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An Economic Impact Study of the "Boom" Period of Baseball Stadium Redevelopment

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AN ECONOMIC IMPACT STUDY OF THE "BOOM" PERIOD OF BASEBALL STADIUM REDEVELOPMENT

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TABLE OF CONTENTS

Introduction……..…...…Page 2

Review of the Literature……..……...……..……..Page 6

Methodology……..……....……Page 18

Data……..……..…Page 20

Empirical Model……..……...…...…Page 23

Results……..……..……Page 27

Conclusion……...……..……...…Page 31

Tables……...……..……..……..…Page 34

Figures……..……Page 42

Bibliography……...……Page 44

INTRODUCTION

Throughout the twentieth century, sports became an increasingly popular and appreciated component of American society, with sports franchises developing as successful, revenue generating entities of American business. A large component of business in the sports industry comprises of the stadiums in which the teams play. During this sports industry growth, stadiums developed an increasing level of importance, especially due to their role in enhancing popularity of a team. This led to a boom of stadium building at the end of the 20th century and into the early 21st century. In particular this boom can be recognized with Major League Baseball franchises, among which 23 of 30 stadiums have been redeveloped or relocated between 1991 and 2010.

As sports franchises have become large revenue generating business entities with their growing popularity, sports stadiums have become recognized as key attributes to economic development projects and redevelopment initiatives, revitalizing neighborhoods of urban areas. The expectation is that the presence of the franchise and stadium in a community will largely contribute to economic growth, especially in terms of job creation and increases in income levels, as well as business development, and improved or expanded housing. This expectation, correlating with the need for modernized stadiums among baseball franchises, led to a widespread argument for redevelopment of major league stadiums. Franchises of Major League Baseball are prime examples resulting in redevelopment projects in urban areas, with the recent boom period of building more modern and glamorous stadiums, providing amenities beyond the game itself.

This specific study analyzes the economic impact of redeveloped Major League Baseball stadiums opened between 1991 and 2004,[1] capturing the economic conditions of the cities during the opening year of the stadium, as well as the prior conditions leading up to the opening of the stadium, and the conditions after the opening year. The expectations are that the effects of a new ballpark on the local economy will be positive, with a sudden initial impact around the time of the opening of the stadium, followed by either a decline once the initial excitement is over, or positive lingering effects that stay consistent or gradually increase. However, this expectation has proven to be wrong in prior research. The specific variables studied are Metropolitan Statistical Area employment rates, as well as real per capita personal income of the MSAs, both of which are assumed to show a positive impact.

This study provides beneficial information for each entity involved with stadium redevelopment, including the baseball franchises, city governments, Major League Baseball (MLB), and city residents. Economic impact studies provide team franchises with information beneficial for creating their plans to redevelop a stadium, particularly for developing adequate proposals and negotiating external funding for the stadium project. City governments considering to host a team, or contribute to stadium redevelopment, will benefit from understanding the ways in which a city is impacted by a redevelopment project, or the overall presence of a team. It is useful and important for MLB, as the governing association of professional baseball, to understand the team monopoly behavior and economic impact of the franchises and stadiums, in order to maintain the best distribution of the franchises. And lastly, city residents benefit from economic impact studies because of their explanation of the effects of a stadium presence or redevelopment project, especially giving consideration to possible tax increases.

[1] Although a total of 23 stadiums were redeveloped between 1991 and 2010, this study only includes

The redevelopment boom in baseball started with the construction of Oriole Park in Camden Yards, the stadium for the Baltimore Orioles[2]. Initiating the concept of stadium centered urban redevelopment, Camden Yards was built near the business district of Baltimore and became widely known for its aesthetic appeal. This was the beginning of almost yearly openings of new ballparks throughout the country, redeveloping many stadiums considered to be outdated or not economically profitable. Most stadiums have mimicked the original project of Camden Yards, using the same architect[3] or style, as well as including creative and unique components to make each stadium memorable for the fans. This includes views from the ballpark, to creative in-stadium attractions, to sculptures and re-creations of iconic baseball figures and franchise symbols.

In order to make such redevelopment projects possible, many franchise owners have turned to local governments, for financial support based on the assumption that building a stadium will provide economic benefits to the surrounding community. Because of this, we have seen a large growth in government financial support of stadium development, in which city or county governments support franchises by providing subsidies for the construction and, or, operating costs. With this significant financial support, the local government expects the economic benefits of the stadium will exceed the value of the subsidies and financial support.

This government support of stadium redevelopment is a primary reason to study the actual economic impact of stadiums, in order to determine if the subsidies actually pay off, and if the economic impact actually is positive, as assumed by the team and government. However, because of the boom of baseball stadium development, it is important for community residents,

[2] Camden Yards opened in 1992 following the opening of U.S. Cellular Field in Chicago. However, Camden Yards is the stadium that initiated this modernized style and urban redevelopment concept.

[3] Fourteen of the twenty-four stadiums rebuilt between 1990 and 2010, as well as one stadium built in the 1970s, were built by HOK Sport Venue Events, part of the HOK Group and now known as Populous. As one of the leading architectural companies, HOK established the modern style for baseball stadiums with their construction of Camden Yards, using historical attributes of the surrounding city, as well as actual parts of older buildings to capture the history of the cities redeveloping their stadiums.

MLB officials, and franchise owners to see how these large projects have influenced economic conditions in the surrounding community, as new city centers reviving downtown areas, or neighborhoods of certain districts. This creates the question of how much do new stadiums actually revitalize or increase economic growth?

Past research done on this subject matter has mostly concluded that in fact, there are no significant measurements of economic impact for stadiums. However, these past assessments have included in their study that many likely benefits are more qualitative and socially based, such as a sense of pride among the local population, greater sense of community, and a sense of celebrity value for the city, making it an appealing destination for new residents, businesses, and tourists.

REVIEW OF THE LITERATURE

Sports economics research as a whole has become much more popular within the last twenty years, as a new and progressively more important form of study. This is due to the increasingly larger role sports have played within our culture and society. Major topics in sports economic studies include revenue and costs of franchises; the labor markets within sports leagues, in particular the salaries of players; the market structure and market outcomes relating to competitive balance, and the balance between winning and making a profit; and public and league policy in relation to specific franchises and in particular their costs and revenues.

Furthermore, each sport has specific topics that dominate the studies relating to that sport. In basketball related studies, the most common research has been based on discrimination within the league due to the historically high minority participation levels. For the National Hockey League, most of the research also focuses on discrimination, however more so pertaining to the French and Canadian players, as well as research on violence, which is highly associated with the sport. In Major League Baseball, the three tiered labor market,[4] and the determination of players' salaries are popular topics, while in soccer, trading of cash versus players is a common focus. In addition to sports research associated with specific sports, there is the general study around sports stadiums as large infrastructural facilities, impacting the surrounding economy.

Overlying all sports economics research is the fact that sports teams act as monopolies. The teams individually, as well as their respective leagues, benefit from a scarcity of teams. The leagues strive to have fewer teams than the number of cities that are considered viable

[4] Three tiers of players categorized in relation to salaries, and based on experience and whether or not a player is a free agent.

franchise sites, thus maintaining a competitive system for cities to retain franchises or for cities without teams to compete for any relocation or expansion opportunities. Relating to economic impact studies, this competitive system increases the price for franchises, in terms of offering subsidies or the most viable land for new stadiums, so as to retain or acquire a team.

The sources of revenue for sports franchises and leagues, as have been studied in sports economics research, primarily include: broadcasting, ticket sales, concessions, naming rights, season long seating sales, and luxury seats. The television rights and networking deals in particular provide franchises with a significant portion of their revenue. While the revenues from broadcasting, as well as ticket and concession sales, have shown significant and steady growth,[5] the demands from players, and in some cases owners, has increased so much that franchises have looked to take advantage of any financial support they can receive from local governments. The eagerness of local governments to retain a sports franchise in their city by providing subsidies, has allowed for a decrease in the need for franchise revenues to be directed toward regular stadium costs. This instead allows the franchise to meet players' salary demands. Because of the proportional increases in salaries for the players to the increases in stadium revenues, any large growth in revenue is largely distributed to players, making it unlikely for the stadium revenues to fully outweigh the costs for running the stadium. This is why government subsidies, and the city appeal of hosting a team, play such a large role in the wealth of franchises, tying in the ability to build elaborate ballparks.

The economic impact of sports stadiums has been a popular research topic within sports economics, as it pertains to urban development, the economic conditions of specific cities, and the success of sports teams in terms of popularity and revenue. Since the 1960s, the sports industry has for the most part been a booming business. Early on the relocation of many

[5] Roger G. Noll and Andrew Zimbalist. "Build the Stadium – Create the Jobs!," in *Sports Jobs and Taxes: The Economic Impact of Sports Teams and Stadiums* (Washington D.C.: Brookings Institution Press, 1997), 3.

teams to other parts of the country expanded the industry. More recently, the redevelopment of many stadiums has added to industry growth. Many cities, and in particular, older cities, have initiated redevelopment of downtown or central business districts to generate more economic activity. The intention is to draw more tourism, as well increase as residential appeal or business opportunities.

