

Evaluating NBA Player Value

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Executive Summary

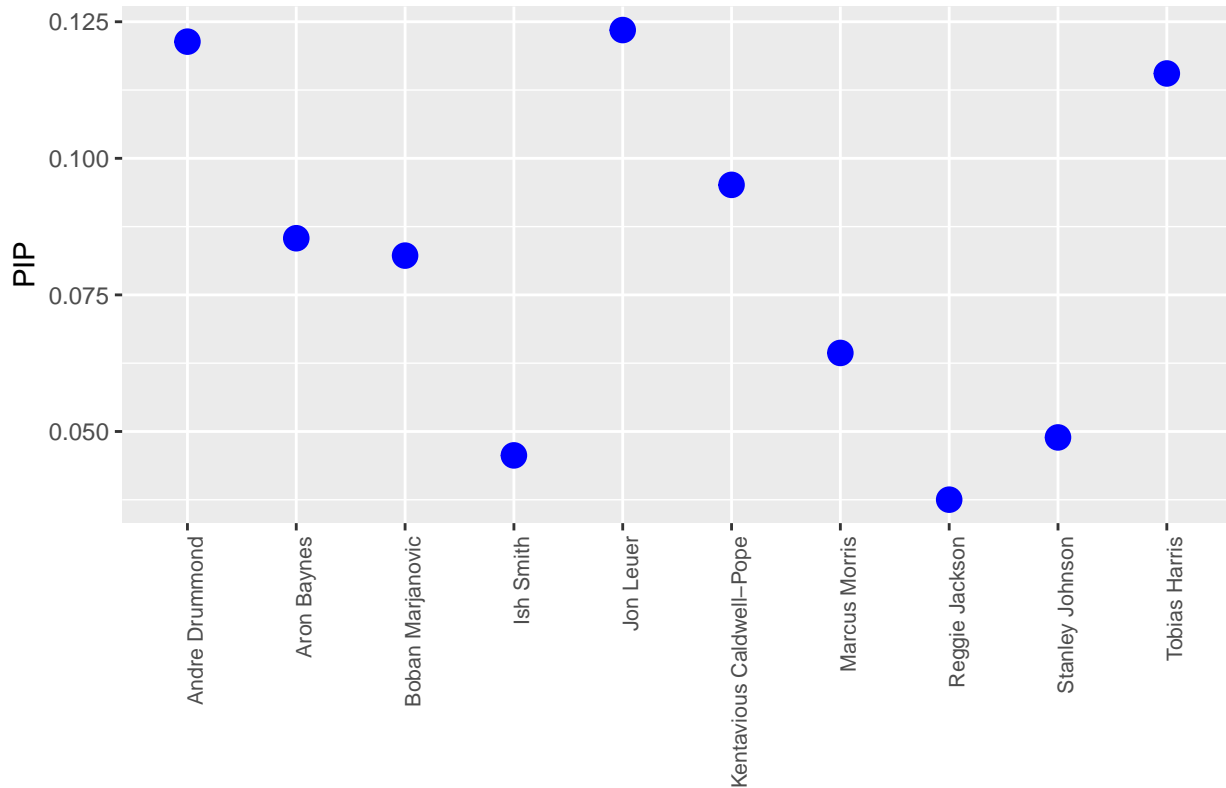
The purpose of this assignment is to develop a single metric to assess an individual player's performance contribution to team output in relation to their salary earned in the current season. This study will explore the 2016-17 Detroit Pistons through the first 46 games of the regular season, and will offer value to front office executives in providing a single measure that will enable the team's coaching staff and player personnel managers to better identify the value of each player's on-court output in relation to the money earned across each spot on the roster. Although there are currently a number of advanced statistics that measure player performance as a measure of team success, this study attempts to further explore this topic with the objective of providing additional context to more accurately assess player value.

In order to develop this metric this research will utilize Win Shares, an advanced statistic that estimates the number of wins contributed to the team by each player. Win Share is computed by calculating the marginal points scored and marginal defensive points allowed while each player is on the court. Additionally, we will leverage each player's minutes per game statistics. Together, these stats will combine to provide a single metric that enables front office management the ability to evaluate whether or not their current dollars are being spent efficiently, as well as in identifying under-valued assets who over-perform their worth who currently have contracts with outside of their specific organization. This newly developed metric, is visualized below and provides context to each player's Win-Share rate in relation to their Minutes Player per Game which provides a new method of assessing a Players' Performance Impact Value.

