not, because of their nature, exist in a market context. The Olympic Games can be categorized as a quasi-private good (Kopp and Portney, 1985) in that there definitely is a

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<sup>12</sup> See Clegg 2005 for an example

public good element but there is also a market aspect of the good as well. Residents can purchase provision of the Olympic Games or the Olympic experience by paying to attend the Olympics, paying to view competitions, or purchasing merchandise. But residents who spend no money on the Olympics are both subject to the crowds and attention the Games bring and also the feeling of pride in the city's role as host to the world's community. The former represents the private good aspect and the latter the public good aspect of the value of hosting the Olympic Games. Figure 5.1 illustrates the components of value from Freeman's (1993) description of environmental and natural resource values. Total value is made up of use value and nonuse value. Here, use value is captured by respondent's projection of how much they would be willing to spend to attend Olympic events and how much they would be willing to spend on Olympic souvenirs. The WTP in donations of time or money to an organization committed to winning the right to host the Olympics captures the nonuse value that is made up of existence value and bequest value. In the Olympic context, the existence value is the value of the city being an Olympic host. For example, a person might not have interest in sport, might not like crowds, and might not spend any money on the Olympics, but still gain value, perhaps in terms of public pride that the world is focused on the city in a positive light. The bequest value associated with the Olympics might be the future benefits of being an Olympic city. Tourists may come for years and the existence of facilities, museums and memorials, along with memories of the Games, might encourage people yet to be born to become interested in sport and to pursue Olympic dreams.

*Table 5.1: Components of Value*

Total value	
Use value:	Non-use value:
Direct use, indirect use, option value	Option value, existence value, bequest value

### **The CVM Approach**

In this study, WTP was elicited in terms of monetary values and also hours that people were willing to volunteer. The sample for each city was randomly split into two segments with one group of respondents asked if and how much money they would be willing to donate and the other asked if and how much time they would be willing to donate to an organization dedicated to bringing the Olympics to their city. There are several reasons why using two measures of WTP is of interest. First, the Olympic Movement relies on thousands of local volunteers to present the Games. If volunteer hours can be expressed in money terms, the results can be tested to see if the ‘amount’ people are WTP is affected by whether they are asked to volunteer or donate money. If there is no significant difference, it suggests that people’s WTV could serve as a proxy for their WTP. This result could be applied looking back at previous Olympics, and the official records of number of volunteers, applicants, and volunteer hours worked. Second, WTV measures, in conjunction with WTP, should lead to more robust estimates of intangible benefits across diverse economies. Since the monetary WTP is a function of ability to pay, and there are potentially large differences between income levels across global cities competing to host the Games, WTV would arguably measure the intangible benefit better in low income countries. Hadker, Sharma, Ashish, and Muraleed Haran (1997) provided a WTV option for respondents, who were typically low income, in their CVM study concerning the Borivli National Park in India. Third, following on the second point, I propose a measure of intensity of support for the

Games among residents of bid cities that is a function of WTP, WTV, and a city's per capita income.

A CVM study is fundamentally composed of three parts according to Mitchell and Carson (1989). Respondents are presented a survey, using a face-to-face interview, phone interview, mail or internet survey, or public intercept survey, consisting of the following three parts. Part 1 is a detailed description of the good or goods being valued and the hypothetical circumstance under which the good is made available to the respondent. This is greatly simplified in the Olympic context because of respondent familiarity with the Olympics and the prevalence of monetary donations and volunteering time in support of Olympic efforts. The hypothetical circumstance in an Olympic study is grounded more in reality and does not have the abstract nature that many traditional CVM studies have. Part 2 are questions eliciting the respondent's WTP for the good being valued. Here respondents are asked either how much they would donate in money, or how much time they would volunteer, if their city was guaranteed of hosting the 2016 Olympics. Part 3 are questions regarding demographic characteristics, respondent preference relevant to the good being valued, and their use of the good. Besides the demographics, approximate age and income, respondents were asked how much time they spend following sports, their favorite sport to follow, if they thought they would attend Olympic events or buy souvenirs, and how much they would be willing to spend attending Olympic events or buying souvenirs.

As mentioned in the literature review above and emphasized throughout this dissertation, the CVM is particularly suited to estimating the intangible benefits associated with the Olympic Games. Consider some of the other examples cited above where CVM was used to measure an intangible benefit. Many of the situations where intangible benefits are relevant are difficult to

conceptualize in a hypothetical market context. How much is a person willing to pay to avoid skin cancer? It is difficult to think of a hypothetical market for avoiding skin cancer. People can take preventative measures, at cost to them, to lower their risk of developing skin cancer, but lower risk is not a discrete good, which suggests another difficulty. Many of the intangible benefits measured by CVM are not provided in clear discrete quantities. Because of these abstract qualities, much of the CVM literature and much of the CVM in practice deals with framing scenarios in useful and as close to realistic ways as possible. Beyond the theory and tests for validity there is an art to framing the typical hypothetical CVM scenario. How much is a person WTP for improved environmental quality? Think of all of the tasks that are required to explore this question in a valid, unbiased manner. What exactly is meant by environmental quality? How is it measured? What are the different levels of environmental quality that can be provided? How does one pay for them? What do the different levels mean to an individual? Do decreased levels of environmental quality result in only increased discomfort for individuals or would it increase health risks or even result in certain damage to one's health? Would it cause irreversible damage to the environment and species of plants and animals? These complications do not exist in a CVM study of hosting the Olympic Games.

In many scenarios the researchers have to thoroughly describe an unfamiliar amenity that is being evaluated and how it is measured and provided while taking care not to introduce bias into the descriptions. They then have to set up a realistic, hypothetical market scenario that allows respondents to place a value on the abstract amenity. The scenario itself and the amenities being studied can be confusing to the average respondent. This creates an environment where respondents are more likely to be seeking bias inducing cues and anchors to

carry them through their confusion as they try to visualize the scenario and estimate the good's worth to them.

The approach is taken here that studies of the intangible value provided by hosting the Olympic Games are an especially good fit for the CVM. Many of the crucial concerns with CVM design in an environmental or natural resource context are not issues when studying the Olympics. First, there are very few things in the world that people are as familiar with as the Olympic Games. When asking a resident of a potential host city about the Olympic Games, the researcher does not have to describe the amenity thoroughly for the respondent to understand the issue. Well over one thousand people in three cities were surveyed for this study. Every single respondent and those few who were approached but declined to take part appeared to be familiar with the Olympics. Not once did someone ask for further clarification about the topic or appear to not understand or have knowledge of the Olympic Games. Hosting the Olympics is a straightforward and clear discrete outcome. The city is either the host city or it is not, which eliminates the issue of levels of provision and respondents trying to ascertain what different levels of provision mean to them and how much they value the changes in level of provision. Only the largest cities in the world consider hosting the Olympic Games and the residents of those cities, who are the target respondents of this study, have experience with and knowledge of large, special events that draw visitors to the city. In the background information on the cities studied above, it is noted that they draw millions of tourists per year and host numerous large events on a regular basis. There are no events that surpass hosting the Olympic Games for a city in terms of the scope and investment in the event, but residents of these cities have a good idea about what hosting large events entail. This greatly reduces the need to educate the respondents and also the corresponding worry that the explanations will introduce bias.

## Data Collection and Sample Size

In this study, the survey instrument was relatively sparse and straightforward. A short explanation of the purposes of the study was provided. This was regularly noted by potential participants and necessary to induce participation by potential respondents. Particularly in the US cities, people are savvy to and suspicious of participating in marketing efforts that collect demographic information for use either to target sales pitches or to be sold to other companies. When approached to be surveyed, many people asked, “are you going to put me on a mailing list?” Upon seeing that the purpose was academic research, most people were happy to take part, but it is likely that the statement of purpose greatly improved the participation rate.

### *Survey introduction:*

The following is a survey of local (metro-city-area) citizens’ attitudes regarding potentially hosting the 2016 Summer Olympic and Paralympic Games in (city). The survey is being conducted solely for the purposes of collecting data for my doctoral dissertation. I offer my sincerest gratitude for your time and participation. If you have any questions, feel free to contact me.

The minimalist approach in this context was used hoping to minimize the risk of introducing bias and maximize the participation rate. Note that a high response rate in and of itself reduces potential bias because it results in a more thorough, representative sample. A complicated survey with a great deal of background can, for example, intimidate people with lower education levels which could introduce an education bias into the results. It is especially important with a public intercept approach as one of the first cues potential participants look for is how much time they will have to spend to complete the survey. It was effective to use the words, “ten questions in one-or-two minutes” when approaching potential respondents. Also,



since public intercept surveys take place in public and potential participants can observe how quickly the process lasts, a clear, concise instrument is extremely beneficial. The body language that we saw repeatedly was that people would initially move away from the researcher when he or she approached a group, not eager to participate, but as long as one person took part, others nearby would see how quick and simple the survey was and they would agree to participate as well.

