

Drafting their Way to Success? Draft Rank and Team Success in the
National Hockey League.

by

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Abstract

In the National Hockey League (NHL), there is a perception that high draft picks are the best way to build a competitive team. This paper empirically tests whether high draft picks are a good predictor of team success using an instrumental variable approach to measure the causal effect of high draft picks on a variety of measurements of team performance. The NHL Draft Lottery is used as a means of eliminating the endogeneity problem present in this analysis. I find that high draft picks have a strong positive effect on team success in the future, and provide an analysis about why this might be the case. These results indicate the existence of perverse incentives for team executives in the NHL, and offers different courses of action for the NHL to pursue in attempting to eliminate these negative incentives.

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Introduction

Professional sports in North America offer a unique example of a labour market. All four major North American sports (hockey, baseball, basketball and football) have an entry draft where teams have the opportunity to select from a pool of new players in the hope of improving their team. The worst teams from the season before are offered better positions in the entry draft, with some element of chance, an opportunity that is meant to encourage parity and a competitive atmosphere. The concept of building a team through the draft has become common in North American sports over the past quarter century (Hermman, 2016, Motomura et al, 2016, McGran, 2015). Player salaries make up a team's greatest expense, and thus teams, as profit-maximizing firms, seek any advantage available to minimize their costs. The hard cap placed on young players' salaries when they enter a league creates a distinct advantage for teams employing these players compared to more experienced players whose salaries are determined by the open market. In leagues with a salary cap on player salaries, such as the National Hockey League (NHL), National Basketball Association (NBA), and National Football League (NFL), the advantage derived from minimizing salary spent on player talent is even more pronounced. Given the restrictive nature of the salary cap, payroll efficiency becomes increasingly important. There is also an incentive to find and draft young players because of the unknown nature of their potential talent, with the possibility that they will produce results that far exceed the value of their contracts (Groothuis, Hill & Perri, 2007).

It is possible that these incentives have led teams to act in a way that can be characterized as anti-competitive. These negative incentives have led to a great deal of discussion centered

around the concept of “tanking”, which here is defined as a team intentionally increasing their odds of losing with hopes of receiving a higher pick in the following year’s entry draft (Soebbing, 2011). Recently, there has been a few notable instances of “tanking” across the four major sports leagues, including the Philadelphia 76ers (Gelles, 2014) of the NBA and the Edmonton Oilers of the NHL (Soria, 2016). In the case of the Edmonton Oilers, winners of the lottery draft in four of six years, there is evidence that the team was constructed not for winning in the present, but to sacrifice current performance for future performance. This meant playing inexperienced players, and accruing a large amount of losses with the intent of increasing their chances for winning the draft lottery and being given the opportunity to select first in that year’s draft. This has motivated a literature that has also found that when a team is out of playoff contention, there is a higher likelihood of the team losing intentionally to improve their draft position (Price, Soebbing, Berri, & Humphreys, 2010). This supports the claim that teams outside of playoff contention have incentives to pursue the best draft pick possible. Given the inherently competitive nature of sports, and the desire of consumers to see the teams they support give maximum effort towards winning, a team intentionally losing poses both practical problems for a league, and a more ambiguous issue with the integrity of the sport. The leagues, to their credit, have modified the process of awarding draft picks to dissuade teams from attempting this strategy, but despite their best efforts, have been unsuccessful. Thus, the question remains, is earning a high draft pick worth all of the trouble? Furthermore, is it economically rational for teams to engage in this strategy, given that teams save a great deal in costs, if this strategy also offers better outcomes, it is clearly an optimal strategy. If high draft picks improve a team significantly, then bad teams that receive the highest draft picks should improve rapidly.

This paper examines the process of building a team through the draft in the context of the NHL and empirically tests how much high draft picks improve performance. Similar to the methodology used by Motomura et al in their paper analyzing the effect of draft picks on winning in the NBA (Motomura et al., 2016), this paper will use several measures of team success to quantify the effect of high draft picks on a team's performance over the short, medium and long-run. Unlike various works in this area, this paper uses an instrumental variable approach to measure the causal effect of draft picks on team success, a meaningful analytical improvement. The results of this analysis show that when we control for team effects and control for variation using an instrumental variable, this paper finds that having high draft picks on average leads to an increase in points in future years.

