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Do NHL Teams Regard Violence as a Positive Player Attribute and Thus Compensate for Violent Acts?

Mitch Zimmerman

ABSTRACT. Hockey has always been a violent sport. Major injuries in sports have made headlines in recent years, so it is important to understand how National Hockey League (NHL) organizations view, use, and sometimes abuse violence. It's not a secret that some players in the NHL don't fit the general profile of a skilled hockey player. This paper investigates whether the unofficial title of "enforcer" really exists in the NHL by showing whether teams compensate certain players with non-typical or "enforcer" skill sets. Using a clustering analysis and a regression analysis there is a clear indication that NHL organizations do in fact incorporate this "enforcer" attribute when determining certain players' salaries.

I. Introduction

"I went to a fight and a hockey game broke out."

-Roger Dangerfield

It's long been known that hockey is one of the most physical, violent sports. It is called the "blood sport." There are two distinct skill sets in hockey. The first set includes: puck handling skills, speed, quickness, quick decision making, and accurate shooting. These are among the qualities of the highest paid players in the National Hockey League (NHL). Yet you don't necessarily have to be good at these skills relative to other NHL players to be successful. You could just be able to fight. If this is the case, then do NHL teams regard violence as a positive player attribute and thus compensate for violent acts?

II. Background

When the National Hockey Association began to fail in the early 1900's, the NHL took over. By 1924 the NHL expanded to the US with a team in Boston and others scattered around Canada. Throughout the mid 1900's the league acquired numerous teams. Today there are 30 teams in the

NHL. These teams range from the East to the West coast, North and South, and through some southern Canadian cities. The league is split into two divisions, the East and West. Seasons are comprised of 82 games, with a four-round bracketed playoff system.

The NHL promotes a faster, more aggressive style of play than other hockey leagues around the world. The International Ice Hockey Federation, to which many European teams belong, sets the standard ice hockey arena at 200 ft by 98 ft. NHL arenas measure 200 ft by 85 ft, narrowing the rink and shrinking the neutral zone to make for a much quicker pace of play (Coates, Battre, and Deutscher 2012, 52).

The game has many rules intended to cut down on violence, or unsportsmanlike actions. These rules prohibit: slashing, hooking, tripping, grabbing, cross checking, and boarding. Slashing is using a player's stick to strike forcefully on the stick, body, or hands of another player. Hooking is using a player's stick to slow down another player from behind. Tripping is using anything to intentionally make an opposing player fall. Grabbing occurs most often in front of the net and is used to keep a player from using his stick at will, or pulling a player out of position. Cross checking is using the shaft of the stick to hit or check an opponent. Boarding is hitting a player in a manner that is deemed overly aggressive and dangerous. This usually occurs when a player along the boards is not looking, and the opposing player hits him from behind, into the boards. Boarding is among the worst offenses and usually results in a game misconduct which requires a player to sit out the next game (Coates, Battre, and Deutscher 2012, 48-49).

The NHL showed it recognized that teams were using players as "enforcers" when it passed a series of rules during the 2005 season. These rules were seen as the NHL taking a stand to curb some of the vicious hits and unnecessary fights that were frequently taking place. Of the many new rules, one was a fight instigator rule. If a player is deemed to have instigated a fight in the last 5 minutes of any game, coaches are subject to a \$10,000 fine and the player receives a game misconduct penalty and an automatic one game suspension (Coates, Battre, and Deutscher 2012, 48). "One primary objective of the new rules will be to reduce the scope of defensive 'tools' a team may effectively employ, and to create a corresponding benefit to the offensive part of the game – thus allowing skill players to use their skills and increasing the number of quality scoring chances in the game" (NHL.com 2005).

The use of enforcers is well-known. While it is not an official title

such as forward, defensemen, or goalie, it is no secret that every team uses them. Sportingcharts.com (2013) defines enforcers as:

A type of player known for their ability to check, fight and intimidate the opposition whose role mainly centers around deterring and responding to actions by the opposition that are considered to be aggressive, uncalled for or dirty. Enforcers will often be players with the most number of fights and lowest amount of time on ice on a team.

