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DOES SALARY CAP MODEL INFLUENCE SPORT LEAGUES' COMPETITIVENESS? A CASE OF NHL VS. NBA

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ABSTRACT

Professional sports is a billion-dollar industry where the biggest assets are the teams' players. This research investigates the relationship between a salary cap model (hard salary cap and soft salary cap model) and a teams success, over 13 seasons. This paper seeks to find if the league that relies on a hard salary cap model (NHL) is more competitive than the league that relies on a slightly softer salary cap model (NBA). The results of regression analysis indicate that league with hard salary cap is slightly more competitive than the league with soft salary cap model as the teams' positions may fluctuate more in a hard cap than in a soft cap league at the end of the regular season.

Keywords: Professional sports, Salary cap, competitive level

INTRODUCTION

Salary caps have been in professional sport in one way or another over a decade. Over that period it has gone through various changes and iderations. Professional leagues have thus implemented them into their league to stablize their financial position as well as deny the league or the players having leverage over one another. With players being a teams most valuable asset it should be clear to compensate them the right way for it. The restrictions of a salary cap have forced teams to focus on their financial side and more importantly on how to keep their assets on the best salary for both parties. A franchises player might be a teams rise to the top of the league or their down fall. As the multi-billion professional sports industry is rising in popularity annually it is important to keep the leagues competitive and balanced. Various changes have happened in the salary cap model and it has developed into a few different models, the hard salary cap, soft salary cap and a voluntary salary cap. Those salary caps are used in almost every sport in the world with different variations depending on the leagues preferences. As the sport business is highly dependable on the team winning games, a team has to always focus on getting the best players they can. Though is the right way for a team to only focus on winning or build a loyal fanbase in the city they play in? Many can argue for both sides but in the end the spectators bring the revenue to the franchises and it is up to them if they want to see a dominant team win every game or support and believe in their childhood favorite team. Could a specific salary cap model be the solution for the most competitive league and results? This paper explores a teams success in two different salary cap models. This paper tries to find the answer to the following questions: Could one salary cap model be more competitive than the other and could it be used in the all the major leagues in north america?

In north america all major professional sport leagues use a salary cap. Those leagues being National Hockey League (NHL), National Basketball Association (NBA), National Football League (NFL) and the Major League Baseball (MLB). All these leagues teams are either from the USA or Canada and consist of 30 to 32 teams and aim to be the champion of the league. The NHL and NFL use a strict hard salary cap. MLB and NBA use a soft salary cap and apply at the same time a luxury tax, it allows teams to surpass the cap though they have to pay additional fines for surpassing it (Ajilore, Hendrickson 2005). These salary caps have increased the competitive level

of the leagues and as a result the attendance and viewership has been on an incline over many years. Theses leagues had a combined revenue of 35.4 billion dollars in revenue with the NFL having the largest share of $13 billion (Mathewson 2019).

For this paper I chose to focus on the NHL and NBA as they were the most viable leagues for my research. As the NFL has little to no diffrences to the NHL's salary cap and for the soft cap the MLB doesn't have a real salary cap as they use the luxury tax whereas the NBA does. This paper analyses the relationship between two salary cap models to their performance in the regular season and post-season. Previous research from Lipasti (2015) has shown that a salary cap raises the competitve level of a league in the case of NHL. Therefore I want to find out if the hard salary cap is more competitive than the soft salary cap of the NBA. The sample size of this research is all the teams of both leagues and their respective performance and salary expenses over the last 13 seasons (2005-2018) as the NHL introduced their salary cap model in 2005. I believe that the hard salary cap model where teams have a specific limit that they cant surpass is more competitive than the soft salary cap. For the regular season a simple regression was performed with four different models and the post-season was researched by analysing teams finals appearances and championships.

This paper begins with the definition of salary cap and some important information about it. After that I will focus on the history and how the salary cap evolved into what it is today. Then, I introduce the different kind of salary caps and the luxury tax as well as previous findings. after the theoretical part I move on to the methodology and results of my findings.

1. BACKGROUND

To fully understand the importance and relevancy of salary caps in professional sport there are some additional factors that need to be cleared up. In this part of the thesis, I introduce and define the relevant parts and factors of salary caps.