The general approach was based on the previous CVM studies regarding sport by Johnson and Whitehead (2000) and Johnson, Grootuis, and Whitehead (2001) summarized in the literature review above. When this project began, these were the only two sport-related CVM studies published. Additionally, Whitehead (2000) wrote “A Practitioner’s Primer on Contingent Valuation” which was followed closely in designing the study. Cost was a definite limiting factor in carrying out the study. The aim was to survey 500 people in each city and the final number of respondents were 499 in Berlin, 342 in Chicago, and 544 in San Francisco.

Whitehead (2000) recommends in order of the most preferred method first, in person interviews, followed by telephone interviews, and finally mail surveys. Personal interviews allow for researchers to control the representativeness of their respondents and mail surveys allow for control of who gets sent a survey, but not who responds, which could introduce a bias. The NOAA panel (1993), and Mitchell and Carson (1989) recommend personal interviews as the best method, though in practice, mail surveys are the most widely used because of the lower cost (Champ 2003).

For this study, public intercept method was chosen as the most logistically feasible option. Public intercept surveys are considered non-probabilistic because unlike a true random

sampling, each member of the population does not have an equal chance of being selected for the survey. Because of this, the method is not generally recommended for use when generalizations are to be made over a population. However, Harrison and Lesley (1996) make the case that non-probabilistic methods achieve essentially the same results when generalized over a population at a far lower cost. They were able to repeatedly replicate the results of the multi-million dollar CVM study commissioned for the state of Alaska after the 1989 Exxon Valdez oil spill with surveys of student groups in their classes using a simplified survey instrument. This suggests that while in theory expensive probabilistic surveys and personal interviews are an ideal approach, in practice, especially for well-known amenities, other less costly methods can yield essentially the same results.

In Berlin, participants were surveyed in the Pariserplatz area and between the Reichstag and the Brandenburg Tor on the 26<sup>th</sup> and 27<sup>th</sup> January, 2007. In Chicago, participants were surveyed in the public parks and beaches along the lake shore north of the Navy pier on the 22<sup>nd</sup> and 23<sup>rd</sup> of September 2007. In San Francisco, members of the University of San Francisco sport management club, under the direction of a graduate student, each took 20-25 surveys to administer to random San Francisco area residents they came across in their normal day-to-day lives from November 2006 until February 2007.

Sample sizes of 500 were targeted for each city. Technically, the goal for selecting sample size is to minimize the standard error given a fixed amount of resources. The standard error is dependent on the variation of the WTP responses (see equation 5.1) which are typically quite wide. Mitchell and Carson (1989) recommend “large” sample sizes because of this. Since the sample size is the denominator of the standard error equation, a larger sample size lowers the standard error. Boyle (2003) recommends using previous studies with similar applications, if

they exist, as guidelines for deciding how many to sample. As this study was being designed, the only CVM studies on the value of sport were Johnson, Groothuis, and Whitehead (2001) and Johnson and Whitehead (2000). The former had a sample size of 309 and the latter 230. As Champ (2003) notes, whether the size of the population from which samples are drawn is 10,000 or 100,000,000, a sample size of approximately 380 is needed to make inferences with a  $\pm 5$  percent sampling error, though in practice most studies choose the largest sample size possible given the available budget. I followed all of these considerations and budgeted for a sample size of 500 for each city, hoping that if there were any problems, the eventual sample size would at least be close to 380.

### **The Timing of Data Collection**

A great deal of attention was paid to the timing of the surveys. Originally, Berlin and San Francisco were the only target cities with data collection planned to take place between November 2006 and February 2007. At the beginning of November 2006 neither city had been ruled in or out as applicant cities by their country's NOC and final determinations were scheduled for the spring of 2007. The goal was to compare two cities in similar stages of a bid process during the same (relatively) Olympic bid news cycle. However, just as the data collection was getting underway in San Francisco, the city's bid effort ended abruptly when it was announced that the proposed Olympic stadium partnership between the organizing committee and the local NFL team, the San Francisco 49ers, had fallen apart. The study was underway, but the surveys were not dated so there was no way to accurately determine when individual surveys were administered and if the announcement had an effect on respondent's valuation of the Olympic bid. In this unforeseen circumstance, an aspect of the study that was hoped to be a strength, that dozens of students were working independently to gather data in

various parts of the city, ended up being a weakness in that efforts to track the dates of surveys were thwarted by the inability to communicate efficiently with all of the students. Because of the situation with the San Francisco data, it was later decided that targeting Chicago, which had been put forth by the USOC as an applicant city, would make the study stronger by providing another dimension of comparison.

### **The Survey Instrument**

Whitehead, in his CVM primer, recommends, “The contingent valuation scenario must be (as) short (as possible), realistic, and simple. The components of a contingent valuation scenario include a description of the resource or policy context, a description of the policy or proposed change in resource allocation that will be valued, a payment vehicle and a policy implementation rule. The description of the resource or policy context must be done in a paragraph or two while explicitly describing exactly what is being discussed.” He suggests that CVM surveys be structured with the background information and hypothetical market scenario first and the questions categorized as follows. First, a question or set of questions designed to help respondents warm up to and engage in the survey. Questions that gauge the respondent’s attitude toward the topic are recommended for this purpose. The second set of questions is recommended as a point to ask behavioral questions. The attitude and behavior responses are used as data in an empirical econometric model addressing the determinants of a respondent’s WTP to support the Olympic bid. Following the behavioral questions, Whitehead recommends posing the key WTP question. He states that there is usually only one chance to get an accurate WTP response and that this section of the survey is the optimal position. While working through the survey, the respondents have gained the background to the study and have considered their attitude and behavior regarding the good in question. The WTP question should immediately

follow at this point and be as straightforward as possible. The WTP question could be followed up with questions regarding related economic variables, some debriefing which might include an open-ended question that elicits an explanation of the WTP response, and demographic questions.

There is an inherent conflict between what is theoretically strongest and what is best used in practice. One of the most crucial and challenging aspects of a successful CVM study, and any survey, is getting a sufficient number of respondents who are representative of the population and eliciting thoughtful, considered responses. The ideal, theoretically strongest instrument is often too cumbersome to administer in practice. The general approach to the instrument used here, particularly given the nature of the good to be valued (an Olympic bid), was to keep everything as simple, straightforward, and as close to realistic as possible, with the hope that the instrument was crafted well enough that respondents could easily understand the scenario and give accurate information without having to engage in much thought. To quote Whitehead, “the more text you ask the respondent to read the more text they will skip and the less accurate their answers will be.”

In keeping with the spirit of simplicity, the background information was brief and straightforward. Two brief sentences of background were provided. The first was a broad statement of the city’s interest in pursuing a bid for the 2016 Games. The second said simply, “Hosting the games involves a large financial commitment from the host city, an influx of international visitors during the event, and virtually unequaled international exposure for the host city.” As a warm up question, respondents were asked a simple yes-or-no question regarding their support for their city to make a bid for the 2016 Summer Olympics, followed by two

behavior questions regarding how much time they spend per week following sport and what their favorite sport is to follow.

*Background information on good to be valued (hosting the 2016 Olympic Games)*

Chicago has been selected by the United States Olympic Committee to represent the US among cities bidding to host the 2016 Summer Olympics and Paralympics. Hosting the Games involves a large financial commitment from the host city, an influx of international visitors during the event, and virtually unequaled international exposure for the host city.

*Attitudinal questions*

Do you support (city's) 2016 Olympic bid?

How much time do you typically spend per week following sports?

\_\_\_ More than 10 hours

\_\_\_ 5-to-10 hours

\_\_\_ less than 5 hours

\_\_\_ I don't follow sports

What is your favorite sport to follow?

For the WTP question, samples were split for each city with one group asked how much money they would be willing to donate (noted as WTP) and the other group asked how much time they would be willing to volunteer (noted as WTV) annually from 2007-2016 to a private organization dedicated to bringing the Olympics to their city, if the effort was assured to be successful. Respondents were given a “payment card” option with values ranging from “no, I am not willing...” to “greater than \$200, €200, or 10 hours” depending on the city and the survey. There are two CVM issues with the use of the payment card and the volunteer contribution approach. There are several methods for eliciting the WTP including discrete choices, where a respondent is given one of several possible randomly distributed values and is asked for a yes/no response, open ended questions, where a respondent is simply asked to give their WTP, and the payment card method, used here, where a respondent is given several levels of payments from which to choose (Broyle 2003, Mitchell and Carson 1989). There is concern regarding bias with the payment card approach since a reasonable person who would like to support the Olympics in this case might check the lowest amount, regardless of what it is. If that is the case, there can be a big difference in the overall result between the choices starting with \$5 or \$50. On the other end of the scale, if the highest annual amount provided on the payment card is >€200, when many of the respondents would be willing to pay more, they might think that more than €200 is too high, which is implicitly suggested since it is the highest amount on the scale. Ideally, people could easily give accurate WTP answers to open ended questions and there would be no chance for researcher bias, but in practice, respondents often have difficulty doing this. That it is difficult for respondents to formulate open-ended valuations is not surprising since consumers are rarely asked to make blind bids in the actual market place. In a research setting a participant might worry about his response seeming foolish to the interviewer by being

too high or too low. In general, closed ended questions providing respondents options from which to choose reduce stress and worry from the participants and typically lead to better results.

