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The Effect Alternate Player Efficiency Rating Has on NBA Franchises Regarding Winning and Individual Value to an Organization

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The Effect Alternate Player Efficiency Rating Has on NBA Franchises Regarding Winning and Individual Value to an Organization

Society seems to measure success numerically. Whether it is how much money someone makes, how much money a company makes, how much someone owns, or what their status is in society, a numerical figure is used. For sport organizations, it can be argued that success is measured in terms of wins and championships. The NBA is no different; the success of an organization is measured in terms of wins and/or championships. In order to be successful, a sport organization must employ players to produce for their respective teams. Certain players are considered valuable "superstars" and known around the league while other players don't share in the same fame. Even though these players may not have a high level of fame, all players fulfill an important role for their team and contribute to the organization's success or lack thereof in terms of wins and revenue. Each player's statistics not only show a history of what they have done for teams but they also help predict what players are going to possibly contribute for their team for the upcoming season.

The common belief in the NBA that wins come from players scoring points, collecting rebounds, blocking shots, or making creative passes (Berri, 2007). But actually there is a deeper meaning behind that because it does not measure how productive or efficient a player really is when just looking at basic statistics. There are statistics that are recorded and looked at when discussing production and efficiency of players. These statistics are Alternate Player Efficiency Rating, Player Efficiency Rating, Value Added, Win Share, and Estimated Wins (Hollinger, 2009). All these statistics will be used to show that there are more important statistical categories to a team than scoring. These statistics will also help show how efficiency of the player's on the roster will translate to the organization being more profitable.

Literature Review

Teams can choose to spend their profits on player salaries. This can be done through free agency, which is a crucial part of the NBA's off-season. This time, known as the free agency period, gives players who are unrestricted free agents an ability to sign with any team in the league they want. This allows teams to try and sign that player to their roster for however long their contract the team would give the player states. However the teams cannot spend freely because the NBA controls how much money a team can spend on salaries in a given year by imposing a salary cap (NBA, 2012).

The free agency period for teams looking to buy players instead of grow players is crucial to compiling a roster in order to win games. If teams are looking to buy players, they will be more active in signing free agents because of the immediate impact those players will have. If teams are looking to grow players, they will not be as active with signing free-agent players instead they will look to grow and nurture the young talent they have for future success. The main difference between the two philosophies is that growing players is usually more cost effective than buying players. This is because when a team drafts a player, that player is usually signed to a contract with a low salary and many years. As that player grows, his skills improve but is still receiving low pay until his contract is up and resigns or that player restructures his contract with the team before it expires. When teams sign free agents they will look to sign a player that fit what their needs as a team are. Free agency not only benefits the player by allowing that individual to shop their services and talents around but also allows the team to build a roster to generate more wins and revenue for the organization (Diamond, 2012).

Demand for a "Superstar"

A fairly new trend beginning to take place in the NBA is assembling a team consisting of a few "superstars" per team that can go out and win games and compete for championships. The 2010-2011 season is evidence this trend now exists in the NBA with LeBron James and Chris Bosh signing with the Miami Heat and Carmelo Anthony and Chauncey Billups being traded to the Knicks. These transactions partially occurred due to management having many desires for acquiring a superstar player a including the desire for having a player who will help sell tickets for the upcoming season (Young, 2007). By trading for and signing "superstar" players, organizations are not only trying to be successful on the court but also off the court in regards to profit and generating revenue.

According to the article, "Stars at the Gate", the term "superstar" can be defined in different ways. The ways the authors studied them in the article was that a superstar is a player who has made the All-Pro team five times or, if he has only played a few years, dominates his position, a player who has played in the NBA All-Star Game for at least 50% of his years in the league, and if he was voted by the media to either the first or second All-NBA teams (Berri, 2004). Superstars are a desirable acquisition in the off season because they are usually great players and they are widely popular names and benefit the organization in many other ways such as bringing in more revenue, revenue is critical to the financial success of professional sport teams (Lawrence, 2009). Sometimes it is not always within budget to go after these "superstar" players, therefore team's need to look for player's who are efficient and productive but fit the budget an organization has to follow. All players have different but valuable skills teams could need or want. These skills allow players to fit into different roles. These different roles come together on a court to produce a win because of the different strengths. The literature suggests it

isn't the scorers who decide games, rather than it is the role players and non-scorers who end up deciding the game (Berri, 2006).

