

Large Market Advantage: The National Basketball Association and the Relationship Between Market Size and Success

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Abstract

The National Basketball Association (NBA) has a fundamental problem with their business model; not every market is created equal. Even though the league is widely popular, after the Financial Crisis of 2008, the majority of teams were losing money. Existing research on financial success factors in the NBA have generalized results across all teams. Using regression techniques, population has been shown to have a significant, positive relationship with a team's revenue. In December of 2011 a new collective bargaining agreement was signed in order to increase the likelihood that small market teams could better compete both financially and competitively. This study intends to decipher whether the CBA is having its intended effects by utilizing a multivariate regression model. Dummy variables will be employed in order to show the interaction between market size and the new CBA to discover if market size is becoming more or less important to both financial and on-court success. After identifying whether or not a difference between market sizes exists, I will attempt to reconcile the findings by looking at the fabric of the current league and identifying what type of teams are succeeding and why.

Keywords: National Basketball Association, NBA, collective bargaining, market size, franchise valuation, success factors

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1.0 Introduction

On July 1st, 2011 the fourth work stoppage in the history of the National Basketball Association (NBA) began. The lockout was brought about by problems with the NBA's business model that were amplified by the financial crisis of 2008. The problems, centering on league financials, reached a head in 2010 when 22 of the 30 league teams claimed to have operated at a loss (Helin, 2011). The lockout lasted 161 days, ending on December 8th, 2011 when the NBA Players Association (NBAPA) and owners signed a new collective bargaining agreement (CBA). The season, shortened from 82 games to 66 games, finally began on Christmas Day 2011 and would end in June 2012 with LeBron James and the Miami Heat as the league champions.

Little more than a month after the abbreviated season began Forbes released their annual valuations for NBA franchises. Forbes has been conducting these valuations for more than a decade and has become a frequently cited source when discussing the value of professional franchises. The valuations released in January 2012 present a particularly interesting installment for Forbes because they were released only a month after the new CBA was signed. The stated goals of the new CBA were to increase profitability and competitive parity across all of the league's franchises (detailed explanations of the changes can be seen in Appendix A).

The valuations from January 2012 provide a unique opportunity to begin to analyze how the signing of the new CBA affected these franchise valuations. As a long time NBA fan, and as a loyal supporter of the small market Minnesota Timberwolves, I had come to suspect that large market teams had a significant advantage over small market teams. These valuations seemed to be an opportunity to discover if the new

agreement was working and subsequently if the fabric of the league was changing. The valuations seemed to be a gateway to answer whether the league was structured in such a way that teams in smaller markets were at a financial and on-court disadvantage.

This study is important because it will be able to lend support as to whether the new CBA is having its intended affects. This is the area in which the study has it broadest implications. The implications of the new CBA affect owners, players, businesses and fans. Over the course of the 161 days of the 2011 lockout all of these parties were adversely affected. The owners lost months of potential revenue generating operations. The hundreds of players, coaches and support staff of all 30 teams went through this period without receiving anticipated wages. Furthermore, local businesses that had developed around and come to rely on NBA games to drive operations were forced to make tough decisions as expected revenue streams disappeared. Lastly and most importantly, fans of the NBA were forced to endure a lengthy lockout for reasons that many could not understand. By identifying if the new CBA is working we can begin to create accountability for the parties involved in drafting and signing the agreement. All parties with an interest in the NBA can benefit from knowing if the league is transitioning to a more financially stable and more competitive league. Furthermore, understanding the factors that drive success in different sized markets can create knowledge that will allow owners, players and fans to have a more directed dialogue as to how to build a winning team. If the CBA is working we can look to the recent decisions that teams have made to understand how those choices have flourished under the league's new rules. If the CBA is not working, then we have an opportunity put pressure on owners and the league to make

wiser decisions in order to bring about changes that will provide all teams with better financial stability and a better opportunity to compete on the basketball court.

The purpose of this study will be to discover if smaller market teams have a significant disadvantage in today's NBA both competitively and financially. By using the signing of the new CBA to mark a change in league structure I will also be able to show if the new CBA is achieving its stated goals of increasing league franchise valuations and league wide parity. In order to obtain these results I will utilize multivariate regression. I will use several control variables, determined with guidance from past literature, and use the explanatory variables of market size and whether a season was played under the new CBA to answer whether large market teams are better suited to succeed financially and competitively in today's NBA.

Section 2 of this thesis will look at existing literature surrounding the areas of franchise valuation, on-court success and other existing research. Section 3 will introduce the methodology behind this study, including introducing the hypotheses. Section 4 will present the results of the study while Section 5 will discuss the results in greater detail. Section 6 will conclude the thesis by discussing the study's key findings, limitations and areas for future study.

2.0 Literature Review

To this point there has been limited scholarly research surrounding the National Basketball Association (NBA). The majority of research that has been completed has primarily surrounded factors that affect a team's on-court success. One area that has been less developed is the factors affecting franchise valuation. By providing a brief background on the current structure of the NBA and providing an overview of the studies that have been completed in the past, I hope to highlight specific factors that have been found to contribute to franchise valuation and on-court success in the past to illustrate how they will influence the approach I take in my study.

2.1 NBA Structure

There are several potential answers to the question I have posed. In order to understand these answers it is important to understand a few things about the NBA. Perhaps the most important things to understand about the NBA are the league's revenue sharing policy and salary cap rules. Both of these things are fairly technical but more accessible when discussed in broad terms.

Revenue sharing stems from the idea that in any league every team invariably relies on other teams. In practice, this means the teams that generate the most revenue can only do so because teams that generate less revenue also play in the league, making professional competitions possible. The league's revenue sharing model is designed so that all teams pay a percentage of revenue into a pool. The funds from this pool are then distributed equally to all 30 teams. The system is designed to redistribute some of the profits from high revenue teams to lower revenue teams that lose money, the idea being

that such distribution will help all teams, at the least, break even. Revenue sharing, in short, helps provide stability to the league by distributing profits to teams that have had a poor financial year.

In addition to revenue sharing the NBA also imposes a salary cap on its teams. The league currently uses a “soft” salary cap model. This means that there is a set-spending limit for player salaries (\$58 million in 2012). The soft nature of the cap means that teams are allowed to spend above and beyond the cap if they desire. The teams that choose to do this are taxed if they exceed a certain limit (\$70 million in 2012). The tax is put into place so that high revenue teams, usually large markets, cannot simply outbid smaller market teams owing to their larger revenue streams. The new CBA specifically made these luxury taxes more punitive in order to promote greater parity throughout the league. Additionally, player salary limits establish the length and amount a player can be paid. The league attempts to further help small market teams retain star players by allowing them to offer the longest and most lucrative contracts to players already on their team. Each team is allowed to assign one player the title of “designated player.” The designated player can be offered a five-year contract by the team they currently play for while other teams can only offer a four-year contract. Additionally, teams are allowed to exceed the salary cap in order to re-sign players that have played for their teams for more than three years. This is known as the “Larry Bird Rule.” This exception to the normal salary cap rules rewards teams for identifying and developing talent. Combined, these measures are efforts designed to help spread talent across the league so that teams from all markets can retain effective players in order to remain competitive.

However, even when receiving higher salaries by remaining loyal to their teams, most of the league's star players are not paid what they are actually worth because of the limits on player salaries. Owing to this phenomenon, star players are inclined to congregate in the same market in order to improve that team's chance for on-court success. The reasons behind these actions are to maximize salary and to maximize on-court performance simultaneously. Higher on-court performance is thought to increase the popularity of well-known players thereby making endorsement opportunities more likely and lucrative. The most recent example of this phenomenon is the Miami Heat, who in 2010 lured LeBron James and Chris Bosh to Miami to join Dwayne Wade. This "Big 3," consisting entirely of perennial all stars, signed together in hopes of winning a championship and as a result have all become better known, if not more popular.