Salary caps in professional sports enforce two major factors, firstly to raise and balance the competitive level within the league by giving teams an equal amount of capital to spend on players' salaries and secondly, to enforce economic balance and overall costs of teams. (Dietl, Franck, Lang & Rathke 2012) Salary cap is defined as: "the limit placed on a salary paid out to employees and enforced by the government or another organization" (businessdictionary.com). In professional sports however the salary cap is negotiated by the league's player association and league management group to reach a level that satisfies both parties. Salary caps are designed to have an upper and lower limit that determines the total amount of spending on salaries by a team. (Késenne 2000) Although it is clear to have an upper limit in salary cap, for many it is still fairly unclear why a lower limit is associated with it. The lower limit was designed to prevent teams from trying to intentionally lose games to get an advantage to get a good young player from the annual draft. Another reason for the lower limit is to make sure players are paid according to rules set for salaries to minimize the risk of organizations having all the power.

Market size of the club is a major factor in defining the economic power of the team. Teams located in rich big-cities like in metropolitan areas have a more attractive side to them than small-city clubs with under one million citizens. As big cities have the ability to fill their arenas faster and more easily, they also would have an advantage to compensate their desired players services better financially than those teams in smaller areas. To diminish that phenomenon salary caps were invented. Salary caps decrease the amount of self-destructing contract, where a team overpays for a player for a long time when the team is not economically stable. (Késenne 2000).

1.1. North American major leagues

In North America there are four major leagues. These leagues are the Major League Baseball (MLB), the National Football League (NFL), the National Basketball Association (NBA) and the National Hockey League (NHL). Those leagues are the biggest and most followed leagues and sports in North America. The major leagues are commonly known as the "Big Four." Each of the leagues is the wealthiest professional league in its sport worldwide. In addition, the sports of these four leagues were all started and grew into their modern forms in North America, and all of the major leagues except American football have become popular also internationally. Thanks to the popularity of the leagues the star players have grown to be icons and impactful individuals in the U.S. and Canada. (Cousens 2005) The Big Four leagues currently have 30–32 teams each, with most of them residing in popular metropolitan areas of the United States and Canada. Unlike many other leagues in the world the major leagues don't use a promotion and relegation systems, that is due to franchising in those leagues. The major leagues maintain the same teams from season-to-season. Teams can be added through expansion into a new city with a newly formed team. Teams do not have a chance to leave the league unless they are disbanded or merged with another team. Relocation of a team is more common in the leagues and those might occur due to a poor viewership market in the area, new owners or financial difficulties. With a relocation a team can change their name, but it is generally still considered to be the same entity. (Opperman 2017) Baseball, American football, and ice hockey have had professional leagues for over 100 years. Early leagues such as the National Association, Ohio League, and National Hockey Association designed the steppingstone of the modern MLB, NFL, and NHL, respectively. Basketball was invented in 1891 and in the 1920s its first professional league was established. The Basketball Association of America formed the basis of the NBA. (Vrooman 2000) Soccer in North America was first professionalized in 1894, but leagues at that time suffered greatly from lack of sustainability and rarely lasted more than a decade. Soccer's greatest successes were in the form of the American Soccer League established in 1921 and the current Major League Soccer that was created in 1996.

1.2 History and development of salary caps

Although many sports have been played in the U.S. over decades the oldest sport with a structured league system is baseball. Baseball introduced the first major league concept in the U.S with the

birth of the National League of Professional Baseball Clubs (NL) in 1876. The Leagues at that time faced a major flaw as the owners of the teams had full monopsy over a players services and had the power to decide how much to pay for a players salary. In that period many sports had rival leagues inculding baseball. Those rival leagues created competition for players services as every league wanted the best players.(Kahn 2000) "To protect itself against the competition of rival leagues and improve the team owners' balance sheets, the NL introduced the "reserve clause" in 1879, which meant that players were bound to the team that originally acquired the rights to contract with them. Consequently, owners now had additional monopsony power over players, and player salaries dropped." (Kahn 2000.) However as the salary decreased in the National League it may have contributed to the start of new leagues in the sport, American Association in 1882, and the increase in salary paid to players that changed leagues. (Kahn 2000)