The paper is arranged as follows. First, I give background information about the NHL Draft Lottery. Second, I review the relevant literature about "tanking the draft" and the NHL. Third, I describe the process used to obtain and clean the data used in the econometric analysis. Fourth, I introduce the methodology used in this paper, and provide the rationale behind the specific methods used. Fifth, I provide the results obtained through the methods in mentioned above, and lastly, I offer a discussion about these results, and provide conclusions from this analysis.

The NHL and its Draft Lottery

The focus of this paper's analysis will be on the first round of the NHL entry draft from 1994-2014. It is important to note here that the NHL changed significantly over the course of this sample of data, beginning with 26 teams in 1994 and expanding to 30 teams by 2014. The first round of the NHL Entry Draft is also unique because of the presence of a lottery system

introduced in 1995. This system was implemented by the National Hockey League as a means of preventing teams from being able to perfectly control where they would choose in the draft, with specific focus being placed on teams that appeared to be vastly underperforming given the talent of the players on their roster. The structure of the draft lottery has remained similar to the original version; the team that finished with the fewest points in the league during the previous season is awarded the highest odds of receiving the first overall pick, with the teams who performed better in the previous season being awarded progressively worse odds of winning the lottery. This means that a team that did not finish last has the opportunity to pick first in the draft should they win the lottery, creating uncertainty surrounding the first pick in the draft. Some alterations were made to this lottery system over the course of this twenty-year sample, in the original version (active from 1995-2013) a team could move up a maximum of four spots in the draft order, and the worst team was guaranteed at worst the second overall pick, however, in 2014 the rules were changed to eliminate the cap on the maximum amount of spots a team could move up in the draft order, and the odds of winning were lowered for the last place team to create a more even distribution of odds.

I take advantage of the fact that the lottery removes the ability of teams to precisely control where they will pick in the next year's draft with the addition of a random component. As such, this is a type of natural experiment that allows for the measurement of a causal effect of high draft picks on team success, as the randomization component is exogenous to team success and finances. Only teams who finished outside a playoff position are entered in the lottery. In other words, teams who finished outside of the top eight teams in their respective conference at the end of the season. In the original version of the lottery, teams had the opportunity to move up a maximum of seven spots in the draft, or of falling a maximum of three spots. In later versions

of the lottery, the maximum number of spots a team could move up was changed to four, and the odds of being awarded the first overall pick were changed.

Literature Review

This paper offers a novel approach to a question that has not been pursued thoroughly in the context of the National Hockey League, by building on an existing literature surrounding other sports and utilizing a causal framework. The empirical approach of this paper draws from the results of various papers to construct the basic empirical framework, and then utilizes this framework to use an instrumental variable approach to offer a more robust analysis of the causal effect of a draft pick. The results of Groothuis, Hill and Perri's paper on the dilemma of choosing talent in the NBA draft informed this paper's decision to use data from the first round of the NHL entry draft in its analysis. The paper focuses on the search for "superstar" talent, or highly impactful players, and finds that the vast majority of upper-end talent is found early in the draft, and analyses the incentives of General Managers of teams in search of improving their team (Groothuis, Hill, & Perri, 2009). This paper focuses on isolating the causal effect of a draft pick on team success, and thus it will be most informative to analyze the picks that will have the largest effect on a team's success. From past papers (Motomura et al., 2016), we know that in the context of the NBA, first round draft picks have a small positive effect on team success, however little research has been done on the subject in the NHL. The initial empirical strategies employed in this paper are based upon the research undertaken by Motomura et al in their paper on the subject of building through the draft in the National Basketball Association (Motomura et al., 2016). Motomura et al. utilize ordinary least squares to regress team performance on recent draft picks, and find evidence that there is a positive correlation between moving up in the first round

of the draft and improved performance in the future. The addition of the instrumental variable allows us to draw conclusions about the causal effect of draft picks on future team success, and provides results that are more robust. This paper uses an approach similar to Angrist, Imbens and Rubin in their paper measuring the causal effect of the Vietnam draft lottery on health outcomes in the United States (Angrist, Imbens, & Rubin, 1996). The two-stage least squares (2SLS) approach is utilized in this paper, a choice that was inspired by Angrist & Imbens' paper in 1995. This strategy differs from other papers in sports economics measuring causal effects of variables on team performance. Consider the paper by Hall, Szymanski and Zimbalist that analyzes the causal effect of payroll on team performance in Major League Baseball and English Soccer. This paper uses an empirical strategy that tests for Granger causality, however the results of their analysis show only a correlational relationship over the entire sample (Hall, Szymanski & Zimbalist, 2002). By using an instrumental variable approach this paper will attempt to improve upon the empirical methods that have been utilized in the field of sports economics in the past, and will use these methods to gain unique and novel insight.