When learning about the NBA, and more specifically about its structure, it becomes apparent quickly that things are complicated. While I have proposed the question as to why it seems small teams fail to attract top players, much of the way the league is set up is to make sure that this is more possible than in a truly open market. In order to wade through my own perceptions and theories popularized in the mainstream media about NBA franchises, I have decided to explore the factors that affect a franchise's valuation and on-court success. Studies in the past have looked at both factors individually; my research attempts to reconcile these factors using one model. Understanding these past studies is a critical first step in understanding the model I have created for this study.

2.2 Franchise Valuation

Past efforts to unlock the mystery behind professional franchise valuations have suffered from the fact that almost all professional franchises are held privately. Owing to this, little to no public accounting information is available. Despite this limitation, a few efforts have been made to decipher which factors drive franchise valuation. Alexander & Kern used regression analysis to show that market size, arena age and on-court success increase the value of a given franchise (2004). Humphreys & Mondello used a hedonic price model to determine that market size and franchise age had a significant impact on valuation while on field success and arena age did not (2008). Building on the work of Humphreys & Mondello, Humphreys & Lee found population, arena characteristics and on-court success to be the main drivers of valuation (2009). These studies serve to provide a useful framework to think about factors affecting franchise valuation.

An important identified element of a team's annual revenue is its winning percentage (Berri, Brook & Schmidt, 2004). Berri, et al. (2004) created a regression model using gate revenue as the dependent variable in order to reveal a significant positive relationship between a team's wins and that team's gate revenue. Next, they found that previous season playoff wins were shown to positively impact revenue more significantly than regular season wins (Berri et al., 2004). This is intuitive because teams that participate in the playoffs are able to generate additional revenue from hosting home playoff games.

2.3 Superstars

Several studies have been conducted to determine what effect an NBA “superstar” can have on a franchise’s annual revenue (Berri, et al. , 2004; Berri & Schmidt, 2006; Goldfarb, Shi & Yang, 2009). In general, these findings concluded that having a superstar on a team could increase gate revenues, but not as significantly as wins could (Berri & Schmidt, 2006). Berri & Schmidt used a regression model to analyze the effect that a “superstar” had on road attendance (road attendance was used as a proxy for gate revenue). They discovered that both star power and wins added play a role, however, star power plays a less significant role than wins added in increasing a team’s revenues (Berri & Schmidt, 2006).

These finding are consistent with those of Berri, et al. (2004) who concluded that it was on court performance more than star power that brings NBA fans to the arena. A player’s ability to add wins to his team is more valuable from a revenue standpoint than his perceived star power, even though the two are invariably linked. In order for a player’s star power to outweigh his on court contribution to his teams winning percentage that player would had to have had five times the star power of the biggest star in the study, Michael Jordan (Berri, Brook & Schmidt, 2004). This means that a player would have to be impossibly famous for his star appeal to weigh more on home attendance and revenue than his contribution to his team’s performance.

Berri & Schmidt (2006) highlight an interesting phenomenon when they point out that a player’s star appeal has greater value to opposing owners than to his own. They posit that road teams are not properly compensated because gate revenues are not shared between both competing teams. Berri & Schmidt argue that greater revenue sharing

would be a better method of dealing with such interconnected cash streams instead of allowing the financial return of a player's star appeal to be redeemed solely by the home team (Berri & Schmidt, 2006).

One important thing to note about superstars is that while every market offers unique benefits to these players, the benefits are not the same and are valued differently by every player (Goldfarb, Shi & Yang, 2009). Basically, certain markets are attractive to certain superstars for certain reasons; this is referred to as "personal player preference." Players sign in the markets and with the teams that are most attractive to them. The reasons a player may choose one team over another could include: salary, location, contract length, climate and endorsement opportunities to name a few. While the NBA attempts to make it attractive for players to remain with the same team, other less controllable factors than salary could cause a player to leave. Not all markets are created equal or identical; this provides an obstacle to the league's goal of creating parity that revenue sharing and special contracts cannot control. Although one superstar is no substitute for a competitive team, the revenue of an NBA franchise can be increased by its finding a superstar player who wants to play in their market or to make their team or location an attractive place for superstars to play.

2.4 Competitive Balance

The tricky issue when discussing competitive balance is that wins in any league are finite. Any additional win captured by one team comes at the expense of another. Quirk & Fort (1997) devised a ratio comparing a league's competitive parity with the ideal parity for a league in which each team would have an equal chance of winning.

They found that of the four professional leagues (MLB, NBA, NFL and NHL) that the NBA was the furthest from the ideal level of parity. Berri, Brook, Fenn, Frick & Vicente-Mayoral (2005) found that this pattern had not changed. Sanderson & Siegfried (2003) furthered the research on competitive balance. They began by addressing that markets are different. Fans in one given location may be more willing to shoulder the costs of winning than the fans in a different location. Economic theory says that teams should then relocate to such areas in order to maximize marginal revenue per win (Sanderson & Siegfried, 2003). The problem with the NBA is that this is not possible because the league prevents teams from congregating in high marginal revenue per win areas like New York, Los Angeles and Chicago in order to generate regional support for the game in various areas of the country.

Since teams are unable maximize their marginal revenue per win by freely choosing their market, competitive balance within the league cannot be maximized (Sanderson & Siegfried, 2003). Despite the inability to maximize competitive parity, the NBA utilizes several mechanisms to promote competitive balance. The salary cap, luxury taxes, and revenue sharing policies (discussed in section 2.1) instituted by the league are specifically designed to narrow the gap in competitive balance (Berri, Brook & Schmidt, 2004). While effective in theory, the observed results indicate that more can be done. For one, The NBA does not share home game gate revenues with the visiting team even though it has been shown that the visiting significantly team affects the demand for the game (Berri, Brook & Schmidt, 2004; Sanderson & Siegfried, 2003). In addition, NBA teams do not share their local television contract revenues which means that teams like the Los Angeles Lakers harvest substantially greater profits than smaller market teams

with less lucrative deals (Sanderson & Siegfried, 2003). In the National Football League, a league with greater competitive balance and similar variation in market sizes, both gate revenues and television profits are shared more effectively to promote competitive parity (Sanderson & Siegfried, 2003).

Research has shown that the NBA is not as competitive as it would be if it allowed multiple franchises to relocate to the largest markets. The less than optimal use of tools like the salary cap and revenue sharing help compound the problem (Sanderson & Siegfried, 2003). The lockout of 2011 stemmed from many of these exact issues. Understanding how competitive balance affects the league and specific locations is a vital aspect of determining how a franchise may best succeed in a specific market.

2.5 Conclusion

Although past research has been able to illustrate that certain factors are significant determinants of a team's financial and on-court success, little direct attention is focused on the specific markets in which a team is located. By using the lens of the signing of the new CBA I am trying to use an event to show how the fabric of the league is changing for large, medium and small market teams. Through my research I hope to help unpack the importance of market size in a franchise's success. In particular, I want to look at the difference between franchises with different market sizes in terms of financial and on-court success in order to discover the level of impact the new collective bargaining agreement is having on making the league more competitive and profitable.