Whether or not asking for voluntary contributions leads to an inflated average WTP is the second issue with the WTP question. Mitchell and Carson (1989) recommend a form of enforceable commitment for WTP responses, which is reflected in the prior sport related CVM studies cited in the literature review. Each one asks for WTP in the form of an increased tax, although Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) asked UK residents outside of London for WTP in voluntary donations. While Champ (2003) essentially agrees that using an enforceable payment mechanism is preferred, she notes that a voluntary contribution can be the best choice in the proper circumstance. A study of the Olympics, and especially this one that makes comparisons across countries and between WTP and WTV, is an appropriate circumstance to use a voluntary payment mechanism. Donating to an Olympic effort is familiar across countries, cultures, and eras. Comparing WTP and WTV requires each to be as similar in magnitude as possible and a hypothetical enforceable WTV scenario would introduce unnecessary stress and complication into the survey. Also, in the cross-city, cross-country comparison, using a tax mechanism introduces several issues including choosing an appropriate taxation method that is recognized across all cities and the worry that responses might tell more about comparisons between different cultural attitudes toward taxation than their valuation of the Olympic Games.



*WTP and WTV questions*

If (city) is assured of hosting the 2016 Games, what is the **MOST** you would be willing to donate, in **annual contributions from 2007-2016**, to a private organization dedicated to bringing the Games to (city)?

\_\_greater than \$200 (€200)

\_\_greater than \$100 (€100) but less than \$200 (€200)

\_\_greater than \$50 (€50) but less than \$100 (€100)

\_\_greater than \$25 (€25) but less than \$50 (€50)

\_\_greater than \$0 (€0) but less than \$25 (€25)

\_\_I would not be willing to donate money to an organization dedicated to bringing the Olympics to (city)

If (city) is assured of hosting the 2016 Games, would you be willing to volunteer your time to a private organization dedicated to bringing the Games to (city)?

☐ Yes ☐ No

If yes, what is the **MOST** amount of time you would be willing to volunteer **annually from 2007-2016**?

☐ less than 2 hours

☐ 2-to-3 hours

☐ 3-to-4 hours

☐ 4-to-10 hours

☐ more than 10 hours

If more than 10 hours, approximately how many hours would you volunteer?

There are reasons to be skeptical of the preference for enforceable payment mechanisms in general. If a respondent is asked about their WTP for a provision of a non-market good in the context of a tax, her response might represent what she thinks everyone should pay and not how much she individually values the good in question or it might be affected by her prior notions of the appropriateness of different forms of taxes. Especially in an Olympic Games context, where the Olympics could be considered a luxury, recreational good in comparison to something like environmental quality or species preservation, many people who might be willing to pay to host an Olympic Games might not think it is appropriate that everyone should be forced to support the Games in the form of a higher tax. The potential for bias from a tax-based payment mechanism is much higher than the potential for hypothetical voluntary contributions leading to an inflated

WTP. It seems odd that a hypothetical scenario in an ethically conducted CVM study, where it would be made very clear that participants' responses would have no affect on actual taxes, should be concerned with the hypothetical enforceability of the hypothetical payment mechanism. If participants have sound understanding of what the good in question is and are expected to be reasonably able to evaluate how much they value the good, it should not matter whether the payment mechanism is hypothetically enforceable. So it is not surprising that pre-survey focus groups and pilot tests by Atkinson, Mourato, Szymanski, and Ozdemiroglu, (2008) found no upward bias associate with voluntary payment mechanisms.

The WTP question was followed up with payment card questions to determine a respondent's use-value estimate of their consumption of the Olympics. Johnson, Groothuis, and Whitehead (2001) were able to ask use-value questions regarding the Pittsburgh Penguins based on past behavior. In the current context, since the Olympic Games are a unique, quadrennial event, participants were asked to speculate if they would attend the Games or buy Olympic souvenirs. If they thought they would do either or both of those things, they were asked what the most they would be WTP for their "Olympic experience" and for souvenir items. While the scenario was written to indicate that annual WTP and WTV commitments would start immediately and last until 2016, these questions required people to speculate about their behavior during the Olympics in 2016. There are several obvious issues with this approach among them, if the person would even live in the city in 2016, or even be alive as a few of the older respondents noted, and if the respondent should base WTP for their Olympic experience and souvenirs on their current income or expected income in 2016. Preliminary surveys tried to address these issues but it appeared to cause more confusion and stress for student reviewers and appeared that it would add very little to the result. As it is written, the results of the study will

provide a hypothetical use value based on projections of behavior and income nine years into the future.

*Debriefing questions- use value of the Olympics*

If the Olympic were in (city) in 2016, do you think you would attend any events?

Yes

No

Maybe

If you might attend, what is the **MOST** you would be willing to pay for your (**individual**) Olympic experience (including admission, parking, concessions)?

\_\_greater than \$1000 (€1000)

\_\_greater than \$750 (€750) but less than \$1000 (€1000)

\_\_greater than \$500 (€500) but less than \$750 (€750)

\_\_greater than \$250 (€250) but less than \$500 (€500)

\_\_greater than \$100 (€100) but less than \$250 (€250)

\_\_greater than \$50 (€50) but less than \$100 (€100)

If the Olympic Games were in (city) in 2016, do you think you would purchase any souvenir items commemorating the event?

Yes

No

Maybe

If you might purchase a souvenir item to commemorate the event what is the **MOST** you would be willing to pay (total) for souvenir items?

\_\_greater than \$1000 (€1000)

\_\_greater than \$750 (€750) but less than \$1000 (€1000)

\_\_greater than \$500 (€500) but less than \$750 (€750)

\_\_greater than \$250 (€250) but less than \$500 (€500)

\_\_greater than \$100 (€100) but less than \$250 (€250)

\_\_greater than \$50 (€50) but less than \$100 (€100)

No further debriefing questions were asked. While it would be beneficial to ask people an open ended question such as why or why not they have WTP, WTV or why they support the Games, with public intercept surveys, written comments are seldom offered by respondents. It is different in a more controlled environment where a participant is at home or in a research setting, but out in public, people tend to be on the move and as mentioned above, there was a need to be conscientious of how the potential participants nearby perceived the ease and brevity of the

survey. A motivated respondent spending an extra few minutes writing out comments could discourage others from participating and ultimately having more quantitative data than comments was more desirable for this study.

The final part of the instrument was a set of demographic questions concerning the respondent's age and income. Respondent's income level played a particularly important role in converting WTV into dollar amounts. As a general rule, the demographic information questions at the end have the lowest response rate for two reasons, first, they are at the end and while most studies in some manner correlate demographic factors with their variables of interest, studies, other than a census, are not conducted for the purpose of finding out demographic variables, so those questions remain at the end so that the people who simply fail to complete the survey at least address the topic of interest. Secondly, many people are sensitive to sharing too much demographic information which they may feel is private. Age and income, which were the two demographic variables asked for in this study, are very sensitive topics for many people. In consideration of that sensitivity, respondents were asked to indicate their age and income in a few, broad categories which makes it a little easier for people to comfortably respond as it does not come across as trying to pin point their ages and income levels. The tradeoff is that the age and income data is not as precise as it might be. Since an aim of this study was to find general relationships between age, income and other variables, it was more important to collect a greater number of completed, but less precise, surveys, than run the risk that too many responses would lack age and income data because the ranges were too precise or that an open ended response was expected.

*Demographic questions*

Are you \_\_male, or \_\_female?

What is your approximate annual household income?

US:

\_\_less than \$30,000

\_\_\$30,001-to-\$75,000

\_\_\$75,001-to-\$125,000

\_\_\$125,001-to-\$200,000

\_\_\$200,001-to-\$275,000

\_\_more than \$275,000

Germany:

\_\_less than 25,000€

\_\_greater than 25,000€, but less than 50,000€

\_\_greater than 50,000€, but less than 100,000€

\_\_greater than 100,000€

How old are you?

\_\_under 25

\_\_26-40

\_\_41-55

\_\_56 or older

## **CONCLUSION**

In this chapter, the background guidelines and resources used to develop this study were described. Boyle (2003), Whitehead (2000), Mitchell and Carson (1989), Cummings, Brookshire, and Schulze (1986) and the NOAA guidelines published in 1993 provided the basis for the approach. A short section describes public good value and the non-rival aspect of the benefits to residents of hosting the Olympic Games that makes the CVM an appropriate tool for this study. The remainder of the chapter addresses some of the issues and thoughts that went into the design of the study and finally, development of the survey instrument is explained. The general approach was purposely straightforward and uncomplicated, which works particularly well with respondent valuation of the familiar topic of the study, hosting the Olympic Games.



## **CHAPTER 6**

### **RESULTS**

#### **INTRODUCTION**

The main results of the study are summarized in this chapter. The major goal of the study is to estimate the monetary value of the intangible benefits enjoyed by the residents of an Olympic host city, so the overall intangible benefit estimates are the focus of the first section. The descriptive statistics are presented in the second section with hypothesis tests to determine what similarities exist among the three cities. Next, empirical models are presented using ordinary least squares (OLS) to help understand what influences people's willingness to support their city hosting the Olympic Games with their time and money. Finally, the proposed measure of intensity results, the BIF factor from Chapter 4 above, are discussed.