Results

In reviewing the results below, the primary player that stands out is Jon Leuer, who appears to contributing the highest impact value to the team. This is surprising first, because he is a role player who currently comes off of the bench to serve as the back-up Power-Forward. Secondly, Leuer is currently the fourth highest player on Detroit's payroll, and is currently producing at a level higher than the player he's replacing, Tobias Harris, who occupies the starting Power-Forward and the 2nd highest payroll on the current roster.

Figure 1: Detroit Player Performance Impact Value



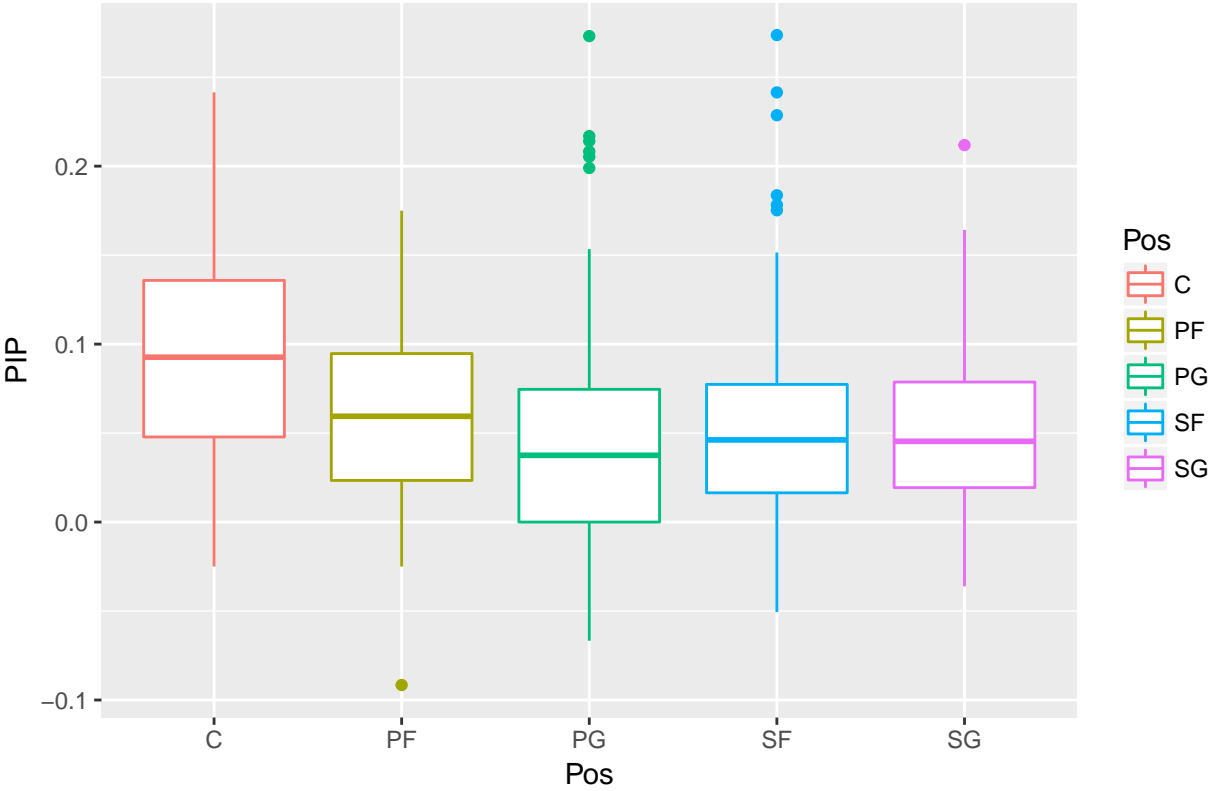
Additionally, this visual makes it evident that the team is currently under-performing at the Point-Guard position. This might be expected, due to the time missed to injury by Reggie Jackson at the beginning of this season. However, since re-joining the team and serving quality ‘starter-like’ minutes since his return, it’s clear that Reggie Jackson is not giving the team the value we’d hope for at the number one Point-Guard position. This is true for two reasons: First, this metric yields equal comparison to Win-Share contribution as it is adjusted for minutes played per game by each player, and we can see that Ish Smith is currently contributing at a higher rate than Jackson. Secondly, if we take Reggie Jackson’s salary into account, he is our third highest player on the payroll, yet contributing at a rate that is less valuable than any of our top ten players in terms of salary earning for the current year. This analysis can be further validated in reviewing the results given in Appendix A and Appendix B, which also factor in USG per Salary Earnings Ratings.

