

**PROFESSIONAL SPORTS DRAFTS AND THEIR ABILITY TO
PREDICT CAREER POTENTIAL**

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Abstract

The forecasting of talented players is a crucial aspect of building a successful sports franchise. Professional sports invest significant resources in making player choices in sport 'drafts'. The current study examined career performance in the form of games played against draft round for the NFL, NHL, NBA and MLB for players drafted from 1980-1989 (N=10,800) against the assumption of a linear relationship between draft round and performance (i.e., that players with the most potential will be selected before players of lower potential). A 3 step analysis revealed significant differences between draft rounds (Step 1), significant negative correlations as draft round increases (Step 2), and when league and position were both controlled for draft round remains a significant predictor of games played (Step 3). The only group that did not follow the pattern of results was MLB pitchers. Results highlight the challenges of accurately evaluating amateur talent. Findings are discussed within the context of previous literature on the accuracy of professional drafts.

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Introduction

The professional sports draft is a process used among all major sports in North America to distribute players among a pool of eligible teams. The purpose of the draft is to give exclusive rights to a team to sign a player to a contract. The best-known type of draft is the entry draft, used to allocate players who have recently become eligible to play in a league. Varying slightly from sport to sport, players can come from junior teams, high schools or colleges from around the world. Theoretically, the entry draft deters costly bidding wars for talented young athletes and ensures that no one team can monopolize all the best young players thereby making the league unbalanced (Popper, 2004). In an attempt to encourage fairness within the sports, teams with poorer season records usually get first selections in the postseason draft; the way in which this is determined however, is different depending on the sport. Accurate scouting of athletic potential is very important for professional franchises interested in having young talented players make impacts on their teams. Making a poor draft pick can lead to significant setbacks for franchises who have invested considerable resources in high draft selections. Professional sports teams invest significant funds each year in the attempt to accurately scout individuals who will fill the gaps in their team and improve its prospects for the future (Popper, 2004).

Professional Sport Leagues' Drafting Processes

The first-year player draft (as opposed to the Rule 5 draft of the MLB, discussed below) was created by Bart Bell who was the commissioner of the National Football League (NFL) in 1935 (MacCambridge, 2004). Bell instituted the draft as a means of constraining the payroll of the teams in the league and reducing the dominance of the

league's most successful teams from year to year. The other major professional sports in North America followed suit with amateur drafts soon afterwards: the National Basketball Association (NBA) in 1947, the National Hockey League (NHL) in 1963, and Major League Baseball (MLB) in 1965 (MacCambridge, 2004).

As mentioned above, the method for determining a team's place in the draft order varies among the four major professional sports. In the NFL there is a reverse record draft order. That is, the last place team picks first in every round and the Super Bowl winner picks last. Very common in the NFL however, is for teams to trade their draft picks depending on their current team needs. There are currently seven rounds in the NFL draft and incoming athletes must be at least 3 years out of high school; as a result, new players are almost exclusively chosen from the football programs in the National Collegiate Athletic Association (NCAA) in the United States (Sloane, 2001). The NFL draft garners a significant amount of public and media attention and as a result is a major event among football enthusiasts, held every April in the Radio City Music Hall in New York City.

The NBA draft currently has only 2 rounds. Because the number of positions and minutes per game available on a professional basketball team is limited, the number of rounds in the NBA draft was reduced from 10 rounds to 2 rounds in 1988. Instead of having the last place team pick first (as in the NFL), a draft lottery is done where the 14 teams who did not make the playoffs the previous year all have a chance to get the first three overall picks. The lottery is weighted, however, so that the worst record teams have a slightly higher chance of getting a higher round selection (Shouler, 2004). After the lottery, the other 16 teams then select in a reverse record draft order (e.g., the last place team chooses first, followed by the team with the second worst record etc.). This rule was

established in an attempt to discourage teams from losing on purpose towards the end of the season in order to get the first overall pick (Shouler, 2004). As with the NFL, the draft is held in New York City and nearly all the players drafted into the league come from the NCAA. Differing from the NFL however, the NBA players' association requires that athletes be only 1 year out of high school to be eligible for the draft (Shouler, 2004).

The NHL uses a combination of formats from the NBA and NFL. There are 7 rounds to the NHL draft and the five teams with the worst records from the previous season are entered into a lottery to determine the drafting order for the proceeding draft. Any North American player aged 18-20 is eligible for the draft as well as any international player over the age of 18 (Lavoie, 2003). Differing significantly from the NFL and the NBA, players drafted into the NHL are usually required to play a number of years for the minor hockey club associated with the professional team, also known as the "farm team" (Lavoie, 2003). Few players enter into the active rosters of their respective franchises without first honing their skills further in farm team leagues.

MLB is distinctive in the way it recruits athletes into the league in that there are two drafts every year, with multiple rounds in each. The first draft is sometimes called the Rule 4 draft, a reference to its place in the Official Professional Baseball Rules Book (Spurr, 2000). There can be up to 50 rounds in this draft, and it takes place during the actual MLB season every summer in June. This first draft is considered the main amateur draft for the league. In this draft only players from Canada and the US may be drafted; players from elsewhere can be signed as free agents (Spurr, 2000). As with the NHL, most players drafted into the league spend many years in the minor leagues before being 'called up' to the professional franchise. The second draft occurs every offseason in

December and is known as the Rule 5 draft (Spurr, 2000). Much shorter, this draft was implemented to ensure that teams could not stockpile a large number of talented athletes in their minor league system if other teams were interested in having them on their major league team. Eligibility for this draft is somewhat complex, but essentially if a player has been in the minor leagues of a franchise for 4-5 years they are eligible to sign with other professional teams, but this in turn makes them unable to play in their new team's minor league system (i.e., they must move up to the professional level; Spurr, 2000).

Making a "Good" Draft Pick

There is considerable economic risk with the drafting process, as the first pick in the draft can sign an initial contract up to four times the amount as the last pick in the first round (Massy & Thaler, 2010). This implies that such a player will be much more successful and bring more market value to the franchise they play for than players drafted in later rounds. It has been shown, however, that managers of professional teams significantly overvalue early draft choices over late draft choices without solid economic rationale (Massy & Thaler, 2010). Massy and Thaler examined a player's compensation costs versus the economic value surplus they brought to the team and found that the surplus value of a pick actually increased further with later picks; the last pick in the first round on average brought in more surplus to his team and costs his team less in compensation than the first pick in the first round, with the most efficient monetary investment occurring in second round draft choices.

Despite the economic risk that comes with the drafting of potential future stars, little research has examined how accurate drafts are at predicting athlete career performance (i.e., athlete potential). While a broad spectrum of literature exists on talent

identification (e.g. see review by Williams & Riley, 2000), a limited amount of analysis has been done to specifically examine associations between draft pick and athletes' performance (e.g., Abrams, Barnes & Clement, 2008; Berri & Simmons 2009; Boulier, Stekler, Coburn & Rankins, 2010; Staw & Hoang, 1995). Players are often selected to teams based on how 'scouts' anticipate a particular player will develop. Statistics are used as an initial indicator of who to begin to scout, but the decision whether or not to pursue the players is almost entirely based on a subjective analysis by the scouts on player characteristics and physical potential (Lewis, 2003). However, more recently, athletes' statistical performance has been a key consideration when assessing players' future success (Berri & Brook, 1999). Logically, assembling players who produce at statistically high levels may ultimately improve a team. In support of this, Berri and Brook (1999) identified a positive link between player statistics and team wins. As a result, it appears that professional teams should use player statistics to guide their draft picks, prior to investing time and money into athletes joining their future teams. However, history has indicated that the evaluation of potential talents is not a precise science, outlining the need for more advanced statistical tools to predict future potential (Amico, 2001).