Player Efficiency

In order for teams to be successful, they need to have productive players on their roster. However it is difficult to measure the productivity of an individual who is participating in a team sport. This is because, in team sports, success of the team is measured through wins and losses. Individual player's productivity contributes to the team's success. However, it is not always direct effect because individuals can have a great game in terms of scoring, but the team still doesn't win the game. This leads to the importance of player efficiency. Player Efficiency is important because, in order to be successful, a team must capitalize on opportunities created by efficiency. However there is a statistic used for the NBA that does measure how efficient and productive NBA players are for their respective team. The statistic that was created by John Hollinger is called Player Efficiency Rating. The player efficiency rating, abbreviated PER, is an *estimate* of player per-minute productivity. This is compared to the Alternate Player Efficiency rating (APER) which measures a player's *actual* efficiency rating for the season that occurred (Hollinger, 2011). The PER and APER account for all the positives a player contributes: field goals, free throws, 3-pointers, assists, rebounds, blocks and steals, and negative ones such as missed shots, turnovers and personal fouls (Hollinger, 2011). These statistics are imperative to seeing how valuable a player is to their respective organization because it not only takes in account for all the positives and negatives but it does it on a per minute basis; therefore players of different minutes can be compared on a similar level. Allowing players of different minutes to be compared can benefit organizations or players in contract negotiations, trade value and free agency value (Hollinger, 2009). This is because if two players were free agents but

previously one had more playing time than the other, it would allow the organization to be able to compare them based on how efficient and productive each player was when they were in the game. It would give the organization an idea of which player would produce more. This isn't just to benefit organizations in free agency it could also be used when deciding which player to play based on who is more efficient.

Points scored are the most common statistic associated with players and a player who scores points can expect to receive a higher salary (Berri, 2007). However, previous research has shown that scoring is not the best statistic to show players productivity to his team's success. Scoring doesn't show efficiency like the PER and APER statistic does. A player could play a high number of minutes and take plenty of shots but that doesn't necessarily mean he makes more shots. Efficiency is important because it shows the players worth to that team (Berri, 2007).

Players in the NBA are known for different talents and value they add to the team because of the diversity of talent they each have. It is important to know the difference between a "starter" and a "replacement" player. A starter is a player that can produce for their team and is the best possible player at that position on a team's roster. A replacement player is a player who produces average statistics and is not the best available player on a team's roster. In order to calculate the player's worth to the team one must also look at the wins players generate for their team (Berri, 2006). Not only is the wins a player adds to their team (Win Share) important but more importantly is the statistic of estimated wins added to a franchise. This statistic shows how many wins a player can contribute over a "replacement player" (Pelton, 2009). The Win Share statistic shows directly how many wins a player contributes to his respective team (Basketball-

Reference, 2011). The Estimated Wins Added is the number of wins added by a player over what a replacement player would contribute.

When calculating a player's value to a team it is important to consider the Value Added (VA) statistic as well. This statistic, created by Hollinger, is to measure not only quality but also quantity (2009). According to Hollinger, Value Added takes the difference between a given player's performance and that of a "replacement level.". The result shows, theoretically, how many number of points the player added to his team's bottom line on the season (Hollinger, 2009). According to Hollinger, takes 30 points over the course of an 82 games season to generate one additional win. Scorers don't decide games. The literature suggests it is the role players who do; therefore, it is important to look at the other statistical categories such as assists, rebounds, steals that contribute to how points are scored. The PER, APER, and Win Share are statistics that do not revolve around scoring the most points. Instead they revolve around the quantity, efficiency, and productivity of every player in the NBA.

Impact on Franchise Economics

According to popular perception and the assertions of franchise managers, sports franchises in the United States are operated as for-profit businesses (Sale, 2009). In order for teams to generate a profit they need to intake revenue through different streams such as television contracts, gate revenues, concessions, and merchandise (Sale, 2009). Both on and off court elements of NBA players contribute to organizational profit margins and revenues. There is a relationship that a player's total salary cost and a team's financial success as measured by operating income (Sale, 2009). If a player brings in more money than what they are earning from the team through their salary, than that player is a valuable asset to the organization. If a player is costing the team more money because they aren't generating more revenue than for

what they are getting paid; they aren't much of an asset to the organization (Gennaro, 2007). A player's "salary" includes total player salary cost includes salaries, benefits, bonuses, and penalties incurred as a result of exceeding the team's salary cap (Sale, 2009). Teams are willing to incur these costs in order to be successful. This is because the more wins a team has will correspond to having more profit, but only to the extent that the victories may be achieved without excess player salary cost (Sale, 2009). If teams have to allocate more money to players it will cut into their profit margin. Organizations who can't afford to have this happen because they don't have much of a profit margin to begin with, need to rely on having more efficient players on their roster.