As part of the economic impact of sports stadiums, the financial implications to the franchise, city, and owners, is a large determinant. Stadiums can be owned by any of three entities: the local government, the team owner, or a third party; or any combination of the three. Historically, stadiums were most commonly owned by private owners; third party owners, or the team owner. However it has become much more common for the local government to have full, or at least partial ownership of the stadium. Despite the sports industry developing into the multibillion dollar industry it is today, the need for government financial support has significantly increased, to help cover costs of new multi-million dollar stadiums. This has created a relationship between franchises and the local government based on financial plans, primarily including subsidies for the franchise's stadium. Government support developed as a result of the concept that a sports team and facility will generate new jobs and even increased spending within the local community, both due to the stadium as a business entity and the likelihood that attendees of the sports events will spend money while traveling to and from the stadium. Overall, events hosted by the stadiums will bring money into the local economy through fan support of ticket sales and additional product revenues, as well as job creation and tax revenues. Furthermore, the presence of the team will presumably result in increases in public transportation, increasing growth of city revenues, along with a multiplier effect of further expenditures in the economy as a result of economic activity growth.

Using this concept, sports franchises advertise that their presence will make a community a "major league city," attracting publicity as well as new businesses, and even residents.[6] The positive association of being a "major league city" very much relates to the idea that the presence of a sports team provides the local area with a celebrity value, that is in turn a component of the reasoning for urban redevelopment based around a baseball stadium. Celebrity value thrives within our social culture today with the fascination and publicity it stimulates, contributing to increases in tourism, or by helping create a thriving community area. This concept of celebrity value has very much been seen in the redevelopment boom of baseball stadiums during the past 20 years, through Major League Baseball, with the creations of a uniform architectural style, as well as multiple forms of entertainment in the stadium beyond just the sports game.

Despite the presumed positive effects and income increases as a result of a local professional sports team, the assumed effects typically are expected and presented to be higher than actually occurs. Rosentraub (1997)[7] found that even though the number of sports related jobs increased, the sports industry is not a large enough component of community economies to have an appreciable impact. And, related to this, jobs of sports stadiums aside from the players and owners, tend to be labor intensive, low wage jobs, limiting the significance of an impact. Additionally, it has been recognized that the spending within sports stadiums is often a result of substitution rather than increased spending within the community, such that money spent at sports game just detracts from spending elsewhere within the economy. People have only a certain level of their income that they will be willing to spend on leisure, therefore, if they spend the money going to a baseball game, they will not be spending the money to go to

[6] Roger G. Noll and Andrew Zimbalist. "Build the Stadium – Create the Jobs!," in *Sports Jobs and Taxes: The Economic Impact of Sports Teams and Stadiums* (Washington D.C.: Brookings Institution Press, 1997), 2.
[7] Andrew Zimbalist. "The Economics of Stadiums, Teams, and Cities" in *The Economics and Politics of Sports Facilities*, ed. Wilbur C. Rich (Westport, Connecticut: Quorum Books, 2000), 59.

another sporting event, the movie theater, or a restaurant. However, we will mention later on, that although the substitution effect is likely, it is also likely for fans of a baseball team to visit restaurants and bars near to the stadium before or after the game, meaning that fans may actually be willing to increase their leisure spending when related to sports events, and in particular baseball stadiums in lively neighborhoods.

Another component of the financial and wealth distribution in relation to a sports franchise, is the fact that the money spent within the stadium on concessions, souvenirs, and additional goods, is divided among many different components, including a portion to the manufacturer, the concession workers, utilities, the players, and the owner of the team. In particular, the last two factors, the owner and athletes themselves, do not always live within the city of the franchise, meaning that the money does not ultimately factor into contributing to the local economy through increasing incomes of the local population, taxes, or even further redistribution with the multiplier effect. Therefore, the local value of sales within the stadium falls much lower than the actual sale price of the goods at the stadium.

Overall, when a city or county government financially supports a stadium redevelopment, it forgoes other investment opportunities. Thus, the government entity needs to evaluate if subsidizing the stadium project will have the largest net impact of the available possible uses for the money. This net impact, according to Baade (1994),[8] is broken down into direct expenditures, indirect expenditures, and psychological benefits, that include community pride and cultural characteristics that relate to the sports team. The indirect expenditures, or subsequent spending by businesses, create the multiplier effect, which is difficult to specifically capture and include in an analysis study. Direct expenditures, or money spent by the franchise, employees, and fans, are considered to only provide a positive impact only if they are a result of new spending, not as substitutions for other spending. However, Baade

[8] Robert A. Baade. "Stadiums, Professional Sports, and Economic Development: Assessing the Reality" (1994).

asserts in this study, that identifying the original spending for which a given sports team substitutes is not feasible.

Before fully studying the impact of sports stadiums, and especially the influence of governments on sports franchises, it is important to understand the stipulations for a city to host a franchise, how cities are chosen to become hosts of franchises, and how cities appeal to sports leagues as a possible major league city. Components of this system include cities' initiatives to appeal to sports leagues through financing and development, and the criteria placed upon potential franchise hosts.

Any study of a sports franchise's stadium or municipal stadium,[9] must take into consideration the relationship between the team utilizing that stadium and the surrounding community. However, with, or occasionally without, public awareness and support, cities that desire to acquire a team, have invested millions of dollars in building and renovating stadiums, building parking facilities as well as other infrastructure elements, and even guaranteeing ticket sales to the sports events, so as to make their city an attractive host location for a sports league. The sources of funding for this can include municipal bonds, private contributions, local tax increases, and state revenues from sports directed lottery tickets. However, such funding comes with the expectation that the benefits will outweigh any of these costs the city must incur in creating funds for the stadium and franchise. Despite creating an initial, appealing environment as a host city, sports teams typically serve as a monopoly market within their given region, while the leagues simultaneously limit the number of franchises within greater regions, so as to always have a prospective host city available. This benefits both the team and league, creating this competition forces cities to regularly evaluate their ways of hosting franchises, and

[9] A municipal stadium is a stadium built by the city or county government, and is entirely run and maintained by the local government, with any team that uses it, paying an equivalent to rental fees.

periodically improve their benefits and distinct methods of support in order to retain the franchise.

Although not much research has focused on relocation and redevelopment of sports stadiums in the context of determining specific viable locations, the basic standards for possible host cities have been broken down. Bruggink and Zamparelli (1999)[10] assert that the three main criteria for evaluating cities as potential host cities for a franchise, are the market factors, the financial backing of an investment group for the franchise, and any possible stadium plans. Furthermore, the city factors that are considered include the population, consumer incomes, corporate presence as a valuable trait for financial support, the current identity of the city as a team host, business fees and pertaining taxes, as well as the distance from other teams in the league. These many components reveal the competition for hosting sports teams, such that the sports leagues are the power player, while cities have to exemplify themselves as viable investment decisions.

This weighted balance of power in determining the most viable host cities does introduce an endogeneity problem for economic impact studies, such that it is possible for relocated teams to be placed within an already thriving community. However, this study almost entirely uses redeveloped stadiums, rather than new or relocated franchises, which in the boom period, have been mostly been built with intentions of reviving a specific neighborhood.

In addition to determining the viability of a city as a sports team host, the determinants of relocation of a sports team, and whether or not to rebuild a stadium, are based on possible economic implications for the city, league and the franchise. In terms of relocation, which effectively creates a larger impact than the redevelopment of a stadium, studies focus on the

[10] Thomas H. Bruggink and Justin M. Zamparelli. "Emerging Markets in Baseball: An Econometric Model for Predicting the Expansion Teams' New Cities" in *Sports Economics: Current Research*, ed. by John Fizel et al. (Westport, Connecticut, Praeger Publishers, 1999).

motivation of sports franchises to relocate, and the role that the local government plays in attracting and retaining teams.

Broken down, there are three agents that serve as determining factors in the decision to relocate. The first is the franchise owner, whose primary concerns include the net revenues of the franchise, profit maximization, players' salaries, stadium rent, television income, ticket revenue, capital gain from franchise value, and the subsidies received from the government. The second agent, if a separate entity than the first, is the stadium owner, whose concerns focus on net revenue for the facility, stadium rent, concession revenue, capital gains from the stadium value, and also, subsidies received from the government. Third is the local government, as an agent concerned about the presence of a team within the city, as well as the costs to the taxpayers of providing subsidies for the team.[11]

With the agent considerations, there are two general theories about the decision to relocate. First, based off of the break down described above, is the likelihood of a team to relocate based on who owns the stadium. The scenario least likely for relocation would be full or even partial ownership of the stadium by the owner of the franchise, or the franchise itself. This is because the owner has a large incentive *not* to relocate, considering that the stadium is likely to lose value when the team moves, therefore impacting personal profits for the owner. Conversely, the situation most susceptible to relocation is when the government is the owner of the stadium, because of their balance between appealing to the taxpayers with low and reasonable taxes, as well as appealing to the franchise through subsidies. As will be explained with the research on subsidies in relation to sports stadiums, government officials, as well as even franchise owners, tend to over exaggerate the economic benefits of the presence of a

[11] Gerard C.S. Mildner and James G. Strathman. "Baseball and Basketball Stadium Ownership and Franchise Incentives to Relocate," in *Sports Economics: Current Research*, ed. by Joh Fizel et al. (Westport, Connecticut, Praeger Publishers, 1999)

sports team within a city, at a large cost to the taxpayers (assuming increasing in taxes are implemented to help pay for the subsidies). However, if subsidies are not retained at a high enough level for the franchise, along with any other possible incentives, franchises are much more likely to at least consider relocation options. When the stadium is owned by a third party, the likelihood of relocation falls in the middle of the spectrum, although this form of ownership is considered to be rare.