Strategic Recommendation

With NBA Trade Deadline rapidly approaching on February 23rd, there will be a number of potential offers on the table that will require critical decisions to be made, and each of these decisions will each require an honest evaluation of the involved trade-offs. Having said that, it is apparent that the Detroit Pistons are currently over-paying at the Point-Guard position, and have one player in particular, who is currently earning far-above the value he is contributing to the team.

Due to the fact that Reggie Jackson’s replacement isn’t quite fulfilling the value on his own, the recommendation in trading Jackson should only be considered if there is additional value to gain in his potential replacement. With that said, the overall recommendation for the current season is to stay the course, and delay an decisions until the season commences. At which time, the franchise can weigh the value of potential draft candidates at the point guard position, while also considering value provided to other organizations with the assets who currently show promise at positions beyond the Point-Guard role.

Figure 2: NBA Player Performance Impact Value by Position



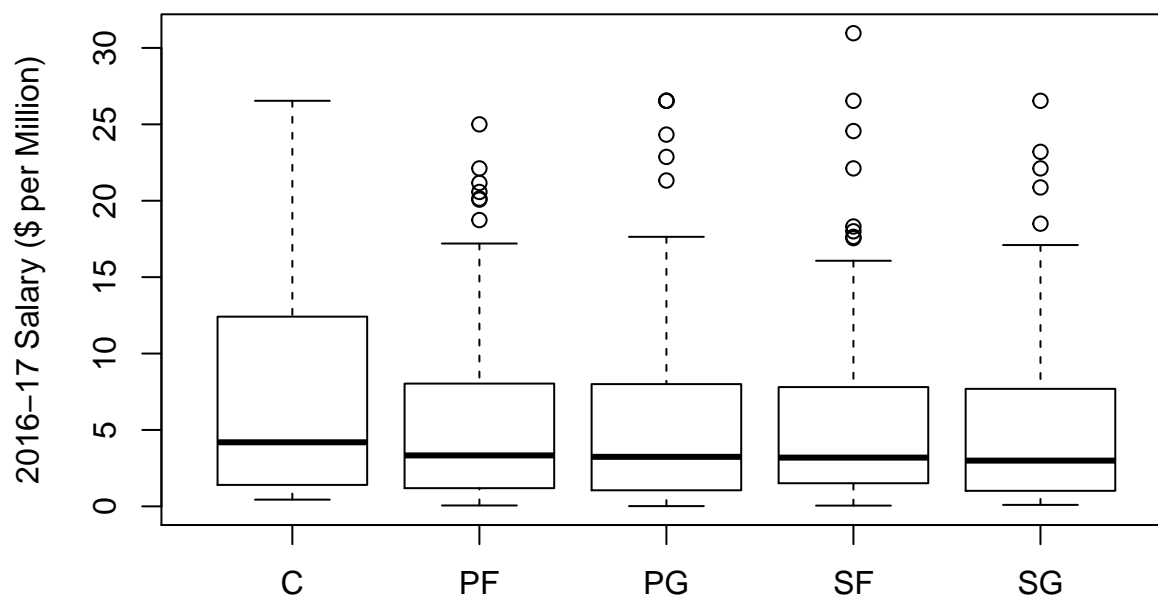
Appendix A

Table 1-A: Detroit Player Impact Performance Value

PIP Rank	Player	PIP Rating	16-17 Salary
1	Jon Leuer	0.12347	10.9
2	Andre Drummond	0.12135	22.12
3	Tobias Harris	0.11553	17.2
4	KCP	0.09514	3.6
5	Aron Baynes	0.08537	6.5
6	Boban Marjanovic	0.08219	7.0
7	Marcus Morris	0.06437	4.6
8	Stanley Johnson	0.0489	2.9
9	Ish Smith	0.04562	6.0
10	Reggie Jackson	0.03751	14.9

The results of Detroit's Player Performance Impact Value to the team are illustrated above in Figure 1, which shows the top ten roster spots in terms of the 2016-17 Salary earned.