A way teams can increase their revenue is to make the post-season. Making the post-season impacts not only league revenue but also affects the utility generated for both participants and observers of professional sports (Robst, 2011). In order for teams to compile a roster that will be competitive enough to take the franchise to the playoffs, teams must determine the optimal strategy for maximizing their probability of success (Robst, 2011). In order for teams to maximize their probability of success, they need to evaluate how to allocate their resources. Teams then have to decide which will generate the highest return. According to Robst, one additional playoff win generated an average of more than one million dollars in gate revenue from the 1992-1993 to 1995- 1996 seasons translating to the estimate that a franchise would need fourteen regular season victories to generate an equivalent level of gate revenue (Robst, 2011). The value of this implemented by Robst shows how important making the playoffs really is. It is a tremendous boost in revenue and can only be achieved by assembling a roster that will perform efficiently night after night while making sure the costs stay low in order to maximize profit margins.

Teams that fail to be successful, in terms of wins and maximizing profits, encounter many problems, some of which are hard to overcome. These problems include but aren't limited to teams met with a loss of revenues and employment, but also public derision via various media outlets (Berri, 2007). Organizations do have times where they experience consecutive unsuccessful seasons. This makes it hard for some NBA franchises to reach success again in the short term because it is more difficult to get great scoring players. This is most likely because players don't want to be associated with a team suffering through that negativity year after year. This fact can be seen almost every year through the signing of free agents. But as seen over the course of the past three NBA seasons, individual scoring doesn't guarantee team success. Berri also discusses that it is not the players, the star power, or offensive power that sell tickets but rather it is how many wins a franchise has that drives revenue (2007).

In order for teams to maximize their profits it will be important for them to look at the efficiency of players. This research will examine a player's value to their respective organization in terms of wins, points, and revenue. In order for teams to maximize their profits it will be important for them to look at the efficiency of players. This research will examine a player's value to their respective organization in terms of wins, points, and revenue. Team financials will be examined to see how much revenue is being generated for that organization and the relation to the Team's Valuation ranking. The project attempts to assess whether a player's PER and APER statistic and their salary correlate to the success of an NBA franchise in terms of wins, and revenue generated.

Method

Participants

All NBA players and teams that made the playoffs from the 2007-2008 season until the conclusion of the 2010-2011 season are used as subjects in this study. These individuals are the focused of the study because of the significance the 2007-2008 season had. This season has left an imprint on the NBA and has changed the focus of almost all front office strategies. Prior to the 2007-2008 season was when the "Big Three" for the Boston Celtics were assembled with one goal in mind, to win a NBA Championship. The Big Three refers to the "superstars" Paul Pierce (drafted by the Celtics in 1998), seven time All Star Ray Allen (acquired in a trade with Oklahoma City then the Seattle Supersonics at the time), and ten time All Star/ former League MVP Kevin Garnett (acquired via a trade with the Minnesota Timberwolves) (NBA, 2012). The "Big Three" and the Boston Celtics achieved that season what they were assembled to do, they won the 2008 NBA Championship.

Over the course of the 2009 and 2010 seasons it was shown through other trades and attempts by organizations to do the same thing. In February of 2008, the Los Angeles Lakers added All Star Pau Gasol to their roster already consisting of Derek Fisher and Kobe Bryant (NBA, 2012). In the summer of 2010, the strategy of the Big Three came to Miami. Free agent All Stars Dwayne Wade, Chris Bosh and Lebron James all decided to sign with the Miami Heat (NBA, 2012). The summer of 2010 also was when Amare Stoudemire signed as a free agent to the New York Knicks. This was the same season that brought Carmelo Anthony to the Knicks (NBA, 2012). Since the trend outlined above has changed the way organizations have approached free agency and trades, it is an accurate assumption that the 2008-2011season

statistic shows the effect the efficiency and productivity statistics of PER, APER, and Win Share have on an organization in terms of wins revenue generated, and an organization's valuation.