3.0 Methodology

Little more than a month after the abbreviated 2011-2012 NBA season began Forbes released their annual valuations for each NBA franchise. Forbes has been releasing these valuations for more than a decade and has become a frequently cited source when discussing what professional franchises are worth. While the valuations are not perfect, they are a useful resource in the absence of accounting information for each franchise. The valuations, released after the new collective bargaining agreement was signed, were an interesting study on the financial impact that the new CBA was having on the structure of the league. The two chief goals of the new CBA were to lower the percentage of revenues attributed to player salaries in order to improve league profitability and to make small market teams more competitive through more aggressive revenue sharing (further details appear in Appendix A). Using regression analysis we can construct a model to identify what factors contributed to higher valuations and higher winning percentages from the onset of the old CBA in 2005 through 2012, the last completed NBA season and first under the new CBA. Utilizing dummy variables, we can reveal the significance of market size on valuation and on-court success both before and after the signing of the new CBA. This analysis will help reveal if the new CBA is having its intended affects and can be a launching point for discussion.

3.1 Hypothesis Statements

As is often the case with negotiations, compromises had to be made when constructing the new CBA. While the owners, by most accounts, came out the victors, they did not accomplish everything that they desired. In the case of the new CBA the

owners pressed harder to ensure their own financial security by lowering the percentage of revenues they have to pay out to players in exchange for giving ground on the side of revenue sharing and indirectly competitive parity.

This tradeoff makes sense coming from owners who are generally successful businessmen that buy into the sport after a successful career in the private sector. However, the real losers in this situation are fans of a competitive league. While some measures were taken to make the league more competitive (increased revenue sharing), several others, including a hard salary cap, were left on the bargaining table.

This tradeoff led me down the path to my hypotheses. Essentially, the owners agreed to trade a more competitive league for greater financial security. While measures like harsher luxury tax penalties and greater revenue sharing were put into place, the measures were not as competition promoting as many had hoped. This got me thinking about what tangible effects the CBA would actually have on the league and more specifically on the impact in regards to teams of various market sizes.

I suspect that the new CBA, as intended, will increase the profitability and Forbes valuations for all market sizes. Additionally, I believe that the competitive parity of the league will remain unchanged such that regular season winning percentages and annual playoff wins will not significantly change across market sizes. By using Forbes valuation, regular season winning percentage and annual playoff wins as dependent variables I will be aiming to see if the relative importance of a franchise's market size has changed significantly with the signing of the new CBA.

Forbes Valuations are a useful measure of a team's relative financial success over time and especially in the absence of alternatives. The new revenue model put into place

by the new CBA should, by its nature, raise the Forbes valuation for each franchise. Building off past research, it stands to reason that the relative valuations for small market teams will appreciate less than those of large market teams (Humphreys & Lee, 2009). Stable factors like market size naturally have a larger weight on valuations than do relatively more controllable factors like on-court performance. Owing to this, I believe that the signing of the new CBA will have a more significant positive relationship with large market teams than with medium or small market teams.

Hypothesis 1:

The increase in Forbes valuation for large market teams will be significantly greater than the increases in Forbes Valuation for medium and small market teams.

In the NBA, the parity of the league can be measured by comparing the regular season winning percentage and annual playoff wins of teams over time. A league with greater parity is a league in which these regular season win percentages and annual playoff wins are similar for all teams and across all market sizes. Using these measures as dependent variables will provide two measures of a team's on-court success that can be compared over time. As mentioned, the signing of the new CBA has led me to suspect that significant changes in competitive parity across market sizes are unlikely. In other words, I suspect the winning percentage and playoff wins for teams from different sized markets will not change significantly as a result of the signing of the new CBA. I believe that there will be no significant difference for two reasons. The primary reason is because

the severity of the changes to the league's structure after the signing of the new CBA did not do enough to promote parity.

As mentioned, the hard salary cap was left off the table, which in my eyes leaves small market teams at a long-term competitive disadvantage. Hard salary caps effectively establish a salary-spending ceiling that no team can exceed. A soft cap, on the other hand, does not establish a hard salary ceiling and instead punishes teams who exceed the soft salary cap with tools like the punitive luxury tax. The reason no significant changes will happen is that without a hard salary cap, large market teams like the Los Angeles Lakers will be able to maneuver around the measures designed to promote parity by means of creative salary construction and cleverly structured trades. For instance, in 2013 the Lakers will exceed the cap considerably and subsequently pay about \$30 million in luxury taxes but can easily afford to pay it owing to their local TV contract. Mechanisms like these essentially function as loopholes that only large market, large revenue teams can utilize. Until every team has to operate under a set of rules that are truly the same, it seems unlikely that the parity of the league across market sizes will change significantly so long as large revenue teams can circumvent certain rules.

In addition, thinking in the short-term, playing only one year under the new CBA seems like too little time for teams to adjust to the new league structure in terms of making significant roster adjustments. This would lead me to believe that even if the changes in structure were starting to have an impact, that they would not yet have an observable impact on league parity. If the changes to the league's structure were, in fact, altering the behavior of teams and creating a league with more parity, these changes might manifest themselves in the data in 5-7 years, after teams have strategically changed

the way they create their teams. Regardless, in my data I do not expect to find significant changes in measures of parity across market sizes after the signing of the new CBA.

Hypothesis 2:

The competitive parity of the NBA as measured by regular season winning percentage and playoff wins, will not be significantly different across large, medium and small market teams after the signing of the new CBA.

3.2 Data Measures & Evaluation

In order to analyze the effects of the new CBA I have gathered financial and on-court performance information for all 30 NBA franchises. Most of my financial data has come from Forbes and their annual “Business of Basketball” article. The on-court data has come from a variety of public sources (ESPN, NBA, APBR, CBAFAQ). The ultimate goal of this thesis will be to run several multivariate regression models in order to examine how the signing of the new CBA in 2011 is affecting teams of various market sizes.

The goal of my regression analysis will be to determine what factors significantly affect a franchises valuation and whether these same factors significantly affect a team’s ability to be competitive on the basketball court. By determining which factors affect the financial and on-court success of teams I will be able to add to existing literature and provide insights as to which markets are best suited to compete in the NBA. Using the signing of the new CBA as a mechanism to assess the changing structure of the league, I

will be able to assess whether unavoidable population differences between markets are significantly affecting a team's ability to succeed on and off the court.

I will utilize 3 multivariate models in order to analyze my data. I will run 9 regressions total for my data that will cover the period from 2005-2012 (the beginning of the old CBA to the end of 2012 season). I have excluded 2011 because the valuations were released so shortly after the signing of the new CBA and access to the Forbes data for this year, for whatever reason, is unavailable. 3 regressions will be run for each of my dependent variables. I will use Forbes valuation, regular season winning percentage and annual playoff wins as these dependent variables. By using a combination of explanatory and control variables I will be able to illustrate the factors that are affecting the dependent variables significantly. The 3 regressions for each dependent variable will utilize nearly identical approaches (the one difference is that winning percentage and playoff wins are independent variables in the regression for Forbes valuation and not for the measures of competitive parity). The first regression for each dependent variable will include only the control variables. The second regression will introduce the dummy variables for large and medium market teams. Finally, the third regression will incorporate the dummy variable for the new CBA and the interactions between market size and the new CBA. The similarity in regression will hopefully allow for useful comparisons across models after introducing standardized variables.

Model for Regression Series 1

$$Y = \alpha + \varphi controls + error$$

Models for Regression Series 2

$$Y = \alpha + \beta_1 \text{LargeMarket} + \beta_2 \text{MediumMarket} + \varphi \text{controls} + \text{error}$$

Model for Regression Series 3

$$Y = \alpha + \beta_1 \text{LargeMarket} + \beta_2 \text{MediumMarket} + \beta_3 \text{NewCBA} + \beta_4 \text{LargeMarket} * \text{NewCBA} \\ + \beta_5 \text{MediumMarket} * \text{NewCBA} + \varphi \text{controls} + \text{error}$$

Building on past research I have included certain variables as controls. Prior studies have found these factors to be significant in contributing to either financial or on-court success. These controls have expected relationships with each dependent variable that are based on this past research, the majority of which are intuitive.