Enforcers are well regarded for their ability to fight and play a highly physical game. However, they generally lack the speed and talent of other players on the team and are often found on the teams 4th line with most teams only carrying one enforcer at a time.

III. Economic Literature Review

Jones et al. use a regression analysis to determine if the salaries of “grunts” and “non-grunts” seem to have different coefficients. By doing a clustering analysis, they effectively sorted out the “grunts” and “non-grunts” (“enforcers” and “non-enforcers”) into two separate categories. Jones et al. compared the coefficients of the salary equation for both categories of player to determine if there indeed was a difference. They showed that there was, implying that the “grunt” category of player is compensated based on different criteria than “non-grunt,” and that more penalty minutes means more pay (Jones, Nadeau, and Walsh 1997).

Jones et al.’s findings seem to create a problem with other research. Studies find that increased penalty minutes tend to lead to lower team success (Coates, Battre, and Deutscher 2012; Gee and Leith 2007). If this is the case, it would imply that NHL organizations compensate players who detract from the success of the team. This does not make sense. Successful teams draw more attendance and more attendance increases revenues. While hockey is indeed a sport, it is also a business. Success is measured in two places: on the ice and at the turnstiles. As D. Coates et al. put it “Success on the ice means season-long playing effectiveness measured by the number of points earned by a team; success at the turnstiles is measured by attendance” (Coates, Battre, and Deutscher 2012, 54).

Stewart et al. addresses this problem by offering the interesting hypothesis that NHL organizations use violence to maximize profits. Stewart et al. find that NHL organizations do use violence as part of the equation to maximize profits (Stewart, Ferguson, Jones 1992). This is supported by Jones et al. who found that violence has a positive effect on overall attendance. What Stewart et al. implies is that there are really two demands from hockey fans: team success on the ice and some amount of violence. So there is an incentive for teams to pay a premium for players who can create big hits and become involved in more fights. Stewart et al. attempts to show that there is indeed a relationship between violence and salary, and therefore teams would use it in some profit maximizing equation (Stewart, Ferguson, Jones 1992).

IV. Clustering Analysis and Data

The Wages of Sin: Employment and Salary Effects of Violence in the National Hockey League, by Jones, Nadeau, and Walsh (1997) is a study of this precise topic using data from the 1989-90 NHL season. My study uses the same clustering technique to determine this unofficial category of players “enforcers” and non-enforcers for the 2010-2011 NHL season, excluding goalies. Jones et al. use two variables in their clustering technique: points per game and penalty minutes per game. They classify players as “grunts” and “non-grunts”. Their clustering analysis classifies 48 of 250 forwards as grunts, and 54 of 138 defensemen as grunts.

The model used in this study adds a third variable, time on ice per game. This is to separate the more aggressive non-enforcers from the enforcer category. Like Sportingcharts.com stated, enforcers will have a high number of fights and a very low amount of time on the ice.

Another criterion added for this study was a minimum number of games played. A player must have played in at least 90% (75 out of 82) regular season to be included in the clustering analysis. This effectively eliminates all temporary players, and severely injured players who participated in a very small number of games. The logic is that if a player has played more than 90% of the season, has relatively high penalty minutes, relatively low points per game, and a low amount of time on ice, then he fits the generally accepted profile of an enforcer.

Before including a minimum games played criterion, the clustering analysis yielded a total population 891 players. When the qualifications for the study were applied, the sample size became 270 players. Of those

270, 43 were classified as enforcers, 227 were classified as non-enforcers. 1.43 enforcers per team appears to align very well with the definition provided from sportingcharts.com. Insidetherink.com, an ESPN affiliate, rated the top enforcers of 2011 by category: heavyweight (5), middleweight (6), and lightweight (3). Of the 14 top enforcers, 10 were classified as enforcers by the cluster analysis in this study. The four that were not listed did not meet the qualifications to be included.