By utilizing the methods used in these papers, while exploiting variation within the data, this paper adds to the existing sports economics literature surrounding entry drafts in the four major sports leagues in North America. A great deal of work has been done to analyze the entry drafts in the National Football League and Major League Baseball, such as the paper on decision making and economic incentives by Massey and Thaler (Massey & Thaler, 2013) However, the National Hockey League draft has remained relatively unanalyzed. Unlike these papers, the focus of this paper will be the effect of draft picks on National Hockey League teams. The National Hockey League has had a considerable amount of empirical work done about it, but there is a hole in the literature surrounding the benefit of building a team through the entry draft.

As the NHL continues to grow, and the profitability of teams continues to rise, the value of building teams in the most efficient way possible will become increasingly important. This increase in value creates higher stakes around each decision a team makes, and in order to inform these important decisions there is a need for informative empirical work such as this paper. This paper, and any extensions done in later papers, will offer data that can be used to draw conclusions about what the most effective method of constructing a team is in the modern NHL.

Data

The data for the analysis was obtained by retrieving data from three online public National Hockey League databases: Hockey DB, Hockey Reference and Pro Sports Transactions. The data covers the 1994-1995 season to the 2013-2014 season, inclusive. Season data was obtained from Hockey Reference, with each season being combined to create a panel data set of 609 unique observations, identified by team name and year. Entry draft data were obtained from Hockey DB, which offers considerable information for each draft pick, giving individual statistics for each player drafted. This dataset was cleaned by dropping individual statistics for each player from the NHL and Major Junior or College level, this cleaning was done because the interest of this analysis is not the effect of an individual player on a team's future performance, but on the institution of the Entry Draft, and the causal effect of draft picks on team's future performance. After merging these two datasets, the information from Pro Sports Transactions was added to include original draft positions of teams before any trades that were made. In the NHL, teams have the option of keeping their own pick they have been assigned, or trading their pick to another team for other assets, whether that be a player or another draft pick in current or future drafts. Therefore, this information on trades is essential as it presents a clear

picture of how teams value their draft picks, and offers context for the decision-making process that teams go through during each draft. Draft data was only obtained for the first round of the NHL entry draft. The rationale behind only using data from the first round is the historical evidence that first round picks have the highest likelihood of playing a large number of games for the team that drafts them, and therefore will have a larger effect on team performance than players selected in later rounds of the draft.

After merging the datasets, more variables were constructed to be included in the analysis. These variables included lagged versions of team's draft ranks (original and realized) as well as averages of a team's draft rank for the previous five seasons. There was also a variable constructed to incorporate the draft lottery, with the variable taking on a value equal to the difference between their final position in the standings (otherwise known as reverse season rank) and their original draft position before any trades or transactions. After constructing the original lottery variable, lagged versions of this variable were also constructed, and the same five-year moving averages as previously constructed for draft ranks. The five-year averages are used in the analysis to minimize the impact of outliers on the results of the data, and are constructed in such a way that they do not overlap with the lagged draft variables to eliminate the issue of collinearity.

A point of interest concerning the sample used in this analysis is the loss of the 2004-2005 NHL season to a lockout between the players and team owners. The lockout substantially altered the state of the league, with many considerable changes incorporated into later seasons. The draft positions for this particular entry draft were awarded in a lottery based on final season rank during the 2003-2004 season. Teams were placed into one of three tiers, with increasing

probability of receiving a higher pick if a team ranked lower in the previous season. As such, this paper uses the 2003-2004 season rank as a proxy for 2004-2005 season rank and constructs the lottery variable for that year using this assumption. This assumption seems to be a reasonable approximation of the lottery effect in this case given a lack of specific data for the season, and allows this year to be included in the sample of data.

The twenty-year data set consists of 30 teams, with the relevant variables for each team presented in the table of summary statistics below.