Table 3.1: Description of Control Variables and Expected Relationships

| Independent Variable | Measure | Description | Expected Relationship to Dependent Variable | | |
|----------------------|---------------------------|---|---|--------------------|--------------|
| | | | Forbes Valuation | Winning Percentage | Playoff Wins |
| Winning Percentage | Percentage | Regular Season Wins/Total Games Played | + | | |
| Playoff Wins | Playoff Wins | Number of wins accumulated in prior season's playoffs | + | | |
| Year | Number | 1-8. 1 = Season ended 2005, 8 = Season ended 2012 | + | 0 | 0 |
| Revenue | Millions of Dollars (USD) | Team revenue for the prior season | + | + | + |
| Operating income | Millions of Dollars (USD) | Operating income for the prior season | + | + | + |
| Player Expenses | Millions of Dollars (USD) | Player expenses for the prior season | + | + | + |
| Gate Receipts | Millions of Dollars (USD) | Attendance revenue for the prior season | + | + | + |
| All NBA | Number | Number of players on All NBA 1st, 2nd or 3rd Team | + | + | + |
| Arena Age | Number | Year of Season - Year Arena was Built | - | 0 | 0 |
| Team Age | Number | Year of Season - Inagural year in Current City | + | 0 | 0 |

The predictor variables in my regression will be market size, whether the season in question was played under the old or new CBA, and the interaction between market size and CBA. Using dummy variables for relative market sizes (large, medium & small) and for whether the data being analyzed was from the old or new CBA, I will be able to evaluate my two central hypotheses. Analyzing the significance of the other variables mentioned will help to evaluate past research and to further explain what factors are driving the financial and on-court success of teams in the NBA. The table below describes the measures used for the control and explanatory variables. Expected relationships with each independent variable are once again included.

Table 3.2: Description of Predictor Variables and Expected Relationships

| Independent Variable | Measure | Description | Expected Relationship to Dependent Variable | | |
|----------------------|---------|--------------------------------------|---|---------------------------|---------------------|
| | | | <i>Forbes Valuation</i> | <i>Winning Percentage</i> | <i>Playoff Wins</i> |
| Large Market | Dummy | 1 = Large Market, 0 = Not | + | + | + |
| Medium Market | Dummy | 1 = Medium Market, 0 = Not | 0 | 0 | 0 |
| New CBA | Dummy | 1 = New CBA, 0 = Old CBA | + | 0 | 0 |
| CBA*Large | Dummy | 1 = Large Market & New CBA, 0 = Not | + | 0 | 0 |
| CBA*Medium | Dummy | 1 = Medium Market & New CBA, 0 = Not | + | 0 | 0 |

3.3 Limitations

While the structure of my study will be able to help support or reject my hypotheses, it does suffer from a few limitations. The biggest limitation is the lack of franchise-by-franchise financial data. I have been forced to rely on the numbers reported and generated by Forbes. While there is no real alternative to this method, ideally a study like this would be done after looking at each team’s accounting information in detail.

Additionally, some of my assumptions are not as robust as they could be. The best example is in assigning dummy variables for market size. I simply broke the league into 3 tiers based on population. This will serve to show the difference between teams in different sized markets but does so somewhat arbitrarily. Ideally a robust framework to differentiate between market size would be created utilizing other telling factors beyond simply population. I did not encounter such a model in my research and had little success when trying to create such a method from scratch. The reason I chose not to use a continuous variable such as market population is because this would likely diminish the ability to draw conclusions about medium market teams. The continuous variable would essentially cut the medium market out of the analysis.

Another severe limitation of this study is that I am using data from only one year after the signing of the new CBA. This is out of necessity since there has only been one season played under the new CBA. The main problem is that with such a small sample size it will be hard to truly assess significance. The reason I feel my study is useful is because I have created a framework to analyze and assess data that can be strongly suggestive and that can easily be added to as time passes and more data becomes available. Lastly, and the limitation that falls most squarely on my shoulders, is the chance for human error in my data entry. I have entered a lot of data into Excel manually. While I attempted to create several quality controls during the data entry process, I cannot guarantee that my data entries were 100% error free.

4.0 Results

The results of my study are interesting because they help validate one of my hypotheses while casting doubt on the other. Table 4.1 helps display that teams playing in large markets, all teams playing under the new CBA and large market teams playing under the new CBA all have significant positive relationships with Forbes franchise valuations.

Much as table 4.1 is useful for analyzing the results of factors affecting franchise valuation, tables 4.2 and 4.3 are useful for looking at competitive parity. These tables are interesting because in some ways they disprove my second hypothesis that competitive parity, or the gap between large and small market teams, has not been impacted by the signing of the new CBA. Large markets themselves actually have a significant negative relationship with winning percentage across all years. This also seems to disprove my assertion that large market teams tend to be more successful on the court than medium and small market teams. Additionally, large market teams playing under the new CBA also have a significant negative relationship with playoff wins. While these results are only suggestive since there is only one year of data to analyze under the new CBA, this suggests that after the signing of the new CBA that large market teams were less likely to win playoff games than they were under the old CBA. Standardized variables can be seen in Appendix B, expected and actual variable relationships can be seen in Appendix C. and summary statistics can be seen in Appendix D in order to illustrate the results in greater detail

Table 4.1: Forbes Valuations 2005-2012

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 112.084 | 29.823 | 0.000 | 124.980 | 29.263 | 0.000 | 49.125 | 22.213 | 0.028 |
| Winning % | -0.917 | 39.422 | 0.981 | 8.126 | 38.564 | 0.833 | -30.926 | 28.354 | 0.277 |
| Playoff Wins | -3.430 | 1.372 | .013** | -2.550 | 1.358 | .062* | -1.087 | 1.002 | 0.279 |
| Year | 16.231 | 2.002 | .000*** | 16.023 | 1.980 | .000*** | -2.139 | 2.055 | 0.299 |
| Revenue | 2.438 | 0.366 | .000*** | 2.312 | 0.359 | .000*** | 1.622 | 0.268 | .000*** |
| Operating income | -1.067 | 0.448 | .018** | -1.223 | 0.439 | .000*** | 0.616 | 0.351 | .081* |
| Player Expenses | -3.521 | 0.667 | .000*** | -3.689 | 0.651 | .000*** | 0.435 | 0.573 | 0.448 |
| Gate Receipts | 3.782 | 0.644 | .000*** | 3.539 | 0.641 | .000*** | 2.541 | 0.476 | .000*** |
| All NBA | 10.164 | 7.987 | 0.205 | 13.827 | 7.998 | .085* | 9.310 | 5.888 | 0.115 |
| Arena Age | -0.818 | 0.453 | .072* | -0.259 | 0.470 | 0.582 | -0.525 | 0.345 | 0.129 |
| Team Age | 1.124 | 0.333 | .001*** | 1.192 | 0.349 | .001*** | 0.581 | 0.259 | .026** |
| Large Market | | | | 29.164 | 10.944 | .008*** | 0.379 | 8.583 | 0.965 |
| Medium Market | | | | -8.793 | 11.029 | 0.426 | -9.981 | 8.595 | 0.247 |
| New CBA | | | | | | | 125.960 | 17.089 | .000*** |
| CBA*Large | | | | | | | 105.405 | 19.462 | .000*** |
| CBA*Mid | | | | | | | 24.720 | 19.276 | 0.201 |

