

Using “Total Value Added” to Analyze the Contract Year Phenomenon in the National Basketball Association

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Introduction: There is a widely held belief among fans of professional sports that players perform better in the final year of their contract. I will use a formula that I have developed, Total Value Added (TVA), to give a new perspective on this phenomenon. Although this topic has been researched in the past, it may be helpful to look at it with recent results and with different measures of performance. I will use TVA to try to determine if there is a statistically significant difference in the performance between players in a contract year and those that are not.

Methods: I performed a statistical analysis of NBA Player Performance using TVA, comparing the TVA/minute of the population vs those of players in contract years to identify any statistically significant difference. I did this by finding and categorizing contract status for the 2021/2022 season (<https://www.spotrac.com/nba/free-agents/>), then calculating the final TVA for each player at the end of the season. As there are fewer than 600 total players in the NBA, I used the entire population and did not require a sampling strategy. My first step in the data process was to download the complete 2021/2022 season statistics for every player from basketball-reference.com and create an Excel file. Next, I used my formula to calculate TVA, which is $\text{Points} + \text{Defensive Rebounds} + 2 * (\text{Offensive Rebounds} + \text{Assists} + \text{Steals} + \text{Blocks}) - 2 * (\text{Turnovers})$. At this time, I also obtained the list of all 2022 Free Agents from spotrac.com and added contract status as a column on the spreadsheet. From there, I did a one sample t-test to measure the group of restricted and unrestricted free agents (RFAs and UFAs) against the total population of the NBA. I also ran a one-way ANOVA to determine if there is a difference between the different types of contract year players (Unrestricted, Restricted, Club Options, and Player Options), as well as players that are not in a contract year.

Results: A one-way ANOVA (Figure #1) was performed to compare the effect of player contract status on TVA/min. A one-way ANOVA revealed that there was a statistically significant difference in TVA/min between at least two groups ($F(4, 600) = [2.691]$, $p = [0.0303]$). Tukey’s HSD Test for multiple comparisons found that the mean value of TVA/min was significantly different between RFAs and non-FAs ($p = 0.0419$, 95% C.I. = $[-0.1862, -0.0022]$) and between UFAs and RFAs ($p = 0.0421$, 95% C.I. = $[0.0027, 0.2368]$). There was no statistically significant difference between the other groups. A one sample t-test (Figure #2) was performed to compare the mean TVA/min of UFAs and RFAs against the population mean. The mean TVA/min ($M = 0.7781$, $SD = 0.2688$) was not significantly different than the population mean; $t(235.45) = -1.059$, $p = 0.2909$.

Conclusion: These results go against the commonly held belief that “contract year” players perform better than the average player. In fact, Restricted Free Agents performed worse than the mean. Further research is warranted.

