Data Project #2

Player Marginal Revenue Product: Analysis of the New York Mets

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Though widely regarded as the lesser of their city's two baseball clubs, the New York Mets have found success in recent history. In the 2022 MLB season, the Mets tied the Atlanta Braves in wins for the top of the National League East. Their roster is among the best in baseball with superstars in Francisco Lindor, Max Scherzer, and Jacob deGrom and strong supporters in Pete Alonso, Starling Marte, and Mark Canha. The Mets had the most expensive 26-man payroll in the 2022 MLB season at $231 million, which is $129 million above the league average.[1] A payroll of this size demands exceptional results. Despite great performance in their 101-win season, the Mets lost to the San Diego Padres in the postseason's wild card round. Therefore, the validity of their enormous payroll can be questioned.

This paper identifies the marginal revenue product (MRP) of individual player contributions to the Mets' performance in the 2022 season. All player and salary data are collected from Baseball Reference and Spotrac respectively. All Mets hitters with more than 100 plate appearances and available salary data for 2022 are measured in the analysis.[2] The Mets' six starting pitchers and top five relief pitchers (as listed on Baseball Reference) are also included.[3]

The Scully-Blass method is used to calculate player MRP. Regression models from the literature are utilized to identify each player's runs created or allowed, the number of wins created through run production, and the value of a win in US dollars.[4] Run production is identified for hitters through a combination of singles, doubles, triples, home runs, walks, times hit by pitch, bases stolen, times grounded into a double play, sacrifice flies, and outs.[5] For pitchers, runs surrendered are calculated from each pitcher's earned runs allowed (ERA).[6] Each

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[1] 'MLB Payroll Tracker'.
[2] 'New York Mets All Team Batting'.
[3] 'New York Mets All Team Pitching'.
[4] Turner, 'Player Value in Baseball', 4, 11; Turner, 'Player Value in Hockey', 19.
[5] Turner, 'Player Value in Baseball', 4.
[6] Turner, 'The Economic Value of Professional Athletes', 18.

run created generates 0.108 wins while each run surrendered generates -0.107 wins; the product of these coefficients and each player's runs created or allowed yields the number of wins they generated for the Mets in 2022.[7] Using aggregated player data from the 2022 season, Mets players are then compared to average players for offense and defense.[8] The marginal number of wins created is the difference between each Mets player's wins created and the hypothetical wins created by an average hitter or pitcher holding constant the number of plate appearances or innings pitched. Finally, each player's marginal revenue product is determined by the value of a win in 2011 US dollars times the number of wins they create beyond the average player in their position. This calculation incorporates 32% inflation since 2011 and discounts revenue in the future 2023 season using a factor of 5%.

Table 1 aggregates Mets players' MRP. It also displays their actual pay for the 2022 season and their deserved earnings. Each player's deserved earnings are the sum of their MRP and the average league salary for their position (either hitter or pitcher).[9]

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[7] Turner, 'Player Value in Baseball', 11.
[8] 'MLB All Teams Standard Batting'; 'Major League Baseball All Teams Standard Pitching'.
[9] 'New York Mets 2022 Salaries Payroll'.

Table 1: Marginal Revenue Product for Mets Players in 2022

Position	Player	Marginal Revenue Product	Salary	Deserved Earnings	Salary as a % of Deserved Earnings
C	Tomas Nido	-$1,155,594.50	$890,000.00	$3,605,764.68	25%
1B	Pete Alonso	$3,491,849.54	$7,400,000.00	$8,253,208.72	90%
2B	Jeff McNeil	$2,366,524.67	$3,000,000.00	$7,127,883.85	42%
SS	Francisco Lindor	$2,316,779.99	$34,100,000.00	$7,078,139.17	482%
3B	Eduardo Escobar	$695,939.42	$10,000,000.00	$5,457,298.60	183%
LF	Mark Canha	$1,794,223.70	$12,666,666.00	$6,555,582.89	193%
CF	Brandon Nimmo	$2,076,010.29	$7,000,000.00	$6,837,369.47	102%
RF	Starling Marte	$1,665,904.44	$15,750,000.00	$6,427,263.62	245%
DH	Daniel Vogelbach	$600,832.59	$800,000.00	$5,362,191.77	15%
IF	Luis Guillorme	-$252,731.09	$875,000.00	$4,508,628.09	19%
C	James McCann	-$615,202.88	$8,150,000.00	$4,146,156.30	197%
OF	Tyler Naquin	-$206,451.45	$4,025,000.00	$4,554,907.73	88%
SP	Chris Bassitt	$1,032,534.92	$8,650,000.00	$5,049,919.59	171%
SP	Taijuan Walker	$779,160.34	$7,000,000.00	$4,796,545.01	146%
SP	Carlos Carrasco	-$16,039.71	$12,000,000.00	$4,001,344.96	300%
SP	Max Scherzer	$2,557,035.04	$43,333,333.00	$6,574,419.70	659%
SP	David Peterson	$144,315.14	$700,000.00	$4,161,699.80	17%
SP	Jacob deGrom	$595,241.90	$36,000,000.00	$4,612,626.57	780%
CL	Edwin Díaz	$1,733,765.51	$10,200,000.00	$5,751,150.17	177%
RP	Adam Ottavino	$1,307,235.98	$5,000,000.00	$5,324,620.64	94%
RP	Seth Lugo	$246,927.04	$3,925,000.00	$4,264,311.71	92%
RP	Joely Rodriguez	-$269,625.33	$2,650,000.00	$3,747,759.33	71%
RP	Drew Smith	$305,809.64	$750,000.00	$4,323,194.31	17%

