THE PENNSYLVANIA STATE UNIVERSITY
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DEPARTMENT OF ECONOMICS

# REVISITING THE SUPERSTAR EXTERNALITY: LEBRON'S 'DECISION' AND THE EFFECT OF HOME MARKET SIZE ON EXTERNAL VALUE

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# ABSTRACT

The movement of superstar players in the National Basketball Association from small-market teams to big-market teams has become a prominent issue. This was evident during the recent lockout, which resulted in new league policies designed to hinder this flow of talent. The most notable example of this superstar migration was LeBron James' move from the Cleveland Cavaliers to the Miami Heat. There has been much discussion about the impact on the two franchises directly involved in this transaction. However, the indirect impact on the other 28 teams in the league has not been discussed much. This paper attempts to examine this impact by analyzing the effect that home market size has on the superstar externality that Hausman & Leonard discovered in their 1997 paper. A road attendance model is constructed for the 2008-09 to 2011-12 seasons to compare LeBron's "superstar effect" in Cleveland versus his effect in Miami. An increase of almost 15 percent was discovered in the LeBron superstar variable, suggesting that the move to a bigger market positively affected LeBron's fan appeal. The results from the road attendance model were then extended to create an estimate for the monetary impact of LeBron's move on television ratings and revenue. Both the model and estimation results reveal that it appears LeBron's move resulted in a sizeable increase in revenue for the other 28 teams in the league. This suggests that the league policies enacted in the newest Collective Bargaining Agreement are inefficient policies that do not lead to a revenue-maximizing distribution of talent.

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# Chapter 1

## Introduction

Over the past two decades, the National Basketball Association (NBA) has experienced a surge in television/media revenue. Coinciding with the recent revenue explosion is an increasing importance of television revenue for both the NBA and the 30 individual teams. In June 2007, the NBA extended its television contracts with ESPN/ABC and TNT for about $930 million per year for the next 8 years. These new deals represent an increase of over 20 percent from the $767 million the league received annually from the previous television contracts (Cohen, 2007). The current television rights contracts expire after the 2015-16 NBA season and some have predicted an increase of at least 30 percent to about $1.2 billion per year (Ozanian, 2011). Each of the 30 teams in the league is heavily dependent on the revenue generated by its local television contracts as well as the shared revenue generated by the league's national television contracts. Media broadcasters are willing to pay such high fees to acquire the NBA television rights because they are able to charge high advertising rates and increase cable/satellite subscriptions. Advertisers are willing to pay high advertising rates to broadcasters because sports telecasts provide access to

the coveted young male demographic. The NBA, as well as other sports leagues, stand to benefit the most from this upstream flow of revenue.

There have been academic findings and recent evidence suggesting that the presence of a “superstar” can positively impact television viewership as well as attendance at NBA games. In their 1997 paper, Hausman and Leonard noted several examples involving Michael Jordan and the results of their study will be discussed in much greater detail later on in this paper.

More recently, there have been several examples of LeBron James creating the same type of superstar effect as Michael Jordan. LeBron James’ regular season debut with the Miami Heat drew a 4.6 Nielsen television rating (meaning an estimated 4.6% of television households watched the game on average) on TNT, the highest rating since a 1996 Chicago Bulls-Los Angeles Lakers game featured the first matchup between Michael Jordan and Magic Johnson after both players returned from retirement. About 7.4 million people watched LeBron James’ debut, making it the most watched NBA regular season game in cable history when accounting for population change.

The 2011 NBA Finals, featuring LeBron James, averaged a 10.2 Nielsen rating, a 20 percent increase over the 2006 NBA Finals which was a matchup of the same teams: the Dallas Mavericks and the Miami Heat. The 2012 NBA Finals featured LeBron James and Kevin Durant, and outperformed the 2011 NBA Finals during the

first five games of the series 10.1 to 9.6 (the 2011 NBA Finals lasted six games and viewer interest is generally increased the longer a series lasts). By contrast, the last NBA Finals that didn't feature a marquee superstar (e.g. LeBron James, Kobe Bryant) or a glamorous big-market franchise (e.g. Los Angeles Lakers, Boston Celtics) was the 2005 NBA Finals, which averaged an 8.2 Nielsen rating. Some of this decline could be attributed to the matchup of the Detroit Pistons and San Antonio Spurs and the particular style of basketball played by the two teams. However, the lack of a superstar player or marquee franchise made a significant negative impact on the viewership.

LeBron James' famous "decision" to move via free agency from the Cleveland Cavaliers to the Miami Heat appeared to significantly affect the values of the respective franchises. In the year following James' departure, the value of the Cavaliers fell 26% to $355 million while the value of the Heat rose 17% to $425 million (Ozanian, 2011). While much public attention has been focused on the effects of LeBron's move with regard to the two franchises involved, not much effort has been focused on the impact the move had on the 28 other teams in the league as well as the health of the league itself.

The two primary focuses of this paper are: 1) analyze the "superstar" effect that LeBron James has on road attendance using techniques employed by Hausman and Leonard, then use these results to estimate his effect on national television ratings;

and 2) estimate the effect of home market size on the external value of a superstar using the recent case of LeBron James. The first objective will be investigated by conducting an econometric analysis on what factors influence the attendance at NBA games to determine if the presence of a "superstar" can significantly affect the attendance of a road game. I will define a "superstar" as a player whose influence on fan interest exceeds his status as an All-Star player. In addition, I will use the results of the formal analysis of LeBron's effect on road attendance to roughly estimate his superstar effect on national television broadcast revenue. The second objective of this paper is to examine whether home market size (and thus, competitiveness) impacts the external value of a superstar. The ability to assess this relationship relies on the rare opportunity of a superstar changing teams at the peak of his skills and popularity. This scenario was presented to us in the case of LeBron James, widely considered the most talented and popular player in the NBA today. In his now-famous "Decision" during the summer after the 2009-10 NBA season, LeBron James announced that he would be moving from the Cleveland Cavaliers to the much more widely followed Miami Heat. To investigate this effect, this paper will calculate the external value created by LeBron James' presence for the 2008-09 and 2009-10 (LeBron's final two seasons in Cleveland) and 2010-11 and 2011-12 (LeBron's first in Miami) seasons. Then a simple comparison of the results will help determine whether home market

size has a positive effect on external value or if the value of a superstar is independent of home market size.

# Chapter 2

## Literature Review

The seminal publication concerning the superstar externality is the previously mentioned 1997 paper by Hausman and Leonard. Although the main superstar effect measured was that of Michael Jordan, Hausman and Leonard examined the effects of other superstars such as Magic Johnson, Larry Bird, Shaquille O'Neal, and Charles Barkley. Hausman and Leonard proposed that individual superstars were the drivers of fan interest in the NBA, a league which suffers from high levels of competitive imbalance. Their results suggest that teams, as well as the league, should market individual players rather than teams in order to maintain consumer demand. In their paper, Hausman and Leonard calculated that Michael Jordan's external value to the other 29 teams in the NBA was $53.2 million in a single year, about $2 million per team. Roughly $36 million, about 70% of Michael Jordan's external value, was generated from his incremental effect on television viewership. However, their method used to estimate Michael Jordan's effect on road attendance was not formally developed. This aspect was extended by Berri and Schmidt in their 2006 paper. In their work, Berri and Schmidt constructed a much more formal model for estimating a superstar's effect on road attendance. Their results confirm that a superstar externality

exists in road attendance in addition to television rating. They also showed that the revenue generated by a superstar for his own team is limited, thus stating that star power matters more to a team's opponent. A handful of other papers such as Scott, Long, & Somppi (1985), Brown, Spiro, & Keenan (1991), Burdekin and Idson (1991), and Berri, Schmidt, & Brook (2004) have examined the relationship between star players and demand with mixed results.

Finally, several papers have analyzed factors influencing consumers' demand for attending NBA games. Rottenberg (1956) used a basic framework to model attendance with factors such as metropolitan population and income, quality of the team, price of admission, stadium attributes, and available substitutes. Included in this was an uncertain outcome hypothesis, which stated than fans were most drawn to competitive games in which the home team won an uncertain outcome. Noll (1974) produced the seminal work on fan demand, finding that team quality, ticket price, population, number of star players, and per capita income were all significant factors. Whitney (1986) added to this by stating that a team's championship prospects are the primary driver for game attendance.

While both the Hausman & Leonard (1997) and Berri & Schmidt (2006) papers have shown the existence of a superstar externality in different revenue streams, neither has examined the effect home market size might have on the external value of a superstar player. It would be anticipated that home market size and a superstar's

external value would be positively related. Such synergistic effects would be anticipated because big market teams generate higher levels of fan interest and the addition of a superstar will only increase these levels. On the superstar's side, the additional publicity and media coverage generated from a move to a larger market will likely result in greater fan interest in the superstar player's performance. This is likely because players who generate a superstar externality do not change teams very often, especially not at the peak of their talent and star appeal. However, Shaquille O'Neal moved from the small-market Orlando Magic to the big-market Los Angeles Lakers in the year before Hausman & Leonard published their paper. This would have provided them with the opportunity to analyze the effect of home market size had they chosen to revisit the topic a year or two later with access to the relevant data. Another way that this paper extends previous works is that it seeks to determine factors which influence the superstar externality.