In 2004, the Oakland Athletics popularized a drafting approach that garnered some attention as it was not based on traditional recruiting or scouting methods. Specifically, the general manager of this franchise drafted athletes and signed free agents based solely on a specific statistical performance that became known as the Money-Ball Approach, after Michael Lewis' extremely influential book from 2003. The Money Ball approach is grounded in the difference between meaningful and meaningless (lesser

value) individual baseball statistics. Specifically, Lewis suggested that statistics such as slugging percentage and on-base percentage are better indicators of success than traditionally scouted statistics of stolen bases, runs batted in and batting average (Lewis, 2003). Focusing on slugging percentage and on-base percentage statistics and ignoring subjective measures, such as how scouts think a player might progress, is central to the Money Ball Approach. This system allowed for the signing of players that traditional scouting and signing techniques would have passed over for below market value, thereby allowing them to compete with larger market teams (i.e., those who have a much higher net worth that therefore have more money to spend on incoming players). A comparison between the New York Yankees' payroll in 2010 of \$206,738,389 and the Pittsburgh Pirates' payroll in 2010 of \$34,933,000 highlights the difference between large and small market teams (ESPN, 2010).

Draft Round as a Predictor of Performance

Some researchers have made an attempt to assess whether franchises can accurately predict who is going to be able to contribute successfully to their team. One would expect that accurate prediction would lead to a significant relationship between how early a player is selected and their subsequent career performance. Figure 1 demonstrates a hypothetical interpretation of this assumption.

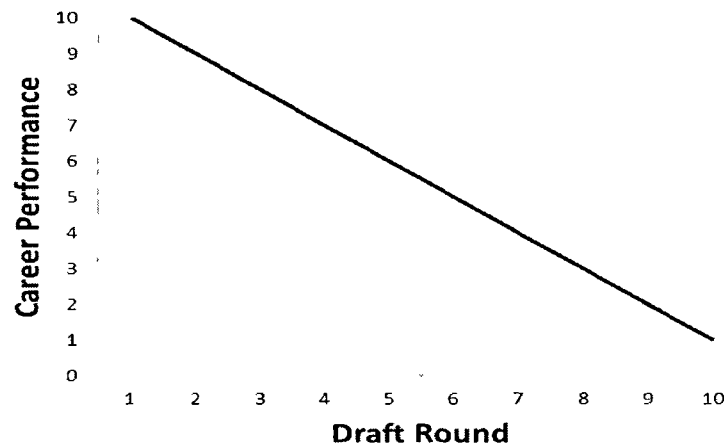


Figure 1. Hypothetical negative linear assumption between draft round and potential career performance.

Staw and Hoang (1995) studied draft order in the NBA to determine whether there was a relationship between the round in which a player was drafted and the playing time that player received. They also wanted to determine the degree to which on-court performance (e.g. points scored) affects this relationship. The researchers examined this association from an economics framework and focused on the concept of “sunk costs” (i.e., costs that cannot be recovered once they have been incurred such as drafted player’s initial salaries). What Staw and Hoang discovered was that the highly paid early round draft picks were not statistically superior to players drafted in later rounds. Overall, early round draft picks had longer survival rates only because of the costs incurred upon them after they were drafted. More specifically, draft order was a significant predictor of survival rate in the NBA, after controlling for on-court performance. These researchers revealed the large risk that goes into the selection of any particular player, because of the potential for passing up the next superstar (Staw & Hoang, 1995). This phenomenon was particularly evident following the 1984 NBA draft when the Portland Trailblazers predicted that drafting Sam Bowie would be more beneficial than drafting Michael

Jordan, passing up drafting the individual many sport enthusiasts consider to be one of the greatest athletes of all time. In the same draft, future hall of famers Charles Barkley and John Stockton were selected after two relatively unknown athletes Sam Perkins and Terrance Stansbury. Staw and Hoang's findings (1995) give rise to an important sociological phenomenon that may be occurring in professional sports: Players drafted in the early rounds may have more time invested in them simply because of the pressures from the media, the owners, the fans and the coaches, because they were a high draft selection. Staw and Hoang suggest that given such pressures, early round players may be seen as 'needing more time to develop their skills' than later round players, which results in longer careers, regardless of their statistical performance.

Camerer and Weber (1999) re-examined the issues raised by Staw and Hoang (1995) as they felt that there could be other possible explanations to the sunk cost phenomenon or what they called the escalation of commitment to early round draft picks in the NBA. From a theoretical and statistical viewpoint, Camerer and Weber attempted to justify whether escalation is a valid concept to be used by economists in assessing rational choices and actions such as draft choices in the NBA. These researchers took a new sample of players drafted in the NBA and replicated the study design used by Staw and Hoang; however, they further analyzed the data to rule out other possible influencing factors such as pre-draft expectations and fan appeal. The final results showed an effect size that was approximately half as strong as that reported by Staw and Hoang, but still statistically significant, supporting the persistence of a sunk-cost effect or an escalating commitment in the NBA draft. This study further reinforced the difficulty in accurately predicting the potential impact and net worth of incoming players into the NBA.

Abrams et al. (2008) conducted an analysis on NBA athletes to predict career longevity based on pre-draft individual statistics. They set out to try to find a relationship between a player's statistics in their final 1 or 2 seasons prior to entering into the NBA and their resulting professional career longevity. The assumption was that on the whole, the seasons immediately prior to entering into the NBA were the athlete's best collegiate seasons (Abrams et al., 2008). The results of their multivariate analysis indicated that certain statistics accumulated by guards and forwards in their previous seasons before entering into the NBA had some predictive value for career longevity. The predictive ability dropped off for athletes in the centre position. Not every college level statistic was significant for the different positions, but key statistics for certain positions (e.g., steals for guards and rebounds for forwards) had significant predictive values (Abrams et al., 2008). The authors suggested that general managers and owners should integrate these findings into talent assessment prior to drafting players.

Two recent studies have assessed the relationship between incoming players drafted into the NFL and their career performance. Berri and Simmons (2009) and Boulrier et al. (2010) attempted to determine how well the NFL draft predicted players' performance throughout their careers. Both studies focused on quarterbacks because of their key role in team success in football, although Boulrier et al. also included wide receivers because of their role in the offensive production of teams.

Differing from previous drafting research in the NFL (Hendricks et. al. 2003, Massy & Thaler, 2010), Berri and Simmons (2009) focused on the performance of a specific player position (i.e. quarterback) as a measure of how appropriate the decision had been to sign this player. Essentially, these researchers compared statistics for

different players in the same position to determine who had been a ‘good’ or ‘bad’ decision to sign. If a player performed worse but was drafted higher, they would be considered an inaccurate or bad signing decision. Although the researchers acknowledged that player impact and statistical output varies by position on the football field, they argued that an assessment of a quarterback’s accumulated statistics was an appropriate measure since he is the player who takes on the starring role and is often considered the most crucial position in determining a team’s wins and losses. Berri and Simmons looked at three main research questions: a) What is the relationship between an NFL quarterback’s draft position and his subsequent performance? b) What factors do NFL teams consider in drafting a quarterback? and c) How do the factors the NFL teams consider in drafting a quarterback relate to subsequent performance? Using quarterback rating as the main measure of performance (a well established measure among NFL analysts designed to assess quarterback performance independent of other quarterbacks, taking into account pass completions, yards run, touchdowns and interceptions per attempt), as well as calculating production per play and total plays, Berri and Simmons found that the relationship between actual performance and draft position was weak. They found a much stronger relationship between total plays and draft position suggesting that early draft position seems to get a player on the field more, however these players do not appear to outperform those taken later.