Table 1- Summary Statistics

	mean	sd	count
pts	84.66321	18.59779	579
w	35.02463	12.01894	579
rk	15.04598	8.449415	609
lagodraft1	15.19862	8.451588	579
instrlag1	-.1761658	3.103194	579
FiveYrOD2	15.4979	5.934669	429
FiveyrI2	-.218648	1.38538	429

Table 1: The table above presents the relevant summary statistics for the analysis to follow. Of note, given the anomalous nature of the 2004-2005 season, there were no points of wins in this year, and thus there are 30 less observations than for the rank variable, which is the team's rank from the 2003-2004 season. The five-year average variables have fewer observations because of the nature of constructing these variables (five previous years were necessary).

Methodology

To determine the effect of draft rank on future success, I begin by employing an ordinary least squares (OLS) approach for regressing team success on draft picks. Given that the draft occurs at the end of a given season, the initial regression takes the form:

$$Pts_{it} = \beta_0 + \beta_1 ODR_{it-1} + u_{it}$$

Where Pts_{it} represents team i 's points earned in year t , and ODR_{it-1} represents the original draft position of team i in year $t-1$, or the nominal draft position of a team before any trades were made, this regression measures the effect of last year's draft pick on the following year's results. Basic regressions are run using various other outcome variables measuring team success as the dependent variable: Rk_{it} representing team i 's rank in year t , $GDif_{it}$ representing a team i 's goal differential (the difference between goals scored and allowed) in year t . Changes in these variables from one year to the next are also used as a measure of performance. This simple regression fails to offer a great deal of insight into the effect of draft picks on a team's success. It also fails to consider the long run effect of team success, and how this success may carry over from year to year, thus an alternate OLS regression is run of the form:

$$Pts_{it} = \beta_0 + \beta_1 ODR_{it-1} + \beta_2 5YrAvg_{it-2} + u_{it}$$

Where $5YrAvg_{it-v}$ represents the average draft position of team i over the previous five years, the five-year average variable was constructed such that it would not overlap with the lagged draft variable, and thus is lagged one additional year. This regression offers a more informed conclusion, using information about the previous five years to increase the explanatory power of the regression; however, the choice of an OLS regression fails to take into account an issue with this estimation method.

There is an endogeneity problem present when considering the question of whether draft picks are a good predictor of team success. Specifically, this problem arises from the possibility that more than just the draft rank in the previous year may determine points in a given year, and thus there is the possibility of correlation with the error term. An example of this kind of correlation would be the aforementioned issue of tanking. If a team can operate in such a way

where they can perfectly determine their draft position, then this estimation method is inherently flawed. This problem can cause a measurement error, and could disproportionately affect the results of this econometric analysis. In order to eliminate this problem, I utilize an instrumental variable approach, specifically the two-stage least squares (2SLS) technique. This technique is widely used in economics to eliminate the problem of omitted-variable bias and to estimate treatment effects of a specific variable on the dependent variable (Angrist & Imbens, 1995). A solution to this problem is to perform an experiment where draft picks are randomly assigned, with this random assignment pulling out the good variation in draft position and the unobserved ability of a team to control where they draft. However, since it is infeasible to perform this experiment, it is acceptable to use a natural experiment that approximates this same outcome. In this case, the natural experiment that is used to generate an instrumental variable is the lottery that occurs each year before the NHL Entry Draft. The draft lottery offers a useful natural experiment because regardless of teams having an ability to determine their position in the standings at the end of a given season, the draft lottery makes it so a team cannot perfectly determine where they will draft. In the case of 2SLS, the endogenous regressor (in this case DR_{it-1}) is regressed on all covariates and on all possible instruments excluded from the original equation. After the 2SLS estimator is obtained, it returns a fitted value from the first-stage regression, \widehat{ODR}_{it-1} . The second-stage regression is run by replacing ODR_{it-1} with \widehat{ODR}_{it-1} in the original OLS regression. The first stage regression takes the following form.

$$\widehat{ODR}_{it-1} = \alpha_0 + \alpha_1 5YrIns_{it-2} + \alpha_2 Ins_{it-1} + \varepsilon_{it}$$

In this case the moving five year average was also instrumented, and thus a first stage regression needed to be run to obtain a fitted value for this variable as well.