#### **Estimate of intangible benefits**

The main focus of this study is to use the CVM to estimate the intangible benefits that residents anticipate if their home city is selected as Olympic host. A secondary purpose is to introduce WTV time as a payment method for a CVM study of hosting the Olympic Games. Normally, survey respondents or interviewees are asked how much they would be willing to pay in fees, taxes, or donations (here donations are used) to guarantee provision of a public good. Introducing WTV is interesting for two reasons. First, since hosting an Olympic Games requires thousands of hours of volunteer labor, if one can show no significant statistical difference between the average value of monetary donations and the average value of volunteer time expressed in monetary terms, volunteer application data might be useful for both future efforts to

estimate the intangible value generated by hosting the Olympic Games and perhaps even efforts to look back and estimate the intangible value generated by Games of the past. Whether WTV in hours converted into monetary terms can serve as a proxy for traditional WTP will be tested in this section. The second point of interest for using WTV, the relationship between WTV and income, will be examined below in the empirical models.

For each city, proceeding in alphabetical order, total intangible benefits that residents anticipate enjoying should their city host the Olympic Games is estimated using three measures. The first measure uses the traditional WTP responses to the question that asks if and how much residents are willing to donate if they were assured the Olympic Games would be hosted by their city that was posed to a subset of the respondents. The second measure converts the average WTV responses from the remaining subset from hours to monetary terms using each city's per capita GDP. A typical hourly pay rate is determined by assuming a 40 hour work week, 52 weeks per year, and dividing the per capita GDP by 2080, the total number of hours worked per year. The third measure combines the previous two and includes the entire sample size for each city.

Each city has a distinct average WTP with Chicago having measures ranging from \$54.79 to \$71.98, San Francisco having measures ranging from \$21.16 to \$56.08, and Berlin having measures ranging from 16.35€ to 18.74€. For each city a *t-test* procedure is used to test the hypothesis that both measures of WTP have the same mean. If the hypothesis cannot be rejected that they have the same mean, it implies that WTV converted into monetary terms could be a proxy variable for WTP monetary donations. Next, WTP measures are aggregated over the metropolitan populations for each city to calculate a total estimate of the value of the intangible benefit in monetary terms. Finally, analysis of variance (ANOVA) is used to test whether there

are significant differences in WTP and WTV results among the three cities. In cases where the null hypothesis, that the mean measure for all three cities is the same, is rejected, a *t-test* is used to check for similar means between groups of two cities.

## INTANGIBLE BENEFIT ESTIMATES

Estimates of intangible benefits for each city are presented below as follows: first, a table indicating the mean and standard deviation of the WTP, WTV, and WTP+WTV measures; second, a table showing the distribution of responses for WTP and WTV; and finally, a hypothesis test to see if the WTP and WTV results are significantly different and an aggregation of the sample results over the population.

### Berlin

*Table 6.1: Berlin WTP/WTV data*

	<b>WTP monetary donation</b>	<b>WTV hours</b>	<b>Monetary value of hour</b>	<b>WTV in monetary terms</b>	<b>WTP + WTV in monetary terms</b>
Mean	16.35	2.21	8.48 <sup>13</sup>	18.74	17.54
Standard deviation	32.41	3.06			29.35

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<sup>13</sup> Monetary value of an hour based on per capita GDP and the assumption of a 40 hour work week, 52 weeks per year

Table 6.2: Distribution of WTP and WTV responses (Berlin)

<b>WTP donations in Euros</b>					
<b>0</b>	<b>0&lt;WTP≤25</b>	<b>25&lt;WTP≤50</b>	<b>50&lt;WTP≤100</b>	<b>100&lt;WTP≤200</b>	<b>≥200</b>
135 (56%)	53 (22%)	33 (14%)	13 (5%)	3 (1%)	3 (1%)

<b>WTV in hours</b>					
<b>0</b>	<b>0&lt;WTV&lt;2</b>	<b>2≤WTV&lt;3</b>	<b>3≤WTV&lt;4</b>	<b>4≤WTV&lt;10</b>	<b>≥10</b>
141 (59%)	6 (2%)	13 (5%)	27 (11%)	47 (20%)	7 (3%)

Although the monetary value of WTV hours and WTP in donations are very close, the distribution of responses above indicate that Berlin residents see donating money and volunteering time as distinctly different. With money donations, there are sequentially fewer responses as the donation amount increases, which is consistent with normal economic behavior and the law of demand. If you consider the WTP amount as the price respondents are willing to pay for the intangible benefit they expect to receive, as prices get higher one would expect fewer people to be willing to pay that price. With regard to the volunteering of time, Berlin residents were more willing to volunteer for the greater amounts of time up to 10 hours. This indicates that Berlin residents might consider volunteering time as a substitute for donating money. While the survey indicated that 81.5% of respondents supported an Olympic bid, the percentage of people willing to donate money or time was roughly the same, 43% were willing to donate money and 41% willing to volunteer time.

## Berlin hypothesis testing

Null hypothesis: the sample means of WTP (16.35) and WTV (18.74) are equal

t-test result (unequal variances<sup>14</sup>): P value > 0.05 (0.378). Therefore, one cannot reject the null hypothesis that the two sample means are equal. This implies that for the city of Berlin, WTV in hours adjusted to reflect monetary terms can be used as a proxy variable for WTP in donations.

*Table 6.3- Aggregate estimates of total intangible benefits*

<b>Berlin- Brandenburg metropolitan area population</b>	<b>Aggregate WTP</b>	<b>Aggregate WTV expressed in €</b>	<b>Aggregate WTP/WTV</b>
5,000,000	81,750,000€/year 810,750,000€ total	93,700,000€/year 937,000,000€ total	87,700,000€/year 877,000,000 total

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<sup>14</sup> Variances were tested using an F-test

## Chicago

Table 6.4: Chicago WTP/WTV data

	<b>WTP monetary donation</b>	<b>WTV hours</b>	<b>Monetary value of hour</b>	<b>WTV in monetary terms</b>	<b>WTP + WTV in monetary terms</b>
Mean	54.89	3.60	20.00	72.00	63.27
Standard deviation	66.23	3.91			72.85

Table 6.5: distribution of WTP and WTV responses (Chicago)

<b>WTP donations in US dollars</b>					
<b>0</b>	<b>0&lt;WTP≤25</b>	<b>25&lt;WTP≤50</b>	<b>50&lt;WTP≤100</b>	<b>100&lt;WTP≤200</b>	<b>≥200</b>
43 (26%)	39 (23%)	26 (16%)	26 (16%)	14 (8%)	18 (11%)

<b>WTV in hours</b>					
<b>0</b>	<b>0&lt;WTV&lt;2</b>	<b>2≤WTV&lt;3</b>	<b>3≤WTV&lt;4</b>	<b>4≤WTV&lt;10</b>	<b>≥10</b>
70 (42%)	6 (4%)	16 (10%)	18 (11%)	26 (16%)	31 (19%)

The distribution of responses and general data above indicate that Chicago residents strongly support an Olympic bid. While 91% of Chicago respondents in this study support an Olympic bid, a full 74% are estimated willing to donate money to support the bid effort and 58% are willing to volunteer their time. The distribution of responses indicates that significant numbers of respondents were willing to donate and volunteer at the highest levels offered. For

the WTV subset of the sample, the number of respondents increased for increasing levels of commitments in hours. It may be the case that the payment card approach taken in this study underestimates the WTP and WTV for Chicago residents. For the WTV responses an open-ended option existed, but it was not used by respondents.

### **Chicago hypothesis testing**

Null hypothesis: the sample means of WTP (54.89) and WTV (72.00) expressed in monetary terms are equal.

t-test result (unequal variances): P value < 0.05 (0.032). Therefore, one can reject the null hypothesis that the two sample means are equal. This implies that for the city of Chicago, WTV in hours adjusted to reflect monetary terms cannot be used as a proxy variable for WTP in donations.

*Table 6.6: Aggregate estimates of total intangible benefits*

<b>Chicago metropolitan area population</b>	<b>Aggregate WTP</b>	<b>Aggregate WTV expressed in \$</b>	<b>Aggregate WTP/WTV</b>
8,000,000	\$439,120,000/year \$4,391,200,000 total	\$576,000,000/year \$5,760,000,000 total	\$506,160,000/year \$5,061,600,000 total

## San Francisco

Table 6.7: San Francisco WTP/WTW data

	<b>WTP monetary donation</b>	<b>WTW hours</b>	<b>Monetary value of hour</b>	<b>WTW in monetary terms</b>	<b>WTP + WTW in monetary terms</b>
Mean	21.41	2.03	27.76	56.35	44.56
Standard deviation	35.73	3.25			77.94

Table 6.8: distribution of WTP and WTV responses (San Francisco)

<b>WTP donations in US dollars</b>					
<b>0</b>	<b>0&lt;WTP≤25</b>	<b>25&lt;WTP≤50</b>	<b>50&lt;WTP≤100</b>	<b>100&lt;WTP≤200</b>	<b>≥200</b>
72 (41%)	57 (33%)	27 (16%)	10 (6%)	7 (4%)	1 (<1%)

<b>WTW in hours</b>					
<b>0</b>	<b>0&lt;WTW&lt;2</b>	<b>2≤WTW&lt;3</b>	<b>3≤WTW&lt;4</b>	<b>4≤WTW&lt;10</b>	<b>≥10</b>
205 (61%)	15 (4%)	33 (10%)	24 (7%)	29 (9%)	30 (9%)

The distribution of responses and general data above indicate that San Francisco residents' support for an Olympic bid was tepid. While 85% of San Francisco respondents in this study support an Olympic bid, only an estimated 59% were willing to donate money to support the bid effort and only 39% were willing to volunteer their time. The distribution of responses indicates that San Franciscans view donating money and volunteering time very



differently. Many more were willing to donate money than time, but among those who were willing to volunteer their time, they were willing to commit higher amounts of time. Nearly 10% of the respondents in the WTV subsample were willing to volunteer the highest amount of time. Although the WTV time question was open-ended at the highest level, respondents did not indicate that they were willing to volunteer more than 10 hours per year. It may be the case that the payment card approach taken in this study underestimates the WTV for San Francisco residents.