Boulier et. al. (2010) examined the relationship between drafting round and performance among quarterbacks and wide receivers. They considered three measures of performance for quarterbacks (years played, number of passes thrown, and quarterback rating), as well as two measures of performance for wide receivers (number of years in

the league and total receiving yards). Spearman rank order correlation coefficients were used to examine: a) the order which a player was drafted relative to others in the same position, and b) players' relative successes. They found that the earlier a quarterback was drafted the better his performance. More specifically, earlier drafted quarterbacks had a higher quarterback rating, threw more passes and played for more years. These findings both reinforce and conflict with previous findings. Boulrier et. al. and Berri and Simmons (2009) showed that earlier drafted quarterbacks received more playing time, and therefore also had higher attempts and games played. However, findings conflict for performance measures since Boulrier et. al. found that having an earlier draft pick was also associated with higher quarterback rating relating to higher performance over a career. As mentioned above, Berri and Simmons did not find that higher draft selections performed higher over a career. Wide receivers showed a similar trend; those drafted earlier played for more years and had more receiving yards. The researchers concluded that football executives made very good draft picks. This conclusion does not necessarily address the issues presented by previous research and could be significantly influenced by such things as the sunk cost effect reported by Staw and Hoang (1995), and the escalation of commitment reported by Camerer and Weber (1999).

Rationale and Purpose

Generally, research with the NBA and NFL suggests that players drafted earlier play for longer and, possibly as a result of longer play, have better performance statistics than player's drafted later. Hypothetically, the process of draft selection would be most effective if franchises first select the best performers, followed by the second best performers, and so on throughout the draft rounds. In other words, a negative linear

relationship is assumed to exist within the drafting process (c.f., Figure 1) that as draft round increases, player potential decreases.

However, this assumed trend is based on very limited research, suggesting that there is considerable room for discovery regarding the accuracy of professional scouts and general managers at selecting the best athletes. There have been few examinations of either NHL or MLB and data from the NFL has been limited to quarterbacks and wide receivers. As such, this study builds on the research presented above by focusing on the four main professional sports in North America. Specifically, the purpose of this study is to determine whether draft order can predict athletic potential (as measured by games played) in the NBA, NFL, NHL and MLB.

Professional sports drafts and their ability to predict career potential

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Abstract

The forecasting of talented players is a crucial aspect of building a successful sports franchise. Professional sports invest significant resources in making player choices in sport 'drafts'. The current study examined career performance in the form of games played against draft round for the NFL, NHL, NBA and MLB for players drafted from 1980-1989 (N=10,800) against the assumption of a linear relationship between draft round and performance (i.e., that players with the most potential will be selected before players of lower potential). A 3 step analysis revealed significant differences between draft rounds (Step 1), significant negative correlations as draft round increases (Step 2), and when league and position were both controlled for draft round remains a significant predictor of games played (Step 3). The only group that did not follow the pattern of results was MLB pitchers. Results highlight the challenges of accurately evaluating amateur talent. Findings are discussed within the context of previous literature on the accuracy of professional drafts.

Professional sports drafts and their ability to predict career potential

The professional sports draft is a process used among all major sports in North America to distribute players among a pool of eligible teams. The purpose of the draft is to give exclusive rights to a team to sign a player to a contract. The best-known type of draft is the entry draft, used to allocate players who have recently become eligible to play in a league. Varying slightly from sport to sport, players can come from junior teams, high schools or colleges from around the world. Theoretically, the entry draft deters costly bidding wars for talented young athletes and ensures that no one team can monopolize all the best young players thereby making the league unbalanced (Popper, 2004).

There is considerable economic risk with the drafting process, as the first pick in the draft can sign an initial contract up to four times the amount as the last pick in the first round (Massy & Thaler, 2010). This implies that a player drafted in an early round will be much more successful and bring more market value to the franchise they play for than players drafted in later rounds. It has been shown, however, that managers of professional teams significantly overvalue early draft choices over late draft choices without solid economic rationale (Massy and Thaler, 2010).

Some researchers have begun to assess whether franchises are accurately predicting who is going to be able to contribute successfully to their team. If they are successful, there should be a significant relationship between how early a player is selected and their subsequent career performance. Figure 1 demonstrates a hypothetical interpretation of this assumption.

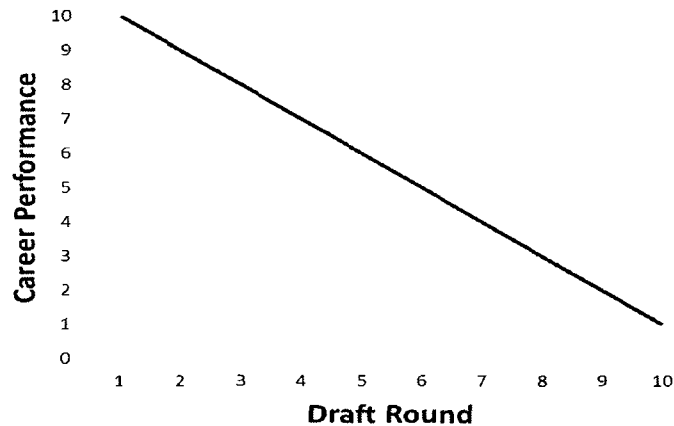


Figure 1. Hypothetical negative linear assumption between draft round and potential career performance.

Staw and Hoang (1995) studied draft order in the National Basketball Association (NBA) to determine the relationship between the round in which a player was drafted and the playing time that player received. The researchers examined this association from an economics framework and focused on the concept of “sunk costs” (i.e., costs that cannot be recovered once they have been incurred such as drafted players’ initial salaries). What Staw and Hoang discovered was that the highly paid early round draft picks were not statistically superior players than those drafted in later rounds. Overall, early round draft picks had longer survival rates only because of the costs incurred upon them after they were drafted. More specifically, draft order was a significant predictor of survival rate in the NBA, after controlling for on-court performance.

In another study examining draft order and performance, Berri and Simmons (2009) focused on the performance of quarterbacks in the National Football League (NFL) as a measure of how appropriate the decision had been to sign this player. The researchers considered three main research questions: a) What is the relationship between an NFL quarterback’s draft position and his subsequent performance? b) What factors do

NFL teams consider in drafting a quarterback? and c) How do the factors the NFL teams consider in drafting a quarterback relate to subsequent performance? Berri and Simmons found that the relationship between actual performance and draft position was weak; interestingly, they found a stronger relationship between total plays and draft position suggesting that draft position gets you on the field more, but quarterbacks who are taken earlier in the draft do not appear to outperform those taken later.

Boulier, Stekler, Coburn and Rankins (2010) examined the relationship between draft round and performance among quarterbacks and wide receivers in the NFL. They considered three measures of performance for quarterbacks (i.e., years played, number of passes thrown, and quarterback rating), as well as two measures of performance for wide receivers (i.e., number of years in the league and total receiving yards). Their data revealed that the earlier a quarterback was drafted the better his performance. More specifically, earlier drafted quarterbacks had a higher quarterback rating, threw more passes and played for more years. These findings reinforce previous work, in that Berri and Simmons showed that earlier drafted players received more playing time, and therefore also had higher attempts and games played. However, findings conflict with previous work showing that earlier draft pick was associated with higher quarterback rating relating to higher performance over a career. Wide receivers showed a similar trend; those drafted earlier played for more years and had more receiving yards. The researchers concluded that football executives made very good draft picks.