$$5Yr\widehat{Avg}_{it-2} = \alpha_0 + \alpha_1 5YrIns_{it-2} + \alpha_2 Ins_{it-1} + \vartheta_{it}$$

For these regressions, $5YrIns_{it-2}$ represents the average lottery effect on team i over the previous five years, and Ins_{it-1} represents the lottery effect on team i in the year $t-1$. The second stage of this regression then takes the following form.

$$Pts_{it} = \beta_0 + \beta_1 O\widehat{DR}_{it-1} + \beta_2 5Yr\widehat{Avg}_{it-2} + u_{it}$$

Team and year fixed effects are added to this model to take into account the various shocks and changes to league structure over the course of the twenty-year sample, and allow us to eliminate some of the noise that may have been present in the data because of these shocks. The following model incorporates year and team fixed effects in both stages of the 2SLS, and utilizes the fitted values from the first stage of 2SLS.

$$Pts_{it} = \beta_0 + \beta_1 O\widehat{DR}_{it-1} + \beta_2 5Yr\widehat{Avg}_{it-2} + \delta_i + \theta_t + u_{it}$$

$$O\widehat{DR}_{it-1} = \alpha_0 + \alpha_1 5YrIns_{it-2} + \alpha_2 Ins_{it-1} + \delta_i + \theta_t + \varepsilon_{it}$$

$$5Yr\widehat{Avg}_{it-2} = \alpha_0 + \alpha_1 5YrIns_{it-2} + \alpha_2 Ins_{it-1} + \delta_i + \theta_t + \vartheta_{it}$$

With δ_i representing a team dummy variable, with each team having a unique variable with a value of 1, and 0 for every other team and θ_t representing a year dummy variable with the same characteristics.

The goal of this is to isolate the causal effect of a single draft pick on success in the subsequent year. An issue with this estimation method is that a draft pick's potential may not be realized for several years after the season in which they were drafted. This issue is controlled for by utilizing various lags on the dependent variables to attempt to observe the long-term effect of

a draft pick on team success. Several other regressions of the same form are run with the points metric being replaced by other methods of measuring success.

Results

The results of the baseline OLS regression without team and year fixed effects offer some interesting conclusions. The sign of the coefficient on the lagged draft position variable has the opposite sign compared to the *a priori* belief that higher draft picks improve future performance, and this sign is consistent across all different outcome variables. The addition of the moving five-year average variable does not change the sign of the coefficient on the lagged draft variable, and the sign of the coefficient is consistent with the sign of the lagged draft variable, however the five-year average variable is insignificant. The baseline model results (found in the Appendix in Table 1), offer little in the way of information for our analysis, but do provide an indicator of how we should proceed.

After adding team and year fixed effects, the sign of the five-year moving average variable changes and becomes statistically significant while the lagged draft variable retains the same properties. The sign on the five-year moving average variable (lagged one extra period to remove any overlap of the data) indicates that the lower your average pick over the previous five years, the better you will perform in a given year. This is consistent with the belief that draft picks improve performance, and that there may be a lag between when a player is drafted and when they develop into a useful player. Though this offers a tantalizing narrative, it is important to note that this is not a statistically significant result.

The results of the first stage of the 2SLS used to obtain the fitted value \widehat{ODR}_{it-1} confirms the power of using the lottery as an instrument, with statistical significance, and a F-statistic of 21.14 that indicates that the lottery is a strong instrument in this instance. Such a low adjusted R^2 value is not necessarily unexpected, and the inclusion of additional explanatory variables would alter this value. However, for the purposes of this analysis, the most important aspect of this result is that there is a significant relationship between the two variables.

The results of the regression used to determine the fitted value $\widehat{5YrAvg}_{it-2}$ were more troublesome. The first-stage shows that there is very clearly not a statistically significant relationship between the moving five-year averages and the associated lottery variable, with the $\widehat{5YrIns}_{it-2}$ variable appearing to be a poor instrument for eliminating the exogenous variation observed in the data. A reason for this is the significantly smaller sample size for these variables, and the effect of trades and transactions on the average draft position. Analytically, it is intuitive that there is a more powerful relationship between the lottery and draft position in a single year than over the course of five years, given the various other factors that may be lying in the error term of this regression.