### **San Francisco hypothesis testing**

Null hypothesis: the sample means of WTP (21.41) and WTV (56.35) expressed in monetary terms are equal.

t-test result (unequal variances): P value < 0.05 (0.000). Therefore, one can reject the null hypothesis that the two sample means are equal. This implies that for the city of San Francisco, WTV in hours adjusted to reflect monetary terms cannot be used as a proxy variable for WTP in donations.

*Table 6.9: Aggregate estimates of total intangible benefits*

<b>San Francisco metropolitan area population</b>	<b>Aggregate WTP</b>	<b>Aggregate WTV expressed in \$</b>	<b>Aggregate WTP/WTV</b>
7,200,000	\$154,152,000/year \$1,541,520,000 total	\$405,720,000/year \$4,057,200,000 total	\$320,832,000/year \$3,208,320,000 total

## Comparisons of WTP and WTV among Berlin, Chicago, and San Francisco

ANOVA procedure is used here to test the hypothesis that WTP and WTV results from all three cities have the same mean. If this hypothesis cannot be rejected, it indicates that there were no statistically significant differences in responses among the cities. If it is rejected, a *t-test* is used to check for similarities in results among groupings of two cities. For these hypothesis tests, WTP results from Berlin were converted to US dollars using the average exchange rate for the two days of data collection in Berlin. The price of one euro in dollar terms was \$1.2945 according to the website FXHistory (<http://www.oanda.com/convert/fxhistory>).

1. ANOVA: WTP- null hypothesis: the mean WTP are the same among all three cities

Result: reject the null hypothesis, P value < 0.05 (0.000)

*t-test* (unequal variances) WTP Berlin and San Francisco

Null hypothesis: the mean WTP is the same for both Berlin and San Francisco

Result: Cannot reject the null hypothesis, P value > 0.05 (0.912)

*t-test* (unequal variances) WTP Berlin and Chicago

Null hypothesis: the mean WTP is the same for both Berlin and Chicago

Result: Reject the null hypothesis, P value < 0.05 (0.000)

*t-test* (unequal variances) WTP Chicago and San Francisco

Null hypothesis: the mean WTP is the same for both Chicago and San Francisco

Result: Reject the null hypothesis, P value < 0.05 (0.000)

Berlin and San Francisco WTP results are not significantly different, however each of those city's WTP results are significantly different from Chicago's.

2. ANOVA: WTV- null hypothesis: the mean WTV are the same among all three cities

Result: reject the null hypothesis, P value < 0.05 (0.000)

*t-test* (equal variances) WTV Berlin and San Francisco

Null hypothesis: the mean WTV is the same for both Berlin and San Francisco

Result: Cannot reject the null hypothesis, P value > 0.05 (0.181)

*t-test* (unequal variances) WTV Berlin and Chicago

Null hypothesis: the mean WTV is the same for both Berlin and Chicago

Result: Reject the null hypothesis, P value < 0.05 (0.001)

*t-test* (unequal variances) WTV Chicago and San Francisco

Null hypothesis: the mean WTV is the same for both Chicago and San Francisco

Result: Reject the null hypothesis, P value < 0.05 (0.000)

Berlin and San Francisco WTV results are not significantly different, however each of those city's WTV results are significantly different from Chicago's.

### **DESCRIPTIVE STATISTICS**

Descriptive statistics are summarized in tables 6.10 and 6.11 for the remaining variables. In the first three columns under the city names the mean result is reported with the standard deviation in parentheses below. The fourth column has the results of ANOVA tests the null hypothesis that the means are the same for each city, which is rejected in every case except for the amount respondents are willing to spend on their Olympic experience. The last column reports *t-test* results of the hypothesis that pairs of cities have the same mean. The result indicates that for support of the Olympic bid, there is no statistical difference between Berlin and San Francisco. For time spent following sports and WTP for souvenir items, there is no statistical difference between Berlin and Chicago. For the other three variables, the results indicate that each city has a unique result. For the demographic variables in table 6.11, ANOVA tests indicate that there were no statistically significant differences between the three cities indicating that for gender, income, and age the samples were consistent across the three cities.

Table 6.10: Descriptive statistics (other variables)

	<b>Berlin</b>	<b>Chicago</b>	<b>San Francisco</b>	<b>ANOVA (P value)</b>	<b>Same means (t-test)</b>
Do you support (city's) 2016 Olympic bid?	0.815 (0.388)	0.910 (0.287)	0.850 (0.357)	(0.001)	Berlin and SF
Time spent per week following sports	5.547 (3.326)	5.570 (3.510)	4.105 (3.540)	(0.000)	Berlin and Chicago
Would attend Olympic events in 2016 if city chosen <sup>15</sup>	0.72 (0.39)	0.85 (0.28)	0.77 (0.35)	(0.000)	
Highest WTP for (individual) Olympic experience	229.95 (202.45)	243.00 (266.31)	210.60 (233.76)	<b>(0.115)</b>	
Would purchase souvenir items commemorating the event if city selected	0.59 (0.43)	0.79 (0.35)	0.69 (0.38)	(0.000)	
Highest WTP (total) for souvenir items?	121.45 (154.63)	126 (199)	99 (162)	(0.037)	Berlin and Chicago

<sup>15</sup> "Yes"=1, "No"=0, "Maybe"=0.5

*Table 6.11: Descriptive statistics (demographic variables)*

	<b>Berlin</b>	<b>Chicago</b>	<b>San Francisco</b>	<b>ANOVA (P value)</b>
Are you __male, or __female?	0.55 male (0.50)	0.50 male (0.50)	0.45 male (0.50)	(0.004)
What is your approximate annual household income? <sup>16</sup>	45,587.18 (23,555.93)	81,463 (58,966)	92,197 (69,079.91)	(0.000)
How old are you? <sup>17</sup>	37 (13.470)	32 (10.79)	35 (13.923)	(0.000)

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<sup>16</sup> Lower bound is the national poverty line. For the U.S, it is \$16,530 for a family of three (U.S. Census). For Germany it is 11,256€ (Friedrich Ebert Stiftung)

<sup>17</sup> Lower bound=15. Upper bound = national life expectancy (Germany=78.42, US=77.14, CIA World Factbook)

## EMPIRICAL MODEL RESULTS

The number of hours following sports is a significant indicator of individuals' expected experience of intangible benefit from their city hosting the Olympics in the U.S. cities, but not in Berlin. For the San Francisco data, the coefficients are positive and significant at the 5% level for the combined WTP/WTW model and the WTW model. For the Chicago data, the coefficients are positive and significant at the 5% level for the combined WTP/WTW model and the WTP model. San Francisco residents who follow sports a great deal appear more likely willing to volunteer their time while Chicago residents who follow sports a great deal appear more likely to donate money to help their respective cities become Olympic hosts. There was no significant relationship evident between the amount of time following sport and the willingness to donate money or time to bring the Olympics to Berlin, which will be explored in greater depth in the following section.

The total planned Olympic spending on attendance and souvenirs variable is the most consistently significant variable across all models for all cities. Only in the San Francisco WTP model is it not significant. That model is the weakest general model of the nine with a low F-statistic and adjusted  $R^2$ . Generally, this variable behaves as expected to a strong degree and indicates that those who expect to experience the highest "use value" from their cities hosting the Olympics, as indicated by their planned expenditures on attendance and merchandise, also expect to experience the highest intangible benefit. This is not surprising and is consistent with results from the Owen (2006) study of the intangible benefit of professional sports teams.

Table 6.13: Berlin regression results (\* indicates significance at 10% level and \*\* indicates significance at 5% level)

	Model 1- total WTP/WTW (in €)		Model 2- donations (in €)		Model 3- donations in time (hours)	
Variable	coefficient	t-stat <sup>18</sup>	coefficient	t-stat	coefficient	t-stat
Hours follow sport	-0.273	-0.88	0.408	1.07	-0.060	-0.87
Total planned Olympic spending	0.058	5.47**	0.081	4.40**	0.003	3.40**
Gender	-6.575	-2.88**	0.574	0.20	-1.817	-4.34**
Income	0.008	0.11	0.099	0.95	-0.014	-0.13
Intercept	7.777	2.15	-9.479	-2.05	3.103	6.02
Model summary						
R <sup>2</sup>	0.154		0.306		0.140	
F-statistic <sup>19</sup>	12.55		6.97		9.12	

The coefficients for *MALE* are negative and significant in at least one model in the data for all three cities. They are significant at the 5% level for the WTP/WTW and WTV models in both the Berlin and San Francisco data and significant at the 10% level for the Chicago WTP/WTW model. This indicates that women enjoy more intangible benefit from their city hosting the Olympics relative to men or at least they are more willing to volunteer their time working to bring the Olympics to their home cities. This is a key result which is discussed below.