The second theory about the decision for teams to relocate is the general assumption that franchises are only likely to relocate if there is a significantly unsuccessful record, or low fan loyalty. In such cases, the owner, in considering the best interests for the team, himself, and the league, looks to break the pattern. Considering the sports industry conditions, in which significant sources of revenues are ticket sales, and local or regional broadcast revenue, low fan loyalty and, or, an unsuccessful record can largely determine the decision to relocate. To improve conditions, owners will very likely relocate to large and growing metropolitan areas, so as to have higher rates of attendance and therefore ticket sales.[12]

Underlying the decision to relocate a team is the large uncertainty of revenue forecast, considering that the future popularity of a team is highly unknown. Related to this, from the government perspective, is that sales taxes, ticket taxes, and even rental payments are dependent on the attendance of fans at games, such that low attendance means low tax revenues for the city. However, there is historical evidence that new or recently renovated stadiums do actually have high levels of attendance.

Although many of these conditions do also apply to the decision to redevelop a stadium, the general motivation for building a new stadium is based on updating infrastructure in relation to the fan appeal to attend games, as well as the opportunity to increase luxury box

[12] Gerard C.S. Mildner and James G. Strathman. "Baseball and Basketball Stadium Ownership and Franchise Incentives to Relocate," in *Sports Economics: Current Research*, ed. by Joh Fizel et al. (Westport, Connecticut, Praeger Publishers, 1999), 76.

seating, which are sold at very high prices, providing the franchise with a new, and large source of revenue.

While several sports economics studies have focused on research of the economic impact of sports stadiums, these studies have primarily focused on the impact specifically in relation to the government subsidies and tax implications associated with the stadiums. This is of reasonable concern in the decision to build or rebuild a stadium because of the implication for the government, taxpayers, and even the extraordinary costs the owners of the franchise are likely to face if subsidies are not offered. The overwhelming evidence of these studies has been that the franchises over-exaggerate the promotion that stadiums and their sports teams help increase revenues within the city, while in fact the costs for cites more often outweigh the increases in tax or over city revenues.

The subsidies provided to franchises for stadium development costs or even operating costs, are a result of a combination of bonds, private donations, state lottery funds, and tax increases that often pertain to sports related sales and tourism. Although many impact studies have concluded that the benefits do not actually significantly outweigh the costs of subsidies, as expected, it is usually the case that cities find more value in having a team while paying forward such costs, rather than not having a team at all.

A large concern of the financial support for the stadiums is the conflict of interest between those paying to fulfill the costs of the subsidies, and the team owners and fans. Whomever benefits from the stadium development is not always who is paying. Baim (1994)[13] asserts that the people who benefit are mostly fans and owners because of the lower prices they incur for stadium costs, costs in the stadium, and ticket prices, whereas those paying for the subsidies are a larger base of the population than the fans. However, distinguishing these lines

[13]Dean V. Baim. *The Sports Stadium as a Municipal Investment.* (Westport, Connecticut, Greenwood Press, 1994).

is difficult, especially because owners and some fans do not always live near the stadium. This is a large reason for why sports lotteries have been created, and why tax increases are often specific to certain sales that somewhat relate to the franchise presence.

Overall, economic impact studies of sports stadiums, particularly in the context of government subsidies, have consistently shown insignificant or negative results for the impact of the stadium on the economic conditions of the local community. For example, Baade (1994)[14] found nearly no significant impact on per capita personal income of sports teams in 36 Metropolitan Statistical Areas. Cochran and Lertwachara (2007)[15] ran an event study, also finding no positive impact of a sports team on the local economy, and Greenberg (1997)[16] concluded that arenas and ballparks among 13 MSAs, had insignificant impacts on sales tax revenues. This conclusion that sports stadiums *do not* actually provide economic benefits for the local community demonstrates that city hosts of sports franchises cannot rely on the expected benefits to local business through increases in revenues, and even necessarily jobs. Rather, the only likely benefits are social and less measurable benefits, such as population satisfaction from the presence of the team and the aforementioned "celebrity value." This satisfaction and benefit is, however, not related to financial transactions of selling tickets, concession and paraphernalia sales within the stadium, broadcasting rights, sponsorships, or other investments. Also mentioned above, the revenues from in-stadium sales as well as the tax dollars later derived from them are assumed to be mostly a result of the substitution effect, such that that money is displaced from sales that otherwise were likely to have occurred at other sporting events, movies, and restaurants.

[14] Robert A. Baade. "Stadiums, Professional Sports, and Economic Development: Assessing the Reality." (1994)
[15] James J. Cochran and Kaveephong Lertwachara. "An Event Study of the Economic Impact of Professional Sport Franchises on Local U.S. Economies" (Journal of Sports Economics, Sage Publications, 2007).
[16] Michael A. Greenberg. "Sports Facilities and Metropolitan Economic Development" (1997).

Building from the research on economic impact and government subsidies in relation to the benefits of having a sports team, Zimbalist (2000)[17] asserts that with larger subsidies provided for sports teams and facilities, the government is likely to have to levy additional taxes, which in turn "discourage business in the area, reducing consumer expenditures, which can start a negative multiplier effect.[18]" However, there is still the hypothesis that it is equally likely that the government would find ways to provide subsidies to businesses within the area of the new stadium so as to encourage a redevelopment initiative in the given area, rather than deterring new businesses for the sake of just the stadium alone.

This would then likely result in increases of employment and personal income, which this study intends to measure in reference to the "boom" of baseball stadium development between 1991 and 2004. It is highly possible that different sports and their equivalent stadiums have different impacts on the local community, providing reason to break the impact study down, focusing specifically on the impact of just baseball, as one of the four major sports in the United States. Furthermore, baseball is unique due to the frequency of games throughout the season. During the baseball season, each team plays 162 games, half of which are played in their home stadium, and overall totally more games in a season than any other sport.

It is also likely that the impact of these stadiums, when broken down into specific measurements, provides positive trends such as increases in new businesses, property values, or public transportation. However, due to data constraints, as will be explained later, these measurements are difficult to determine explicitly, which is why the study will measure the overall impact on employment rates and per capita personal income.

[17] Andrew Zimbalist. "The Economics of Stadiums, Teams, and Cities," in *The Economics and Politics of Sports Facilities,* ed. by Wilbur C. Rich (Westport, Connecticut, Quorum Books, 2000).
[18] Ibid., 59.

METHODOLOGY

This economic impact study of stadium development uses two regressions to analyze the changing economic conditions in relation to the development of a new baseball stadium. The first regression is an Ordinary Least Squares (OLS) empirical model for studying the specific impact of the new ballpark to capture any possible effects that are solely a result of the opening of the stadium. The second regression uses an event study model to capture the prior economic conditions relative to the new ballpark, including any effects from the announcement or anticipation of the new stadium, along with any lingering effects of this ballpark development in the years following the opening.

The development and opening of a new baseball stadium can have a variety effects, and the two regression models allow us to recognize the specific effects. In the years prior to an opening, the announcement of the new stadium can initiate an immediate change in economic conditions, as may the construction period and the anticipation effects in the years right before the opening. The opening year itself may have no significant effects due to the fact that any impact may grow slowly over time as the ballpark gains recognition, or there could be a sudden and significant change in conditions because of the enthusiasm of the new ballpark and correlating high levels of attendance. In the years following the opening there are three possible impact results. It is possible that the effects of the new ballpark decrease as the enthusiasm wears off after the opening season. Also possible, is that any impact from the opening year stays steady and consistent over time. Lastly, it is possible for the impact to continues to gradually increase due to a positive reaction to the new ballpark, and continued enthusiasm pertaining to revitalization in the surrounding neighborhood.

In order to recognize an economic impact, this study measures the changes in specific economic conditions during a given time frame. These conditions are used in the OLS regression and the event regressions, allowing the study to capture the specific impact of when the stadium opened, as well as relative prior conditions and any lasting effects. If there is a positive impact, there should be a positive trend starting just before the opening year of the stadium accounting for the anticipation, followed by further growth in the opening season, and then showing residual positive effects in the years following, thus capturing the stability of the conditions. While the OLS regression singles out the effects of the new ballpark, the regression analysis for the event study measures the changes of economic conditions as they are related to each other and, most importantly, to the development of a new baseball stadium. The regression analysis also enables us to measure the statistical significance of the results, in order to determine if the effects are significant enough that the impact is not just a result of chance. This significance also represents the controls placed on the regression for changing trends in the Metropolitan Statistical Areas, showing that the results actually represent the ballpark development, not other events in the given area.

The economic impact analysis in this study is applied to 18 Metropolitan Statistical Areas (MSAs), each of which has had a stadium redevelopment or construction project between 1991 and 2004. The analysis uses two different dependent variables to study the impact. These variables are the employment rates, and the per capita personal income levels within the Metropolitan Statistical Areas. Furthermore, one set of the regressions gives equal value to the stadium in the opening year as well as the years following the opening, to differentiate the new ballpark from the prior ballpark, and a second set of the regressions singles out the opening year of the ballpark to be different from the years before the opening, as well as the years following.

DATA

The regressions include data for 18 stadium redevelopments, the corresponding Metropolitan Statistical Areas for each ballpark, the years in which each ballpark was built with a range of at least five years before and after to be included, the employment rates for the MSAs, and the per capita personal income levels for the MSAs.