Hypothetically, the most effective process in the draft would be to select the most desirable player in round one, followed by the second most desirable player in round two, and so on (i.e. negative linear relationship c.f., Figure 1) based on the assumption that as

draft round increases, player potential decreases. Although there is some support for this assumption in the work summarized above, it is based on very limited evidence and there is considerable room for discovery regarding the accuracy of professional scouts and general managers at selecting the best athletes. There have been few examinations of either NHL or MLB and data from the NFL has been limited to quarterbacks and wide receivers. As such, this study builds on previous research by focusing on the four main professional sports in North America. Specifically, the purpose of this study was to determine whether draft order can predict athletic potential (as measured by games played) in the NBA, NFL, NHL (National Hockey League) and MLB (Major League Baseball).

Methods

Participants

To maintain consistency across sports, the sample included players drafted into the NHL, NFL, NBA and MLB from 1980-1989 who recorded 1 or more games played. One thousand fifty nine players from MLB, 407 from the NBA, 2380 from the NFL and 1028 from the NHL made up the resulting sample. Given that most players drafted during this time period had finished their careers at the time of data collection, complete career statistics were collected in most cases. The number of individuals who had not completed their career was minimal (less than 1% of players) and was not expected to have an effect on the analysis. For the NHL and NFL the entire sample of drafted players was used. For the NBA only the first two rounds of the draft data was used. This was done to maintain consistency with previous work (Staw and Hoang, 1995) as well as to be applicable to the current draft structure. For MLB a different approach was necessary, given that MLB has

2 main drafts and 2 supplementary drafts each year. The sample was limited to the first 15 rounds of the June Amateur draft only for the MLB for two reasons. First, the June Amateur draft is the primary entry draft for this league. Second we wanted to maintain relative consistency with the other leagues in this study in the number of rounds examined.

Data Collection

The performance data for the sample populations were collected through the official online resources of the professional leagues (i.e., www.nhl.com, www.nfl.com, www.mlb.com, and www.nba.com) in January to May of 2010. These websites contain information on each year of the corresponding sports' drafts since the leagues' inceptions, as well as links to individual players' statistics. Specifically, they are the primary sources of data on players in the professional leagues as they house information on each player who has been drafted and competed at the professional level of competition (i.e., has a statistic recorded in the official database). A combination of manual extraction and Microsoft Excel macros was used to extract the data from the online sources. Consolidation macros facilitated organization of the data into the proper format for analyses. Reliability of the data collected was determined through a cross examination of a random selection of 10% of the athletes' statistics with an official encyclopedia of North American professional sports (Graschnitz, 2008). Reliability check resulted in perfect (i.e., 100%) consistency between the online sources and the published encyclopedia.

Measures

The databases provide a considerable range of player performance indicators. In an effort to maintain consistency across the sports and positions, *games played* was used as the standard outcome variable as it is the only variable that crosses all sports and positions. Moreover, a preliminary analysis (Koz, Baker & Fraser-Thomas, 2009) showed that games played accounts for 80% of the variance in the points scored by NHL players drafted from 1980-1989, increasing the construct validity of this variable as an appropriate measure of performance. Further, it can be reasonably argued that if players are accumulating playing time then they must be contributing sufficiently to be considered an asset to their franchises. More simply, an athlete's value to a team (i.e., potential) is reflected in coaching decisions to play the athlete as often as possible. While the authors recognize games played may not be the most accurate depiction of player potential for a given league, it is a variable that can cross over all sports and positions to give a general indication of the franchises' ability to decide who will be of valuable to their team, as there is no one specific statistic that takes into account team strategy and specific player or position contribution. The predictor variable in the current analyses was *draft round*.

Data Analysis

The basis for the analyses outlined below was the hypothetical relationship noted in Figure 1. Inherent in the draft structure (i.e., draft order determined by the previous season's outcome, with the teams with the worst records selecting before teams with the best records) is the assumption that player potential differs for the incoming athletes, and a team's draft position matters. More specifically, there should be a relationship evident

in the overall production of the players selected in earlier versus later rounds, or draft round and selection order would serve little purpose. If incoming players all have the same potential for contribution to the teams in the league, the structure should be a free-for-all selection of a pool of players until the teams have satisfied a certain player quota for their next seasons training camp. Instead, the draft structure serves a purpose and one of those purposes is to allow an orderly selection of the incoming talent into the league. So, to examine whether professional drafts are indeed accurate at predicting player potential we used a 3-step approach.

First, we determined whether there was a difference in games played across draft rounds using Kruskal-Wallis tests. We ran five separate analyses: one for NBA, NHL, and NFL, and two for MLB, separating into pitchers and fielding players. Independent analyses was conducted for pitchers and fielding players because pitchers work on a rotation basis, usually with 5-6 regular starting pitchers per franchise, whereas fielding players (barring any injuries) usually play in most of the regular season games. Test variables included games played and draft round, with the corresponding ranges based on the number of draft rounds in the league being analyzed (i.e., 1-12 for NFL, 1-15 for the MLB, 1-10 for the NHL and 1-2 for the NBA). Although non-parametric tests of difference (i.e., K-W test) were most appropriate for the data, post hoc analyses can be difficult to administer (and interpret). Therefore, we ran parallel analyses with Analysis of Variance and where appropriate, post hoc tests were conducted using Tukey's method. The second step in the analysis involved examining the relationship between draft round and games played in each league using Spearman correlations. Finally, the third step of the analysis used multiple regression to consider the global relationship between games

played (the dependent variable) and draft round (the independent variable) while controlling for important covariates (i.e., league, position and year of the draft). All analyses were performed using SPSS version 17.0 and statistical significance was set at $p < 0.05$.

Results

Results for steps 1 and 2 of the analysis are presented by league, followed by the results of step 3, the regression analysis, which includes all 4 leagues. Step 1 shows the mean number of games played across draft rounds as well as a K-W analysis result and post hoc test to show the differences in rounds. Step 2 shows Spearman correlations between draft round and games played. Step 3 shows a multiple regression that was done with league, position and year as covariates, games played as the dependent variable and round as the independent variable.

NFL

Step 1. Figure 2 shows mean number of games played across draft round. Results from the K-W analysis indicated significant differences between the number of games played across the draft rounds ($X^2 [11] 377.16, p < 0.05$). Post hoc analyses indicated that Round 1 differed from all other rounds. Round 2 differed from all other rounds except round 3. Round 3 differed from rounds 2, 4 and 5. Round 4 differed from rounds 1, 2 and 11. Round 5 only differed from round 1 and 2. Rounds 6 through 10 differed from rounds 1, 2 and 3. Round 11 differed from rounds 1, 2 and 4 while round 12 differed from rounds 1 through 4.

Step 2. The Spearman correlation between draft round and games played in the NFL, showed a significant negative correlation ($r = -.378$, $p < 0.05$), indicating that as draft round increased, player potential (i.e., games played) decreased.

MLB

Step 1. Figures 2 and 3 present the mean number of games played by draft round for MLB pitchers and fielders respectively. Results from the K-W analysis for MLB Pitchers did not indicate a significant difference in the number of games played across the draft rounds ($X^2 [14] 23.354$, $p = 0.055$). K-W analysis of the baseball hitters indicated a significant difference in games played across the draft rounds ($X^2 [14] 33.482$, $p < 0.05$). Post Hoc analysis indicated that while no rounds were significant from each other at the $p < 0.05$ level, the difference between round 1 and round 2 and round 7 approached significance ($p < 0.10$).