# Chapter 3

# Competitive Balance and the NBA

## The National Basketball Association (NBA)

After experiencing a period of success during the 1990's, the NBA's total revenue has surged in the new millennium despite a work stoppage that caused the cancellation of games during the 2011-12 NBA season. In November 2012, NBA Commissioner David Stern estimated that the league's revenue would reach a record $5 billion during the current NBA season, which would be a 20 percent increase from the 2010-11 season (Associated Press, 2012). Hausman & Leonard noted that increases in player salaries coincide with increases in overall league revenue and the recent evidence shows that this trend is continuing. The average salary in the NBA during the 2010-11 season was $5.15 million, easily the highest among the four major sports leagues (Aschburner, 2011). The salary distribution in the NBA is heavily skewed in favor of the select group of the league's highest paid players as evidenced by the fact that the median salary in the NBA in 2010-11 was about $2.33 million (Aschburner, 2011). Figures 3.1 and 3.2 shows the growth of the salary cap and average player salary over the past two decades. In fact, there are twenty players in the NBA with salaries of at least $15 million for the 2012-13 NBA season, led by Kobe Bryant's salary of about $27.8 million.

**Figure 3.1: NBA Salary Cap 1984-2012**

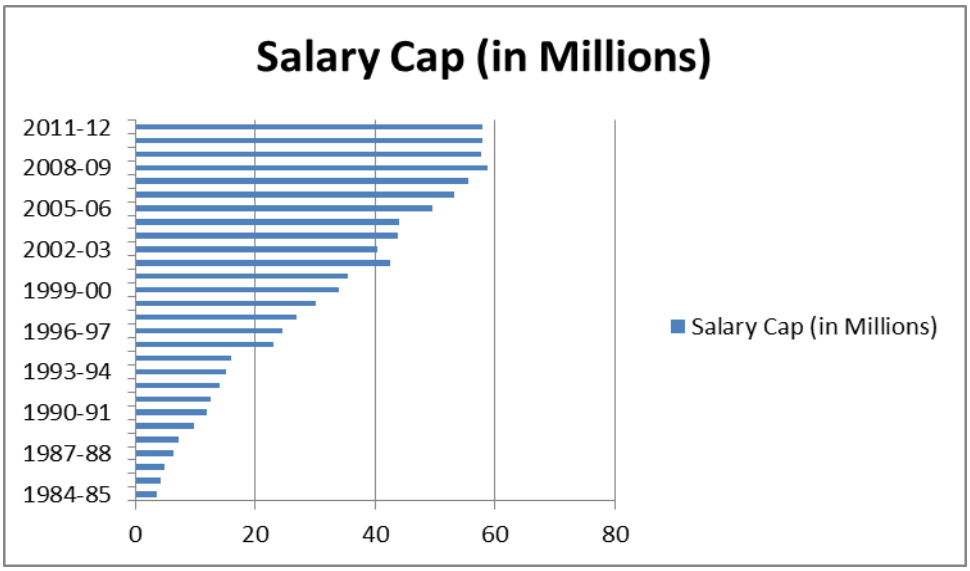
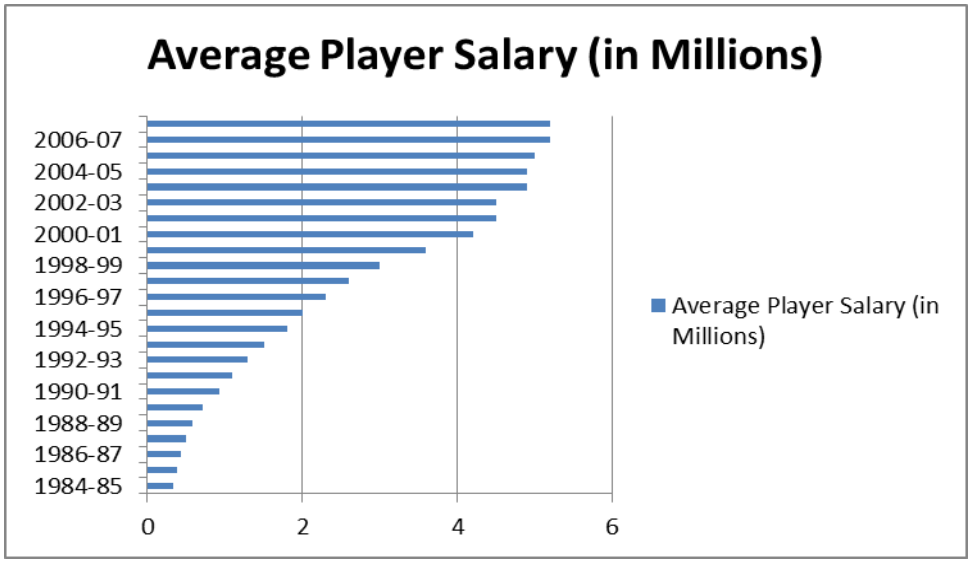



**Figure 3.2: Average Player Salary 1984-2007**




Source: www.Basketball-Reference.com

The issue of All-Star-caliber players moving from small markets to larger markets is not a new trend, but it gained prominence during the NBA lockout that resulted in a shortened 2011-12 season. The most scrutinized recent examples of superstar player

movement were LeBron James' move via free agency from the Cleveland Cavaliers to the Miami Heat and Carmelo Anthony's forced trade from the Denver Nuggets to the New York Knicks. When combined with league reports that 22 of the league's 30 teams had lost money during the final year of the Collective Bargaining Agreement (Helin, 2011), the issue of player movement to larger markets became motivation for small market owners to demand a lockout of the players. After a 161-day lockout resulting in a shortened 66-game season, the NBAPA and the owners reached an agreement on a new Collective Bargaining Agreement. Some of the relevant features of the new CBA include a decrease in the players' share of basketball-related income (BRI) from 57% to 49-51.2% (resulting in a lower salary cap level), a stiffer luxury tax penalty, and the adoption of a new clause, the "Derrick Rose Rule", that allows teams to sign players who demonstrate immediate All-Star caliber performance to contracts worth significantly more than any other team in the league can offer (Aschburner 2011). Each of these measures was taken in part to allow small market teams to re-sign and keep their homegrown talented players and their effectiveness will be assessed throughout the life of the new CBA.

**Market Size and Competitive Balance in Sports**

The discrepancies between teams located in large markets and those located in small markets have been analyzed and debated by both league officials and sports economists. In their 1995 paper, Fort & Quirk developed a model to analyze these discrepancies. The model features a two-team league with one large market team and one small market team. They derive that since the larger market team has a larger drawing audience (through attendance and local game broadcast viewers), it has a higher marginal revenue function than the small market team (i.e. $MR_i > MR_j$). Therefore, since each team faces the same marginal cost of talent $c^*$, in equilibrium we arrive at $MR_i=MR_j=c^*$. If we let $w_i$ and $w_j$ be the talent choices of each team, we find that in equilibrium $w_i > w_j$ so the larger market team acquires a better overall team. In essence, superstar players and their high level of talent are more valuable to big market teams because of those teams' higher marginal revenue functions for talent. From this, the analysis performed in this paper seeks to determine if it is better for the league as a whole for the flow of elite superstar talent to mirror Fort & Quirk's findings. Illustrations of Fort & Quirk's analysis are provided in Figure 3.3 below.

**Figure 3.3: Big Market & Small Market Marginal Revenues and Equilibrium**


*Figure* 1. Marginal Revenue Functions in a Two-Team League

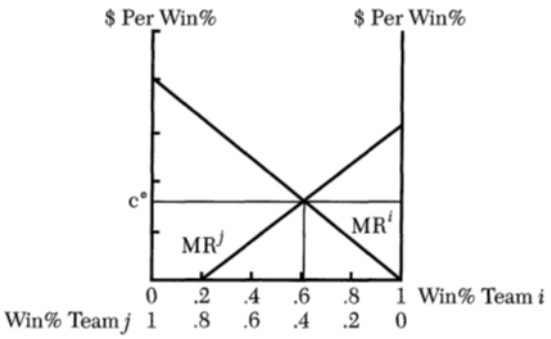



*Figure* 2. Two-Team League Free Agency Equilibrium without Revenue Sharing

Source: Fort & Quirk (1995)

To alleviate some of the effects of the disparities between large market and small market teams, the NBA has enacted several competitive balance measures. The two most prominent of these measures are the salary cap and the reverse-order draft. As previously mentioned, the share of BRI that the players receive via salaries is determined by the current CBA. The system employed by the NBA is known as a "soft-cap" system, which means that teams can exceed the salary cap level (currently set at $58.044 million for the 2012-13 season) without penalty up until the luxury tax threshold. Once a team's salary exceeds this threshold (currently set at $70.307 million for the 2012-13 season), they are subject to various degrees of luxury tax payments which are then shared among non-violating teams in the league. There exist several salary cap exceptions included in the CBA designed to give teams an advantage in re-signing their own players and preventing large market teams from acquiring all of the most talented players. This paper's purpose

is not to give an in-depth description of each of the many exceptions, but to provide an overview of their main purpose.