In Major League Baseball there are a total of 30 franchises located in 28 cities, with each franchise using its own stadium. This study looks at the impact of the 18 stadiums developed between 1991 and 2004. Five ballparks were built from 2005 through 2010 but were not included in the study, because, with a limit of data through only 2009, the analysis would not be able to have the span of five years after the opening of the ballpark in order to recognize any lingering effects. There are also seven ballparks currently used, that are not included because they were built before 1990. One of these stadiums was built in 1989 and is home to the Toronto Blue Jays in Canada. In the United States prior to 1990, the most recent stadium built or redeveloped was in 1973 in Kansas City, Missouri. The six stadiums developed before 1990 (four between 1962 and 1973, and two in 1912 and 1914), fall out of the reasonable time frame for the most recent boom period of stadium development. As explained previously, this boom period not only introduced a new style of stadium construction with a multitude of amenities within the stadium, but is also largely based on the intention of positively impacting the local economy. This positive impact is expected from creating new cultural areas of a larger metropolitan community, with the ballpark and team as the core, as well as providing new jobs and ideally higher income levels and city revenues.

Each of the eighteen ballparks used in the study are located in a major city. They are part of a Metropolitan Statistical Area, which is defined as a geographic area of high

population density, with significant overlap of economic activity between cities and, in some cases, counties. Metropolitan Statistical Areas provide the best geographic base for analyzing an economic impact of stadiums for multiple reasons. First and foremost, fans for the team represent a wide geographic area, which pertains to the monopoly market Major League Baseball strives to sustain. This means that it is likely the teams appeal to, and impact, a wide geographic area. However, the further away from the stadium, the less likely there is to be an economic impact. MSAs capture the widespread support, while also containing the highest likely economic impact. Secondly, the MSAs capture indirect expenditures that result from the presence of a sports franchise, not just the direct expenditures within the stadium or related to the franchise. Lastly, the employed staff of the franchise and stadium come not only from the city hosting the stadium, but also the surrounding communities as well, making MSAs the appropriate level at which to incorporate the employment rates and income levels.

Some Metropolitan Statistical Areas have multiple stadiums; however, none of the areas used had more than one redevelopment project within the time frame used. These MSAs include New York, Los Angeles, Chicago, and San Francisco. Chicago and San Francisco each have a ballpark used in the study, while New York and Los Angeles were not included. New York, however, is a unique case because the city underwent simultaneous redevelopment of two stadiums in the city, which both opened for the 2009 season. However, because of how recently they were developed, the study does not include them.

The event study regressions take into account the economic conditions of the Metropolitan Statistical Areas before the opening of the stadium, as well as years following the opening. This allowed looking at the impact for a minimum of five years prior to the opening year, the opening year itself, and five years following the opening year. Overall the study included data for five years before the first stadium was built (1991) through five years after

the most recent stadium was built (2004), resulting in complete data for all 18 ballparks between the years of 1986 and 2009.

A list of the ballparks used, as well as their corresponding MSAs and years in which they were opened, can be found in Table 1. Summary statistics for average employment rates and per capita personal income overall, as well as for each MSA, are listed in Tables 2 through 4. Figure 1 shows the frequency of MLB stadium development between 1991 and 2004.

EMPIRICAL MODEL

The building of a new sports stadium can have several effects, which can be dependent on relation in time to the opening of the stadium, and different types of economic conditions. In order to analyze changes in economic conditions with consideration to timing, this study uses the OLS regression and event study as two separate empirical models, in attempt to identify the effect of the stadium redevelopment. The OLS regression analyzes the impact of the new stadium, while the event study analyzes the prior economic conditions in relation to the new stadium, as well as the continual effects of the new stadium.

Each of these regression models is run twice: first looking at the impact of the new stadium in the opening and following years combined, and secondly looking at the opening year independently, on the assumption that the opening year has a distinctly different impact than the continual effects of the new ballpark. Prior research of new stadium development has concluded that the appeal of a new stadium creates a significant increase in attendance, especially during the first year. This means that activity around the stadium is predictably much higher than before, due to fans eating at local restaurants, or spending time at bars before and after the game. Within the stadium, higher attendance increases the sales of souvenirs and food, as well as increasing the need for staff necessary to oversee the business inside the ballpark. These reasons are why the study incorporates into the regressions the differentiation of the opening year from the combined impact of the opening year and following years, measuring the overall impact of the new ballpark.

Furthermore the two empirical models were each run with two dependent variables: employment rates and per capita personal income. These two variables allow the study to look at changes in two types of economic conditions, both of which are presumed to be positively

impacted by the development of a new ballpark. With the combinations of these different ways of looking at the impact of a new stadium, the overall study includes eight different regressions.

The first series of four regressions use the OLS model, looking at the independent impact of the new stadium. Using employment as the initial dependent variable, the regression first combines the opening year with the ongoing years of the new ballpark and secondly looks at the impact of the new ballpark just during the opening year. This is done by creating a dummy variable for the stadium that takes on a value of one for the opening year along with the following years, and zero for all years prior to the new ballpark. In order to look at the impact of the new ballpark only during the opening year, the dummy variable only takes on a value of one for that opening year in each Metropolitan Statistical Area. After applying these dummy variables to the effect on employment in the simple regression model, we change the dependent variable and use the log of per capita personal income, with the two separate conditions. The model for these simple regressions is as follows:

$$Y_{i,t} = \alpha + \beta stad + e_i$$

$Y_{i,t}$ represents the dependent variable: either employment rates, or the log of per capita personal income within the Metropolitan Statistical Areas, for MSA "i" during year "t." "Stad" represents the dummy variable, measuring the impact of all the years of the new stadium, or just the opening year. β is the coefficient for this dummy variable, showing the actual impact of the stadium on employment rates, or per capita personal income. Lastly, "α" represents the fixed effects for the MSAs and, e_i is the stochastic error to capture any unaccounted for variables or effects.

The second series of regressions use the event study model to capture the prior economic conditions to the new stadium, as well as the continual impact of the stadium. The

intention of stadium owners is for the impact of the new stadium to be continually positive, correlating with the intention for the increase in attendance to be continuous, not just for the opening year. This would mean that the intended positive impact would increase significantly in the opening year of the stadium and remain constant or even gradually increase in the years following. Prior to the opening season, with the announcement effect and anticipation of the new stadium, the local area of the stadium is likely to see a positive trend of restaurant, bar, and store openings in preparation for the opening of the stadium. Therefore, while the simple regression lets us look at the effects of the new stadium as a single event, the event study will capture the years before and after the opening to see if the predicted trends are significant.

The event study regressions are the same as for the simple regressions, in that, employment rates are used as the dependent variable, first with the dummy variable equaling one for all years of the new stadium, and secondly, with the dummy variable equaling one for only the opening year of the new ballpark. For the regression in which the dummy variable holds a value of one for the combined opening year and years following, the model looks at the overall range of years between 1986 and 2009. However, for the model in which the dummy variable only takes on a value of one for the opening year of the ballpark, the study only looks at the impact relative to the opening year, meaning during a span of five years before and five years following the opening. After using employment rates, the study uses the log of per capita personal income as the dependent variable, running this regression with the two separate dummy variable conditions. The model for the event study regressions is as follows:

$$Y_{i,t} = \alpha + \sum_{y=-18}^{-1} \lambda_y D_i 1(t - T_i^* = y) + \sum_{y=1}^{18} \delta_y D_i 1(t - T_i^* = y) + e_i$$

$Y_{i,t}$ is the dependent variable, being either the employment rate or per capita personal income, with "i" representing the Metropolitan Statistical Areas in year "t." α is the fixed

effects for the MSAs, and e_i at the end of the model represents the stochastic error. The first summation accounts for the years prior to the opening year, with the prior conditions and effects resulting from the announcement or construction period. The second summation represents the years after the opening of the stadium. Broken down, λ_i and δ_y are the coefficients, or outcomes for the years before and the years after, respectively. D_i is the dummy variable originally equaling one for all years of the new ballpark, and secondly equaling one only for the opening year of the stadium. "$1(t-T_i^* = y)$" is an indicator function for the years removed from the opening of a stadium, such that it is equal to 1 for the years removed from the stadium in which $y = -18,-17,-16 \ldots 16,17,18$ relative to the opening year T_i^* when looking at all years of the new ballpark, and $y= -5,-4,-3 \ldots 3,4,5$ for the regressions only looking at the opening year impact.

Using these two models with the different conditions results in a total of eight regressions. For each of the regressions, controls are gradually added to the empirical model to account for any other effects influencing the economic conditions of the Metropolitan Statistical Areas. First the regressions were run without these controls to have a basic measurement of the impact. Secondly, they were controlled for the time trend effect to account for the yearly differences between MSAs, and third the regressions were controlled for the fixed effects of the MSAs pertaining to differences in economic conditions among the MSAs. These controls capture the time variant characteristics, or different MSA characteristics that are external to the stadium development but correlate with it as well as with the dependent variables, eliminating an endogeneity problem.

RESULTS

The intention of this study is to analyze the economic impact of recently redeveloped baseball stadiums on the surrounding Metropolitan Statistical Areas, specifically looking at the effects of the boom of ballpark redevelopment on the employment rates and per capita personal income. The common assumption is that stadium redevelopment will provide a positive impact on the surrounding community, initiating revitalization of urban neighborhoods as well as increasing job opportunities, income levels, and city revenues. To study the breadth and timing of the possible impact, two regression models were used with varying conditions. The specific results of the regressions are shown in Table 5 through Table 12, as well as Figure 2 through Figure 5. This section will first discuss the results of the ordinary least squares model, looking at the overall impact of the new baseball stadium. Secondly the results of the event study will be discussed, taking into consideration prior economic conditions as well as any short run, or lingering effects that follow the opening of the stadium.

The ordinary least squares model measures the relationship between the dependent variable, employment or income, and the redeveloped ballpark. First it looks at the impact on employment rates in relation to all years of the new ballpark, followed by results pertaining to just the opening year. Next it reviews the impact on per capita personal income.