Step 2. Spearman correlations between games played and draft round for the MLB showed a small but significant negative correlation for both pitchers ($r = -.107$ $p < .05$) and hitters ($r = -.162$ $p < .05$) indicating that as draft round increased, player potential (i.e., games played) decreased.

NHL

Step 1. Figure 4 presents the mean number of games played across draft round for the NHL. Results from the K-W analysis indicate significant differences between the number of games played across the draft rounds ($X^2 [9] 519.559$, $p < 0.05$). Post hoc analyses indicated that Round 1 and 2 differed from all other rounds, while round 3 differed from all rounds but rounds 4 and 6. Round 4 differed from rounds 3 and 6. Round 5 differed from rounds 6 through 10. Round 6 differed from rounds 3 through 9,

and round 7 differed from rounds 5 to 10. Rounds 8 and 9 both differed significantly from rounds 5 to 10. Finally round 10 differed from round 5 and 7 through 10.

Step 2. Spearman correlation between games played and draft round for the NHL showed a moderate significant negative correlation ($r = -.457$ $p < 0.05$), indicating that as draft round increased, player potential (i.e., games played) decreased.

NBA

Step 1. Figure 5 presents the mean number of NBA games played across draft round for the NBA. Results from the K-W analysis indicate a significant difference between the distributions of games played across the two draft rounds ($X^2 [1] 85.309, p < .05$).

Step 2. Spearman correlation between games played and draft round for the NHL showed a moderate significant negative correlation ($r = -.506$ $p < 0.05$) indicating that as draft round increased, player potential (i.e., games played) decreased.

NFL, MLB, NHL, and NBA

Step 3. Table 1 presents results of the hierarchical multiple regression analysis performed to determine the overall effect of draft round on games played across the 4 leagues examined in this study, when controlling for position, league, and draft year. Results indicate that position and league were significant covariates, accounting for 16% and 1% of the variance in games played respectively. Post hoc examinations were conducted using one-way ANOVA with Tukey's HSD. All leagues were significantly different from each other at the $p < 0.05$ level, with the exception of the MLB and NBA. The difference between these two leagues did however approach significance ($p = 0.095$). Post hoc comparisons of position indicated that in the NFL and NBA no position was

significantly different from any other in terms of games played. In the MLB pitchers played significantly fewer games than other all positions except for those players categorized as 'in-field'. MLB catchers also played significantly fewer games than first basemen, short stops and third basemen. First basemen played significantly more games than pitchers, catchers, second basemen, infielders and outfielders. Second basemen played significantly more games than pitchers, but less than first basemen, short stops and third basemen. Short stops played more than pitchers, catchers, second basemen and outfielders. Third basemen also played significantly more games than pitchers, catchers, second basemen, infielders and outfielders. Infielders played significantly fewer games than first basemen and third basemen. Finally outfielders played more games than pitchers, but significantly fewer games than first basemen, shortstops and third basemen. All significant differences were at the 0.05 level.

In the NHL the only significant difference that occurred by position was that both goalies and those classified as NHL forwards played significantly fewer games than centre men. After removing the variance associated with the covariates, draft round remained a significant predictor of games played, accounting for 4% of the variance in games played with overall results across all four leagues indicating that as draft round increased, games played across one's career decreased.

Discussion

This study was the first to broadly investigate the North American professional sports leagues and positions in order to develop our understanding of professional sports drafts and their efficacy. Consistent with past work (Boulier et al., 2010; Staw & Hoang, 1994), this study found that regardless of league, there is a negative relationship between

draft round and games played; however, the relationship was stronger for the NFL, NHL and NBA than for the MLB. As a whole what this analysis was able to show is that players drafted earlier are used more by their coaches and the franchises to which they are drafted. This knowledge advances our understanding of draft accuracy among these professional leagues and informs models of talent detection and development.

Understanding difference in games played across draft round

With the exception of the MLB pitchers all analyses noted significant differences in games played across the draft rounds suggesting that draft round may be a reasonable measure of player potential. There were numerous differences seen across draft round in every draft but the MLB, and most notably round 1 differed significantly from all other rounds. There were a number of intermediate differences in the draft rounds of the NHL and NFL and these need to be investigated further in order to be able to explain their appearance. As mentioned, the most consistent and notable difference is seen with round 1 picks as these athletes appear to be a unique group. It is possible that these individuals are just the most talented bunch of incoming athletes and therefore have the most games played because they have the most to offer their respective franchises. It is also possible however that these players are the ones who are most affected by the intangibles of the draft (sunk cost, escalation of commitment) because of the hype and expectation which often surrounds early draft picks. Our analyses only indicates that this group appears to be unique in terms of their games played, and in the future it will be a point of interest to investigate these early round individuals more in depth to see what is making them such a consistently unique group.

Interestingly, pitchers showed a pattern that was contrary to the one hypothesized in Figure 1. Although the difference across rounds approached significance, Figure 3 suggests that the mean games played across the draft round differed considerably from the patterns demonstrated in other leagues. Spurr (2000) found that draft position predicted the chance of logging a game played in the major leagues. Our findings indicate no significant difference in total games played between pitchers who reach the major leagues but are drafted in different rounds. These differing findings may be because our analyses excluded players who did not log a game played. More specifically, our pitchers included the 88 drafted in round 1, the 47 drafted in round 2, and the approximately 20 pitchers drafted in each of rounds 8 to 15 who reached the major leagues and logged at least 1 game played. Similar to Spurr our data indicate those drafted later have a smaller chance of logging a single game at the major league level. Other research (Boulier et al., 2010; Staw & Hoang, 1995) has used total games played as an indicator vs. those who played a single game (Spurr, 2000). The former can be argued to be a more accurate measure of a player's potential, as total games played is a better representation of the value of a drafted player.

Understanding the relationship between draft round and player potential in each league

Staw and Hoang showed that in the NBA, players drafted in the second round play less than those drafted in the first round, providing the strongest support for the hypothesized negative linear relationship between draft round and potential; however with only 2 rounds in the NBA draft it is difficult to conclude too much from this league alone. However, the relationships between these variables in the NHL and MLB were also moderate in strength while the correlations in MLB were relatively weak, but in the

direction hypothesized. Even though there is varying strength in the relationship between games played and draft round, from the consistency of the pattern in these findings provides good evidence that the later a player is drafted, regardless of the league they drafted in, the fewer games that they are likely to play in their career.

There are several explanations for this pattern of results. For instance teams generally have few starting spots and as a result players drafted earlier (i.e., deemed to have greater ‘value’) fill those spots initially thereby receiving more attention from the coaches and more playing time than those selected in the later rounds. Although it is not possible to tease apart the mechanisms of the inverse relationship between draft round and games played, it is reasonable to assume it is due, at least in part, to the sunk cost / escalation effect described in previous NBA analyses. Because there is an increased investment in earlier drafted players when they initially come in the league, this increased initial investment may have carry over effects that may be a better predictor of games played than actual performance.

The NFL and NHL both showed lesser but still moderate negative correlations. This is consistent with previous literature on the NFL. Assessment of the effectiveness of the NHL draft has not been done in the past and these results will provide a foundation for further analyses. Both the NFL and NHL have more players on their active rosters (53 and 23, respectively) than the NBA (12). The number of players on team’s active rosters was not a variable which we controlled for in our analyses but might affect the depth of competition for spots on a team, and therefore may have been a contributing factor to the difference seen in the NFL and NHL vs. the NBA.