The second prominent competitive balance measure the league has enacted is the reverse order draft. Unlike other professional sports leagues' drafts, the NBA enters the 14 teams that did not make the playoffs the previous season into a lottery for the top 3 picks of the draft. The odds of winning the lottery are weighted depending on each team's place in the final standings, with the team with the worst overall record receiving the highest chance, 25 percent, of receiving the first pick in the draft. Therefore, the draft process assigns the best incoming players to the teams with the worst records. Entering players are not allowed to sign with a team via free agency, thus preventing the large market teams from acquiring all of the best young talent. The league asserts that the combination of the salary cap and the reverse order draft provides the small market teams with the ability to be competitive with the large market teams.

# Chapter 4

## Methodology

This section discusses the regression used to obtain the results of this paper, which are discussed in Section V. The single regression used in this analysis was a simple OLS regression of the factors described below. This regression attempts to determine the effects of various factors on attendance at NBA games.

**Regression 1:** Attendance = $\beta_0$ + $\beta_i$(home team i) + $\beta_j$(Month j) + $\beta_k$ (Day of the week k) + $\beta_4$ (no. of All-Stars of visiting team) + $\beta_5$ (LeBron James dummy variable) + ε

The first examined factor is the identity of the home team. Some NBA franchises have a higher level of local support and their stadiums approach or reach maximum capacity regardless of the opponent. This home attendance figure is determined by a variety of factors which are unrelated to this paper. Therefore, this figure should encompass factors such as the quality of the home team as well as fan loyalty, among others. A table showing the seating capacities for every NBA team's arena can be found in the Appendix. A similar indicator variable for the identity of the road team was not included because, for most teams, the effects were not found to be statistically significant.

Secondly, to account for the quality of the visiting team, the number of All-Star players on the visiting team's roster is included. The All-Star players are determined as the 24 to 28 players who were selected to participate in the NBA All-Star Game during the current season. In the NBA All-Star Game, 12 players from both the Eastern Conference and the Western Conference are chosen to participate. The starting 5 players for each conference are determined by a fan voting over the course of the preceding months, with the rest of the roster spots chosen by the coaches of each team. Any player selected for the All-Star Game who is unable to participate due to injury is replaced by a player selected by the commissioner, David Stern. This process is how the total number of All-Stars can fluctuate above 24 in a given year. The group of All Stars is a good measure of the highest performing and most popular players on a yearly basis. A list of All-Stars for each respective season is provided in the Appendix. In addition, the presence of All-Star players on a team's roster is correlated with team success, so the number of All-Star players is a viable measure of team quality and competitiveness. It is expected that the number of All-Star players on the visiting team's roster is positively related to game attendance.

Thirdly, this analysis will control for when a game is played. This includes the month and day of the week that the game is played. The month during which a game is played is significant for two reasons. The first is that the availability of fans can vary from month to month for a variety of reasons. The second is that during the middle

months of the NBA season, January to March, fans may lose some interest during the seemingly less meaningful games at the height of the grind during the season. The day of the week that a game is played is significant because, once again, fans are more willing and able to attend games during the weekend than during the standard working week. The starting time of the game was a variable included in Hausman & Leonard's analysis which was considered for this paper. However, after an analysis of the league's schedule, it was discovered that the starting time was closely correlated to the day of the week that the game was being played. Therefore, starting time was not included in the analysis for this paper.

Finally, a superstar indicator variable is included to account for whether or not LeBron James played in the game. Since LeBron James did not appear in every game during any season included in this analysis (he missed 6 games in 2009-10 and 3 games in 2010-11), this variable will not be credited for games in which it was previously announced that he would not appear in the game. To determine whether LeBron's absence from a game was expected or unexpected, I will review articles and announcements from ESPN and NBA.com published during the days leading up to the games he missed. This indicator variable is meant to help differentiate between LeBron's superstar effect and his status as an All-Star player. "Superstar player" has been the subject of numerous definitions from several previous papers. Scott et al. (1985) used the definition of a superstar as "player who has made the All-Pro team five times, or, if he

has only played a few years, dominates his position." (53). Brown et al. (1991) denoted superstar as "a player who has played in the NBA All-Star Game for at least 50% of his years in the league" (38). Burdekin and Idson (1991) defined a superstar as a player who was selected to the first or second All-NBA teams, which are postseason awards which differ from the midseason All-Star Game. Each of these definitions was crafted specifically for its respective paper and are too broad for the purpose of this paper. In this paper, a superstar player will be defined as a player whose external appeal to fans (through either road attendance or TV ratings) significantly exceeds their status as an All-Star player. For example, Hausman & Leonard (1997) found these types of effects for Magic Johnson, Larry Bird, and, especially, Michael Jordan while other high profile players such as Charles Barkley and Shaquille O'Neal were found to have less drastic effects on fan interest. Thus, by the definition of superstar in this paper, fewer than five players in the NBA in a given year are determined to be superstars. Empirically, a positive value for the superstar variable suggests that a player's fan appeal is greater than his All-Star talent level would imply.

This regression was then performed on four datasets consisting of every NBA game played during the 2008-09, 2009-10, 2010-11, and 2011-12 seasons. These seasons were chosen because they constitute LeBron James' final two seasons with the Cleveland Cavaliers and his first two seasons with the Miami Heat. A two-year window on either side of LeBron's decision was chosen to extend beyond any effects of a short-term

increase in fan interest during LeBron's first season with the Miami Heat. There were a total of 1,230 observations for the first three seasons examined and 990 observations for the lockout-shortened 2011-12 season.

In order to estimate the superstar effect of LeBron James, I will calculate LeBron's incremental effect on road attendance during the 2008-09, 2009-10, 2010-11, and 2011-12 NBA seasons. For each of the respective seasons, attendance figures as well as a number of other game characteristics were compiled from the website basketball-reference.com. All characteristics noted have been determined to possibly influence the attendance of a NBA regular season game. Since almost all NBA playoff games are sold out regardless of the teams or players participating, this analysis will only focus on regular season games.

# Chapter 5

# Data and Discussion

### The Superstar Effect on Road Attendance

The regression results for each season are summarized in the following tables.

**Table 5.1: 2008-09 Season Regression Results**

| Attendance | Coef. | Std. Error | t | P >\|t\| |
|---|---|---|---|---|
| **ATL** | … | … | … | … |
| **BOS** | 2109.68 | 321.189 | 6.57 | **.000** |
| **CHA** | -2055.753 | 320.766 | -6.41 | **.000** |
| **CHI** | 4326.696 | 322.866 | 13.40 | **.000** |
| **CLE** | 3212.543 | 392.659 | 8.18 | **.000** |
| **DAL** | 3494.312 | 321.794 | 10.86 | **.000** |
| **DEN** | 674.450 | 320.866 | 2.10 | **.036** |
| **DET** | 5333.936 | 320.649 | 16.63 | **.000** |
| **GOL** | 2431.348 | 321.097 | 7.57 | **.000** |
| **HOU** | 892.005 | 320.908 | 2.78 | **.006** |
| **IND** | -2480.296 | 320.648 | -7.74 | **.000** |
| **LAC** | -337.473 | 321.646 | -1.05 | .294 |
| **LAL** | 2528.602 | 323.689 | 7.81 | **.000** |
| **MEM** | -4017.295 | 320.947 | -12.52 | **.000** |
| **MIA** | 1719.833 | 321.103 | 5.36 | **.000** |
| **MIL** | -1460.73 | 321.309 | -4.55 | **.000** |
| **MIN** | -2180.889 | 320.264 | -6.81 | **.000** |
| **NJN** | 468.584 | 320.705 | 1.46 | .144 |
| **NEW** | -1423.633 | 320.099 | -4.45 | **.000** |
| **NYK** | 2662.315 | 320.699 | 8.30 | **.000** |
| **OKC** | 2263.282 | 321.149 | 7.05 | **.000** |
| **ORL** | 486.612 | 321.187 | 1.52 | .130 |
| **PHI** | -919.653 | 320.688 | -2.87 | **.004** |
| **PHO** | 1836.861 | 320.988 | 5.72 | **.000** |
| **POR** | 3945.485 | 320.417 | 12.31 | **.000** |
| **SAC** | -3909.634 | 321.031 | -12.18 | **.000** |
| **SAS** | 1697.261 | 320.808 | 5.29 | **.000** |
| **TOR** | 2180.532 | 322.654 | 6.76 | **.000** |
| **UTA** | 3388.622 | 321.556 | 10.54 | **.000** |
| **WAS** | -173.919 | 320.472 | -0.54 | .587 |
| **Monday** | -607.700 | 177.603 | -3.42 | **.001** |
| **Tuesday** | -284.505 | 166.005 | -1.71 | .087 |
| **Wednesday** | -368.974 | 152.763 | -2.42 | **.016** |
| **Thursday** | -259.967 | 230.901 | -1.13 | .260 |
| **Friday** | 519.757 | 152.034 | 3.42 | **.001** |
| **Saturday** | 898.707 | 168.908 | 5.32 | **.000** |
| **Sunday** | … | … | … | … |
| **October** | -270.317 | 321.643 | -0.84 | .401 |
| **November** | -1228.016 | 165.423 | -7.42 | **.000** |
| **December** | -943.604 | 166.677 | -5.66 | **.000** |
| **January** | -880.806 | 164.769 | -5.35 | **.000** |
| **February** | -780.370 | 172.226 | -4.53 | **.000** |
| **March** | -419.360 | 165.113 | -2.54 | **.011** |
| **April** | … | … | … | … |
| **# of All-Stars** | 529.605 | 46.591 | 11.37 | **.000** |
| **LeBron** | 749.848 | 236.984 | 3.16 | **.002** |
| **Constant** | 16830.21 | 287.936 | 58.45 | **.000** |