Table 4.2: Regular Season Winning Percentage 2005-2012

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 0.399 | 0.052 | 0.000 | 0.376 | 0.052 | 0.000 | 0.355 | 0.056 | 0.000 |
| Year | 0.005 | 0.004 | 0.227 | 0.004 | 0.004 | 0.317 | 0.000 | 0.006 | 0.951 |
| Revenue | -0.001 | 0.001 | 0.184 | -0.001 | 0.001 | 0.341 | -0.001 | 0.001 | 0.259 |
| Operating income | 0.000 | 0.001 | 0.891 | 0.000 | 0.001 | 0.862 | 0.001 | 0.001 | 0.591 |
| Player Expenses | 0.000 | 0.001 | 0.958 | 0.000 | 0.001 | 0.734 | 0.001 | 0.002 | 0.408 |
| Gate Receipts | 0.003 | 0.001 | .005*** | 0.003 | 0.001 | .010*** | 0.003 | 0.001 | .015** |
| All NBA | 0.119 | 0.013 | .000*** | 0.114 | 0.014 | .000*** | 0.113 | 0.014 | .000*** |
| Arena Age | -0.003 | 0.001 | .003*** | -0.003 | 0.001 | .001*** | -0.003 | 0.001 | .001*** |
| Team Age | 0.001 | 0.001 | .032** | 0.002 | 0.001 | .030** | 0.001 | 0.001 | .052* |
| Large Market | | | | -0.049 | 0.022 | .023** | -0.050 | 0.023 | .035** |
| Medium Market | | | | -0.012 | 0.022 | 0.585 | -0.007 | 0.024 | 0.762 |
| New CBA | | | | | | | 0.056 | 0.047 | 0.232 |
| CBA*Large | | | | | | | -0.019 | 0.053 | 0.718 |
| CBA*Mid | | | | | | | -0.028 | 0.053 | 0.603 |

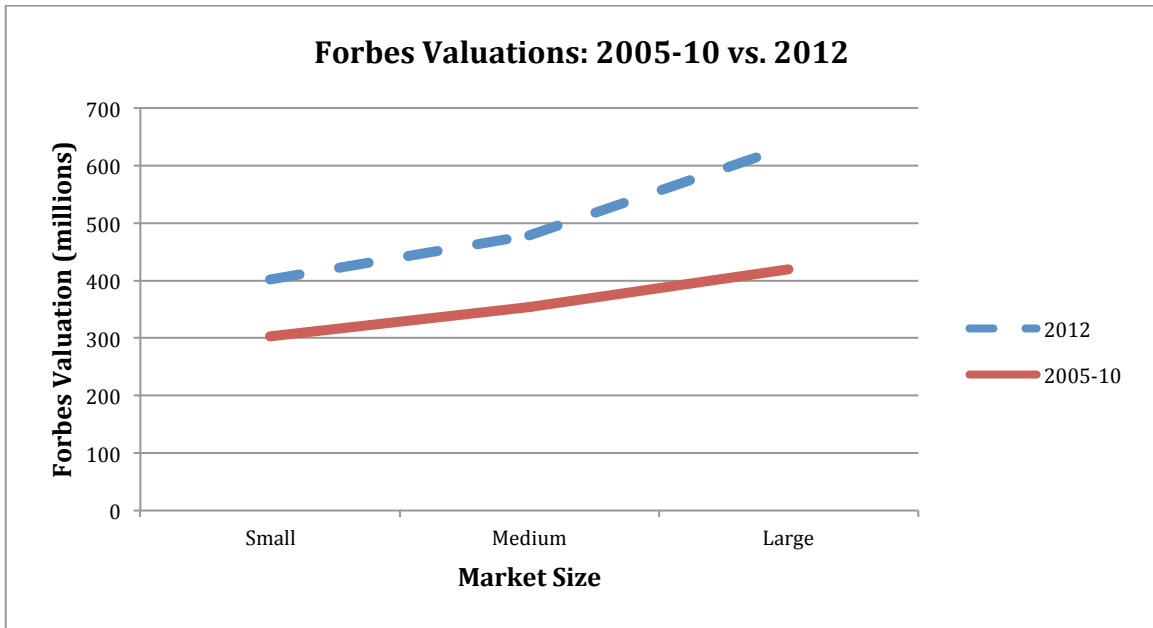
Table 4.3: Annual Playoff Wins 2005-2012

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 4.496 | 1.488 | 0.003 | 3.482 | 1.491 | 0.020 | 3.776 | 1.583 | 0.018 |
| Year | 0.247 | 0.112 | .029** | 0.248 | 0.112 | .028** | 0.306 | 0.159 | .055* |
| Revenue | -0.047 | 0.021 | .023** | -0.039 | 0.020 | .059* | -0.035 | 0.021 | .091* |
| Operating income | -0.042 | 0.025 | 0.101 | -0.032 | 0.025 | 0.197 | -0.041 | 0.027 | 0.135 |
| Player Expenses | -0.098 | 0.037 | .009*** | -0.086 | 0.037 | .020** | -0.104 | 0.044 | .018** |
| Gate Receipts | 0.211 | 0.033 | .000*** | 0.213 | 0.033 | .000*** | 0.218 | 0.034 | .000*** |
| All NBA | 2.652 | 0.372 | .000*** | 2.292 | 0.388 | .000*** | 2.331 | 0.392 | .000*** |
| Arena Age | -0.073 | 0.025 | .004*** | -0.096 | 0.026 | .000*** | -0.095 | 0.026 | .000*** |
| Team Age | 0.053 | 0.018 | .004*** | 0.046 | 0.020 | .020** | 0.049 | 0.020 | .015** |
| Large Market | | | | -1.376 | 0.615 | .026** | -0.946 | 0.663 | 0.155 |
| Medium Market | | | | 0.523 | 0.628 | 0.406 | 0.667 | 0.670 | 0.321 |
| New CBA | | | | | | | 0.673 | 1.332 | 0.614 |
| CBA*Large | | | | | | | -2.555 | 1.511 | .093* |
| CBA*Mid | | | | | | | -1.121 | 1.506 | 0.457 |

5.0 Discussion

In writing this thesis I set out to discover how the new NBA collective bargaining agreement was affecting large, medium and small market teams. More specifically, I wanted to find out if the new CBA was significantly affecting the valuations and on-court success of teams from these markets. As mentioned in the results section, after running various regressions, the results of the data are quite interesting. The results are interesting because they support my intuition and hypothesis stating that the new CBA is having a more significant positive impact on the valuations of large market teams while casting doubt on the intuition and hypothesis stating that the new CBA is having no effect on the competitive parity of the league across various market sizes.