Figure 1-A: Earnings by Position: Entire NBA



In reviewing the results from the Figure above, we can compare those results with the makeup of the current Pistons roster below in Figure 2-A.

Figure 2-A: Earnings by Position: Detroit Pistons

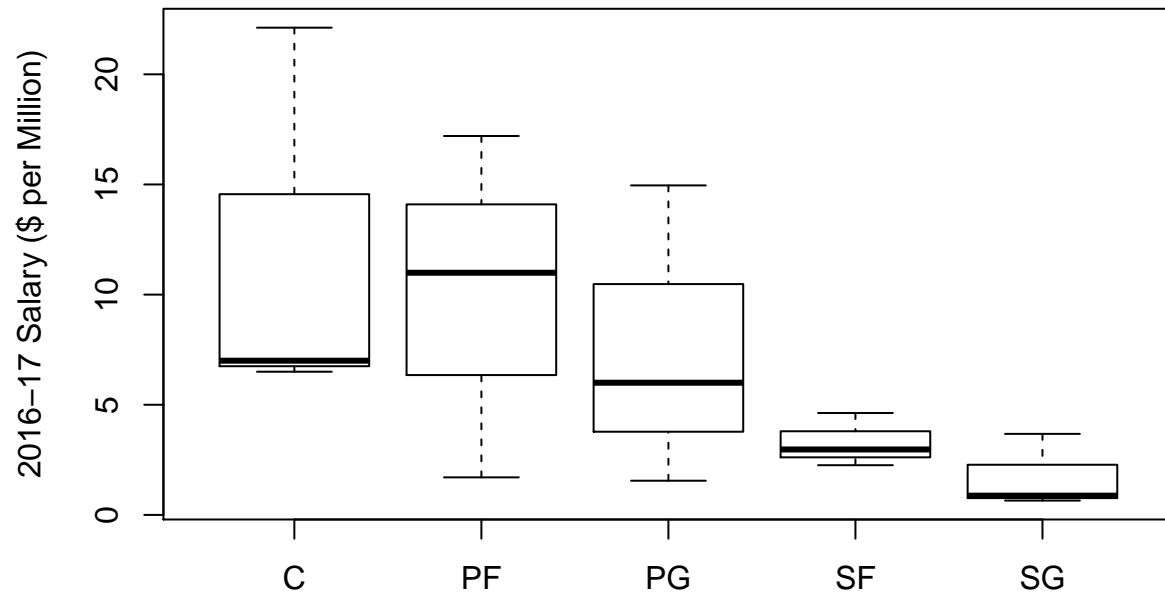


Table 2-A: Win-Share by Position

Win-Share by Position	Point Guard	Shooting Guard	Small Forward	Power Forward	Center
NBA Average	3.2	3.4	2.9	3.2	2.8
Detroit Starting Five	1.1	3.2	2.1	3.8	3.7

Table 2-A, indicates that the Piston's roster is less effective in Win-Share contributions at the point guard, shooting guard, and small forward positions, while also highlighting a greater effectiveness of Win-Share contributions at the power forward and center positions.

Table 3-A: Pearson's Product-Moment Correlation to Win-Share

Correlation Rank	Predictor Value	Correlation to Overall Win-Share	T-Statistic	p-Value
1	Offensive Win-Share	0.9556075	68.877	< 2.2e-16
2	Points Scored	0.8474175	33.896	< 2.2e-16
3	Defensive Win-Share	0.8146919	29.835	< 2.2e-16
4	Minutes Played	0.7713036	25.736	< 2.2e-16
5	Box Plus-Minus	0.6698258	19.411	< 2.2e-16
6	Player Efficiency Rating	0.6649388	19.156	< 2.2e-16
7	Player Salary	0.6148886	16.777	< 2.2e-16
8	Games Played	0.5689389	14.692	< 2.2e-16
9	Player Usage Rating	0.4448690	10.549	< 2.2e-16
10	Effective FG Rate	0.2987801	6.7294	5.058e-11