<sup>18</sup> t-statistic is for hypothesis testing for the slope of a single coefficient. If the t-statistic  $\geq 2.00$  (absolute value) then the null hypothesis that the slope = 0 is rejected at the  $\alpha=0.05$  significance level.

<sup>19</sup> F-statistic tests the null hypothesis that all slope coefficients have slope = 0. If  $F > 2.5$  (here), the null hypothesis is rejected and at least one slope coefficient  $\neq 0$ .



Table 6.14: Chicago regression results

	<b>Model 1- total WTP/WTV (in \$)</b>		<b>Model 2- donations (in \$)</b>		<b>Model 3- donations in time (hours)</b>	
<b>Variable</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>
Hours follow sport	2.139	2.01**	2.969	2.39**	0.064	0.093
Total planned Olympic spending	0.075	4.40**	0.067	2.91**	0.004	2.83**
Gender	-13.586	-1.84*	-13.335	-1.45	-0.720	-1.22
Income	0.008	0.08	0.188	1.28	-0.002	-0.47
Intercept	15.557	0.58	-2.519	-0.21	1.546	2.04
Model summary						
R <sup>2</sup>	0.091		0.130		0.071	
F-statistic	6.82		4.46		2.90	

Table 6.15: San Francisco regression results

	<b>Model 1- total WTP/WTW (in \$)</b>		<b>Model 2- donations (in \$)</b>		<b>Model 3- donations in time (hours)</b>	
<b>Variable</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>
Hours follow sport	3.461	3.19**	0.597	0.64	0.157	2.68**
Total planned Olympic spending	0.052	3.59**	-0.001	0.15	0.003	3.61**
Gender	-16.033	-2.36**	-0.104	-0.02	-0.728	-2.06**
Income	0.049	0.97	0.112	2.59**	0.000	0.00
Intercept	16.466	2.67	8.949	1.87	0.772	2.59
Model summary						
R <sup>2</sup>	0.097		0.052		0.131	
F-statistic	9.28		1.94		9.79	

Income is, surprisingly, generally not a significant factor in individual's WTP or WTV. The coefficient is positive and significant at the 5% level in only the San Francisco WTP model. Income as a variable in the WTV models for all three cities suggests that neither the wealth or substitution factor dominate the relationship between WTV time and income. This has implications for the use of WTV time as a payment vehicle in the presence of income inequities for CVM studies, particularly of lower income cities and countries which will be addressed below. Additionally, the results suggest that with the exception of the residents of San Francisco, individuals coming from families with higher income do not expect to experience intangible benefits from their city hosting the Olympics to a different degree than those coming from lower income families. For the relationship between income and WTV, it could be the case that low income people are willing to donate time in lieu of scarce money while high income

supporters of the Olympics are also willing to donate time because they can afford that luxury. As mentioned above it is surprising that a stronger relationship was not found between income and WTP in every city. The amount a person planned to spend on his or her Olympic experience if their city became host appears to be the most significant factor influencing an individual's WTP indicating that people who expect to have high "use value" of the Olympics are more likely to support the Games with their donations. The expected "use value" does not appear to be closely related to household income. A potential factor in this result is that respondents were asked to project annual monetary donations until the year 2016 and expenditures on the Olympic Games in 2016, but asked to report their current household income.

### **AVID FANS OF POPULAR SPORT AND OLYMPIC BID SUPPORT**

The results from the OLS econometric models above are generally not too surprising with the exception of the relationship shown between the hours a person follows sport per week and willingness to contribute time and money to an effort to host the Olympic Games. It was expected to be a universally positive and significant factor and it was not. It was positive and significant for the combined WTP/WTV and WTP models for the Chicago data and for the combined WTP/WTV and WTV models for the San Francisco data. Hours spent following sport did not have a significant impact on Berlin resident's willingness to contribute time or money to their city's efforts to host the Olympic Games. The models below test if avid fans of the most popular professional sport in each city were less likely to feel as if they benefit from their city hosting the Olympics. It could be the case for these fans that hosting the Olympics might intrude on their normal enjoyment of their favorite spectator sport. Evidence of that would be showing that they are less likely to donate money or time to an Olympic bid effort.

As part of the survey, respondents were asked what their favorite sport is to follow, as opposed to one in which they participate. The results from this question give interesting insight into the sport culture of each city. See Table 6.16 below for the list of favorite sports for each city and which are the most popular. No other sport rivals soccer for popularity in Berlin. In the US cities, baseball and US football are the most popular sports. In Chicago, baseball was the favorite with US football not far behind while in San Francisco it was the opposite. Recognizing that Chicago residents were surveyed during the last month of the regular professional baseball season and San Francisco residents were surveyed during the last month of the regular professional football season, it is reasonable to assume that both sports are nearly equally popular in both cities and people who like both might claim the sport that is most recently in season as their favorite. Because of this in the models below soccer is used for the most popular sport in Berlin and baseball and US football is used as the most popular “sport” in Chicago and San Francisco. The model is put forth primarily as an attempt to explain the lack of significance between hours following sport and willingness to donate time and money to an Olympic host city bid in Berlin.

The empirical models below take exactly the same form as the models above with the exception that the variable *HOURS* above is replaced by the variable *AVID* which is a dummy variable for avid soccer fan in Berlin and avid baseball or football fan in Chicago and San Francisco. The enthusiasm is measured by respondents who identified themselves as following 10 or more hours of sports weekly. My hypothesis is that avid fans of the most popular sport are less likely to benefit from the Olympics and thus will have a lower WTP. The logic behind the hypothesis is that the most popular professional sports are not primarily Olympic sports, in the case of soccer, or are not Olympic sports at all, in the cases of baseball and US football. Avid

fans of those sports might view the Olympic Games as a distraction from the sports they normally follow. For these fans, I hypothesize that their city hosting the Olympics might interfere with and steal attention from their favorite sports. My prior expectation is that the sign for the coefficient of *AVID* will be negative in all of the models.

The results indicate different behaviors and attitudes among avid fans of the most popular sport across the three cities. In Chicago, avid baseball and football fans were not any more or less likely to support their city's bid to host the Olympics with their time or money than other residents. Avid soccer fans in Berlin were more likely to volunteer their time to such an effort. In San Francisco, the people identified as avid fans of baseball and football were more likely to support the Olympic host city bid with contributions of money and time.

Table 6.16: Respondents' favorite sport to follow by city

Berlin (sport-responses)		Chicago (sport-responses)		San Francisco (sport-responses)	
Soccer	132	Baseball	103	US football	139
Athletics	51	US football	92	Baseball	90
Handball	28	Basketball	36	Basketball	73
Tennis	22	Soccer	33	Soccer	42
Basketball	21	Tennis	9	Ice hockey	14
Gymnastics	21	Gymnastics	6	Tennis	12
Swimming	21	Ice hockey	6	Swimming	10
Motor sports	20	Volleyball	6	Golf	6
Boxing	18	Bicycling	5	Bicycling	5
Equestrian	17	Rugby	4	Volleyball	5
Wrestling	10	Swimming	4	Athletics	4
Dancing	9	Athletics	3	Figure skating	3
Bicycling	8	Figure skating	3	Gymnastics	3
Volleyball	8	Ski	3	Skating	3
Golf	7	Golf	2	Softball	3
Fencing	5	Boxing	1	Bowling	2
Ice hockey	5	Kayak	1	Boxing	2
Rowing	5	NASCAR	1	Equestrian	2
Martial arts	4	Skateboard	1	Lacrosse	2
Ski	4	Squash	1	Mixed martial arts	2
Aerobics	3	Surfing	1	Rugby	2
Formula 1	3	Ultimate Frisbee	1	Surfing	2
Yoga	3	Wrestling	1	Acrobatics	1
Walking	3	Yoga	1	Badminton	1
Biathlon	2			Bocce	1
Extreme sport	2			Motocross	1
Ice skating	2			Sailing	1
Judo	2			Water polo	1
Pool	2				
Ski jump	2				
Snowboard	2				
Squash	2				
Surfing	2				
Synch swimming	2				
Table tennis	2				
US Football	2				

Table 6.17 Avid soccer fans and support for Olympic bid- Berlin

	<b>Model 1- total WTP/WTW (in €)</b>		<b>Model 2- donations (in €)</b>		<b>Model 3- donations in time (hours)</b>	
<b>Variable</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>
Avid soccer fan	-0.482	-0.18	-5.500	-1.57	0.842	1.94*
Total planned Olympic spending	0.056	5.17**	0.083	4.72**	0.002	2.32**
Gender	-7.302	-2.93**	2.846	1.00	-2.361	-5.48**
Income	0.006	0.34	0.015	1.19	-0.009	-0.89
Intercept	7.934	2.65	-4.510	-1.19	3.127	6.09
Model summary						
R <sup>2</sup>	0.145		0.301		0.161	
F-statistic	11.92		6.30		9.63	