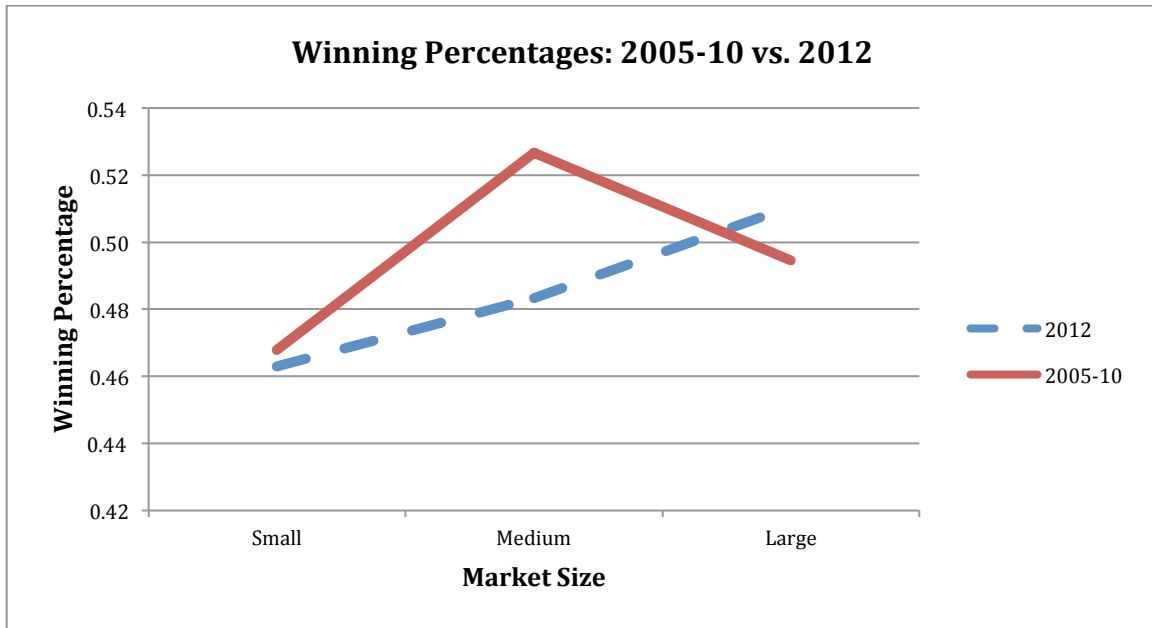
The results of the regressions using Forbes valuation as the dependent variable support the hypothesis that large market teams benefitted more from the signing of the new CBA than medium and small market teams did. This information is easier to interpret when presented visually. When charting the mean valuation from 2005-2010 vs. the mean valuation in 2012 we can observe a change. Taking this one step further, if we find the means during those time periods for large medium and small markets we can observe trend lines.



The trend lines support the data by illustrating that large markets seem to appreciate in value noticeably more than medium and small market teams. The steeper line between medium market teams and large market teams in 2012 lends support to this notion. Medium sized markets also appear to have increased in value at a larger rate than would have been predicted, but not to a significant extent. Additionally, the upward shift in the valuation line is evidence that paying players a smaller percentage of the revenue pie is having its intended affect of increasing overall league wealth. League wealth can be roughly measured by summing the valuations for each franchise; the sum of the 2012 values was \$15.13 million while the average sum from 2005-2010 was \$10.76 million. The decision by NBA owners to focus on financial stability during the negotiations for the new CBA appear to have been a very wise decision; it has greatly improved the value of their investments (franchises).

What this graph is really telling us, however, is that the large market teams benefitted the most financially from the signing of the new CBA. This is made more interesting when one considers the other provision of the new CBA, increased revenue sharing. Increased revenue sharing means that large market teams will likely be paying much larger portions of their profits into the league wide revenue sharing pool. This will invariably decrease franchise profitability. What the substantial uptick in valuations for large market teams tells me is that while large market teams may annually pay more to keep other teams afloat, that the league's new revenue model and the subsequent upticks in valuations have left the league in strong long-term financial health.

As much as the regression utilizing Forbes valuation as the dependent variable have helped confirm my intuition, the regression attempts using measures of competitive parity (regular season winning percentage & annual playoff wins) have challenged my intuition in a few ways. In regards to winning percentage, the visual support for the data is not as suggestive as it is for the Forbes valuations. The visual representation indicates that large market teams are winning a higher percentage of their games after the signing of the new CBA while the middle market and small market teams are losing a higher percentage. None of these trends, however, have been shown to be significant from the data and therefore are only potentially suggestive.



What this chart seems to suggest is that in 2012 large market teams won a larger percentage of their games at the slight expense of small market teams and major expense of medium market teams. This makes sense when you look at team-by-team win-loss records. During the 2012 season, the New York Knicks and Los Angeles Clippers experienced large upticks in their respective winning percentages. The winning percentage of these two teams was much higher in 2012 than it had been from 2005-2010. These winning percentages are largely a result of these teams attracting superstars. The Clippers drafted Blake Griffin in 2010 and during the 2012 season he emerged into a star. Additionally, the Clippers traded for Chris Paul, arguably the league's best point guard, prior to the 2012 season. These two events likely led to the team's improved success. Similarly, within the span of a year in 2011, the New York Knicks acquired Amare Stoudemire, Carmelo Anthony and Tyson Chandler. These superstars were the result of an overhaul to a Knicks roster that had been underachieving for most of the 2000's. The New York market in particular was attractive to Carmelo Anthony, one of

the league's top players. These three superstars have helped create a more competitive Knicks teams and have ignited a resurgence of fan support for basketball in New York.

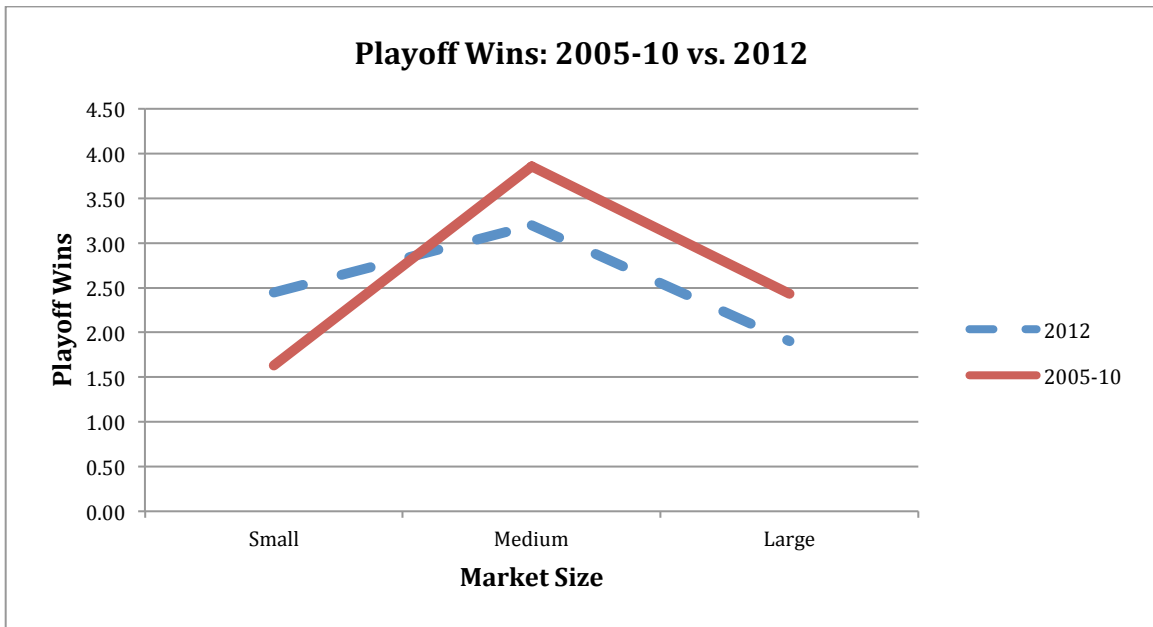
The Phoenix Suns and Cleveland Cavaliers can largely explain the downtick in average valuation for medium market teams. The Phoenix Suns fell victim to injuries and an aging team and as such won a much smaller percentage of their games in 2012 than they had from 2005-2010. The aging of Sun's point guard and two time league MVP Steve Nash also seemed to have contributed to the lower win total as Nash's statistics were much lower in 2012 than throughout the course of his career. Similarly, the Cleveland Cavaliers also won substantially fewer games in 2012 than they had from 2005-2010. This decline in performance can be attributed to LeBron James deciding not to resign with Cleveland in order to join forces with Dwayne Wade and Chris Bosh in Miami. Below is a table that groups each NBA franchise based on their market size.