The impact of the redeveloped ballpark on employment rates shows a small positive impact, with a high level of significance. As control variables were added, the impact decreased some, representing a possible endogeneity problem of correlating effects to those of the ballpark redevelopment. Although the addition of variables showed such a change, the results rose to a reasonably high explanatory power, such that 84% of the variance can be explained by the model.

Results for the effects of new ballparks on employment solely during the opening years show a smaller, but still significant and positive impact on the MSAs. The coefficient increased with the control for time trend and fixed effects, while also significantly increasing the explanatory power to 91%.

Looking at the impact on per capita personal income from all years of the new ballparks, there is a positive impact with high statistical significance and a high level of explanatory power at 95% as control variables were added. With the addition of control variables, the impact decreased significantly but remains positive nonetheless, again, meaning that originally there was likely an endogeneity problem.

When taking into consideration only the opening year of the ballpark, the impact on personal income is also positive and of statistical significance, although less than that of the prior regression. Here, too, the impact decreases with the addition of control variables, while the explanatory power increases to 97%.

Although the impact is not extremely large in any of the regressions, the results all show positive effects with high statistical significance, as well as high level of explanation for the variable, meaning that they were not likely to have occurred just by chance. The most positive results are for the regressions incorporating all years of the new stadium in the dummy variable, meaning that the employment and per capita personal income show slightly positive effects from the presence of the redeveloped ballpark for longer than just the opening year.

The event study takes into consideration the years prior to the opening of the redeveloped ballpark, as well any lingering impact on employment rates and per capita personal income. First, the following reviews the results of the effects relative to employment rates, followed by the impact relative to per capita personal income, distinguishing the change

in the dummy variable from incorporating all years of the new ballpark, as well as just the opening year.

The impact of all years of the new stadium on employment rates over time show that prior to the opening of the ballpark, the employment rates were lower, but increasing as time moved closer to the opening of a new ballpark, overall showing a positive trend. The coefficients for these years before are negative to represent the fact that the employment rates are lower in these prior years than in the years of the new ballpark. In the years just before the opening of a new ballpark, the coefficients become less significant, although the only not statistically significant outcome is during the year just before the opening. In the years following the opening of the stadium, the impact is somewhat volatile, although slightly positive in the first three years, followed by a mostly negative impact starting eight years after. Until ten years after the opening though, none of the effects are significant, meaning that it is likely any impact is just a result of chance. After adding more controls, the impact became greater in this model, along with a large increase in explanation to 91%.

Looking at the results of the impact on employment in relation only to the opening year, and controlling the time frame to five years before and five years after, the outcomes show a higher impact, but a trend similar to the prior regression. Thus, prior to the opening, there was a decreasing magnitude of lower rates in the years prior, with an increasingly positive impact in the years following. The results for the years prior to the opening have statistical significance, but the first two years immediately following do not. Furthermore, the impact is not very large, nor is the magnitude of difference prior to the opening. However, the coefficients do increase with the addition of the controls for time trends and fixed effects, as does the explanatory power rising to 93%.

The results of the impact on per capita personal income, considering all years of the new stadium to be equal, shows a consistent positive trend, leading up to the opening, and

continuing in the years following. All outcomes are statistically significant eliminating the likelihood they are due to chance. They also demonstrate a higher positive impact than the other regression models. Although the explanatory power for this regression was somewhat high without controlling for variables, it increases with the addition of controls, to 99%.

The last regression, of the impact on income taking into consideration only the opening year of the stadium and limiting the time frame to five years before and five after, shows very similar, significant results of decreasing magnitude of coefficients in the years leading up to the opening, followed by a continued positive trend in the years after. The results are all significant, with a high explanatory power of 99%. Even after adding control variables, the coefficients are very similar between the basic relationship excluding controls, and the regression including both controls.

Overall the event study model shows that although the effect on employment rates may be somewhat due to chance and more volatile than the impact on personal income, each regression proves a positive trend in both the years leading up to the opening of a redeveloped ballpark and in the years following. For the event study, measuring the impact with the dummy variable only representing the opening year of the stadium, appears to provide the best results, especially for employment as the dependent variable.

The results from both empirical models show positive impacts of the redeveloped ballparks on the surrounding community during the opening years, and the years following. Although the consistently positive trends may represent other omitted variables, there are periods of volatility, as well as statistical significance and explanatory power for the regression results, showing that the positive effects are likely related to the ballpark. Therefore, although the impact is not large, the redevelopment of the baseball stadiums has a slightly positive effect on Metropolitan Statistical Area employment rates and per capita personal income levels.

CONCLUSION

As explained by the results of the regressions in this study, the impact of redeveloped baseball stadiums between 1991 and 2004 have thus far had a slightly positive impact on the surrounding Metropolitan Statistical Areas, both during the opening years of the ballparks and the years following the opening. These results are different from the results of many prior studies related to the economic impact of sports stadiums.

Reasons for this difference in results likely include the fact that many prior studies have not focused on a specific sport, instead including different stadiums for multiple types of sports in their study, as well as the fact that many prior studies were completed in the 1990s, or very early 2000s. Therefore, this study differentiates the impact, because of the focus on baseball stadiums alone, eliminating any drastically different impacts of other sports stadiums, especially because of the high frequency of home baseball games compared to the irregular frequency of other sporting events. Additionally, the recent time frame of this study focuses on the impact of the boom period of ballpark redevelopment, incorporating more than half of Major League Baseball stadiums, compared to past studies that not captured the full boom period.

Furthermore, although the impact appears to be positive with consistently high statistical significance, the impact of these recently redeveloped ballparks is not overwhelmingly large. This means that the results more so prove that there is not a negative, or completely insignificant impact of redeveloped baseball stadiums on the surrounding community's employment rates and per capita personal income.

The hypothesis of the study, and the widespread assumption of stadium redevelopment, is that the presence of a modern stadium and enthusiasm surrounding a sports franchise will

revitalize economic activity, creating a distinctly positive impact on the economic conditions. However, there are various reasons for why this is not actually the case. In relation to this study, there is a likely chance that different ballparks have extremely different impacts within their community, ranging from negative, to insignificant, to positive. Although the MSA time trends and fixed effects somewhat account for variation, they do not fully recognize the possible acute differences among stadium effects. Additionally, in reference to per capita personal income, the majority of the new job opportunities related to the ballpark redevelopment are low wage positions, therefore, not contributing to a significant increase in income levels. Furthermore, it is possible that this study does not capture the actual impact of the redeveloped ballparks, such that their impact is concentrated solely to the urban district around the stadium. Alternatively, any significant impact may be seen only in specific measurements, not captured by employment and personal income.

In order to further understand the economic impact of ballparks, it would be valuable to measure the impact on additional economic conditions, breaking down the impact further to identify specified negative or positive impacts. These measures could include public transportation, because of the likely increase in public transportation modes, increased variation of the schedule, and government revenues resulting from the use of public transportation. All effects are likely because of the high levels of traffic around sporting events that increase the incentives for fans to use public transportation, increasing overall demand. Another variable could be based on new businesses within the concentrated areas of the redeveloped stadium. Because the redevelopment of ballparks has been based on urban district revitalization, it is likely that governments establish business incentives in the area of the redeveloped ballpark, to encourage restaurants, bars, and additional consumer stores. These businesses are likely to have high levels of traffic around the times of sporting events, increasing their opportunity for raising revenues, and ultimately providing tax revenues to the

city. Criminal activity would be an additional specific variable, because of the possibility that either criminal activity significantly decreases in the revitalized neighborhood, or increases because of the potential hostility among fans or crowded setting susceptible to theft and violence. Lastly, studying changes in property values or housing values would help evaluate the impact on real estate values, in the Metropolitan Statistical Area as a whole, or within the given area of the ballpark.

Due to limitations in data, these variables are not all easily measurable, and therefore are only useful in case by case studies of specific ballparks. Because these ballparks receive various amounts of funding from local governments, the level of impact is also likely to change relative to how much government money is directed towards the stadium. It is likely that privately owned stadiums would initiate higher increases in economic activity because funds are not directed to the ballpark itself and can instead be used to create incentives for the surrounding areas.

Regardless of these additional variables that can be used to measure economic impacts of baseball stadiums, this study shows that the boom of ballpark redevelopment may actually have positive effects, contrasting prior research on the subject. This means that the recent boom period, focusing on the use of these stadiums in revitalizing urban areas, may actually be effective, and useful in further developing future plans for modernizing and redeveloping baseball stadiums.