Variables

The variables for this research are the NBA organization, the different seasons (2008-2011), the sum of each team's Alternate Player Efficiency Rating, the sum of each team's Player Efficiency Rating, the team's average Win Share per player, the team's regular season win total, the organization's revenue total, and the team's valuation ranking for each season. The player efficiency rating, which is abbreviated PER, is an *estimate* of player per-minute productivity. This is compared to the Alternate Player Efficiency rating (APER) which measures a player's *actual* efficiency rating for the season that occurred (Hollinger, 2011). The Win Share statistic is the wins a player adds to their team. The team's regular season win total is the number of games the team won during the regular season. The organization's revenue total and valuation ranking show much revenue was generated by each team for that year and also what they were ranked by Forbes.com based on economic factors such as revenue, operating income, and profit.

Data Collection Procedure

The data was acquired from different reputable sources to ensure the most accurate information was being used in this procedure. There was one website that provided all the statistical information for the APER, PER, and WS. ESPN's data is available on their affiliate website, hoopdata.com, and it was gathered by looking up the individual players, the team, and the season. Also ESPN had rosters listed from the 2008-2011 seasons on the website. This is beneficial to see which players played for which teams during what seasons. ESPN's data was sorted into two categories: the regular season and the post season. In order for the data to be accurate for all teams, the regular season statistics are the focus for this analysis.

The other source that played a major role in this data collection is Forbes.com. Forbes had data sets for NBA Team Valuations which are the financial information for all NBA franchises, specifically the revenue generated for each team, as well as current value, debt/value, and operating income of every organization. This information is available for all the years this study focuses on and provides sufficient information regarding each team's financial status for each respective year and how they rank among the rest of the teams in the league.

Data Analysis

The data is analyzed a few ways. One analysis is done by taking the sum of the PER and the APER and average of the Win Share statistics for each team over the past four seasons (2008-2011) and applying it to how successful their team was in terms of wins, revenue generated, and the team valuation ranking in those same years. The sum of the teams' APER and PER statistic was used because it showed the collective efficiency of the team. This allowed for comparison across the league to show the probability of the team's success. The summation was done by creating a correlation chart listing each variable so the correlations could show the significance to the other variables. The collective team statistics (APER & PER) were correlated with revenue generation, win share, regular season wins, and team valuation. Wins can be attributed to teams being efficient and maximizing on the opportunities they create during a basketball game. This efficiency can be calculated through the APER; therefore, the higher the APER, the more wins a franchise can have, the more wins the franchise has the more successful they will be on the court. Another method that is used is to analyze the Win Share variable with the regular season wins total, the revenue total, and the valuation rank to see the correlation that exists.

Results

The data analysis was able to answer the question of whether or not a player's PER and APER statistic was a significant contributing factor to an NBA franchise in terms of wins, revenue generated and valuation ranking of the team. The research shows that the APER and PER statistics only correlate with each other and do not have any significant effect on a player's Win Share, an organization's total regular season wins, the organization's revenue, and the valuation rank of that player's organization (see Appendices A-D). The correlation between APER and PER revealed a very high correlation (r=.993). The hypothesis that the APER and PER would correlate with the other variables: Win Share, win totals, revenue generated and valuation rank is not supported by the data; however, the data did show other correlations between the variables.

There is a significant correlation between a player's Win Share and the amount of wins a team has in the regular season. This Pearson Correlation is equal to a r=.295 ($p<.05$). Based on the research, it can be said that if a team wants to win games, then they need to acquire players with a high Win Share statistic and release the players with a low Win Share. By doing this, teams would increase their regular season win total. Another correlation in the data is between the regular season wins and the amount of revenue the organization makes in a season. Based on this correlation, (r=.308), it can be said that the more wins a team has in the regular season, the more revenue that team will generate over the course of that season. Having more regular season wins also correlates to having a higher valuation rank. Based on the research teams can see that the more games they win in the regular season, the better economics they will have (r=.360, $p<.01$). The final analysis was conducted between the revenue organizations generated for that season and their valuation rank. This is the strongest correlation in the research and shows the

amount of revenue a team generates will dictate whether or not they have a high valuation rank or low valuation rank (r=.847).

Discussion

The data shows that a player's efficiency and productivity doesn't correlate to having a significant effect on their respective organization. Instead the data says that the only correlation of significance is with the Win Share statistic. This statistic correlates to the regular season win totals which effects total revenue generated, which then affects the organizations valuation total. Therefore it is not the productivity or efficiency that has a significant effect on their organization; rather it is the player's ability to win games for their organization that is the significant factor.