The increase in salaries at that time was not certain evidence that monopsony power of owners decreased. A reason for the increase may have also stemmed from the growth in popularity of baseball. However 10 years later the American Association dissolved and four of the American Association teams joined into the National League. With the merger a new salary policy was announced by the National League owners' in 1893 where the maximum pay for a player was to be $2,400, which was the first time in sport history that a salary cap for players was intoduced. The sharp decline in player salaries does not appear to reflect a major decline in the demand for baseball entertainment, as attendance climbed through the 1895 season. (Staudohar 1998)

In the late 1890s the baseball market grew in popularity even though the success of the National league declined, partly due to a lack of competitive balance. The decline of the National League brought a new rival league into baseball, the American League. It successfully lured several star players from the National League and surpassed it in attendance. That phenomenon raised the salaries of players again and in response, the National League attempted to have its reserve clause enforced by state courts to prevent players from jumping leagues. The attempt was ultimately unsuccessful in this effort due to not having restrictions beyond the state borders. (Kahn 2000) The two leagues merged during the 1903 season to become the Major League Baseball, which led to them being a organisation but still playing in their own respective league. Even with the merger the salaries in Major League Baseball fell again, but the decline did not reflect in any fall in baseball's popularity. (Vrooman 2000)

1.2.1 The 20th century and the development of salary cap and free agency

The development of the Major League Baseball in the beginning of the 20th century had a positive impact, with players salaries under control and attendance on the rise. Dissatisfaction among players due to unstable salaries paved the way for a new rival league, the Federal League, which was able to attract well-known Major League baseballplayers. The new rival league raised salaries from about $3,000 to $5,000 in. After a few seasons of the Federal League, most of the owners were "bought out" in December 1915 by the major leagues and salaries plummeted back to $4,000. The fall in salaries had an even larger effect in real terms due to the inflation of the World War I period. (Kahn 2000).

In 1970 a well known player, Curt Flood filed a lawsuit against Commissioner Bowie Kuhn, the presidents of the Major League Baseball organization. Flood protested the league's player reserve clause, which prohibited players from changing teams unless they were traded. "In the lawsuit Flood v. Kuhn, Flood argued that the reserve clause violated antitrust laws and violated the 13th Amendment, which barred slavery and involuntary servitude." (History 2009).

Flood was not the first player to challenge the reserve clause, Though he was the most well-known player to do so and had the most to lose from his lawsuit. Floods claim was rejected by the U.S. district court judge in August 1970, the case was continued by the U.S. Supreme Court, which in the end resulted in a loss for Flood. Though Flood's career was over. His battle for free agency turned into an eventual win for the players. In 1973 the Major League Baseball agreed to federal arbitration of players' salary demands and in 1975 free agency was introduced in baseball, and other professional sports, as an arbitrator effectively threw out the reserve clause. (Kahn 2000)

Like in baseball, basketball went through its "dark ages" for player salaries during the years of the reserve clause. "Players are drafted by National Basketball Association (NBA) teams that have an exclusive right to sign the player they select. Once a drafted player signs a contract he becomes the exclusive property of the club." (Staudohar 1998) The initial use and aim of the reserve clause was to keep a player in a team for life, unless the player was traded, or put on waivers. With the right to use of the players' services as they needed consequently clubs had monopsony control. The clubs were at that time the only buyer in the market for the players. Players made legal challenges to the reserve clause without any success. A new collective bargaining agreement was reached between the NBA and the National Basketball Players Association in 1976 that removed

the reserve clause option from players contracts. With the removal of the reserve clause there were some restrictions on free agency set to equal the playingfield for players and owners. One restriction was that a team had a chance about to match the offer made by another club for a player they were about to lose, and that way retain the player. In succeeding collective bargaining agreements free agency continued to become more liberal. (Staudohar 1998) In the early 1980s the NBA´s Commissioner Lawrence O'Brien and Assistant Commissioner David Stern sat down with the counsel of the NBAPA Lawrence Fleisher and its president Bob Lanier, to work out the first collective bargaining agreements in all of professional sports. The focus of the collective bargaining agreement was to establish moderate salaries, which lead to difficulties on the NBA´s side, with difficulties surfaced talks of a strike were raised. The 1982-83 season started without an agreement, though the players set a clear deadline for reaching the agreement which was the 1st of April, just before the playoffs would begin. The deadline and the risk of a strike would have been especially vulnerable for the owners, because the post-season yields them a considerable share of their revenue. The talks of the agreement gained momentum when the owners were ready to offer a share of the revenue with the players, as an so-called salary cap. The first proposal of the revenue share was 40 percent, but after further negotiations the limit was set to 53 percent by the owners. That agreement established the first salary cap in sports. (Staudohar 1998)