Having observed that the moving five-year averages offer little additional information to the analysis, the most robust second stage regression features only the lagged draft variable and year fixed effects. The result of this regression is especially interesting because the sign of the coefficient on the lagged draft variable has switched. The results of this regression have the coefficient on the lagged draft variable being significant at the ten percent significance level. Furthermore, the coefficient on the lagged draft variable remains extremely practically significant. The interpretation of this result would be that moving up one position in the first

round of the draft would net a team nearly one point in the next season, or equivalently, nearly half a win per position in the draft. In a league with as much parity as the NHL, one point can be the difference between a playoff spot (and the additional revenue that comes from hosting playoff games) and another entry into the draft lottery. The implications of these results are very compelling, and offer one explanation for why teams value draft picks so highly in today's NHL.

Discussion and Conclusion

This analysis offers intriguing results from which we may draw conclusions. Simply basing our analysis on the initial OLS regression appears to lead to false conclusions, with the noise in the data leading to inferences that do not line up with our intuition. This is to be expected as this basic estimation method is heavily influenced by the unobserved factors in the error term that determine team quality. The inclusion of fixed effects helps to eliminate some of this issue; however, as observed in the baseline model with fixed effects, it does not completely eliminate the issue. It is encouraging to see that the inclusion of the lottery as an instrument changes the sign of the coefficient to match our expectations. By utilizing the lottery as an instrument, it is possible to observe the effects of a first round draft pick on future team success. What we observe in the data is that picking higher in the draft does in fact lead to a substantial improvement as early as the next year. Anecdotally this makes sense, and it is well aligned with the value the market has set for a first round pick. When looking at transactions involving first round draft picks over the past twenty years, there has been an increase in value placed on the additional years of cheap labour afforded to teams picking in the first round, despite the existence of a lottery that adds uncertainty to the equation. Teams have become less willing to part with draft picks over this period as the introduction of the salary cap in the NHL began to

take hold. No longer could teams spend as much money as they pleased when building their team, now each team was held to the same constraint placed on expenses. This move was meant to create more parity in a league that has often struggled with long stretches of dominance by single franchises and has had difficulty incorporating new franchises during its rapid expansion over the past forty years. The salary cap has absolutely increased parity within the league, and has effectively created a more competitive atmosphere, but one unexpected outcome was the increased premium placed on draft picks. The best teams (both in the sense of winning and profit maximizing) had always prioritized building their teams through the draft, but the introduction of the salary cap encouraged other teams to follow this strategy or risk becoming mired in mediocrity.

The results of this analysis show that the strategy of “tanking” and accumulating large amounts of draft picks can be an effective method of building a team. A team that finds itself on the margin of competing for a playoff spot has incentives to lose intentionally because moving up several spots in the draft has large positive outcomes the next year. Based solely on this outcome, it is surprising to see that there are not more teams openly tanking to improve their rosters. Most arguments against tanking begin with the assertion that consistently losing or asking a team’s players to underperform their potential may have adverse effects on future performance and the abstract concept of team chemistry. One issue with this analysis is that it is unable to observe the difference between the increase in performance experienced by teams that were constructed poorly (and thus perform poorly honestly) and teams that are losing on purpose. Should one be able to perfectly differentiate between these two types of teams, it would be interesting to see if the positive effects of picking one spot higher in the draft have the same magnitude for the two different types of teams.

If the league perceives the incentives for a team to tank as a problem, which given the changes made to the lottery and the outward display of public disapproval for the concept of tanking seems like a reasonable assumption, they should take measures to eliminate the advantage posed by picking higher in the draft. Even with the presence of the draft lottery, there are still large incentives in place to reward teams for “tanking” and securing the best pick possible. The lottery still disproportionately rewards the team that finishes last in the standings; however, the National Hockey League has taken steps recently to eliminate this advantage. For the 2016 NHL Entry Draft, the rules of the draft lottery were changed so that the lottery would determine the order of the first three picks in the draft, with the worst team only being guaranteed the opportunity to pick in the fourth position at worst, instead of second. Given the results of this paper, it would seem that even more measures might need to be taken to eliminate the advantages of picking higher in the draft. Consider a lottery where the winner is no longer allowed to win in back to back years, something that has been proposed by General Managers in the NHL after the recent string of lottery success experienced by the Edmonton Oilers. If this were the case, then teams would have to consider the long-term implications of employing the strategy of tanking. Team construction is a difficult task at any time, but attempting to play poorly one year, parlay that poor performance into a top pick, and then succeed the following year appears to be an insurmountable task. There is an argument to be made that this strategy would disproportionately affect teams that play in small markets and thus have a low budget, because they must usually build a team through the draft. A more drastic alternative would be to completely randomize the draft order, with each team being awarded equal odds of being rewarded with the first overall pick. Although this option eliminates the incentives for teams to lose intentionally, it also adversely affects teams that are bad because of poor roster construction.