The data did show some unexpected trends. Aside from the APER and PER statistics not correlating significantly with the other variables, there were also some negative correlations. There was a negative correlation between regular season wins and team valuation and also between revenue generated and team valuation. Since this is a negative correlation there is something causing the negative effect between the correlated variables. These negative correlation for between these variables could be for numerous reasons. One reason could the organization is not operating to ensure the maximum amount of revenue possible is generated. They could be focused on other aspects of the business such as signing superstar players and lowering ticket prices in order to fill seats for home games which lowers the revenue they could potentially generate. Another reason could be market size. When collecting the Team Valuation data, there was a trend that the larger markets had a higher valuation rank and the smaller markets had a lower rank. Usually those teams had more wins as well but there were several teams in the top ten in valuation that were not in the playoffs for that given year and there were

several teams in the bottom of the valuation rank that had a high number of wins and in the playoffs. Another reason for this negative correlation could be because of the economy. Over the last four years, the economy in the United States has not been very stable. There have been constantly changing prices and unemployment rates rising. This could account for the negative correlation because even though the team is successful on the court fans may not be spending money like they used to because of tough financial times; therefore, revenue for the organization decreases.

Limitations

There were some limitations that came with this research. The research only shows teams that made the playoffs. This is a limitation because it doesn't show a full study of the thirty teams over the last four years. If these 120 teams were represented by the data then the correlations would have been stronger or different. It could have been stronger because it could provide more support and a higher correlation; different because it could have shown other correlations. The other limitation would be how the APER and PER data was summed instead of averaged. This would have made a difference because some rosters were larger than others. If the APER and PER statistics were averaged than it would not have mattered how many players were on the roster or not because it would be fair to divide the total APER and PER by the number of players so teams were not at a disadvantage by having less players.

Future Directions

This research could be continued to adjust the method so that way the limitations are reduced. If this research is continued then the data can easily be averaged instead of summed. Also more data should be included to include scoring as a variable. One thing that would be done differently next time is to include scoring. The assumption that scoring wasn't significant

in the correlation between the other variables was made because of past research. One of these trends was in 2011 the Dallas Mavericks had the highest team APR and they won the NBA Finals that year. Past research also showed that only three players since 1950 have ever won the Scoring Title and NBA Finals in the same season. These three players are Kareem Abdul-Jabbar, Shaquille O'Neal, and Michael Jordan. It was determined not to use scoring because those trends showed APER had more of a recent impact on success than scoring did. Scoring should be correlated to all the other variables (PER, APER, WS, Regular Season Wins, Revenue and Valuation). Since there was no correlation between APER and PER with the rest of the variables, scoring may be found to have a significant relationship with those variables. If so, this would explain why there is so much emphasis on scoring throughout the NBA. While conducting research for the effect APER and PER has, there was no research that emphasized this notion of scoring being more important than efficiency. Also future research should include all thirty NBA basketball teams and not only the ones that make the playoffs. This would then show league wide trends and correlations instead of just with playoff caliber teams.

Conclusion

Even though efficiency and productivity, the APER and PER statistics, did not correlate significantly with franchise economics there was a correlation between the Win Share statistic and wins in relation to franchise economics. Players contribute these wins to their team not through efficiency and productivity, but possibly through another variable or statistic. These wins contributed by the players turn into wins for the organization which then turns into more revenue for that respective organization.

This research demonstrates that some player statistics do have a correlation with franchise economics. Statistics such as the Win Share can be used by organizations to sign or

trade for players that fit what the organization is looking for in terms of wins. By knowing an estimate of how many wins an organization will have in a season, franchises can project the amount of revenue they will generate. This will allow organizations to plan their costs, like contracts, accordingly. A team can use that information, the estimate of wins and revenue generated, to compete against the other teams for success both in terms of wins and revenue.

Based on this study teams can use the correlation between revenue and valuation ranking to estimate their financial success compared to the rest of the league. Since organizations will be able to estimate and predict their financial information based on the Win Share, the Win Share is an important and significant statistic that can be used by any basketball organization to not only predict success, in wins and revenue. Based on the correlations and the significance of the data, it can be shown that teams that win more games generate more revenue. Teams should use this information to coordinate front office efforts that will win games to generate more revenue. Teams can also use this information to see if they are spending money efficiently. If there is a negative correlation then teams are spending their salary cap inefficiently causing them to lose money or not generate many wins. If teams are spending their money efficiently, they will see a positive return in terms of wins and revenue generated.