Table 6.18: Avid baseball and football fans and support for Olympic bid- Chicago

	<b>Model 1- total WTP/WTW (in \$)</b>		<b>Model 2- donations (in \$)</b>		<b>Model 3- donations in time (hours)</b>	
<b>Variable</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>
Avid baseball or football fan	10.670	1.53	6.080	0.68	0.800	1.46
Total planned Olympic spending	0.097	8.85**	0.100	5.89**	0.005	6.00**
Gender	-10.554	-1.51	-8.023	-0.96	-0.645	-1.16
Income	0.063	1.01	0.157	1.02	0.002	0.46
Intercept	9.428	1.26	-0.463	-0.04	0.872	1.56
Model summary						
R <sup>2</sup>	0.265		0.293		0.239	
F-statistic	23.10		11.13		10.77	



Table 6.19: Avid baseball and football fans support for Olympic bid- San Francisco

	<b>Model 1- total WTP/WTW (in \$)</b>		<b>Model 2- donations (in \$)</b>		<b>Model 3- donations in time (hours)</b>	
<b>Variable</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>	<b>coefficient</b>	<b>t-stat</b>
Avid baseball or football fan	14.667	1.84*	23.745	3.74	1.511	4.16**
Total planned Olympic spending	0.066	4.01**	-0.009	-0.81	0.003	3.56**
Gender	-5.220	-0.69	0.253	0.04	-0.317	-0.86
Income	0.016	0.28	0.140	2.75**	0.001	-0.22
Intercept	18.921	2.25	0.870	0.16	0.603	1.800
Model summary						
R <sup>2</sup>	0.084		0.173		0.145	
F-statistic	4.780		4.170		8.75	

## INTENSITY OF PREFERENCE MEASURE (BIF)

The measure of intensity of preference, the bid intensity factor (BIF) proposed in Chapter 4 is summarized below and BIF results are given for each city.

$$(4.11)BIF = \frac{[Ave\ WTP + WTV(\$)]}{per\ capita\ GDP\ (weekly)}$$

Table 6.20: BIF measures

	<b>BIF</b>
<b>Berlin</b>	0.103
<b>Chicago</b>	0.159
<b>San Francisco</b>	0.070

In the current context, if the mean WTP and WTV results for Berlin are transformed into US dollars using the exchange rate when data was collected, Berlin WTP equals \$21.16 and WTV equals \$24.26. San Francisco mean WTP equals \$21.41 and WTV equals \$56.35. If the

CVM results were used as an indicator of support for an Olympic bid among city residents, the conclusion is that San Francisco residents support the bid more than the people from Berlin. However, the BIF measure indicates the Berlin residents' support is deeper than those of San Francisco when adjusted for income levels and the mix of volunteering and donating money. The support for a Chicago bid ( $WTP = \$54.89$ ,  $WTV = \$72.00$ ) is higher than either of the other cities using either measure, but the BIF measure increases the magnitude of difference compared to San Francisco and lessens it when compared to Berlin.

As noted above in Chapter 4, if the wealth effect dominated in the relationship between income and WTV, the BIF measure would not be effective because people from wealthier cities would normally donate both more time and money all things being equal. In this study, neither the wealth or substitution effect dominated suggesting that the BIF measure, in tandem with CVM surveys that include WTV payment vehicles, could be a promising measure for comparing the depth of the support among cities vying to host the Olympic Games.

## **CHAPTER 7**

### **CONCLUSION/DISCUSSION OF KEY RESULTS**

#### **INTRODUCTION**

The major results of this dissertation are the estimates of the intangible benefits residents expect to experience if their home city was selected as Olympic host. From this partial perspective and in monetary terms, the US cities would stand to gain more intangible benefit than Berlin with Chicago gaining the most. In addition to that the other key result concerns the use of CVM results to derive a BIF score that allows for better comparisons of intensity of support for Olympic bid efforts across rival bid cities. Using the BIF score which adjusts for per capita GDP, Berlin residents' support for the Games, in terms of WTP and WTV is stronger than those from San Francisco but still not as strong as those from Chicago. A noteworthy empirical result which held for all three cities studied here is that willingness to donate time and money toward an Olympic bid among women is higher than that of men. In this final chapter there is, first, a brief discussion of those key results and then concluding remarks.

#### **KEY RESULTS**

The estimated intangible benefits that the cities' residents would enjoy if they earned the right to host the Olympic Games ranged from roughly \$5 billion for Chicago, around \$3 billion for San Francisco, and over \$1 billion for Berlin. In comparison, the 2005 EFTEC CVM study of the UK estimated that the entire country would enjoy £3.2 billion of intangible benefit, with about 65% of that amount coming from London and the remaining amount from the rest of the country (Clegg, 2005). The magnitude of the results here, which only considered intangible benefits in the potential bid cities, is in the neighborhood of the EFTEC results, the only previous

similar CVM study. If the results here are accurate and comparable, this study would provide support for Harrison and Lesley's (1996) conclusion that CVM studies, in many contexts, can be done much more cheaply and straightforward than they normally are, and yield essentially similar results. The EFTEC study which conducted focus groups and primarily used comprehensive personal interviews was much more expensive and complicated than what was done here with non-probabilistic public intercept surveys.

The comparison of the magnitude of each city's estimated intangible benefit makes intuitive sense, since in hindsight, the Berlin and San Francisco 2016 efforts barely got off the ground while Chicago is currently poised as one of the four remaining candidate. Recall that the data from Chicago was collected 8-to-10 months after the other two cities and it was after Chicago had been put forth by the USOC as an applicant city. Also, the San Francisco data was collected during an immediately after the city's bid prospects fell apart. If those things had any effect on the result here, it makes sense that Chicago might gain more support as it gets closer to being an actual host (but that might not necessarily hold) and that some San Francisco residents might have been disappointed and disillusioned because of how their bid effort turned out. Given the data here, there is no way to test whether those occurrences affected the study results or not. Anecdotally, while people in both cities seemed aware of an Olympic effort, in neither case did 2016 Olympic news reach the point where most people knew what was going on in detail. Even the abrupt withdrawal of San Francisco from the bidding process, which was a significant story to Olympic scholars and the Olympic community in the US, only warranted a short article in the San Francisco Examiner (Eslinger, 2006) and a brief editorial (How to lose and Olympic bid, 2006) bemoaning the fact that while the city's mayor enthusiastically favored the bid, the city's legislature- the city supervisors- did not. For the most part, people in each city

were aware, but not well informed, about what was happening regarding their city's bid. The main reason the study was conducted several years prior to the host being determined was so people wouldn't be unduly influenced by the news of the day when they were assessing their WTP to support an Olympic bid. Though in the results of this study San Francisco had a lower level of support than Chicago, it could just as plausibly be due to the city generally not being as supportive of public financing of sport, as indicated by the city's history, as it could be because of the bid effort falling apart during the time data was collected. While in each case the intangible benefit was estimated to be more than a billion US dollars, the significant monetary value of the estimates is not enough by itself to offset the likely amount of public investment that will be required of the 2016 Olympic hosts. This study was approached in the context of the Olympic economic impact literature that exists and concludes that generally the tangible benefits of hosting the Olympics are not worth the massive costs and financial guarantees that are required.

In Chapter 4 on theory, three possible explanations are offered for the observed phenomena of many cities vying to host the Games while many economists seem to agree that economically hosting is not worth the cost. The revealed preference explanation is that cities reveal by their behavior that hosting the Olympic Games is worth the cost and therefore economists and researchers must be failing to accurately consider and assess all of the benefits that hosting the Olympics provide. If the estimates here are accurate and they resulted in intangible benefit estimates of a magnitude sufficient to off-set the cost of hosting the Games, then this study might offer a solution to the issue. Considering and estimating the intangible benefits experienced by residents helps make a better economic case for hosting the Games, but from the results here, it does not make a complete case because the estimated value of the

intangible benefit likely does not equal the shortfall between the tangible economic benefits and costs. The result does support the alternative theories provided in Chapter 4. Either the IOC uses its unique position as the only provider of the Olympic Games to extract the value of the net benefits in the form of economic rents from the host cities in the bidding process, or the “winners” of the bidding process experience the “winner’s curse.” However, there are additional benefits of hosting the Olympics beyond the tangible monetary benefits and the intangible benefits experienced by residents, such as increased future tourism, and improved knowledge base to name two. A more comprehensive view of the costs and benefits would likely make a stronger economic case for the benefits of being Olympic host.

In the competitive atmosphere in which the Olympic bidding process occurs, it is only natural that the result of a study like this could be used to boost a city’s prospects. For example, since the intangible benefit estimated for Chicago is larger than the other cities it could be said that the Olympics should be hosted in Chicago rather than Berlin or San Francisco because the Games would provide more benefit there. The problem with using the conventional CVM approach in this way is that the amount of benefit a respondent can indicate is limited by their budget, even though the scenario is hypothetical. As an illustration, the value of South African pride in hosting the 2010 FIFA World Cup could be greater than it would be among the host residents if the tournament were held in Europe because South Africa will be the first African nation to host an event of that stature. However South African incomes are low relative to European incomes so that added value would not be captured in a normal CVM survey because estimated values would be restrained by the lower South African budgets.