The results of Table 1 indicate that most Mets players are significantly over or underpaid compared to their deserved salary as predicted by the Scully-Blass approach. Several exceptions to this trend exist in Pete Alonso, Brandon Nimmo, Adam Ottavino, and Seth Lugo. Among the twenty-three players analyzed, twelve are overpaid and eleven are underpaid. Given this significant variation around the deserved salary, the Scully-Blass method is a poor predictor of player salary for the Mets.

Among batters, discrepancies between the deserved and actual salaries can be attributed in part to defensive contributions. Since the Scully-Blass approach only considers offensive

metrics for non-pitchers, their defensive abilities are left out of their MRP. To illustrate, most of the Mets' starting fielders are overpaid considering their run production alone. However, fielders are very useful in denying runs surrendered. Good outfielders can deny home runs and extra base hits, while good infielders can effectively prevent singles and create double plays. The lack of consideration for these contributions to wins created by hitters in the Scully-Blass method leads to discrepancies between actual and deserved salaries. The only exception to this principle is the Mets' first baseman, Pete Alonso. Though necessary to a strong defense, first base is a simple position to play. Its main responsibilities involve catching balls and occasionally lunging, which most major league players have no difficulty performing. This may suggest why Alonso's salary is predicted with relative accuracy: his defensive contribution relative to a first baseman of average skill is insignificant, so his offensive ability accounts for most of the wins he produces.

These results also indicate that the team's superstars are wildly overpaid. Lindor, Scherzer, and deGrom are all paid in excess of five-times their deserved salaries, with deGrom being the most overpaid Mets player at 780% of his deserved salary. However, it is important to note that superstars create more revenue for their teams than they generate through wins alone. Big-name players attract viewership from fans and non-fans alike, which creates revenue through ticket sales and television broadcasts. These players are also significant drivers of merchandise sales, namely through jerseys. Moreover, superstars can easily become leadership figures for teams and potentially boost the immeasurable qualities of players. Lastly, superstars are also relevant to a team's capabilities in the postseason. The actions of individuals matter much more to team outcomes when the stakes are high-stakes games, so having high-quality stars is considerably beneficial in playoffs. This implies that postseason abilities are considered when determining the salaries of superstars. These factors suggest that superstars are worth far more to

teams than their run production would suggest alone. As a result, it is unclear if the Mets are truly overpaying their superstars.

Among the Mets' pitchers, their relievers are underpaid more often than starters. Since ERA was the metric used to evaluate pitcher skill, each pitcher's MRP is largely influenced by the Mets' overall defensive ability. In other words, the MRP calculated for each pitcher cannot be interpreted as their own isolated contribution to the number of runs surrendered by the Mets.

The Scully-Blass approach is likely overestimating the MRP of relievers. As explained by Bill James in a journal for the Society for American Baseball Research, the ERA of a reliever is between 0.15 and 0.25 points lower on average relative to starting pitchers of comparable skill.[10] There are several reasons for this. Relievers typically arrive at the mound when they have a clear advantage over the batters in the on-deck circle, such as a platoon advantage. This allows them to perform relatively better than starters who face many batters with no substantial advantage. Additionally, relievers will typically begin pitching part of the way through an inning. If there are any runners on base and the reliever indirectly allows them to score, they are counted against the pitcher who was relieved.[11] There is also no need for relievers to save energy as they do not pitch for long, meaning they can use all of their effort in acquiring outs. These factors contribute to systematically lower measures of ERA for relievers relative to starters.[12] As a result, the Scully-Blass methods overrepresents the abilities of relievers and consequently suggests that they are underpaid.

Most of the reasons for discrepancies in players' actual salaries versus their deserved salaries can be explained by shortcomings of the Scully-Blass approach. This is especially true of

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[10] James, 'The Relief Pitcher's ERA Advantage'.
[11] Ibid.
[12] Ibid.

hitters, whose defensive contributions are ignored in their MRP. Superstars are intriguing cases as they create revenue for their teams through more avenues than wins alone. Pitchers are difficult to evaluate using the Scully-Blass method due to the nature of ERA. A pitcher's strikeout to walk ratio may be a more relevant metric in determining skill, but it would be a worse predictor of how many wins a pitcher contributes to their team. Some combination of the two metrics, such as an interaction term between them, may yield a more relevant metric with which pitcher contributions can be determined. Overall, the Scully-Blass approach is much too simple to accurately predict Mets players' salaries.

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