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Appendix A
Team Information by Year

Team	Year	APER	PER	Win Share	Regular Season Wins	Revenue Generated (millions)	Team Valuation Rank
ATL	2008	188.78	186.35	3.37	37	102	21
BOS	2008	195.85	191.81	3.97	66	149	9
CLE	2008	198.63	206.46	2.87	45	159	5
DAL	2008	229.19	225.37	3.24	51	153	7
DEN	2008	192.8	193.87	3.74	50	112	19
DET	2008	244.91	243.96	3.4	59	160	4
HOU	2008	325.13	336.03	3.2	55	156	6
LAL	2008	257.14	258.28	4.61	57	191	2
NOH	2008	200.65	207.33	3.69	56	95	28
ORL	2008	209.38	214.41	3.53	52	100	17
PHI	2008	186.35	189.07	3.11	40	116	13
PHO	2008	222.07	226.22	4.82	55	148	8
SAS	2008	213.73	223.78	2.95	56	138	10
TOR	2008	225.63	227.12	3.33	41	138	11
UTH	2008	183.2	178.86	3.92	54	119	14
WAS	2008	181.68	182.71	4.19	43	118	15
ATL	2009	183.19	178.7	3.42	47	103	21
BOS	2009	210.83	215.02	3.63	62	144	8
CHI	2009	240.7	239.67	3.76	41	168	3
CLE	2009	185.28	192.52	3.67	66	159	5
DAL	2009	195.42	197.16	3.6	50	154	7
DEN	2009	202.81	205.69	3.54	54	115	17
DET	2009	213.72	210.32	3.84	39	171	4
HOU	2009	229.5	230.27	3.67	53	160	6
LAL	2009	190.36	199.74	3.82	65	209	1
MIA	2009	210.89	211.61	3.55	43	126	12
NOH	2009	182.71	185.19	3.63	49	95	28
ORL	2009	213.74	215.03	3.94	59	107	13
PHI	2009	177.02	180.31	3.88	41	115	14
POR	2009	197.62	198.11	3.42	54	121	16
SAS	2009	294.99	299.85	3.15	54	133	10
UTH	2009	203.48	202.28	4.05	48	118	15
ATL	2010	184.55	184.42	3.64	53	105	23

BOS	2010	198.96	201.31	3.16	50	151	4
CHA	2010	281.89	279.07	3.56	44	98	25
CHI	2010	198.21	197.56	3.29	41	169	3
CLE	2010	208.58	210.24	3.99	61	161	15
DAL	2010	240.82	241.05	4.1	55	146	6
DEN	2010	175.74	177.51	4.41	53	113	20
LAL	2010	171.32	173.6	4.26	57	214	2
MIA	2010	174.68	172.69	3.4	47	124	7
MIL	2010	214.38	210.51	2.8	46	92	30
OKC	2010	227.56	227.31	3.26	50	118	18
ORL	2010	184.44	185.91	4.59	59	108	11
PHO	2010	199.86	197.99	4.09	54	147	8
POR	2010	250.35	250.44	3.93	50	127	14
SAS	2010	247.23	246.62	3.4	50	135	9
UTH	2010	217.2	212.72	4.11	53	121	16
ATL	2011	214	206.29	3.56	44	109	28
BOS	2011	248.16	249.52	3.52	56	146	5
CHI	2011	186.47	190.91	4.16	62	185	3
DAL	2011	254.85	259.2	3.57	57	166	4
DEN	2011	276.29	279.42	4.43	50	113	21
IND	2011	193.37	189.89	3.48	37	101	25
LAL	2011	206.08	204.89	3.66	57	208	1
MEM	2011	250.74	246.95	2.98	46	99	29
MIA	2011	191.27	197.48	3.94	58	158	6
NOH	2011	211.31	215.35	2.93	46	109	24
NYK	2011	251.96	254.42	3.89	42	244	2
OKC	2011	207.59	212.53	3.58	50	126	15
ORL	2011	209.48	209.96	3.98	52	140	11
PHI	2011	168.91	169.05	3.4	41	116	22
POR	2011	194.79	190	3.39	48	132	13
SAS	2011	221.96	220.78	2.9	61	139	9

Appendix B

Correlation between Statistics and Data

	Total APER	Total PER	Win Share	Reg. Wins	Revenue
Total PER	.993**				
Win Share	-.115	-.113			
Reg. Wins	.041	.083	.295*		
Revenue	.140	.168	.214	.308*	
Valuation Rank	-.125	-.158	-.194	-.360**	-.847**

Note: Numbers in the table indicate a Pearson Correlation.
** Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).