TABLES

Table 1.
Stadiums and Corresponding Metropolitan Statistical Areas Used in Study

Team	Stadium	Metropolitan Statistical Area	Opening
Atlanta Braves	Turner Field	Atlanta-Sandy Springs-Marietta, GA	1997
Baltimore Orioles	Camden Yards	Baltimore-Towson, MD	1992
Chicago White Sox	U.S. Cellular Field	Chicago-Joliet-Naperville, IL-IN-WI	1991
Cincinnati Reds	Great American Ballpark	Cincinnati-Middletown, OH-KY-IN	2003
Cleveland Indians	Progressive Field	Cleveland-Elyria-Mentor, OH	1994
Texas Rangers	Rangers Ballpark in Arlington	Dallas-Fort Worth-Arlington, TX	1994
Colorado Rockies	Coors Field	Denver-Aurora-Broomfield, CO	1995
Detroit Tigers	Comerica Park	Detroit-Warren-Livonia, MI	2000
Houston Astros	Minute Maid Park	Houston-Sugar Land-Baytown, TX	2000
Florida Marlins	Sun Life Stadium	Miami-Ft. Lauderdale-Pompano Beach, FL	1993
Milwaukee Brewers	Miller Park	Milwaukee-Waukesha-West Allis, WI	2001
Philadelphia Phillies	Citizens Bank Park	Phila.-Camden-Wilmington, PA-NJ-DE-MD	2004
Arizona Diamondbacks	Chase Field	Phoenix-Mesa-Glendale, AZ	1998
Pittsburgh Pirates	PNC Park	Pittsburgh, PA	2001
San Diego Padres	Petco Park	San Diego-Carlsbad-San Marcos, CA	2004
San Francisco Giants	AT&T Park	San Francisco-Oakland-Fremont, CA	2000
Seattle Mariners	Safeco Field	Seattle-Tacoma-Bellevue, WA	1999
Tampa Bay Rays	Tropicana Field	Tampa-St. Petersburg-Clearwater, FL	1998

Source: *ballparksofbaseball.com and United States Bureau of the Census*

Table 2.
Summary Statistics for Dependent Variables

Employment Rate	Average	Maximum	Minimum	Obs.
All Years Before	46.26%	57.83%	36.43%	164
5 Years Before	46.91%	54.71%	40.76%	14
Opening Year	48.56%	56.70%	39.82%	18
5 Years After	47.99%	56.13%	40.26%	18
All Years New Stadium	47.97%	56.70%	39.40%	216
Per Capita Personal Income				
All Years Before	23,197	32,553	14,806	216
5 Years Before	23,962	43,540	17,408	18
Opening Year	31,032	49,652	22,853	18
5 Years After	35,857	54,910	28,170	16
All Years New Stadium	36,165	62,634	22,853	198

Table 3.
Summary Statistics for Employment Rate based by MSA

Employment Rate				
	Average	Minimum	Maximum	Obs.
Atlanta-Sandy Springs-Marietta, GA	48.64%	45.82%	51.04%	16
Baltimore-Towson, MD	50.36%	47.87%	52.88%	20
Chicago-Joliet-Naperville, IL-IN-WI	49.57%	47.14%	52.88%	20
Cincinnati-Middletown, OH-KY-IN	50.07%	47.14%	52.88%	20
Cleveland-Elyria-Mentor, OH	50.07%	47.14%	52.88%	20
Dallas-Fort Worth-Arlington, TX	49.25%	44.42%	53.53%	20
Denver-Aurora-Broomfield, CO	52.20%	48.01%	56.13%	20
Detroit-Warren-Livonia, MI	45.56%	39.51%	49.53%	20
Houston-Sugar Land-Baytown, TX	45.69%	43.27%	47.81%	20
Miami-Ft. Lauderdale-Pompano Beach, FL	41.64%	38.92%	44.21%	20
Milwaukee-Waukesha-West Allis, WI	53.93%	48.74%	57.83%	24
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	46.24%	43.54%	48.26%	20
Phoenix-Mesa-Glendale, AZ	45.01%	39.40%	48.54%	24
Pittsburgh, PA	45.54%	41.68%	48.78%	20
San Diego-Carlsbad-San Marcos, CA	40.01%	36.43%	44.16%	24
San Francisco-Oakland-Fremont, CA	48.03%	44.21%	51.57%	20
Seattle-Tacoma-Bellevue, WA	50.98%	48.94%	54.10%	20
Tampa-St. Petersburg-Clearwater, FL	43.85%	39.57%	48.42%	24

Table 4.
Summary Statistics for Per Capita Personal Income by MSA

Per Capita Personal Income				
	Average	Minimum	Maximum	Obs.
Atlanta-Sandy Springs-Marietta, GA	27,838	16,808	39,066	23
Baltimore-Towson, MD	27,941	17,516	40,118	23
Chicago-Joliet-Naperville, IL-IN-WI	28,123	16,808	40,118	23
Cincinnati-Middletown, OH-KY-IN	28,123	16,808	40,118	23
Cleveland-Elyria-Mentor, OH	28,123	16,808	40,118	23
Dallas-Fort Worth-Arlington, TX	28,626	17,516	41,667	23
Denver-Aurora-Broomfield, CO	31,787	17,616	48,010	23
Detroit-Warren-Livonia, MI	28,518	17,373	39,028	23
Houston-Sugar Land-Baytown, TX	28,829	15,603	45,835	23
Miami-Ft. Lauderdale-Pompano Beach, FL	28,939	17,394	43,013	23
Milwaukee-Waukesha-West Allis, WI	28,840	16,389	42,824	23
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	30,283	17,003	45,927	23
Phoenix-Mesa-Glendale, AZ	25,180	15,717	36,673	23
Pittsburgh, PA	27,046	14,806	42,104	23
San Diego-Carlsbad-San Marcos, CA	29,514	17,256	46,649	23
San Francisco-Oakland-Fremont, CA	39,581	21,516	62,634	23
Seattle-Tacoma-Bellevue, WA	32,272	17,402	50,586	23
Tampa-St. Petersburg-Clearwater, FL	25,605	14,994	37,512	23

TABLE 5.
Employment Rate OLS Regression Results for All Years of New Ballparks

VARIABLES	(1) emplrate	(2) emplrate	(3) emplrate
stad	0.0171***	0.0117***	0.0148***
	(0.00423)	(0.00433)	(0.00354)
Constant	0.463***	0.461***	0.468***
	(0.00344)	(0.00455)	(0.00221)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	380	380	380
R-squared	0.044	0.582	0.842

Notes:
Sources: Bureau Labor Statistics Data Series and U.S. Bureau Census Population Data
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 6.
Employment Rate OLS Regression Results for Opening Years

VARIABLES	(1) emplrate	(2) emplrate	(3) emplrate
stad	0.00602	0.00140	0.00946**
	(0.00553)	(0.00382)	(0.00398)
Constant	0.478***	0.467***	0.483***
	(0.00419)	(0.00680)	(0.00645)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	190	190	190
R-squared	0.006	0.833	0.911

Notes:
Sources: Bureau Labor Statistics Data Series and U.S. Bureau Census Population Data
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 7.
Per Capita Personal Income OLS Regression Results for All Years of New Ballparks

VARIABLES	(1) loginc	(2) loginc	(3) loginc
stad	0.450***	0.0143**	0.0852***
	(0.0207)	(0.00698)	(0.0198)
Constant	10.03***	9.718***	9.758***
	(0.0151)	(0.00685)	(0.00591)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	414	414	414
R-squared	0.532	0.975	0.949

Notes:
Sources: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 8.
Per Capita Personal Income OLS Regression Results for Opening Years

VARIABLES	(1) loginc	(2) loginc	(3) loginc
stad	0.232***	0.00507	0.0548***
	(0.0296)	(0.00800)	(0.0173)
Constant	10.17***	9.744***	9.841***
	(0.0220)	(0.0108)	(0.0217)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	196	196	196
R-squared	0.240	0.981	0.974

Notes:
Sources: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 9.
Employment Rate Event Study Results for All Years of New Ballparks

VARIABLES	(1) emplrate	(2) emplrate	(3) emplrate
stad_1bfr	-0.00360	0.00136	-0.00459
	(0.0138)	(0.00745)	(0.00445)
stad_2bfr	-0.00587	0.00316	-0.00860*
	(0.0138)	(0.00764)	(0.00452)
stad_3bfr	-0.00800	0.00581	-0.0119**
	(0.0132)	(0.00795)	(0.00512)
stad_4bfr	-0.00767	0.00932	-0.0188***
	(0.0130)	(0.00901)	(0.00556)
stad_5bfr	-0.0166	0.00449	-0.0293***
	(0.0143)	(0.0102)	(0.00627)
stad_6bfr	-0.0259*	-0.000241	-0.0381***
	(0.0147)	(0.0110)	(0.00622)
stad_7bfr	-0.0275*	-3.53e-05	-0.0444***
	(0.0160)	(0.0121)	(0.00518)
stad_8bfr	-0.0335**	-0.00240	-0.0479***
	(0.0153)	(0.0124)	(0.00542)
stad_9bfr	-0.0330**	0.00173	-0.0494***
	(0.0159)	(0.0143)	(0.00633)
stad_10bfr	-0.0387**	0.000452	-0.0535***
	(0.0164)	(0.0161)	(0.00675)
stad_11bfr	-0.0499**	-0.00833	-0.0604***
	(0.0208)	(0.0192)	(0.00698)
stad_12bfr	-0.0492**	-0.00424	-0.0662***
	(0.0233)	(0.0221)	(0.00638)
stad_13bfr	-0.0355	0.00812	-0.0677***
	(0.0275)	(0.0245)	(0.00701)
stad_14bfr	-0.0370	0.0119	-0.0648***
	(0.0298)	(0.0275)	(0.0120)
stad_15bfr	-0.0501	0.00475	-0.0788***
	(0.0397)	(0.0388)	(0.0178)
stad_16bfr	-0.104***	-0.0448***	-0.0619***
	(0.00950)	(0.0149)	(0.0105)
stad_17bfr	-0.112***	-0.0527***	-0.0700***
	(0.00950)	(0.0157)	(0.0112)