**Bold** = significant at 95% confidence level, R-squared = .756

**Table 5.2: 2009-10 Season Regression Results**

| Attendance | Coef. | Std. Error | T | P>\|t\| |
|---|---|---|---|---|
| **ATL** | … | … | … | … |
| **BOS** | 2202.362 | 333.787 | 6.60 | **.000** |
| **CHA** | -663.358 | 335.819 | -1.98 | **.048** |
| **CHI** | 4165.932 | 338.351 | 12.31 | **.000** |
| **CLE** | 1940.055 | 407.0822 | 4.77 | **.000** |
| **DAL** | 3621.76 | 335.325 | 10.80 | **.000** |
| **DEN** | 1628.422 | 336.060 | 4.85 | **.000** |
| **DET** | 2312.289 | 334.137 | 6.92 | **.000** |
| **GOL** | 1534.809 | 334.526 | 4.59 | **.000** |
| **HOU** | 55.881 | 334.725 | 0.17 | .867 |
| **IND** | -2264.77 | 334.087 | -6.78 | **.000** |
| **LAC** | -37.300 | 335.631 | -0.11 | .912 |
| **LAL** | 2744.069 | 337.423 | 8.13 | **.000** |
| **MEM** | -3063.424 | 335.841 | -9.12 | **.000** |
| **MIA** | 1393.961 | 336.057 | 4.15 | **.000** |
| **MIL** | -1528.479 | 335.605 | -4.55 | **.000** |
| **MIN** | -1420.358 | 333.385 | -4.26 | **.000** |
| **NJN** | -1351.872 | 333.687 | -4.05 | **.000** |
| **NEW** | -3356.902 | 333.888 | -10.05 | **.000** |
| **NYK** | 3214.721 | 335.290 | 9.59 | **.000** |
| **OKC** | 1653.349 | 334.357 | 4.94 | **.000** |
| **ORL** | 1082.87 | 333.765 | 3.24 | **.001** |
| **PHI** | -2286.568 | 334.945 | -6.83 | **.000** |
| **PHO** | 1259.428 | 333.892 | 3.77 | **.000** |
| **POR** | 4205.856 | 334.950 | 12.56 | **.000** |
| **SAC** | -3111.227 | 335.379 | -9.28 | **.000** |
| **SAS** | 1696.246 | 333.865 | 5.08 | **.000** |
| **TOR** | 1568.527 | 335.649 | 4.67 | **.000** |
| **UTA** | 2973.363 | 337.406 | 8.81 | **.000** |
| **WAS** | -279.574 | 335.139 | -0.83 | .404 |
| **Monday** | -154.378 | 186.571 | -0.83 | .408 |
| **Tuesday** | -462.293 | 176.739 | -2.62 | **.009** |
| **Wednesday** | -241.650 | 159.156 | -1.52 | .129 |
| **Thursday** | -85.485 | 242.080 | -0.35 | .724 |
| **Friday** | 754.272 | 162.538 | 4.64 | **.000** |
| **Saturday** | 1024.971 | 175.4034 | 5.84 | **.000** |
| **Sunday** | … | … | … | … |
| **October** | 61.725 | 285.589 | 0.22 | .829 |
| **November** | -1302.975 | 176.856 | -7.37 | **.000** |
| **December** | -985.499 | 176.157 | -5.59 | **.000** |
| **January** | -1028.26 | 175.097 | -5.87 | **.000** |
| **February** | -808.804 | 182.709 | -4.43 | **.000** |
| **March** | -599.814 | 174.372 | -3.44 | **.001** |
| **April** | … | … | … | … |
| **# of All-Stars** | 558.972 | 56.237 | 9.94 | **.000** |
| **LeBron** | 1318.83 | 241.331 | 5.46 | **.000** |
| **Constant** | 16479.7 | 305.801 | 53.89 | **.000** |

**Bold** = significant at 95% confidence level, R-squared = .720

**Table 5.3: 2010-11 Season Regression Results**

| Attendance | Coef. | Std. Error | t | P<\|t\| |
|---|---|---|---|---|
| **ATL** | … | … | … | … |
| **BOS** | 3221.613 | 335.994 | 9.59 | **.000** |
| **CHA** | 186.645 | 334.692 | 0.56 | .577 |
| **CHI** | 6237.434 | 336.703 | 18.53 | **.000** |
| **CLE** | 4523.48 | 334.786 | 13.51 | **.000** |
| **DAL** | 4639.57 | 335.3744 | 13.83 | **.000** |
| **DEN** | 1537.463 | 335.374 | 4.59 | **.000** |
| **DET** | 1007.979 | 334.887 | 3.01 | **.003** |
| **GOL** | 3163.37 | 335.546 | 9.43 | **.000** |
| **HOU** | 573.616 | 334.641 | 1.71 | .087 |
| **IND** | -1984.123 | 335.224 | -5.92 | **.000** |
| **LAC** | 2171.282 | 336.077 | 6.46 | **.000** |
| **LAL** | 3588.146 | 337.722 | 10.62 | **.000** |
| **MEM** | -997.245 | 334.708 | -2.98 | **.003** |
| **MIA** | 3406.701 | 419.229 | 8.13 | **.000** |
| **MIL** | -371.080 | 335.327 | -1.11 | .269 |
| **MIN** | -350.453 | 335.120 | -1.05 | .296 |
| **NJN** | -880.387 | 335.148 | -2.63 | **.009** |
| **NEW** | -1408.456 | 335.081 | -4.20 | **.000** |
| **NYK** | 4234.356 | 334.702 | 12.65 | **.000** |
| **OKC** | 2696.486 | 335.193 | 8.04 | **.000** |
| **ORL** | 3584.912 | 335.789 | 10.68 | **.000** |
| **PHI** | -839.802 | 335.095 | -2.51 | **.012** |
| **PHO** | 2054.326 | 336.200 | 6.11 | **.000** |
| **POR** | 4957.615 | 336.502 | 14.73 | **.000** |
| **SAC** | -1538.893 | 334.705 | -4.60 | **.000** |
| **SAS** | 2698.503 | 334.809 | 8.06 | **.000** |
| **TOR** | 991.984 | 336.23 | 2.95 | **.003** |
| **UTA** | 4072.816 | 336.23 | 12.11 | **.000** |
| **WAS** | 1112.616 | 334.848 | 3.32 | **.001** |
| **Monday** | -327.589 | 177.304 | -1.85 | .065 |
| **Tuesday** | -527.410 | 178.149 | -2.96 | **.003** |
| **Wednesday** | -285.898 | 154.872 | -1.85 | .065 |
| **Thursday** | -485.620 | 235.721 | -2.06 | **.040** |
| **Friday** | 379.151 | 158.867 | 2.39 | **.017** |
| **Saturday** | 818.370 | 175.181 | 4.67 | **.000** |
| **Sunday** | … | … | … | … |
| **October** | -319.172 | 273.801 | -1.17 | .244 |
| **November** | -1288.645 | 177.805 | -7.25 | **.000** |
| **December** | -1011.319 | 176.565 | -5.73 | **.000** |
| **January** | -1013.637 | 176.389 | -5.75 | **.000** |
| **February** | -699.286 | 183.639 | -3.81 | **.000** |
| **March** | -320.523 | 175.999 | -1.82 | .069 |
| **April** | … | … | … | … |
| **# of All-Stars** | 556.862 | 47.456 | 11.73 | **.000** |
| **LeBron** | 938.736 | 263.994 | 3.56 | **.000** |
| **Constant** | 15824.56 | 300.543 | 52.65 | **.000** |