The pattern of results for MLB was relatively unique compared to the other leagues, especially for pitchers. Possible explanations for this include the fact that almost all players who are drafted into MLB go through lengthy careers in the minor leagues. This prolonged ‘trial’ period before the players enter the major leagues is the best indicator of their ability to compete at a high level as well as stay injury free until there are signed to their respective professional franchises. A player’s performance in the minor league system over time could washout any high draft selection biases that have been mentioned in previous research, such as the sunk cost effect. It is possible that there are other reasons for the results that seem to make the MLB a unique group, as the NHL also has a farm system where players hone their skills after being drafted and before they are called up to the professional ranks yet shows a similar trend to the NFL and NBA. A more in-depth analysis of MLB, both individually and in comparison to the other leagues, would expand our understanding of the factors affecting games played at the highest level of professional sport.

Predicting player performance

It is not surprising that the leagues were generally different from each other in terms of games played, as all the leagues have schedules of varying length. However, it was surprising that there was no difference between the MLB and the NBA since these leagues have a vastly different number of games per season (i.e., 162 for the MLB and 82 for the NBA). It is possible that because of the long schedule, players in the MLB take games off to rest, but because of the nature of basketball and having only 5 main starters per team, barring any significant injury players will play every game in the season. This,

however, is unlikely to fully account for these leagues not being statistically different and provides an interesting avenue for future research.

There were some differences in the MLB and NHL for the amount of games played by position. In the MLB, as expected, pitchers differed from all other positions. Pitchers of course work on a rotation basis, and therefore are going to appear in fewer games than those classified as ‘hitters’. Catchers having significantly fewer games played could be due to the fact that this position involves being constantly crouched causing stress on the knees and therefore may subject these players to the necessity of games missed because of rest or injury. First basemen having more games played could be due to the opposite reason, this position in baseball does not often require a lot of movement as they are most active in catching throws from their fellow infielders. The risk of injury and need for rest may be less because the fielding and movement requirements are less.

In the NHL goalies playing significantly fewer games than centre may be explained in a similar fashion to pitchers and hitters in baseball. The goalie position may work on a rotational basis as and this may cause the decrease in games played over their career, so therefore may have less games played than centre men. A secondary analysis of goalies separate from other players was done in order to ensure that this group did not show a different trend when entered alone into the analyses, and also did not skew the analyses of the ‘skaters’ (forwards and defensemen). It is difficult however to explain why only centre men and not defensemen or either of the wingers show similar trends in regards to those players in the goalie position, and this may require a further in-depth analyses of the NHL statistics to uncover. These and other position differences which appeared post-hoc will be something which needs further in-depth investigation as

position was not a primary focus of the current analyses, but is an interesting avenue to examine.

Limitations

Although this study provides a useful step in developing our understanding of professional sports drafts, there were some limitations to our analysis. First, this study did not take account for injuries sustained by players drafted in any round which can shorten their career prematurely. In such cases this is not necessarily a measure of how that individual 'could' have performed had they been able to stay injury free, and if enough players from any particular round sustained career shortening injuries, this could bias the results. Players drafted from every round are exposed to injury risk however, and with such a large sample size of players from each of the four leagues we expected that the overall influence of injury on our analyses was minimal.

Second, as mentioned previously pitchers in the MLB can be either starting pitchers or relief. Because the relief pitchers get called into the game for fewer innings, they can play in more games than the starters who work on a rotation (usually play every 5 games). Our data did not include this measure (and this designation typically changes across a pitcher's career), however, researchers may wish to control for this influence in future analysis.

Finally, the timeframe of 1980-1989 for drafted players was chosen because nearly all of these players were completed their careers thereby allowing access to career statistics. However, this may be a limitation to our analyses since it is possible that drafting techniques have changed over the past 20 years. Although it is unlikely that these changes have been so drastic as to completely change the pattern of results (although this

may be the case for the NBA) future studies are necessary to determine the longevity of the results seen in these data. The NBA may be an exception since its draft process underwent a significant change, being reduced from 10 rounds prior to 1987 to 2 rounds in 1988 and onwards. Only the 2 rounds of data were included in our analyses because this is the most applicable to the modern structure, but it is possible drafting strategies different in the early and mid-80s when more rounds of the draft were available.

Future directions

There are several lines of research that flow directly from this initial analysis, some of which have been highlighted in the discussion above. Including other performance statistics more specific to each sport and each position is the next logical step to these analyses. However, these future analyses should not be at the expense of games played since overt statistics are not always the best measure of an individual's contributions to a team's success, as these do not take into account intangible qualities that can often lead to more playing time for athletes.

Furthermore, MLB showed a significantly different trend than the rest of the leagues and further work is needed in order to explain this difference. Adding the performance statistics and/or collecting minor league performance data may help to answer this question. Additionally, it will be interesting to see which teams are better or worse at accurately drafting high caliber players. If there is a significant difference in franchises over time to outperform each other in the draft, this will be valuable information for creating more effective drafting strategies. Grouping the players by initial drafting team and performing similar analyses could yield interesting information.

Conclusion/Summary

Players drafted into professional sports often come with high expectations from media, fans and teammates. Whether or not these players meet those expectations or fulfill their potential is the result of a dynamic interaction among a host of variables including player characteristics, team environment, and social pressure. This analysis has indicated that the NFL, NBA, and NHL show similar trends between games played and draft round with MLB as the anomaly. These analyses provide a foundation for future analyses to inform our understanding of the drafting process and improve the accuracy of professional franchises in predicting potential.

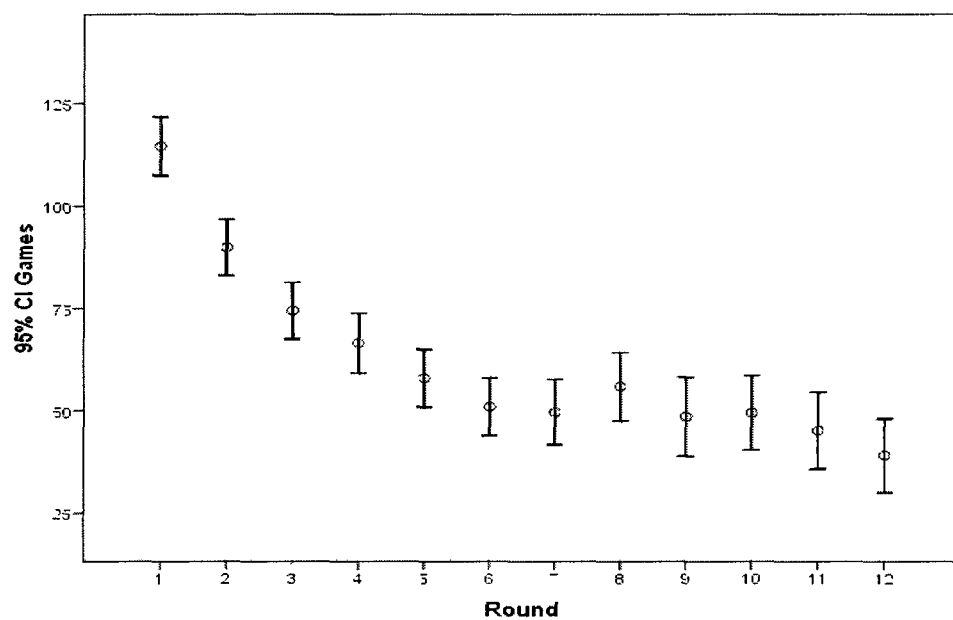


Figure 2. NFL Mean Games played Across Draft Round.