stad_18bfr	-0.119***	-0.0602***	-0.0779***
	(0.00950)	(0.0166)	(0.0118)
stad_18aft	-0.0377***	-0.177***	-0.0675***
	(0.00950)	(0.0328)	(0.0123)
stad_17aft	-0.0114	-0.137***	-0.0358***
	(0.00958)	(0.0304)	(0.0115)
stad_16aft	-0.0284	-0.115***	-0.0334**
	(0.0277)	(0.0282)	(0.0162)
stad_15aft	-0.0206	-0.119***	-0.0339***
	(0.0151)	(0.0292)	(0.0126)
stad_14aft	-0.00782	-0.109***	-0.0250**
	(0.0126)	(0.0270)	(0.0107)
stad_13aft	-0.00280	-0.0970***	-0.0186**
	(0.0144)	(0.0230)	(0.00851)
stad_12aft	-0.0132	-0.1000***	-0.0225***
	(0.0167)	(0.0229)	(0.00859)
stad_11aft	-0.0272	-0.0938***	-0.0264***
	(0.0169)	(0.0182)	(0.00818)
stad_10aft	-0.0138	-0.0782***	-0.0153***
	(0.0139)	(0.0163)	(0.00587)
stad_9aft	-0.0175	-0.0671***	-0.00940
	(0.0143)	(0.0150)	(0.00670)
stad_8aft	-0.00457	-0.0532***	-0.00185
	(0.0123)	(0.0138)	(0.00574)
stad_7aft	0.00144	-0.0417***	0.00340
	(0.0131)	(0.0116)	(0.00497)
stad_6aft	0.000229	-0.0372***	0.00181
	(0.0139)	(0.0105)	(0.00543)
stad_5aft	-0.00578	-0.0306***	-0.000834
	(0.0140)	(0.00886)	(0.00520)
stad_4aft	-0.00398	-0.0238***	-2.29e-05
	(0.0132)	(0.00858)	(0.00484)
stad_3aft	-0.00219	-0.0171**	0.000772
	(0.0130)	(0.00822)	(0.00498)
stad_2aft	-1.11e-05	-0.00993	0.00197
	(0.0128)	(0.00768)	(0.00494)
stad_1aft	0.000133	-0.00483	0.00112
	(0.0131)	(0.00719)	(0.00463)
Constant	0.486***	0.428***	0.504***
	(0.00950)	(0.0174)	(0.00592)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	380	380	380
R-squared	0.163	0.707	0.908

Notes:
Sources: Bureau Labor Statistics Data Series and U.S. Bureau Census Population Data
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 10.
Employment Rate Event Study Results for Opening Years

VARIABLES	(1) emplrate	(2) emplrate	(3) emplrate
stad_1bfr	-0.00360	0.000259	-0.00729*
	(0.0135)	(0.00514)	(0.00433)
stad_2bfr	-0.00587	0.00106	-0.0138***
	(0.0135)	(0.00585)	(0.00438)
stad_3bfr	-0.00800	0.00265	-0.0197***
	(0.0129)	(0.00678)	(0.00499)
stad_4bfr	-0.00767	0.00413	-0.0285***
	(0.0127)	(0.00818)	(0.00606)
stad_5bfr	-0.0166	-0.00113	-0.0431***
	(0.0140)	(0.00935)	(0.00680)
stad_5aft	-0.00578	-0.0251**	0.0127*
	(0.0137)	(0.00973)	(0.00762)
stad_4aft	-0.00398	-0.0194**	0.0108*
	(0.0130)	(0.00834)	(0.00589)
stad_3aft	-0.00219	-0.0138**	0.00888*
	(0.0127)	(0.00689)	(0.00497)
stad_2aft	-1.11e-05	-0.00773	0.00737
	(0.0126)	(0.00562)	(0.00482)
stad_1aft	0.000133	-0.00373	0.00383
	(0.0128)	(0.00458)	(0.00438)
Constant	0.486***	0.439***	0.542***
	(0.00930)	(0.0207)	(0.0148)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	190	190	190
R-squared	0.014	0.847	0.933

Notes:
Sources: Bureau Labor Statistics Data Series and U.S. Bureau Census Population Data
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 11
Per Capita Personal Income Event Study Results for All Years of New Ballparks

VARIABLES	(1) loginc	(2) loginc	(3) loginc
stad_1bfr	-0.0535	-0.00704	-0.0523***
	(0.0724)	(0.0129)	(0.0113)
stad_2bfr	-0.0995	-0.00664	-0.0971***
	(0.0718)	(0.0129)	(0.0110)
stad_3bfr	-0.148**	-0.00922	-0.145***
	(0.0712)	(0.0136)	(0.0117)
stad_4bfr	-0.197***	-0.0112	-0.192***
	(0.0714)	(0.0152)	(0.0121)
stad_5bfr	-0.253***	-0.0214	-0.248***
	(0.0712)	(0.0160)	(0.0117)
stad_6bfr	-0.287***	-0.0269	-0.296***
	(0.0705)	(0.0167)	(0.0116)
stad_7bfr	-0.320***	-0.0320*	-0.347***
	(0.0694)	(0.0175)	(0.0115)
stad_8bfr	-0.343***	-0.0271	-0.386***
	(0.0684)	(0.0189)	(0.0129)
stad_9bfr	-0.350***	-0.0245	-0.428***
	(0.0664)	(0.0213)	(0.0148)
stad_10bfr	-0.380***	-0.0285	-0.477***
	(0.0678)	(0.0248)	(0.0140)

stad_11bfr	-0.426***	-0.0289	-0.522***
	(0.0694)	(0.0272)	(0.0137)
stad_12bfr	-0.459***	-0.0308	-0.568***
	(0.0705)	(0.0297)	(0.0135)
stad_13bfr	-0.465***	-0.0194	-0.626***
	(0.0675)	(0.0318)	(0.0151)
stad_14bfr	-0.499***	-0.0202	-0.671***
	(0.0715)	(0.0386)	(0.0168)
stad_15bfr	-0.537***	-0.0550	-0.722***
	(0.0802)	(0.0379)	(0.0217)
stad_16bfr	-0.515***	-0.0373	-0.767***
	(0.0745)	(0.0400)	(0.0269)
stad_17bfr	-0.574***	-0.0521	-0.828***
	(0.0720)	(0.0388)	(0.0283)
stad_18bfr	-0.570***	-0.0193	-0.866***
	(0.0533)	(0.0200)	(0.0378)
stad_18aft	0	0	0
	(0)	(0)	(0)
stad_17aft	0.404***	-0.202***	0.587***
	(0.0531)	(0.0410)	(0.0215)
stad_16aft	0.425***	-0.143***	0.585***
	(0.0583)	(0.0400)	(0.0189)
stad_15aft	0.376***	-0.130***	0.554***
	(0.0580)	(0.0370)	(0.0187)
stad_14aft	0.323***	-0.129***	0.507***
	(0.0565)	(0.0348)	(0.0217)
stad_13aft	0.320***	-0.121***	0.468***
	(0.0611)	(0.0327)	(0.0210)
stad_12aft	0.279***	-0.113***	0.431***
	(0.0635)	(0.0283)	(0.0158)
stad_11aft	0.233***	-0.118***	0.380***
	(0.0619)	(0.0269)	(0.0160)
stad_10aft	0.196***	-0.0945***	0.345***
	(0.0580)	(0.0246)	(0.0129)
stad_9aft	0.207***	-0.0741***	0.325***
	(0.0659)	(0.0246)	(0.0142)
stad_8aft	0.243***	-0.0720***	0.292***
	(0.0759)	(0.0252)	(0.0136)
stad_7aft	0.229***	-0.0530***	0.262***
	(0.0727)	(0.0195)	(0.0124)
stad_6aft	0.191***	-0.0445**	0.226***
	(0.0725)	(0.0189)	(0.0143)
stad_5aft	0.152**	-0.0443***	0.180***
	(0.0703)	(0.0162)	(0.0129)
stad_4aft	0.139**	-0.0471***	0.134***
	(0.0704)	(0.0146)	(0.0124)
stad_3aft	0.104	-0.0354**	0.100***
	(0.0708)	(0.0145)	(0.0130)
stad_2aft	0.0662	-0.0266**	0.0639***
	(0.0717)	(0.0126)	(0.0118)
stad_1aft	0.0346	-0.0118	0.0335***
	(0.0737)	(0.0131)	(0.0123)
Constant	10.32***	9.721***	10.31***
	(0.0531)	(0.0198)	(0.0126)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	414	414	414
R-squared	0.693	0.979	0.993

Notes: Sources: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 12.
Per Capita Personal Income Event Study Results for Opening Years

VARIABLES	(1) loginc	(2) loginc	(3) loginc
stad_1bfr	-0.0535	-0.00893	-0.0538***
	(0.0712)	(0.0119)	(0.0112)
stad_2bfr	-0.0995	-0.0104	-0.100***
	(0.0706)	(0.0121)	(0.0106)
stad_3bfr	-0.148**	-0.0149	-0.150***
	(0.0700)	(0.0128)	(0.0111)
stad_4bfr	-0.197***	-0.0188	-0.198***
	(0.0702)	(0.0148)	(0.0123)
stad_5bfr	-0.253***	-0.0308*	-0.255***
	(0.0700)	(0.0163)	(0.0128)
stad_5aft	0.152**	-0.0344*	0.189***
	(0.0692)	(0.0176)	(0.0138)
stad_4aft	0.139**	-0.0395***	0.140***
	(0.0692)	(0.0144)	(0.0120)
stad_3aft	0.104	-0.0297**	0.105***
	(0.0697)	(0.0139)	(0.0119)
stad_2aft	0.0662	-0.0228*	0.0669***
	(0.0705)	(0.0121)	(0.0114)
stad_1aft	0.0346	-0.00989	0.0350***
	(0.0724)	(0.0119)	(0.0119)
Constant	10.32***	9.743***	10.33***
	(0.0522)	(0.0219)	(0.0211)
MSA Trends	No	Yes	Yes
MSA Fixed Effects	No	No	Yes
Observations	196	196	196
R-squared	0.310	0.983	0.991