Recognizing this as a potential issue in the Olympic context, WTV was introduced as a complementary measure since time budgets are at the core equal across all nations- we are each

allotted 24 hours every day. While there are differences between per capita GDP levels between Berlin, Chicago, and San Francisco, stark differences of a greater magnitude would be more revealing on this topic. The basic idea is that if lower income people substitute volunteering time for donating money, because for them time is relatively cheaper, using combined WTP and WTV measures would better capture the true intangible benefit without biasing the result as much toward those with bigger budgets.

The empirical results here showed no discernible relation between income and the amount of time residents were WTV. Perhaps there were as many high income people WTV their time because they could afford to forego work as there were low income people who volunteered their time because they could not afford to donate money to a bid effort. Since there was no discernible relationship found between WTV and income, one could argue that the payment vehicle doesn't matter, though average WTV was higher for both Chicago and San Francisco than it was for Berlin.

If lower income cities do have a substitute relationship between income and time volunteered, using both WTP and WTV as payment vehicles in conjunction with the BIF measure proposed allows for results that can be more usefully compared between cities with large income differences. Without considering the BIF factor, the conclusion based on average WTP and WTV would be that residents of Berlin value hosting the Olympics the least among the three cities. Using the BIF measure, residents of Berlin value hosting the Olympics more than San Francisco residents, but less than Chicago residents do. With these results one can make a compelling case that for a rank order of residents valuing the bid the rankings should be Chicago first, Berlin second, and San Francisco third. The introduction of the WTV payment vehicle in this context and the BIF could be significantly useful in future applications if formal estimates of



intangible benefit experienced by cities is considered as a factor for comparison in the overall host selection process. It would allow for comparisons that more accurately value intangible benefits such as those that are being experienced in South Africa in the example above. This could be a direction for further study, comparisons of CVM estimates between countries with significantly different per capita income levels.

Other key results came from the models exploring the relationship between demographics, behavior and willingness to support the Olympics. Across all three cities women were more likely to support and value hosting the Olympic Games than men. This has potential implications for marketing, sponsorships, and how the Games are presented. A plausible explanation for this effect is that while elite male athletes have many platforms and stages to perform and be appreciated in the public eye, the Olympic Games are the primary major platform for elite female athletes. Therefore women value the Olympics more than men do. That held for these three cities and it would not be surprising if the result represented an effect that is widespread across many cultures. In most countries men have many options to participate in, support, or celebrate elite male athletic accomplishment. For women, the Olympics stand uniquely above all other competitions. This relationship implies valuable sponsorship opportunities for companies with products aimed toward women.

## **CONCLUSION**

The primary purpose of this dissertation was to estimate the intangible benefit of hosting the Olympic Games in monetary terms. It is the second to do this for a potential host city and the first that compares outcomes across competitor bid cities. It was presented in the context of the existing body of economic impact of hosting the Olympics literature that focuses primarily on

determining the tangible costs and benefits. Further understanding of the intangible benefits of hosting the Olympics and refined and universally accepted methods to estimate those benefits will lead to better informed decisions among prospective host cities and IOC decision makers. This should grow into a key element of the literature focused on reliable estimates of the costs and benefits experienced by Olympic hosts.

Comparing CVM results among cities allows for some of the issues that arise when trying to make useful comparisons to be addressed. Payment responses were elicited in both monetary terms and willingness to donate time in the hopes of developing relevant comparisons that apply across the wide array of economic conditions that exist in potential host cities. A conventional CVM approach is not useful for these comparisons. A measure of support labeled BIF was presented that in theory leads to more useful comparisons and the empirical results of this study indicated promise for this measure as well. The type of CVM approach used here, with two payment vehicles, may become useful in determining which potential host city's residents will benefit the most from being awarded the Olympics. If it is accepted that these results represent true differences in intangible value among cities, they should be a factor in the cost-benefit analysis that is the basis of the key decisions.

Ultimately the results here estimate that Chicago would enjoy approximately \$5 billion of intangible benefit, San Francisco would enjoy \$3-\$4 billion worth, and Berlin would enjoy over \$1 billion of benefit. These results are comparable to the EFTEC CVM study that found intangible benefits of London 2012 to be an estimated £3.2 billion across the entire country (Clegg, 2005). Including WTV and accounting for income differences with the BIF measure, Chicago had the most intense support at 0.159, Berlin was second with 0.103, followed by San Francisco with 0.07. The intangible benefits, as estimated, would likely not be enough to justify

or offset the massive spending that will be required of the eventual 2016 Olympic hosts, but it represents a significant amount of benefit that has previously not been a formal part of the cost-benefit equations. Measuring the intangible benefits anticipated by residents in addition to other difficult to measure benefits that are part of a comprehensive cost-benefit analysis could help explain why cities around the world remain eager to be the next Olympic hosts.

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## (KURZFASSUNG)

Zu den wichtigsten möglichen Effekten, die durch die Ausrichtung von Olympischen und Paralympischen Spielen erzielt werden, gehören intangible Effekte wie zum Beispiel Nationalstolz, ein besseres Image des Austragungsorts, das historische Erbe im Anschluss an eine erfolgreiche Austragung Olympischer Spiele sowie der "Wohlfühlfaktor". Viele Ökonomen haben bereits die ökonomischen Effekte der Austragung Olympischer Spiele anhand von Einkommensmessung und ökonometrischen Verfahren analysiert, welche jedoch nicht die möglichen enormen intangiblen Effekte messen. In dieser Dissertation werden mithilfe der Contingent Valuation Methode die von den Einwohnern erwarteten intangiblen Effekte in drei Städten gemessen, welche sich für die Teilnahme am Vergabeverfahren bewerben möchten: Berlin, Chicago und San Francisco.

Zusätzlich zu den Schätzungen im Hinblick auf die intangiblen Effekte, welche die Einwohner jeder Stadt erwarten, wird eine neue hypothetische Fragevariante zur Erfassung einer bestimmten Bereitschaft in den Olympischen Kontext eingeführt, nämlich die Bereitschaft zu ehrenamtlicher Arbeitszeit (*willingness to volunteer time*). Überdies werden die Bedingungen untersucht, unter denen die Bereitschaft zu ehrenamtlicher Arbeitszeit als ein Proxy für die herkömmliche Zahlungsbereitschaft für Steuern, Gebühren oder Spenden gebraucht werden kann, falls die Bereitschaft zu ehrenamtlicher Arbeitszeit einen adäquaten hypothetischen Fragevariante für zukünftige Contingent Valuation Studien in verschiedenen potenziellen Austragungsstädten in Ländern mit niedrigem Einkommen darstellen kann. Des Weiteren wird ein Maß bezüglich der Intensität der Befürwortung vorgestellt, welches mithilfe der Ergebnisse der Contingent Valuation Frage und der Bereitschaft zu ehrenamtlicher Arbeitszeit das Ausmaß



der öffentlichen Unterstützung der Bewerbung in verschiedenen potentiellen Bewerbungsstädten vergleichbar machen kann.

Die Ergebnisse aus drei Städten werden miteinander verglichen und mithilfe ökonometrischer Modelle werden Zusammenhänge im Hinblick auf die Bereitschaft der Einwohner, Geld oder Zeit für die Unterstützung einer Olympiabewerbung aufzubringen, analysiert. Im Rahmen weiterführender Ergebnisse wird dargestellt, wie das Geschlecht der Befragten und die Begeisterung für populären professionellen Sport die Unterstützung der Olympiabewerbung der eigenen Stadt beeinflussen.

## (ABSTRACT)

Among the most significant potential benefits that can be gained from hosting the Olympic and Paralympic Games are intangible benefits such as community pride, an enhanced global image of the host city, the historic legacy that follows the successful hosting of an Olympic Games, and the “feel good factor”. Economists have analyzed the economic impact of hosting the Olympic Games using income accounting and econometric approaches that fail to formally assess the potentially enormous intangible impact. In this dissertation the contingent valuation method is used to estimate the intangible benefit anticipated by the residents of three potential Olympic bid cities; Berlin, Chicago, and San Francisco.

In addition to estimates of the intangible benefits residents expect to experience in each city, a new hypothetical payment method, willingness to volunteer time, is introduced in the Olympic context. The circumstances under which willingness to volunteer time might be used as a proxy for the traditional willingness to pay in taxes, fees or donations will be explored as well if willingness to volunteer might be an appropriate hypothetical payment method for future contingent valuation studies of potential host cities from lower income countries. I also propose a measure of intensity of preference that can use contingent valuation results and the willingness to volunteer measure to compare the depth of public support for potential bids to host the Olympic Games.

Results from the three cities are compared and empirical econometric models are used to understand the relationship between resident’s willingness to donate money or time in support of an Olympic bid. Other key results relate how gender and avid following of popular professional sports affect support for home city Olympic bids.