Table 5.1: NBA Franchises & Market Size

| | | | | | |
|---------------------|--------------|------------------------|---------------|-----------------------|--------------|
| Chicago Bulls | Large | Atlanta Hawks | Medium | Charlotte Bobcats | Small |
| Dallas Mavericks | | Boston Celtics | | Indiana Pacers | |
| Houston Rockets | | Cleveland Cavaliers | | Memphis Grizzlies | |
| LA Clippers | | Denver Nuggets | | Milwaukee Bucks | |
| LA Lakers | | Detroit Pistons | | New Orleans Hornets | |
| New Jersey Nets | | Golden State Warriors | | Oklahoma City Thunder | |
| New York Knicks | | Miami Heat | | Orlando Magic | |
| Philadelphia Sixers | | Minnesota Timberwolves | | Sacramento Kings | |
| Toronto Raptors | | Phoenix Suns | | San Antonio Spurs | |
| Washington Wizards | | Portland Trail Blazers | | Utah Jazz | |

While looking at the average regular season wins for teams across various market sizes can be better explained by looking at the composition of these teams from a more qualitative standpoint. It is important to remember that the data is from only year of observations and is not significant, only suggestive.

Annual playoff wins are where the results begin to get especially interesting. Looking at the data one can see that large market teams playing under the new CBA actually had a significantly negative relationship with playoff wins at the 0.1 level. This means that large market teams were less likely to win playoff games than medium and small market teams after the signing of the new CBA.



At first this seems counterintuitive because the results for regular season winning percentage were lending support (albeit not significantly) to the opposite notion. When digging in to what actually happened in the 2012 playoffs, however, I discovered that the results made more sense when looking at the composition of the teams that succeeded. In the 2012 playoffs the two teams that won the most playoff games were the Miami Heat and the Oklahoma City Thunder. These teams are medium market and small market teams respectively. The fact that they accumulated 29 of the 84 total playoff wins starts to explain the story. Additionally, large market teams that had experienced new found

success in the regular season could not sustain it during the playoffs. The Knicks and Clippers combined for only 5 of the 84 wins. A playoff run by the San Antonio Spurs and an early exit by the Los Angeles Lakers provide further evidence of why the playoff success of large market teams declined as success for medium market teams rose.

This is a noteworthy trend. This means that market size does not significantly indicate playoff success, which at the end of the day is what every fan hopes for. What the data seem to indicate is that the teams with the best players do the best in the playoffs. LeBron James and Dwayne Wade lead the Heat while Kevin Durant and Russell Westbrook pace the Thunder. James is a 3-time league MVP and is widely considered the best player in the NBA. Wade is a premier shooting guard who has won 2 NBA titles and can attack the rim at will. Durant is the 3 time reigning scoring champion with a unique combination of size and outside shooting. Westbrook is an electric point guard and one of the league's fastest players. These are four of the leagues top players spread across only two teams. The Heat manufactured success by luring LeBron to Miami. Oklahoma City has built success by drafting well - selecting and grooming both Durant and Westbrook.

If there is one take away from the data surrounding parity it should be this point. Teams can either build or manufacture success. Large market teams are generally better suited to manufacture success owing to their ability to stomach luxury tax expenses. However, as the Miami Heat illustrate, where and why players choose to play is up to them. Increased revenue sharing can help ensure profitability for all teams, but the fact remains that the NBA is the professional league with the largest gap in talent (Berri et al..., 2004). This gap on talent is not something the league can control without radically altering the rules of basketball. In short, the teams that control the best players will win

the most games and titles. NBA history tells us that this is true. The silver lining for all of this is that any franchise has a chance to succeed on the court. It takes a combination of smart decision-making and a substantial amount of luck, but teams like Oklahoma City and San Antonio have shown repeatedly that smaller market teams can consistently compete on the court if they build their teams wisely.

6.0 Conclusions

The results of my thesis have left me aching for more data. The fact that I have only one year of data under the new CBA prevents me from feeling very confident in truly supporting or rejecting either of my hypotheses. However, many of my findings lend support to ideas that can have important implications for the NBA.

The results from the regressions on Forbes valuations suggest that large market teams are benefitting more from the signing of the new CBA than are teams in smaller markets. They are benefitting despite the fact that they have to share a larger percentage of their profits. The change in the league's revenue model combined with the results from 2012, the one season played under the new CBA, seem to strongly suggest that these valuations will not significantly change as more seasons under the new CBA are played. Future research might be geared towards understanding the tradeoff between increased valuations and revenue sharing paying particular attention to whether increased revenue sharing leads to a free rider problem.

The results surrounding competitive parity are much murkier since there is only one season of available and unlike for Forbes valuations, the changes the new CBA intended to bring about to address competitive parity are less tangible than a concrete change in revenue model. This prevents me from making any definitive conclusions since any season could theoretically be an anomaly. However, the data surrounding playoff wins provides an opportunity to discuss the fabric of current teams in the league. In general, playoff success is retrospectively a better measure for how good a team was than is regular season winning percentage. This likely has to do with the idea of players "rising to the occasion." The NBA regular season consist of 82 games over a grueling 7

months. Many teams use the regular season to discover their identity. Teams need to deal with things such as growing familiar with new players and battling through injuries. Furthermore, older teams may “coast” at times in an attempt to rest their players for the playoffs. The pool of talent in the NBA is such that in any year there seem to be only 5 or 6 teams capable of winning the title. Teams that feel they are in this inner circle care less about the regular season and instead use the regular season to prepare for the playoffs in whatever manner they see fit. Further research could be undertaken to better understand why regular season winning percentage and annual playoff wins are different across various market sizes identifying some of the reasons suggested are an explanation for this phenomenon.

The reason these results have left me hopeful is because they seem to reject my notion that large market teams are fundamentally better suited to win games and titles in the NBA. While the evidence can only suggest this, when you dig into the actual teams and trends in the league, like Miami and Oklahoma City, this notion appears to pick up more traction. On-court success in the NBA is about making smart decisions with personnel and attracting and retaining superstars. This task is admittedly easier for large market teams, but over time this advantage has not led to significantly greater success. The reason that large market teams have not been able to generate and sustain a competitive advantage is unknown, however, this might be attributable to a certain complacency by large market teams whose bankrolls allow decision makers to spend impulsively rather than rationally. This is another interesting area that future research could investigate.

In conclusion, I am pleasantly surprised with what I have discovered. It is not surprising that large market teams are significantly more valuable after the signing of the new CBA. The business model of the NBA is now much more attractive and sustainable for owners. Naturally, the markets best suited to success will be most rewarded by this structural change. I was, however, surprised to unveil findings that suggest that market size is not significantly related to playoff wins. My intuition may have been biased by the fact that my team, the Timberwolves, have made very poor personnel decisions over the past half-decade. This may have led me to devise plausible excuses for my team's lack of success. Whatever the reasons, it is comforting as an NBA fan to know that while large market teams may generate high revenues and high valuations, that doesn't always mean they will win more championships.