**Bold** = significant at 95% confidence level, R-squared = .718

**Table 5.4: 2011-12 Season Regression Results**

| Attendance | Coef. | Std. Error | t | P<\|t\| |
|---|---|---|---|---|
| **ATL** | … | …. | … | … |
| **BOS** | 3687.055 | 383.105 | 9.62 | **.000** |
| **CHA** | -378.109 | 382.664 | -0.99 | .323 |
| **CHI** | 5338.441 | 383.775 | 13.91 | **.000** |
| **CLE** | 965.373 | 384.179 | 2.51 | **.012** |
| **DAL** | 4292.098 | 382.958 | 11.21 | **.000** |
| **DEN** | 2172.366 | 382.763 | 5.68 | **.000** |
| **DET** | -743.482 | 382.973 | -1.94 | .053 |
| **GOL** | 3691.009 | 382.956 | 9.64 | **.000** |
| **HOU** | 405.743 | 382.406 | 1.06 | .289 |
| **IND** | -958.929 | 384.827 | -2.49 | **.013** |
| **LAC** | 4210.059 | 382.690 | 11.00 | **.000** |
| **LAL** | 3869.384 | 384.931 | 10.05 | **.000** |
| **MEM** | 811.489 | 384.194 | 2.11 | **.035** |
| **MIA** | 4601.973 | 488.830 | 9.41 | **.000** |
| **MIL** | -469.667 | 383.816 | -1.22 | .221 |
| **MIN** | 2443.171 | 382.466 | 6.39 | **.000** |
| **NJN** | 112.529 | 382.586 | 0.29 | .769 |
| **NEW** | -1039.769 | 383.668 | -2.71 | **.007** |
| **NYK** | 4836.944 | 382.833 | 12.63 | **.000** |
| **OKC** | 3097.032 | 382.655 | 8.09 | **.000** |
| **ORL** | 3806.526 | 382.243 | 9.96 | **.000** |
| **PHI** | 2434.734 | 383.958 | 6.34 | **.000** |
| **PHO** | 689.192 | 382.357 | 1.80 | .072 |
| **POR** | 4688.937 | 383.470 | 12.23 | **.000** |
| **SAC** | -620.494 | 383.369 | -1.62 | .106 |
| **SAS** | 3274.037 | 382.319 | 8.56 | **.000** |
| **TOR** | 1841.216 | 383.273 | 4.80 | **.000** |
| **UTA** | 4313.571 | 383.209 | 11.26 | **.000** |
| **WAS** | 1718.151 | 382.767 | 4.49 | **.000** |
| **Monday** | -540.751 | 196.626 | -2.75 | **.006** |
| **Tuesday** | -635.433 | 205.164 | -3.10 | **.002** |
| **Wednesday** | -410.695 | 182.860 | -2.25 | **.025** |
| **Thursday** | -592.739 | 225.160 | -2.63 | **.009** |
| **Friday** | 421.177 | 188.206 | 2.24 | **.025** |
| **Saturday** | 735.631 | 202.320 | 3.64 | **.000** |
| **Sunday** | … | … | … | … |
| **December** | 826.937 | 234.974 | 3.52 | **.000** |
| **January** | -899.734 | 145.316 | -6.19 | **.000** |
| **February** | -182.684 | 152.389 | -1.20 | .231 |
| **March** | -78.080 | 145.661 | -0.54 | .592 |
| **April** | … | … | … | … |
| **# of All-Stars** | 728.485 | 69.713 | 10.45 | **.000** |
| **LeBron** | 711.993 | 318.814 | 2.23 | **.026** |
| **Constant** | 14764.27 | 319.325 | 46.24 | **.000** |

**Bold** = significant at 95% confidence level, R-squared = .714

Upon reviewing the first two seasons of analysis, LeBron's final seasons in Cleveland, we notice a few points of interest. For the 2008-09 season, the coefficients for the All-Star player and LeBron variables were 529.608 and 749.848, respectively. This can be interpreted as the presence of each All-Star player on the visiting team's roster results in about 530 additional fans attending the game and the presence of LeBron James results in about 1,280 (All-star effect + LeBron James effect) additional fans attending the game. LeBron's teammate, Mo Williams, was also selected to participate in the All Star Game that season. However, when the results from the 2009-10 season are analyzed, we realized that LeBron's total effect is much greater. For the 2009-10 season, the coefficients for the All-Star player and LeBron variables are 558.971 and 1318.83 respectively. Therefore, LeBron's presence in a game results in about 1,878 additional fans attending the game. It should be noted that none of LeBron's teammates were selected to the All-Star game that season, which redirects us back to the data from the previous season. Due to Mo Williams' status as a borderline All-Star player, it is safe to assume that we can attribute his All-Star effect to LeBron James. This is because Mo Williams was on the Cleveland roster each year but the difference between LeBron's incremental effect during those years was almost exactly equal to the All-Star effect attributed to Mo Williams during the 2008-09 season. Thus, after assigning Mo Williams' All-Star effect to LeBron James, the incremental effect of LeBron's presence becomes

about 1,810 fans. In his final two seasons with Cleveland, LeBron James' incremental effect has been estimated at 1,810 and 1,878 fans respectively. This means that in a sellout for a Cleveland Cavalier road game in the average NBA arena, LeBron James' presence is responsible for 9.5% and 9.8% of the fans in attendance during the 2008-09 and 2009-10 seasons respectively. These figures were calculated by dividing LeBron's incremental effect by the average NBA arena capacity.

We can use similar analysis to estimate LeBron's incremental effect on attendance after his move to Miami. For the 2010-11 season, the coefficients for the All-Star player and LeBron variables were 556.862 and 938.736 respectively. For the 2011-12 season, the coefficients for the All-Star player and LeBron variables were 728.485 and 711.993 respectively. Thus, the initial calculations of LeBron's incremental effect on attendance for his first two Miami seasons are 1,496 and 1,440 fans respectively. It should be noted that in each of these seasons, two of LeBron's teammates, Chris Bosh and Dwyane Wade, joined him in the All-Star game. Therefore, we can use the same assumptions from the previous paragraphs to gain a more realistic estimate of LeBron's incremental effect. Although Chris Bosh had been selected by the coaches as a member of the All-Star team for each of the four seasons analyzed in this paper, he was never voted by the fans as a starter in any year. On the other hand, both LeBron James and Dwyane Wade were voted by the fans as starters in every year of this analysis. Thus, it is safe to assume that fans are attending Miami Heat games to see James and Wade.

Therefore, we can assign Bosh's All-Star effect to LeBron James similar to the Mo Williams situation during the Cleveland years. As a result, the LeBron's estimated incremental effects on attendance during his first two seasons in Miami are calculated to be 2,053 and 2,168 respectively. Thus, in a sellout of a Miami Heat road game in the average NBA arena, LeBron's presence is responsible for 10.7% and 11.3% of the fans in attendance during the 2010-11 and 2011-12 seasons respectively. An argument could be made that even part of Dwyane Wade's All-Star effect should be attributed to LeBron James. This argument stems from the fact that while Wade missed over one quarter of the games during the 2011-12 season, the Miami Heat continued to play road games in arenas at or near maximum capacity. For the purpose of this paper, I will not assign any of Dwyane Wade's effect to LeBron James and just note that it's possible for the calculations of LeBron's effect to be underestimates of his total incremental effect.

It is clear to see that LeBron's incremental effect in Miami is greater than it was in Cleveland. The difference between LeBron's average effect in his final seasons in Cleveland and his first two seasons in Miami is about 267 fans, a 14.5% increase. This evidence suggests LeBron's move from the smaller-market Cleveland to the more glamorous, bigger-market Miami increased his incremental effect on fan interest.

When LeBron's incremental effect is translated into monetary worth, his significance to the NBA becomes very apparent. Consider the incremental revenue LeBron generates for other teams during Miami Heat road games. An estimate can be

produced by multiplying LeBron's incremental effect on attendance times the average price of an NBA ticket. In the 2008-09, 2009-10, and 2010-11 seasons, LeBron played in 41, 38, and 38 road games, respectively, and in the shortened 2011-12 season, he played in 30 roads games. Table 5.5 illustrates the estimated incremental revenue produced for the other 29 teams by LeBron's presence on the court.

**Table 5.5: Estimated Revenue from Attendance Generated by LeBron**

| Season | No. of LeBron Road Games | LeBron's Effect on Attendance | Average NBA Ticket Price | Revenue Created by LeBron |
|---|---|---|---|---|
| **2008-09** | 41 | 1,810 | $48.48 | $3,597,700.80 |
| **2009-10** | 38 | 1,878 | $47.66 | $3,401,208.24 |
| **2010-11** | 38 | 2,053 | $48.78 | $3,805,522.92 |
| **2011-12** | 30 | 2,168 | $50.19 | $3,264,357.60[#] |

# For sake of comparison, this value prorated to a normal-length season becomes $4,461,288.72

For each of his final two seasons in Cleveland, LeBron generated a little less than $90,000 in additional revenue for every road game he played in. After moving to Miami, the revenue generated by LeBron's presence increased to over $100,000 per game. NBA scheduling rules mandate that most teams in the same conference play four-game series (two home games each) against each other every season. On a rotating basis, teams in the same conference play three-game series where one of the teams gets two home games that season. Teams in different conferences play two-game series (one home game each) against each other. Therefore, many teams in the Eastern Conference receive about $200,000 per year specifically from LeBron's effect on road attendance. It should also be noted that these values represent a lower bound for the revenue generated by LeBron

James because this doesn't include any additional money spent on concessions, parking, and other merchandise. While it's hard to quantify, the additional fans brought in by LeBron are making these purchases, thus increasing the total revenue generated by LeBron for the other 29 teams in the league.