V. Regression Model

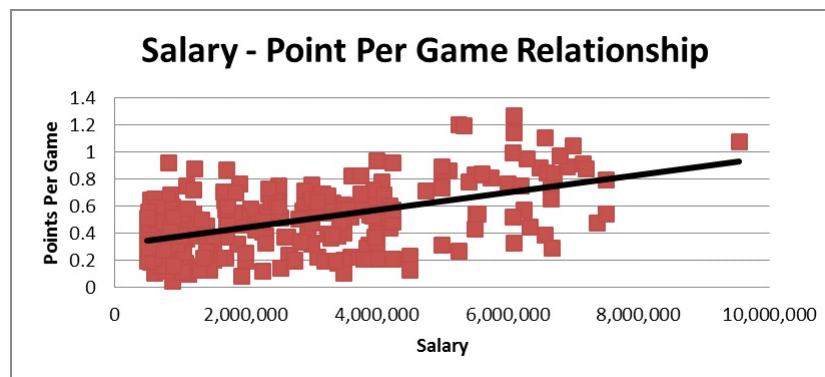
The equation used for this OLS regression is as follows:

$$\text{Salary} = \beta_0 + \beta_1 \text{PPG} + \beta_2 \text{TOIPG} + \beta_3 \text{Enforcer}$$

This is to say that salary is a function of a constant (β_0) plus points per game plus time on ice per game plus a dummy variable that classifies enforcers (1 for enforcer; 0 if otherwise). Points per game and time on ice were found to be salary determinants by other studies (Jones and Walsh 1988; Jones, Nadeau, and Walsh 1997) and therefore, will be used in this one.

Points per game are a key attribute in the game of hockey. Teams score and win games by earning points. If you score a lot of points, you make a lot of money, no matter what position you play. Because scoring is so important to team success, the expected coefficient for points per game is positive and is expected to be significant.

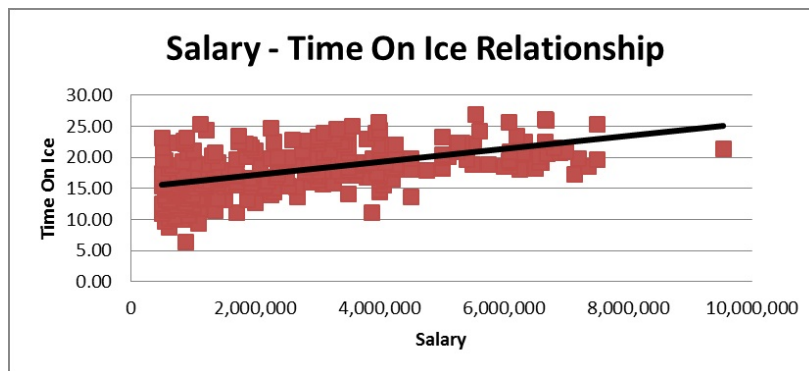
The data used in this study reveal that the league does in fact tend to pay more money to players who score more frequently. The graph below shows that there is a clear trend in the NHL of paying more for higher



scoring players. However, it also reveals that there must be more to the picture as the dots appear scattered throughout the graph. If points per game were the only determinant, the dots should follow the line exactly.

Time-on-ice is another key factor to team success. If a team has players who can spend more time playing (on average) before fatigue sets in, it has the advantage of having more rested players. The average on ice time for the data sample used in this study is 17.93 minutes per game, or less than 1/3 of the game. Teams that have players who can play well over this average have a strategic advantage. This means they can let less rested players sit longer. If the higher stamina players are big scorers, they can leave them on the ice longer, increasing the likelihood of scoring. Thus, time on ice is expected to have a positive coefficient and is expected to be significant.