The possibility of the rich getting richer (the best teams receiving the best picks) while the bad teams remain bad invites the possibility of creating more disparity in the league, a possibility that runs in opposition with the league's agenda. It remains unclear if there is a perfect solution to this problem; however, based on the results of this paper, there are clearly incentives in place for teams to do everything in their power to move up one spot in the draft.

In sum, this paper confirms what those responsible for building teams in the National Hockey League have known for years, it is extremely beneficial to pick higher in the draft. The novel contribution of this paper is quantifying the size of this effect. What we find is that moving up one position in the draft is equivalent to gaining half a win in the next year, an enormous change. With teams looking for any inefficiency possible to exploit for their team's benefit, it appears that the largest inefficiency of all still remains in the draft. Despite the National Hockey League's best efforts, there remains an incentive to pursue the strategy of "tanking", and until there are significant changes made to the structure of the draft, these incentives will remain present.

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Appendix

Table 2- OLS Results

	(1)	(2)	(3)	(4)
	pts	pts	pts	pts
lagodraft1	0.854*** (0.077)	0.649*** (0.099)	0.596*** (0.073)	0.516*** (0.082)
FiveYrOD2		0.312* (0.144)		-0.117 (0.152)
_cons	73.61*** (1.347)	73.00*** (2.359)	75.04*** (3.839)	83.32*** (4.605)
FE			X	X
N	549	402	549	402
R ²	0.1814	0.1417	0.5011	0.5340

* $p < 0.1$, ** $p < 0.01$, *** $p < 0.001$ (se in parentheses)

Table 2: Regression 1 gives the results for the baseline model with no fixed effects. Regression 2 offers results for the baseline model with the inclusion of the five-year moving average variable. Regression 3 represents the results for the baseline model including team and year fixed effects and Regression 4 offers results for the baseline model including fixed effects and the five-year average variable. Note, Regressions 2 and 4 have less observations than the corresponding analysis of the five-year average variable in Table 3 due to the structure of the lagged draft variable, with each of the 27 teams in the first year of the sample losing one year of data from the 1-year lag.

Table 3 – First Stage IV Results

	(1)	(2)	(3)	(4)
	lagodraft1	FiveYrOD2	lagodraft1	FiveYrOD2
instrlag1	-0.512*** (0.111)		-0.638*** (0.103)	
FiveyrI2		0.633** (0.205)		0.110 (0.183)
_cons	15.11*** (0.346)	15.64*** (0.287)	12.78*** (2.181)	13.15*** (1.374)
FE			X	X
N	579	429	579	429
F	21.14	9.532	4.530	9.879

* $p < 0.1$, ** $p < 0.01$, *** $p < 0.001$ (se in parentheses)

Table 3: Regression 1 offers the results for the first stage of the 2SLS for the lagged draft variable.

Regression 2 presents the first stage for the five-year average variable. Regression 3 and 4 present results for the same first stage regressions including team and year fixed effects.

Table 4 – Second Stage IV Results

	(1)	(2)	(3)	(4)
	pts	pts	w	goaldif
lagodraft1	-0.885 (0.112)	-0.887* (0.505)	-0.479* (0.265)	-2.737* (1.473)
_cons	100.0*** (0.000)	106.0*** (8.582)	48.43*** (4.49)	42.43* (25.02)
FE		X	X	X
N	549	549	549	549
R ²	N/A	N/A	N/A	N/A

* $p < 0.1$, ** $p < 0.01$, *** $p < 0.001$ (se in parentheses)

Table 4: This table offers the key results for the paper. Regression 1 represents the second stage of 2SLS without fixed effects. Regression 2 offers results with only year fixed effects (referenced in paper above). Regression 3 presents the core results of this paper utilizing wins as the performance metric. Similarly, Regression 4 offers the core results utilizing goal differential.