Notes:
Sources: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

FIGURES

Figure 1.
Number of Ballpark Openings During Each Year Between 1991 and 2004

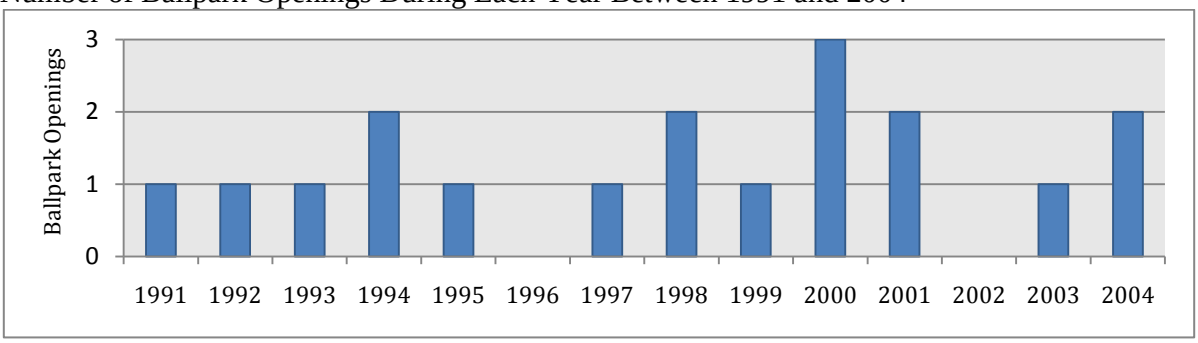


Figure 2
Employment Rate Event Study for All Years of New Ballparks

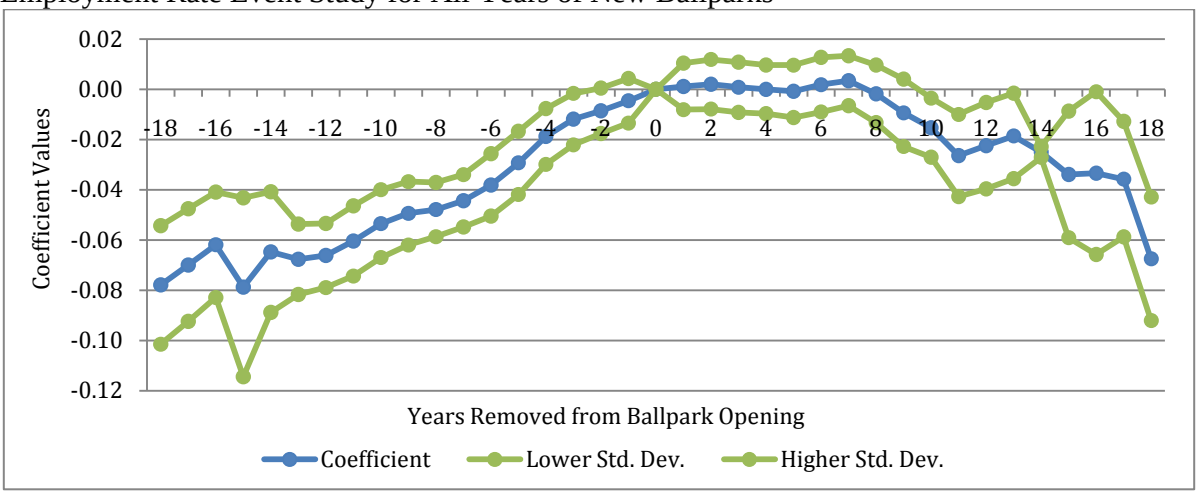


Figure 3.
Employment Rate Event Study for Opening Years

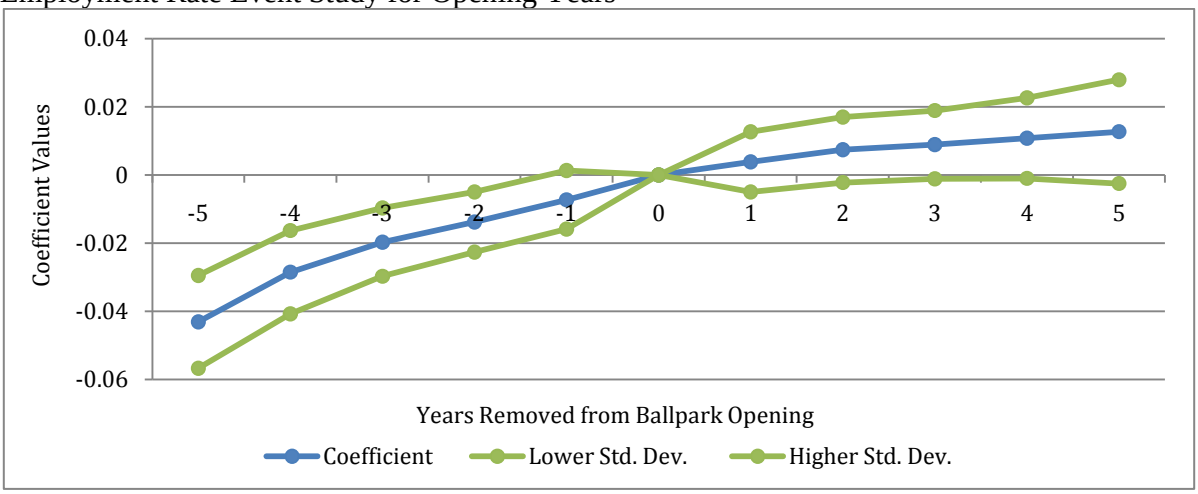


Figure 4.
Per Capita Personal Income Event Study for All Years of New Ballparks

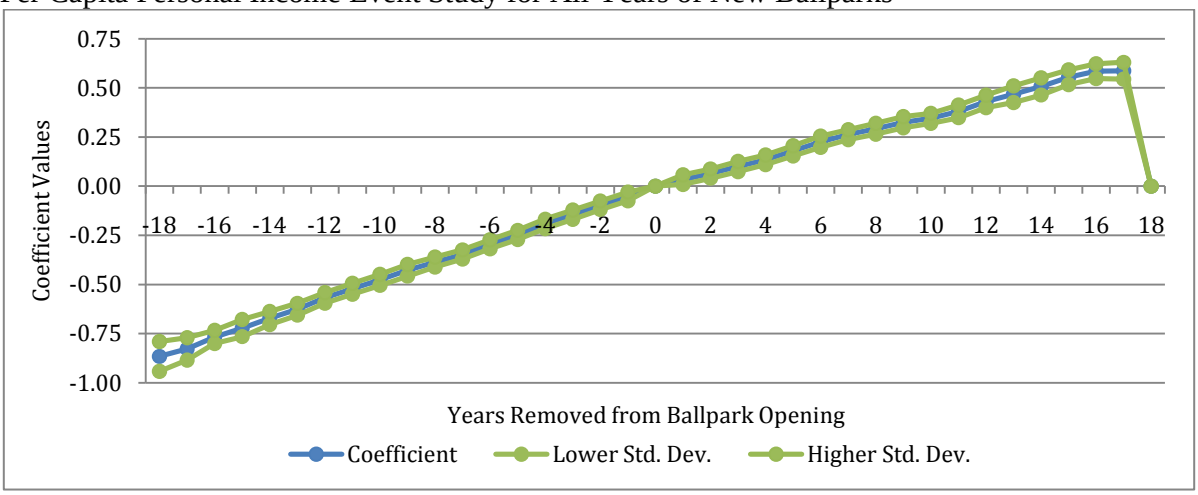
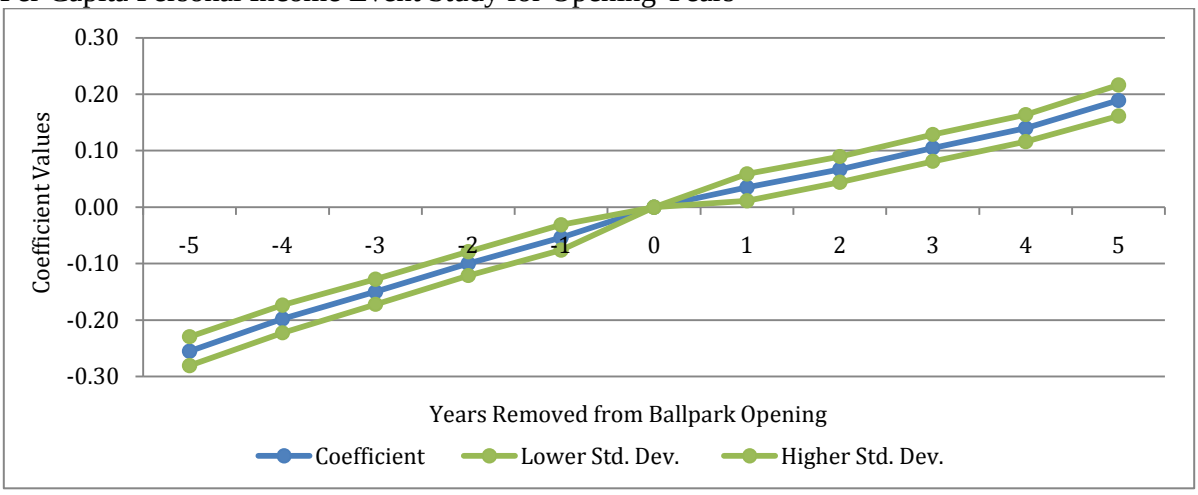


Figure 5.
Per Capita Personal Income Event Study for Opening Years



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