## Estimation of Superstar and Home Market Size Effects on Television Ratings

### Background Information on NBA Television Broadcasts

There are five types of telecasts which broadcast NBA games to viewers. Two types of telecasts are considered "local" while the other three are considered "national." First, a game could be televised locally in the surrounding area of one of the participating teams by a local over-the-air (OTA) station. This type of telecast is not included in my analysis because only about half of the teams in the NBA still employ local OTA broadcasts. The second type of local telecast is where a game is broadcast locally in the surrounding area of one of the participating teams by a local cable outlet, now referred to as a regional sports network (RSN). This type will be referred to as a "local cable telecast." The third type of telecast, and first national type, is where a game is broadcasted nationally on the NBA's national OTA network, the American Broadcasting Company (ABC). The fourth type of telecast is where a game is broadcasted nationally on the NBA's national cable network, Turner Network Television (TNT). Finally, there is

a national NBA-sponsored cable network, NBA TV, which broadcasts selected feeds from local cable telecasts nationally. This type of telecast is also not included in the analysis of this paper.

The NBA negotiates the national television rights (OTA and cable) contracts on behalf of all 30 teams and the national television revenue is shared evenly among the league's teams (with the exception of a small fee paid directly to the league office). Local television contracts are negotiated individually by each of the teams. Currently, every team in the NBA has a local cable contract with a RSN, but only about half of the teams have a local OTA contract. The value of the local television contracts varies significantly among the teams and market size is the major cause of the disparity. For example, the Los Angeles Lakers recently agreed to a deal with Time Warner Cable SportsNet that is worth $3 billion for 20 years, that is, $150 million per year. On the other hand, the Memphis Grizzlies only receive an estimated $5-10 million per year from a contract with Fox Sports Tennessee (Veazey 2011).

**Methodology and Results of Estimation**

As mentioned previously in this paper and demonstrated by Hausman & Leonard (1997), the superstar effect translates to Nielsen television ratings. This is where LeBron James becomes extremely valuable to the other 29 teams in the NBA and where the

effects of the differences in LeBron's home market size become significant. As previously mentioned, the current national television broadcast rights agreement expires after the 2015-16 season, meaning that negotiations for the next deal should begin shortly. This makes it worthwhile to create a rough estimate of the LeBron James effect on a television audience and then translate that into a monetary external value for the other teams in the NBA. It should be noted that I have taken a few liberties in creating this estimate and that this process is much less formal than the work done by Hausman & Leonard.

As mentioned earlier, the annual value of the national television contract is $930 million. This annual value includes the broadcast rights for both the regular season and the playoffs. Since I have only calculated LeBron's effect on fan attendance during the regular season in this paper, I will focus on estimating his effect on television viewership during the regular season. Every game in the playoffs is nationally televised and these broadcasts generate much higher ratings, so the value of the playoff broadcasts is much higher. Therefore, I must account for this when estimating the proportion of the national television contract that stems from the regular season broadcasts. Because this proportion is not disclosed, I will arbitrarily assign the annual value of $300 million to the broadcast rights for the NBA regular season games. To illustrate the effects of home market size, I will compare the monetary estimates from LeBron's final season in Cleveland, 2009-10, to his first season in Miami, 2010-11. There were 143 national television broadcasts of

NBA games during the 2009-10 season and 142 national television broadcasts of NBA games during the 2010-11 season. In both years, LeBron's teams were tied with the Los Angeles Lakers and the Boston Celtics for the most national television appearances with 25. Therefore, LeBron James participates in about 17.5% of the national broadcasts each year, which amounts to being worth about $52.5 million. The calculated incremental effect of LeBron James on road attendance was 9.8% in 2009-10 and 10.7% in 2010-11. Again, these figures can be interpreted as the percentage of fans who are attending the game directly because LeBron James is playing. We can use the same intuition and apply these effects to a television audience. Thus, if we assume that 9.8% of the viewers of national NBA game broadcasts involving the Cleveland Cavaliers were watching the game solely because of LeBron James, this amounts to an external value of $5.145 million. By the same reasoning, if we assume that 10.7% of the viewers of national NBA game broadcasts involving the Miami Heat were watching the game solely because of LeBron James, the external value of LeBron in 2010-11 was $5.6175 million, a $472,500 increase.

Since a television broadcast has no upper bound such as a stadium capacity, we can assume that this would likely be underestimating LeBron's effect on television ratings. This is because Hausman & Leonard found that the superstar effects of Michael Jordan, Larry Bird, and Magic Johnson ranged from 21% to 44% on national broadcasts (p. 608). One could argue that LeBron has reached the same level of popularity and thus,

we could be underestimating the external value of LeBron James and possibly understating the monetary effect home market size has on that value. I decided to construct a table of the external values of LeBron James at various degrees of his incremental effect of on television ratings. Since we do not know the true incremental effect of LeBron James on television ratings, this table can illustrate a range of possible monetary values that the effect of home market size can take. The estimation calculations begin with fixed levels of LeBron's hypothetical effect on television ratings as a member of the Cleveland Cavaliers. I will increase this baseline effect in 5% increments starting at 10%, which is almost exactly the value for LeBron's effect on road attendance, and ending at 50%, which is the highest incremental effect on television ratings calculated for Michael Jordan by Hausman & Leonard (1997). Then, I used the previously calculated figure for the increase of LeBron's average effect on attendance from his final two seasons with Cleveland and his first two seasons with Miami, which was 14.7%, to determine LeBron's theoretical effect on ratings in Miami. After obtaining these combinations, I calculated the monetary external value of LeBron James in each scenario. Finally, I calculated the difference between the external values of LeBron James in Cleveland and Miami to show that a greater magnitude of LeBron's incremental effect on television ratings results in a higher external value. Table 5.6 shows the results of these estimations.

**Table 5.6: Estimations of External Value from National Broadcasts**

| Cleveland Effect | Miami Effect | Cleveland Ext. Value | Miami Ext. Value | Difference |
|---|---|---|---|---|
| **10%** | 11.47% | $5,250,000 | $6,021,750 | $771,750 |
| **15%** | 17.21% | $7,875,000 | $9,035,250 | $1,160,250 |
| **20%** | 22.94% | $10,500,000 | $12,043,500 | $1,543,500 |
| **25%** | 28.68% | $13,125,000 | $15,057,000 | $1,932,000 |
| **30%** | 34.41% | $15,750,000 | $18,065,250 | $2,315,250 |
| **35%** | 40.15% | $18,375,000 | $21,078,750 | $2,703,750 |
| **40%** | 45.88% | $21,000,000 | $24,087,000 | $3,087,000 |
| **45%** | 51.62% | $23,625,000 | $27,100,500 | $3,475,500 |
| **50%** | 57.35% | $26,250,000 | $30,108,750 | $3,858,750 |

From Table 5.6, we can see that as LeBron's effect on television ratings increases, the external benefit of his move to a bigger market increases. Although LeBron's true effect on television ratings was unable to be calculated in this paper, we could use the effects of other superstar players as benchmarks for comparison. Hausman & Leonard (1997) calculated that the superstar effects of Larry Bird and Magic Johnson to be in the 25% to 35% range. If that same magnitude of effect also applies to LeBron James, then his move to a larger market would result in an external value increase of between $50,000 and $100,000 to every other team in the league. In addition, if the next contract for the national broadcasts rights increases significantly in value as some experts are predicting, LeBron's move to a bigger market will become even more valuable to the rest of the teams in the league.

**Discussion of Estimation Results**

It must be remembered that the figures for the monetary external value of LeBron's effect on television ratings is a very rough estimation used to give a better

understanding of the total effect home market size has on the external value of a superstar. I would like to quickly addresss some of the limitations of this calculation as well as provide insight into some of the reasoning behind the estimation. The first major limitation of the calculation is that I assumed that the increase in LeBron's effect on television viewership was equal to the increase of his effect on road attendance after moving from Cleveland to Miami. This was the best method I could use for this estimation without having access to the Nielsen television ratings. As mentioned before, the presence of stadium capacities greatly affects the value of LeBron's effect on attendance. Such bounds do not exist on television ratings, and since the cost of watching a game on television is significantly less than the cost of actually attending the game, the rates of change for the two categories are not necessarily related. However, since the purpose of the calculation was to provide a rough estimate, I feel that I made an adequate decision.

The second major issue that arises is the fact that the national television contracts are negotiated years in advance and the annual payouts are fixed regardless of the league's performance. This issue is something that Hausman & Leonard did not address even though the foundations of their calculations arrive at the same issue. While I understand that this means that whatever external value from television ratings is calculated for LeBron James is revenue that the teams are already receiving, I like to interpret these results as LeBron's impact on the popularity and bottom line of the NBA. Thus, this figure could be used to compare LeBron's effect on the NBA relative to other high profile players if similar calculations and estimates were conducted for them. However, the incremental effect of LeBron James on television ratings does eventually

lead to increases in tangible revenue for the rest of the league. LeBron's effect on television ratings will become influential, to some extent, during the next round of national television broadcast rights negotiations. Any increase in television ratings of Miami Heat games could be pitched to television network executives as increasing fan interest which means more access to desired demographics for advertisers, resulting in a higher overall value of the broadcast rights. Therefore, the true incremental effect of LeBron James on national television ratings could translate into tangible external revenue in future years.