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Appendix A: Old CBA vs. New CBA

| | Old CBA | New CBA |
|-------------------------------|--|---|
| Length | 7 (opt out after 6) | 10 (opt out after 6) |
| Revenue Split | 57% | 50% |
| Revenue Sharing | Some funds from luxury penalties are redistributed | 3 times as many funds are redistributed |
| Required Team Spending | 75% of cap | 90% of cap |
| Luxury Tax | \$1 for every \$1 over cap | Incremental tax for every \$5million over cap, harsher penalties for repeat offenders |
| Max Contract Length | 6 years | 5 years |

Appendix B: Standardized Regressions

2005-2012 Forbes Valuations

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 0.000 | 0.031 | 1.000 | -0.054 | 0.061 | 0.375 | -0.170 | 0.048 | 0.001 |
| Winning % | -0.001 | 0.049 | 0.9815 | 0.010 | 0.048 | 0.833 | -0.038 | 0.035 | 0.277 |
| Playoff Wins | -0.122 | 0.049 | .013** | -0.091 | 0.048 | .062* | -0.039 | 0.036 | 0.279 |
| Year | 0.296 | 0.037 | .000*** | 0.292 | 0.036 | .000*** | -0.039 | 0.037 | 0.299 |
| Revenue | 0.607 | 0.091 | .000*** | 0.575 | 0.089 | .000*** | 0.404 | 0.067 | .000*** |
| Operating income | -0.167 | 0.070 | .018** | -0.191 | 0.069 | .000*** | 0.096 | 0.055 | .081* |
| Player Expenses | -0.369 | 0.070 | .000*** | -0.386 | 0.068 | .000*** | 0.046 | 0.060 | 0.448 |
| Gate Receipts | 0.495 | 0.084 | .000*** | 0.463 | 0.084 | .000*** | 0.333 | 0.062 | .000*** |
| All NBA | 0.057 | 0.045 | 0.205 | 0.078 | 0.045 | .085* | 0.053 | 0.033 | 0.115 |
| Arena Age | -0.069 | 0.038 | .072* | -0.022 | 0.039 | 0.582 | -0.044 | 0.029 | 0.129 |
| Team Age | 0.142 | 0.042 | .001*** | 0.151 | 0.044 | .001*** | 0.074 | 0.033 | .026** |
| Large Market | | | | 0.238 | 0.089 | .008*** | 0.003 | 0.070 | 0.965 |
| Medium Market | | | | -0.072 | 0.090 | 0.426 | -0.081 | 0.070 | 0.247 |
| New CBA | | | | | | | 1.027 | 0.139 | .000*** |
| <i>CBA*Large</i> | | | | | | | <i>0.860</i> | <i>0.159</i> | <i>.000***</i> |
| CBA*Medium | | | | | | | 0.202 | 0.157 | 0.201 |

2005-2012 Regular Season Winning Percentages

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 0.000 | 0.050 | 1.000 | 0.136 | 0.098 | 0.169 | 0.087 | 0.107 | 0.420 |
| Year | 0.070 | 0.057 | 0.2266 | 0.058 | 0.058 | 0.317 | -0.005 | 0.082 | 0.951 |
| Revenue | -0.191 | 0.143 | 0.184 | -0.137 | 0.143 | 0.341 | -0.167 | 0.147 | 0.259 |
| Operating income | -0.015 | 0.110 | 0.891 | 0.019 | 0.110 | 0.862 | 0.065 | 0.121 | 0.591 |
| Player Expenses | 0.006 | 0.109 | 0.958 | 0.037 | 0.108 | 0.734 | 0.108 | 0.130 | 0.408 |
| Gate Receipts | 0.346 | 0.122 | .005*** | 0.323 | 0.124 | .010*** | 0.308 | 0.126 | .015** |
| All NBA | 0.543 | 0.059 | .000*** | 0.519 | 0.062 | .000*** | 0.512 | 0.063 | .000*** |
| Arena Age | -0.178 | 0.059 | .003*** | -0.206 | 0.061 | .001*** | -0.211 | 0.062 | .001*** |
| Team Age | 0.142 | 0.065 | .032** | 0.153 | 0.070 | .030** | 0.140 | 0.072 | .052* |
| Large Market | | | | -0.324 | 0.142 | .023** | -0.325 | 0.154 | .035** |
| Medium Market | | | | -0.079 | 0.145 | 0.585 | -0.047 | 0.155 | 0.762 |
| New CBA | | | | | | | 0.370 | 0.309 | 0.232 |
| CBA*Large | | | | | | | -0.127 | 0.350 | 0.718 |
| CBA*Medium | | | | | | | -0.182 | 0.349 | 0.603 |

2005-2012 Annual Playoff Wins

| | Model 1 | | | Model 2 | | | Model 3 | | |
|------------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|--------------------|-----------------------|----------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> | <i>Coefficient</i> | <i>Standard Error</i> | <i>P-value</i> |
| Intercept | 0.000 | 0.050 | 1.000 | 0.064 | 0.098 | 0.517 | 0.037 | 0.106 | 0.726 |
| Year | 0.127 | 0.058 | .029** | 0.127 | 0.057 | .028** | 0.157 | 0.082 | .055* |
| Revenue | -0.330 | 0.144 | .023** | -0.271 | 0.143 | .059* | -0.248 | 0.146 | .091* |
| Operating income | -0.183 | 0.111 | 0.101 | -0.142 | 0.110 | 0.197 | -0.180 | 0.120 | 0.135 |
| Player Expenses | -0.289 | 0.109 | .009*** | -0.253 | 0.108 | .020** | -0.307 | 0.129 | .018** |
| Gate Receipts | 0.777 | 0.123 | .000*** | 0.786 | 0.123 | .000** * | 0.802 | 0.125 | .000*** |
| All NBA | 0.422 | 0.059 | .000*** | 0.365 | 0.062 | .000** * | 0.371 | 0.062 | .000*** |
| Arena Age | -0.172 | 0.059 | .004*** | -0.228 | 0.061 | .000** * | -0.224 | 0.061 | .000*** |
| Team Age | 0.190 | 0.066 | .004*** | 0.164 | 0.070 | .020** | 0.174 | 0.071 | .015** |
| Large Market | | | | -0.316 | 0.141 | .026** | -0.217 | 0.152 | 0.155 |
| Medium Market | | | | 0.120 | 0.144 | 0.406 | 0.153 | 0.154 | 0.321 |
| New CBA | | | | | | | 0.155 | 0.306 | 0.614 |
| CBA*Large | | | | | | | -0.586 | 0.347 | .093* |
| CBA*Medium | | | | | | | -0.257 | 0.346 | 0.457 |

Appendix C: Expected and Actual Relationship to Independent Variables

| Expected Relationship to Dependent Variable | | | |
|---|-----------|-----------|--------------|
| | Valuation | Winning % | Playoff Wins |
| Winning % | + | | |
| Playoff Wins | + | | |
| Year | + | n/a | n/a |
| Revenue | + | + | + |
| Operating income | + | + | + |
| Player Expenses | + | + | + |
| Gate Receipts | + | + | + |
| All NBA | + | + | + |
| Arena Age | - | n/a | n/a |
| Team Age | + | n/a | n/a |
| Large Market | + | + | + |
| Medium Market | n/a | n/a | n/a |
| New CBA | + | n/a | n/a |
| CBA*Large | + | n/a | n/a |
| CBA*Medium | + | n/a | n/a |

| Actual Relationship to Dependent Variable | | | |
|---|----------------|-----------------|-----------------|
| | Valuation | Winning % | Playoff Wins |
| Winning % | -30.926 | | |
| Playoff Wins | -1.087 | | |
| Year | -2.139 | 0.000 | 0.306* |
| Revenue | 1.622*** | -0.001 | -0.035* |
| Operating income | 0.616* | 0.001 | -0.041 |
| Player Expenses | 0.435 | 0.001 | -0.104** |
| Gate Receipts | 2.541*** | 0.003** | 0.218*** |
| All NBA | 9.310 | 0.113*** | 2.331*** |
| Arena Age | -0.525 | -0.003*** | -0.095*** |
| Team Age | 0.581** | 0.001* | 0.049** |
| Large Market | 0.379 | -0.050** | -0.946 |
| Medium Market | -9.981 | -0.007 | 0.667 |
| New CBA | 125.960*** | 0.056 | 0.673 |
| CBA*Large | 105.405*** | -0.019 | -2.555* |
| CBA*Medium | 24.720 | -0.028 | -1.121 |