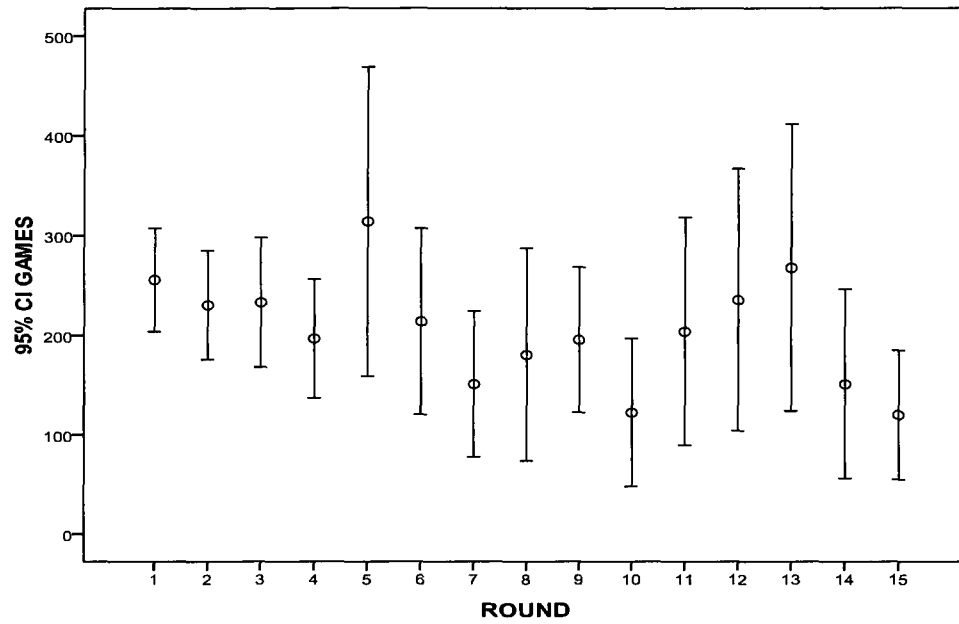


Figure 3. MLB Mean Games Played for Pitchers Across Draft Round

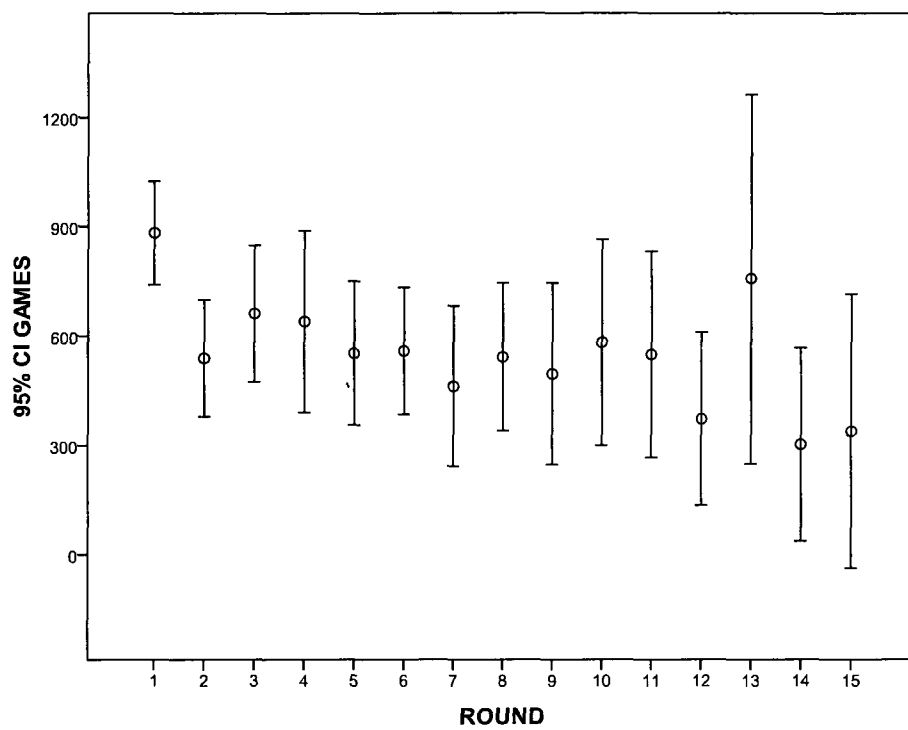


Figure 4. MLB Means Games Played for Fielding Players Across Draft Round

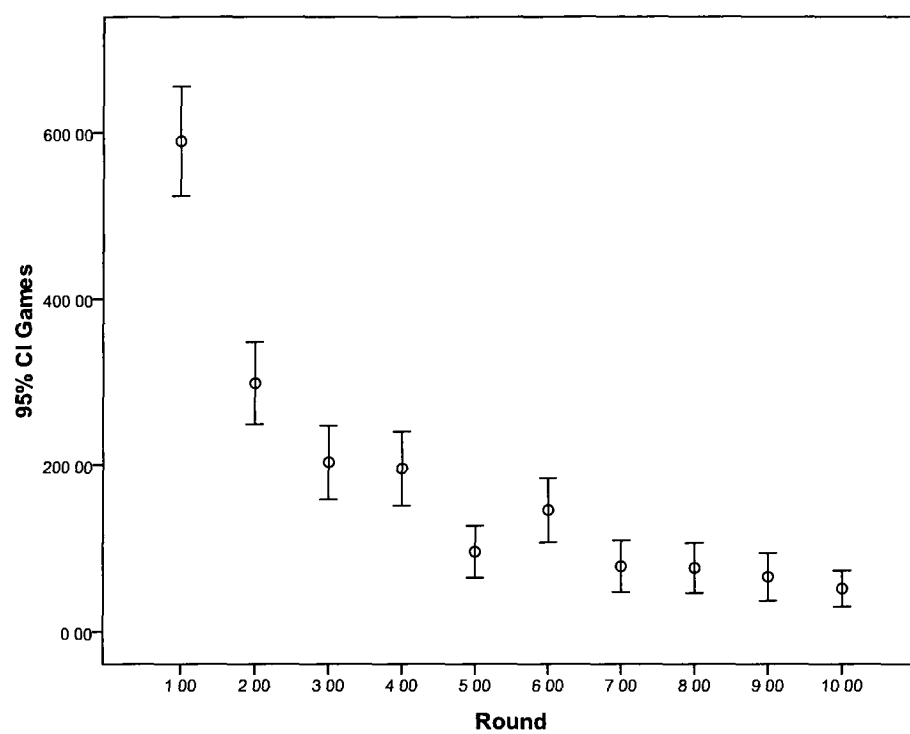


Figure 5. NHL Mean Games Played Across Draft Round

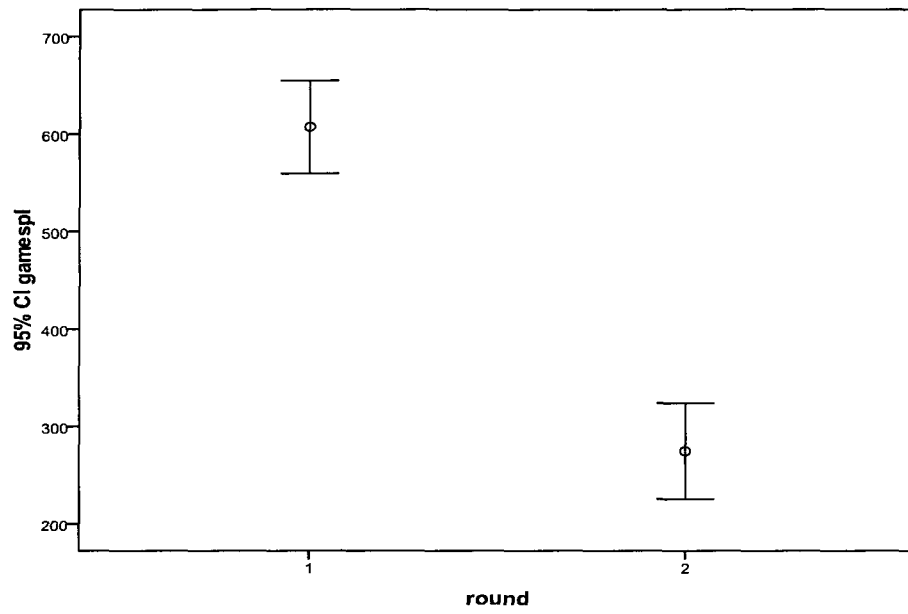


Figure 6. NBA Mean Games Played Across Draft Round

Table 1

Hierarchical Multiple Regression for Draft Predicting Games Played Across All Leagues