Figure 3-A: Detroit Player Usage Rating Through 46 Games 2016–17

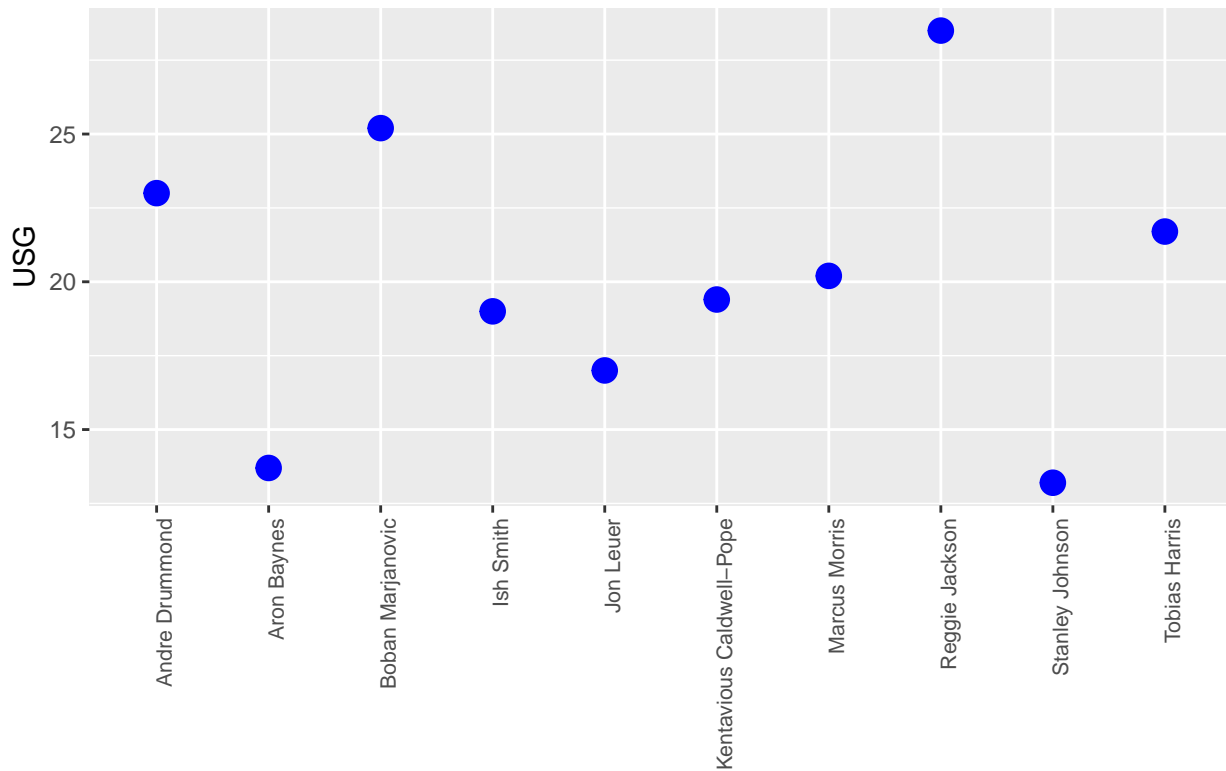


Figure 4–A: Detroit Player Win–Shares
Through 46 Games 2016–17