The third and final major issue I would like to address is LeBron's effect on local television broadcasts and playoff broadcasts. Like the national television broadcasts, I did not have access to the ratings data for local television broadcasts. The reason I chose not to attempt to estimate LeBron's external value from these broadcasts is because the terms of these local broadcast contracts vary widely from team to team and are difficult to obtain, so creating a reasonable estimation of the external value of LeBron James becomes extremely difficult. I believe that the number and intensity of the assumptions necessary to calculate an estimation would render the results mostly unhelpful. Although I ultimately chose to exclude these broadcasts from the analysis of this paper, it is necessary to state that the revenue generated from these contracts is very important to every team in the NBA.

I have a similar explanation for excluding revenue from playoff broadcasts. Despite my estimation that the majority of the television rights' value stems from playoff broadcasts, I feel that there are too many uncertainties that prevent me from calculating a reasonable estimation of LeBron's impact. The major uncertainty is that nobody knows

how far any team will advance in the playoffs in the current year much less in future years. The amount of total playoff games played as well as the number of playoff games LeBron James participates in can vary significantly from year to year. Therefore, I was unable to create a method to estimate LeBron's effect on the ratings without having access to the ratings data. Once again, playoff broadcasts likely represent a significant portion of LeBron's total external revenue and must at least be mentioned in a paper on the topic.

# Chapter 6 Conclusion

## Overview

In order to examine the effect that home market size has on the external value of a superstar in the National Basketball Association, I considered the case of LeBron James and his move from the Cleveland Cavaliers to the Miami Heat via free agency before the 2010-11 season. To calculate his external value, I calculated the incremental effect of LeBron James on the attendance at NBA games where he was playing on the visiting team. With that data, I was then able to calculate the difference between LeBron's effect in Cleveland and his effect as a member of the Heat. I found that LeBron's average incremental effect on road attendance in his first two seasons in Miami was 14.7% greater than his incremental effect on road attendance in his final two seasons with

Cleveland, providing evidence that home market size has a positive effect on a superstar's incremental effect. From there, I was able to translate this incremental effect into external revenue and found that, on average, LeBron James generated about $15,000 more per game as a visiting opponent while a member of the Miami Heat than while a member of the Cleveland Cavaliers. This shows that the other 29 teams in the league benefitted from LeBron's move to a more glamorous, larger-market team. In addition, I used data from the formal econometric analysis on LeBron's effect on road attendance to generate a rough estimate of his impact on Nielsen television ratings. According to my estimations, LeBron's move to a larger market generated an increase in his external value of between $775,000 and $2.7 million. Although this was admittedly a much less formal calculation, it provides some evidence that home market size of a superstar player can also positively affect his external value that's derived from television revenue. Therefore, LeBron's move positively affected the other teams in the league financially (except for Cleveland, obviously). Finally, this analysis is likely an understatement of LeBron's external worth because important elements such as his effect on local television broadcast ratings and playoff broadcast ratings were unable to be estimated.

There are still a few aspects of the topic of the external value of a superstar player and its relationship with home market size that can provide for interesting future work. The obvious work that can be done would be to perform the analysis discussed in this paper with the actual Nielsen television ratings for both national and local television

broadcasts. This would provide a formal calculation to replace my rough estimate of LeBron's external value derived from national broadcasts as well as create results for elements that I was unable to reasonably estimate such as local television broadcasts and playoff broadcasts. Such results would allow us to have a fuller understanding of LeBron's total external value and provide us with a clearer opportunity to examine the impact of home market size on this value. Finally, I believe that interesting future work on the topic would be an analysis on the effects various home markets have *relative* to each other. This analysis would help us estimate the external value of LeBron James if he had chosen to play for the New York Knicks instead of the Miami Heat. I'm not entirely certain that this type of analysis is feasible due to the scarce number of superstar players and the even scarcer scenario of a superstar player changing teams at the peak of his talent level and popularity. This would be a next step in the direction of determining the factors that influence the value of the superstar externality.

## Implications

This paper's findings concerning the presence of a superstar externality generated by LeBron James and the positive effect of home market size on a superstar's external value have some notable implications. Berri and Schmidt (2006) noted that a superstar's talent level, specifically his ability to produce wins, generates much revenue for the team

employing him, while his superstar appeal generates very little. Basically, the superstar effect is much more beneficial and significant to his team's opponents (2006, p. 354). This superstar effect also shows that the revenue streams for each team in the league are dependent upon each other as discussed in the work of Neale (1964). Berri & Schmidt, along with Hausman & Leonard (1997), argue that the existence of the superstar externality provides evidence that greater revenue sharing could be beneficial to the league's teams as well as the league itself. This is because some teams could be perceived as free-riding off of the benefits stemming from the presence of a superstar player on another team and not being required to share that revenue. Finally, the presence of a superstar externality means that a superstar player is underpaid in relation to revenue that he generates for the other teams in the league. According to Berri & Schmidt, LeBron James would be properly paid if he earned the exact amount he generated for the rest of the teams in the league through his superstar appeal.

The findings that a superstar's home market size is positively related with his external value suggest that some newly developed league policies do not provide an optimal allocation of a superstar's talent. These inefficiencies can be traced back to the interests of small-market owners during the recent lockout. Some features of the new Collective Bargaining Agreement (CBA) are several policies and exceptions that were designed in part to help teams keep their best players re-signed and prevent scenarios such as LeBron's move to Miami. A major feature of these policies, the most notable of

which is the aforementioned Derrick Rose Rule, is that a team has the ability to re-sign their own players to contracts worth substantially more than any other team in the league can offer. The reasoning behind this is that star players will want to maximize their salaries and thus often re-sign with their current teams. Small market owners argued that this would create a more competitively balanced and, as a result, a more profitable league. However, the presence of a superstar externality suggests that these policies, while benefitting certain teams and players, actually hurt the overall health of the league. A superstar player would benefit the league as a whole by moving to the home market which maximizes his external value. However, since a player cannot benefit from his external value under the current structure of league rules, he is more likely to take the larger salary and re-sign with his current team. Berri & Schmidt as well as Hausman & Leonard would likely suggest that these policies are preventing an optimal allocation of a superstar player and not allowing the NBA to function as efficiently as possible. Since these policies are only about a year old, it's too early to tell if these policies introduced in the new CBA will actually have the theoretical consequences discussed.

## Appendix A

## NBA All-Stars by Season

| 2008-09 NBA All-Star Teams | | | |
|---|---|---|---|
| **Eastern Conference** | | **Western Conference** | |
| ***Allen Iverson*** | Detroit Pistons | ***Chris Paul*** | New Orleans Hornets |
| ***Dwyane Wade*** | Miami Heat | ***Kobe Bryant*** | Los Angeles Lakers |
| ***LeBron James*** | Cleveland Cavaliers | ***Amar'e Stoudemire*** | Phoenix Suns |
| ***Kevin Garnett*** | Boston Celtics | ***Tim Duncan*** | San Antonio Spurs |
| ***Dwight Howard*** | Orlando Magic | ***Yao Ming*** | Houston Rockets |
| **Ray Allen** | Boston Celtics | **Chauncey Billups** | Denver Nuggets |
| **Devin Harris** | New Jersey Nets | **Tony Parker** | San Antonio Spurs |
| **Joe Johnson** | Atlanta Hawks | **Brandon Roy** | Portland Trail Blazers |
| **Jameer Nelson** | Orlando Magic | **Pau Gasol** | Los Angeles Lakers |
| **Mo Williams** | Cleveland Cavaliers | **Dirk Nowitzki** | Dallas Mavericks |
| **Danny Granger** | Indiana Pacers | **David West** | New Orleans Hornets |
| **Rashard Lewis** | Orlando Magic | **Shaquille O'Neal** | Phoenix Suns |
| **Paul Pierce** | Boston Celtics | | |
| **Chris Bosh** | Toronto Raptors | | |

| 2009-10 NBA All Star Teams | | | |
|---|---|---|---|
| **Eastern Conference** | | **Western Conference** | |
| ***Allen Iverson*** | Philadelphia 76ers | ***Steve Nash*** | Phoenix Suns |
| ***Dwyane Wade*** | Miami Heat | ***Kobe Bryant*** | Los Angeles Lakers |
| ***LeBron James*** | Cleveland Cavaliers | ***Carmelo Anthony*** | Denver Nuggets |
| ***Kevin Garnett*** | Boston Celtics | ***Tim Duncan*** | San Antonio Spurs |
| ***Dwight Howard*** | Orlando Magic | ***Amar'e Stoudemire*** | Phoenix Suns |
| **Joe Johnson** | Atlanta Hawks | **Chauncey Billups** | Denver Nuggets |
| **Rajon Rondo** | Boston Celtics | **Jason Kidd** | Dallas Mavericks |
| **Derrick Rose** | Chicago Bulls | **Chris Paul** | New Orleans Hornets |
| **Paul Pierce** | Boston Celtics | **Brandon Roy** | Portland Trail Blazers |
| **Gerald Wallace** | Charlotte Bobcats | **Deron Williams** | Utah Jazz |
| **Chris Bosh** | Toronto Raptors | **Kevin Durant** | Oklahoma City Thunder |
| **Al Horford** | Atlanta Hawks | **Dirk Nowitzi** | Dallas Mavericks |
| **David Lee** | New York Knicks | **Zach Randolph** | Memphis Grizzlies |
| | | **Pau Gasol** | Los Angeles Lakers |