Figure #1: All Free Agent Status Types

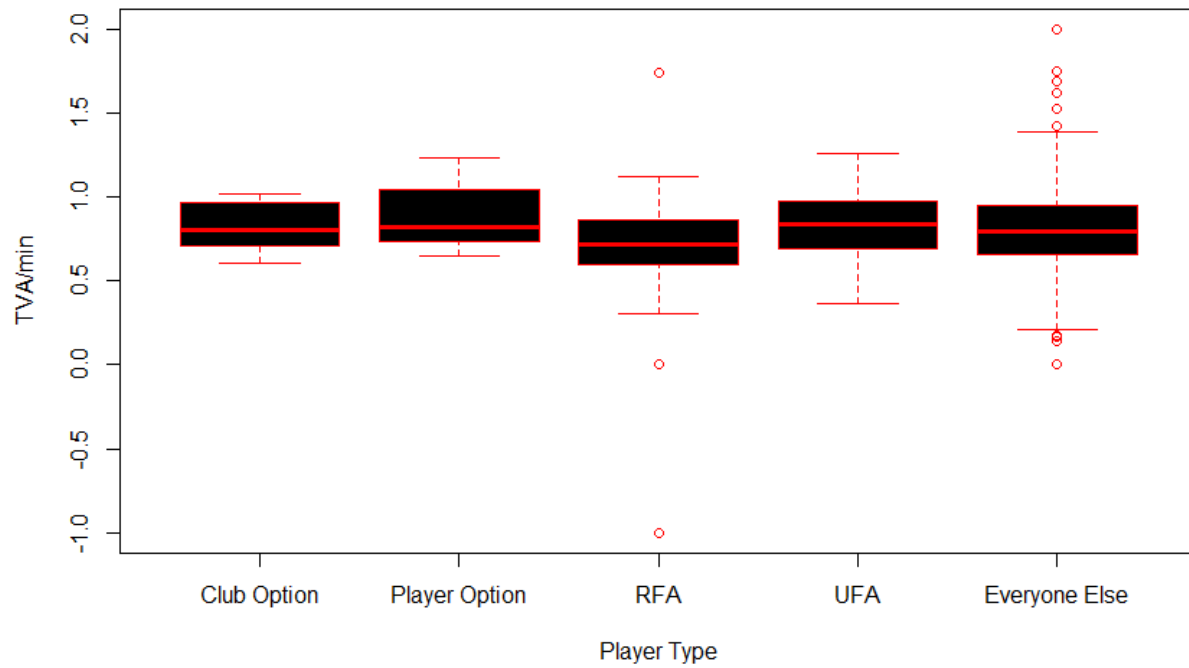
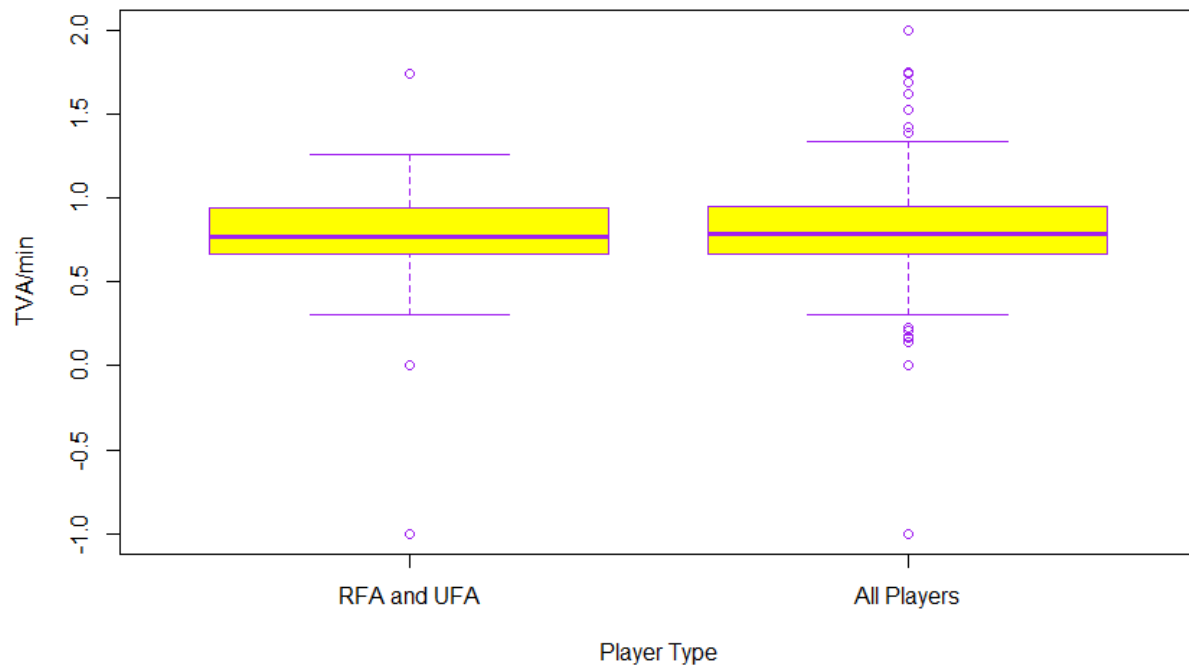


Figure #2: Free Agents vs All Players



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