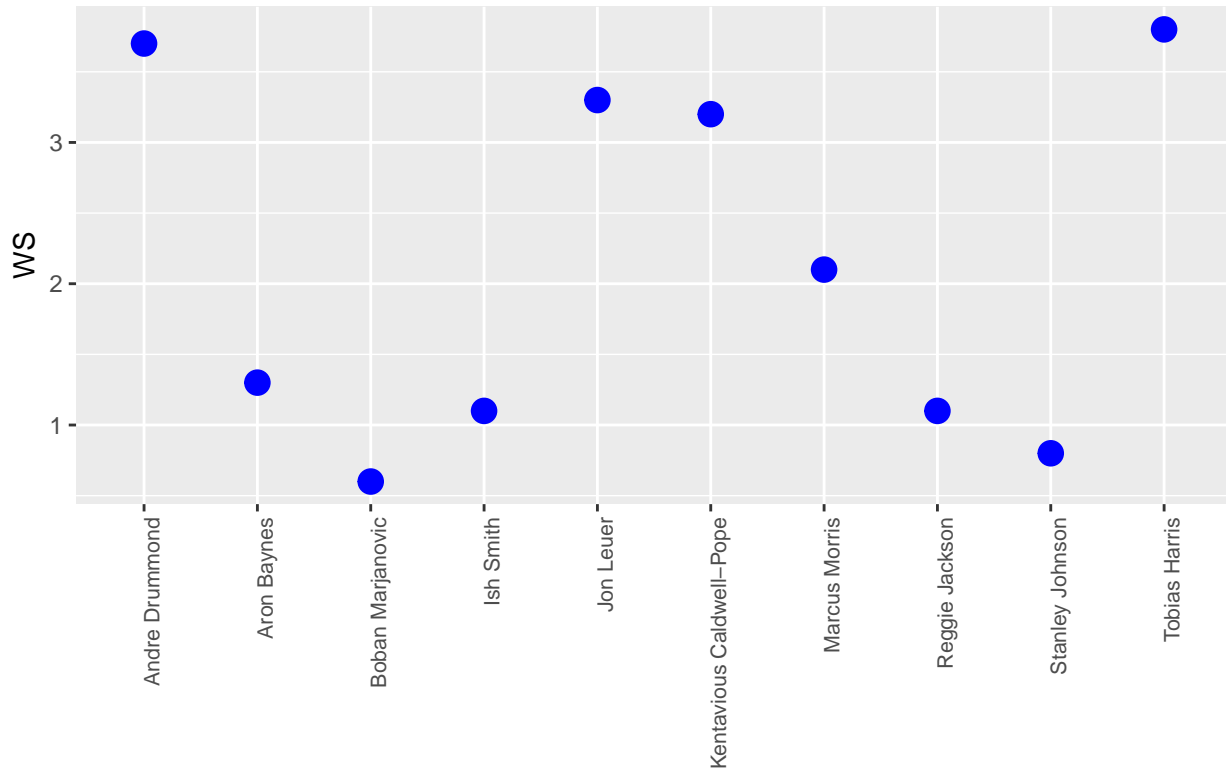


Figure 5–A: Detroit Player Win–Share per 48 Mins
Through 46 Games 2016–17

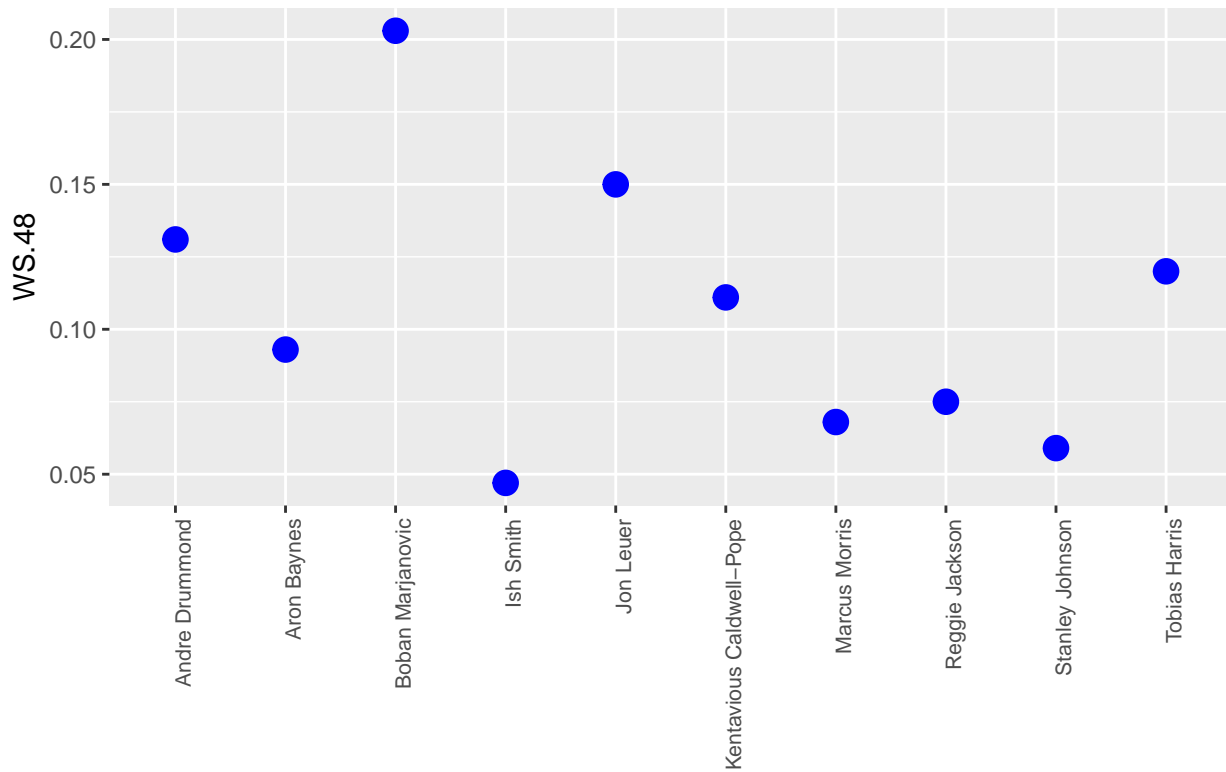