	ΔR^2	β
<u>Step 1 Covariates</u>	.087***	
Position		.394***
League		-.106**
Draft Year		-.008
<u>Step 2 Primary IV</u>	.035***	
Draft Round		-.192***
TOTAL R^2	.122***	

Note. **= $p < .01$, ***= $p < .001$

General Discussion

Professional Drafts

There has been relatively little research on the accuracy of professional drafts, particularly the connection between draft round and playing time. On the whole, studies that have been conducted show that as draft round increases, games played and statistics such as yards gained or points scored decreases. Findings from this thesis displayed significant difference between draft rounds (Step 1) and a significant negative correlation as draft round increases (Step 2) and when league and position are both controlled for, draft round remains a significant predictor of games played (Step 3). The only group that did not follow the pattern of results was MLB pitchers.

Understanding the risk in the professional draft

Cost benefit analyses of incoming players and current players on professional league teams has been conducted (Massy & Thaler, 2010; Popper, 2004; Simmons & Berri, 2007). Sports at the professional level are considered a business with the primary goal of turning profits by minimizing unnecessary expenditure while maximizing gains. This is precisely what professional franchises attempt to do and why accurate drafting is so critical. Massy and Thaler (2010) highlight the importance of properly assessing cost-return ratios, making the argument that first round players may have a lower value than later round players. Although our analyses do not take into account player salaries, it does not change the result that a player who is drafted higher tends to have a longer career and therefore a higher potential for contribution to their team. It is difficult to apply an economic focus to the current results as we would need to compare the contracts signed

by individuals between and within rounds. However, if contract size differs between rounds in an inverse direction, this would further support our findings.

Games played as a measure of performance

As mentioned previously, the findings from the studies done on the professional drafts have on the whole found that players drafted earlier have superior performance statistics and play more games than those drafted later. Past research has mentioned that *games played* can be deceiving as a measurement of player potential and performance (Staw & Hoang, 1995) because of other factors such as the sunk cost effect or escalation of commitment. The current analyses did not control for this and the possibility that other factors may have influenced results remains. Determining a player's true value remains a difficult task. Often players of the same position on different teams can have very different expectations for contribution. Some players are expected to score and produce points, whereas some players may have a role which is defined by some intangible value such as leadership, hard work or an aggressive playing style. Arguably one way to assess value is through playing time (see also Spurr, 2000). However, the legitimacy of this outcome as the 'best' measure of player potential remains to be determined.

Identification of inconsistency in games played

The inconsistency seen in the MLB relative to the other leagues could be due to a number of reasons. However, because the MLB draft has not received very much attention it is difficult to conclude why this difference appeared. We speculated that the difference seen in the MLB may be because almost all drafted players spend significant time in the minor leagues or on the farm teams to their respective major league team. Moreover, the MLB draft is much larger than the other leagues draft (50+ rounds) and

occurs twice a year and as a result, a larger quantity of skilled athletes are given the opportunity to pursue careers in baseball. Compared to other professional sports, they are often drafted young and go through a number of developmental years before eventually getting the opportunity to enter into the major league. These phenomena are specific to the MLB and may wash out the effects of the draft (e.g., sunk cost, escalation of commitment). Consequently, games played in MLB may depend more on factors such as training and minor league performance. It could be argued that because of this finding perhaps the MLB drafting system is more beneficial (less risky) to professional franchises because they do not have to invest considerable money in professionally untested amateur players before seeing how they develop in their minor systems. Despite its benefit, this system may not be feasible for other leagues. Baseball's minor league system is widely established and ingrained in baseball culture and playing in this league is a normalized condition of becoming a professional baseball player. Ice hockey has the closest comparable minor league structure however establishing a similar structure in football or basketball would be an immensely complex and expensive undertaking.

Future Research

It is important that this study be seen as one step among many along the journey to develop an understanding of the draft system of professional sports. In addition to the future research directions noted in the preceding manuscript, it may be useful to conduct independent regression models on the 4 leagues, similar in structure to the global regression done in this analysis. Because of the differing nature of the leagues in terms of draft strategies, farm team development, and games played per season, it might be more appropriate to consider the leagues as independent populations of players.

It could also be useful to include as many years of the modern draft as possible (possibly including all years up to and including the current year). Although this might improve the contemporary relevance of the results, there are difficulties with this design. The difficulty with including years past is that the amount of teams in each league has changed, which changes drafting strategy, and the difficulty with including very current years is that it is difficult to assess the potential of athletes who have only been in the league for a very short period of time. Controlling for these factors would be necessary but might provide valuable data to contribute to the understanding of talent identification and draft accuracy.

An important future direction is to examine where managers and scouts of these professional franchises focus when approaching the draft. Our analysis suggested a curvilinear relationship (as opposed to a linear relationship), however this appears contrary to the goal of the current drafting structure. It is possible that the early round draft picks are a unique group and have higher performance because this is where scouting resources are focused, so these players receive more attention with the later rounds reserved for less scouted (i.e., less known) players. A study examining the focus of drafting strategies (with particular focus on the later rounds) would help to explain the leveling off of performance in the middle to late rounds.

There are players in all four of the professional leagues analyzed in this paper who have bypassed the draft system to gain access to the league and have had successful and influential careers. A recent example of this is NFL player Antonio Gates, who holds many of the all-time records for Tight Ends, yet was overlooked completely in the 2002

NFL draft. Comparing these players to those selected in the draft might also contribute to our understanding.

Further, it would be useful to expand on research done that focused on developing a statistical tool to assist with draft accuracy (e.g. Abrams, 2008). Constructing a matrix analog which can be used to accurately identify which pre-draft statistics or variables have predictive value for future success may be of significant practical use in draft analysis research.

Similarly, adding a within round analysis to our current between round design may help us to determine the effectiveness of the current reverse-rank draft order system. A difficulty is that a within round design needs to take into consideration team needs and player position. A player drafted may not be the best athlete available at the time, but of certain position that potentially fills a void for a specific franchise. A useful addition to this design would be to see the relationship between contract size and performance with players drafted within the same rounds of the draft. This would give us an indication of the level of specificity involved in draft position, and if teams are justified in the investments they make in those players.

Lastly, a study focusing on the transferability of this information and statistical analysis to other professional and amateur sports would help to inform models of talent identification and athlete development. Focusing on a more globally popular sport such as soccer and/or including some less developed or publicized leagues (e.g., female sport leagues) would add depth to our understanding of talent identification.

Conclusion

The results of this thesis and any research stemming from it will be used to determine how accurate sports drafts are in predicting the future performance (player potential) of amateur players entering the professional ranks. Future research investigating the accuracy of this process will permit professional league scouts and general managers to approach drafts with an understanding of which players to target and reduce the potential of costly drafting mistakes.

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