| | | | |
|---|---|---|---|
| | | **Chris Kaman** | Los Angeles Clippers |

| **2010-11 NBA All Star Teams** | | | |
|---|---|---|---|
| **Eastern Conference** | | **Western Conference** | |
| ***Derrick Rose*** | Chicago Bulls | ***Chris Paul*** | New Orleans Hornets |
| ***Dwyane Wade*** | Miami Heat | ***Kobe Bryant*** | Los Angeles Lakers |
| ***LeBron James*** | Miami Heat | ***Kevin Durant*** | Oklahoma City Thunder |
| ***Amar'e Stoudemire*** | New York Knicks | ***Carmelo Anthony*** | Denver Nuggets |
| ***Dwight Howard*** | Orlando Magic | ***Yao Ming*** | Houston Rockets |
| **Ray Allen** | Boston Celtics | **Tim Duncan** | San Antonio Spurs |
| **Chris Bosh** | Miami Heat | **Pau Gasol** | Los Angeles Lakers |
| **Kevin Garnett** | Boston Celtics | **Manu Ginobili** | San Antonio Spurs |
| **Al Horford** | Atlanta Hawks | **Blake Griffin** | Los Angeles Clippers |
| **Joe Johnson** | Atlanta Hawks | **Kevin Love** | Minnesota Timberwolves |
| **Paul Pierce** | Boston Celtics | **Dirk Nowitzki** | Dallas Mavericks |
| **Rajon Rondo** | Boston Celtics | **Russell Westbrook** | Oklahoma City Thunder |
| | | **Deron Williams** | Utah Jazz |

| **2011-12 NBA All Star Teams** | | | |
|---|---|---|---|
| **Eastern Conference** | | **Western Conference** | |
| ***Derrick Rose*** | Chicago Bulls | ***Chris Paul*** | Los Angeles Clippers |
| ***Dwyane Wade*** | Miami Heat | ***Kobe Bryant*** | Los Angeles Lakers |
| ***LeBron James*** | Miami Heat | ***Kevin Durant*** | Oklahoma City Thunder |
| ***Carmelo Anthony*** | New York Knicks | ***Blake Griffin*** | Los Angeles Clippers |
| ***Dwight Howard*** | Orlando Magic | ***Andrew Bynum*** | Los Angeles Lakers |
| **Chris Bosh** | Miami Heat | **LaMarcus Aldridge** | Portland Trail Blazers |
| **Luol Deng** | Chicago Bulls | **Marc Gasol** | Memphis Grizzlies |
| **Roy Hibbert** | Indiana Pacers | **Kevin Love** | Minnesota Timberwolves |
| **Andre Iguodala** | Philadelphia 76ers | **Steve Nash** | Phoenix Suns |
| **Joe Johnson** | Atlanta Hawks | **Dirk Nowitzki** | Dallas Mavericks |
| **Paul Pierce** | Boston Celtics | **Tony Parker** | San Antonio Spurs |
| **Rajon Rondo** | Boston Celtics | **Russell Westbrook** | Oklahoma City Thunder |
| **Deron Williams** | New Jersey Nets | | |

## Appendix B

## NBA Arena Capacities

| NBA Arena Capacities | |
|---|---|
| **Atlanta Hawks** | 18,238 |
| **Boston Celtics** | 18,624 |
| **Charlotte Bobcats** | 19,077 |
| **Chicago Bulls** | 20,917 |
| **Cleveland Cavaliers** | 20,562 |
| **Dallas Mavericks** | 19,200 |
| **Denver Nuggets** | 19,155 |
| **Detroit Pistons** | 22,076 |
| **Golden State Warriors** | 19,596 |
| **Houston Rockets** | 18,023 |
| **Indiana Pacers** | 18,345 |
| **Los Angeles Clippers** | 19,060 |
| **Los Angeles Lakers** | 18,997 |
| **Memphis Grizzlies** | 18,119 |
| **Miami Heat** | 19,600 |
| **Milwaukee Bucks** | 18,717 |
| **Minnesota Timberwolves** | 19,356 |
| **New Jersey Nets** | 18,711 |
| **New Orleans Hornets** | 17,188 |
| **New York Knicks** | 19,033 |
| **Oklahoma City Thunder** | 18,203 |
| **Orlando Magic** | 18,846 |
| **Philadelphia 76ers** | 20,328 |
| **Phoenix Suns** | 18,422 |
| **Portland Trail Blazers** | 19,980 |
| **Sacramento Kings** | 17,317 |
| **San Antonio Spurs** | 18,581 |
| **Toronto Raptors** | 19,800 |
| **Utah Jazz** | 19,911 |
| **Washington Wizards** | 20,308 |
| **Average** | 19,143 |

**BIBLIOGRAPHY**

Aschburner, Steve. "NBA's 'Average' Salary--$5.15 Million-- a Touchy, Trendy Subject."*NBA.com*. National Basketball Association, 19 Aug. 2011. Web. 5 Dec. 2012.

Aschburner, Steve. "New CBA Spreads Gains, Pains to Both Sides." *NBA.com*. National Basketball Association, 26 Nov. 2011. Web. 18 Nov. 2012.

Associated Press. "David Stern: NBA Revenue up to $5B." *ESPN.com*. ESPN Internet Ventures, 12 Nov. 2012. Web. 5 Jan. 2012.

*Basketball-Reference.com*. Sports Reference LLC, n.d. Web.

Berri, D. J., & Schmidt, M.B., (2006). “On the Road with the National Basketball Association’s Superstar Externality.” *Journal of Sports Economics*, 7(4), 347-358.

Berri, D. J., Schmidt, M.B., & Brooks, S. L., (2004). “Stars at the Gate: The Impact of Star Power on NBA Gate Revenues.” *Journal of Sports Economics*, 5(1), 33-50.

Brown, E., Spiro, R., & Keenan, D. (1991). “Wage and Non-wage Discrimination in Professional Basketball: Do Fans Affect It?” *American Journal of Economics and Sociology*, 50(3), 333-345.

Burdekin, R. C., & Idson, T. L. (1991). “Customer Preferences, Attendance, and the Racial Structure of Professional Basketball Teams.” *Applied Economics*, 23, 179-186.

Cohen, Rachel. "NBA Extends TV Deals with ESPN/ABC, TNT." *USATODAY.com*. USA Today, 27 June 2007. Web. 3 Feb. 2013.

Fort, R. and Quirk, J. (1995). “Cross-subsidization, Incentives, and Outcomes in Professional Team Sports Leagues”. *Journal of Economic Literature*, 33(3):1265–1299.

"From Way Downtown, Bang for Your Buck." *Teammarketing.com*. Team Marketing Report, Nov. 2010. Web. 15 Nov. 2012

Hausman, J. A., & Leonard, G. K. (1997). “Superstars in the National Basketball Association: Economic Value and Policy.” *Journal of Labor Economics*, 15(4), 586-624.

Helin, Kurt. "League Says 22 Teams to Lose Money, $300 Million Total This Season."*NBCSPORTS.com*. NBC, 15 Apr. 2011. Web. 13 Jan. 2013.

Neale, W. (1964). “The Peculiar Economics of Professional Sports.” *Quarterly Journal of Economics,* 78(1), 1-14.

Noll, R.G. (1974). “Attendance and Price Setting”. In RG Noll (ed.), *Government and the Sport Business*, The Brookings Institution, Washington

"On Point: NBA Tix Lifting Off Post-Lockout." *Teammarketing.com*. Team Marketing Report, Nov. 2012. Web. 5 Dec. 2012.

Ozanian, Mike. "Higher NBA TV Ratings Mean at Least 30% Increase in Broadcasting Fees." *Forbes.com*. Forbes, 20 Apr. 2011. Web. 5 Dec. 2012.

Ozanian, Mike. "The NBA's Most Valuable Teams." *Forbes.com*. Forbes, 26 Jan. 2011. Web. 5 Dec. 2012.

Rottenberg, S. (1956). “The Baseball Players’ Labor Market.” *The Journal of Political Economy*, 64(3), 242-258.

Scott, F., Jr., Long, J., & Sompii, K. (1985). “Salary vs Marginal Revenue Product Under Monopsony and Competition: The Case of Professional Basketball.” *Atlantic Economic Journal*, 13(3), 50-59.

Veazey, Kyle. "NBA Lockout May Jeopardize Season, but Memphis Grizzlies Likely to Gain in Long Term." *Commercialappeal.com*. Commercial Appeal, 17 July 2011. Web. 4 Oct. 2012.

Whitney, J. (1988). “Winning Games Versus Winning Championships: The Economics of Fan Interest and Team Performance.” *Economic Inquiry*, 26(4), 703.

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