In this data set, player number 138 (Duncan Keith, Chicago Blawkhawks) plays the most minutes on average, 28.66 per game. Of the 16 players who play the least, 13 of them are classified as enforcers. The graph below shows the expected results. Within this sample, NHL teams tend to pay more for players who play more, no matter what position. Again, however, the graph remains somewhat scattered, which indicates that time on ice per game is not the only factor determining salary.



VI. Results

The results of the OLS regression are shown in the table below:

Dependent Variable: Salary				
Heteroskedasticity-robust standard errors, variant HC1				
	Coefficient	Std. Error	t-ratio	p-value
Const	-2.60E+06	413907	-6.2872	0.0000
Enforcer	485960	239056	2.0328	0.0431
PPG	3.16E+06	432806	7.3052	0.0000
TOIPG	207263	25460.7	8.1405	0.0000
Mean dependent var	2731791	S.D. dependent var		1944063.0000
Sum Squared resid	5.96E+14	S.E. of regression		1497012.0000
R ²	0.413647	Adjusted R ²		0.4070
F(3,266)	63.93513	P-value (F)		3.70E-31
Log-likelihood	-4220.223	Akaike criterion		8448.4470
Schwarz criterion	8462.841	Hanna-Quinn		8454.2270

As predicted, all three variables have positive coefficients. Enforcer is statistically significant at the 95% level. Points per game (PPG) and time on ice per game (TOIPG) are significant at the 99% level. For a salary equation, the adjusted R² is quite good at .407. Heteroskedasticity is accounted for and corrected by the model.

If a variable has a positive coefficient, it means it has a positive impact on a player’s salary (the dependent variable). The regression shows that, all else equal, a player who averages one additional point per game in the NHL during the 2010-2011 season earns an additional 3.16 million dollars. Time on ice per game (TOIPG) has a coefficient of 207,263. This means an increase of playing time by one minute per game on average, all else equal, would increase a player’s salary by 207,263 dollars.

The enforcer variable is a dummy variable. The coefficient of enforcer is a “one-time payment” so to speak. Either you get the payment for being an enforcer, or you don’t. If a team believes that a player possesses the qualities and attributes to be an enforcer, all else equal, the player’s salary on average will increase 485,960 dollars. The positive

coefficient for enforcer shows that teams view the ability to be violent as a positive attribute.

VII. Limitations

A study of this nature has a few limitations. Contracts pertaining to salary can be somewhat unreliable. Many players sign long contracts in their first few years to ensure themselves money if they don't succeed. However, some players go way above and beyond the expectations of their contracts. When this happens, teams reap the benefits of exceptionally good players at low costs. On the flip side, a player could be extremely good and sign a lengthy contract, only to become mediocre in his older age or due to injury.

Another limitation is that there is no official position of "enforcer." While it is felt that the clustering analysis used in this paper is very accurate, there is no guarantee. Some players in this study may be classified as enforcers when in fact they are not. This can skew some of the data and provides some small level of expected error.

Previous research on violence in sports can be found everywhere. However, research around team compensation for violent acts tends to be sparse. Even more sparse, are studies that focus on compensation for violence in hockey. Most papers look at whether violence sells more tickets. However, violence has a multitude of impacts on the game besides ticket sales. This means the research presented in this paper is somewhat original, especially since the rule changes in 2005.

VIII. Conclusion

This study clearly shows that NHL teams do in fact incorporate this "enforcer" attribute into salary determination. The results show that the predictions were correct and that they make sense. People who score more and play more tend to make more money. What wasn't nearly as clear was whether the NHL offered employment to, and thus compensated players who lack the most necessary skills to succeed in the game. With 95% confidence, this study can say that they do indeed do just that. NHL teams use these violent enforcers in a strategic way to maximize profits while not sacrificing success on the ice. "I went to a fight and a hockey game broke out" may be a bit extreme, but there is certainly evidence that NHL

organizations do little to prevent it from happening. Perhaps, this study would conclude that they encourage it.

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