Figure 6–A: Detroit Player Cumulative Minutes Played Through 46 Games 2016–17

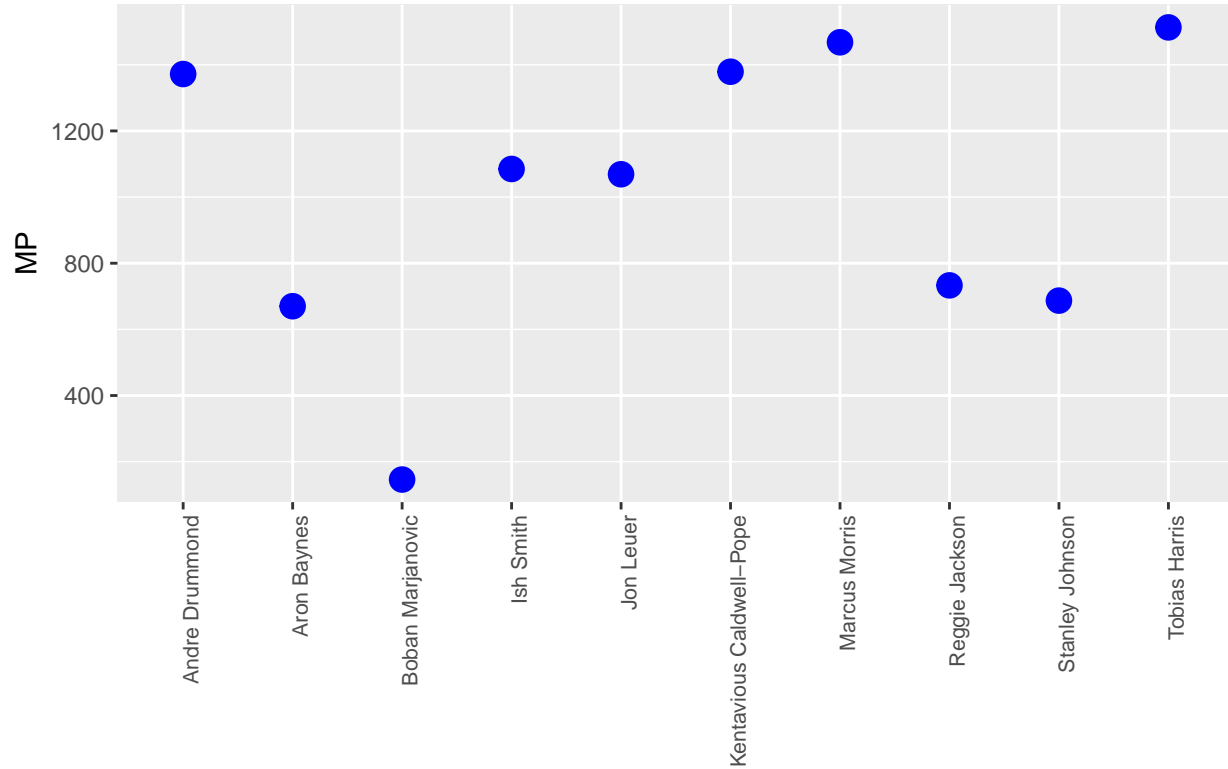


Figure 7–A: Detroit Player Minutes per Game Through 46 Games 2016–17