The National Football League (NFL) and the NFL Players Association (NFLPA) have faced major difficulties before having a collective bargaining agreement that suited both sides. The agreement in the NFL was established in 1993, though before that the NFL took advantage of the players and NFLPA. In 1987 the players had a strike in an attempt at modifying the free agency system. In the timespan of 1977 to 1987 there was only one free agent that signed with another club. At that time voluntary movement of players was almost nonexistentdue to a compensation rule that required for teams that signed free agents to compensate the other team with draft picks depending on the size of the contract. The compensation rule discouraged teams to do future deals and losing valuable draft picks. That kind of system frustrated players, because it kept their salaries low due to not having the chance to let other teams offer them contracts. As players were unhappy ith the situtation and not renewing their collective bargaining agreement. The NFL decided to modify the free agency by allowing all but 37 players of a 47-player team roster to hit the free agency market, which ultimately lead to the best players being unable to move to another team. Finally in 1993, both parties reached a new collective bargaining agreement that benefits each side. The agreement gave the union real free agency for the first time and the league attaining a salary cap to protect

the owners from over spending on players. The agreement was 7-years long with a option of the union to extend it by 1or 2 years. (Staudohar 1998)

In the National Hockey League (NHL) the salary cap was introduced in 2005-06 season by the NHL comissioner Gary Bettman, who worked for the NBA when salary cap was introduced there. The salary cap in the NHL was enforced to give a better chance for small-market teams to compete with the popular and succesful organisations. Prior to the salary cap in the NHL there was a lock-out season for the first time in north american professional sport history where no games were played. The reason for the lock-out season stemmed from the owners demanding inflexible salary cap. The NHLPA was strongly against a salary cap and were ready for a lock-out season. The Collective bargaining agreement made in 2005 included that players are guaranteed 54-57 percentage of the leagues revenue every year and a players highest salary can be 20% of the teams salary cap.

2. DIFFERENT TYPES OF SALARY CAPS

"Salary cap is an agreement on how much team can spend on their players, and it is implemented to keep the competition balanced. League's goal is to reduce the difference in talent levels between high-spending and low-spending teams to create a more equal playing field (Shorin 2017)." When using salary caps, each team has generally the same economic conditions and should have the possibility to have the same amount of talent as other teams. Salary cap brings more economic benefits for the team, since spectators and fans are more interested in wins and balanced competition in the league. If salary caps wouldn't exist, the big city teams with the most wealth could sign all the star players in the league and be the favorite to win the league. That would drop the intrest level of the league and would result in poorer ratings. (Noponen 2018)

2.1 Hard salary cap

A hard salary cap means that teams have a strict limit on how much they can spend on players salaries in a season. Of the major leagues in north america two of them use a hard salary cap, the NHL and the NFL. (Totty and Owens 2011) The NHL follows a strict hard cap where a team can not under any circumstances go over the salary cap. The NFL on the other hand follows the same rule with one exception. In the NFL all contracts made must be approved by the league office, and if any contract would make a team go over the salary cap in a given year is rejected. The exception in the NFL is a rule called the carry over rule. The rule states that if a teams salary is under the salary cap in one year, they have the possibility to carry over the difference between the salary cap and what they spent into the next year if they notify the league.(Thurmann 2016) To better understand how the exception works the author will break it down. The salary cap in the NFL in 2014 was $133 million. If a team then spent $126 million that year, they would be qualified to carry over the $7 million difference into the 2015 season, and can spend an additional $7 million over the 2015 salary cap. (Spotrac 2014)

Figure 1. Usage of salary cap compared to the salary cap in the NHL
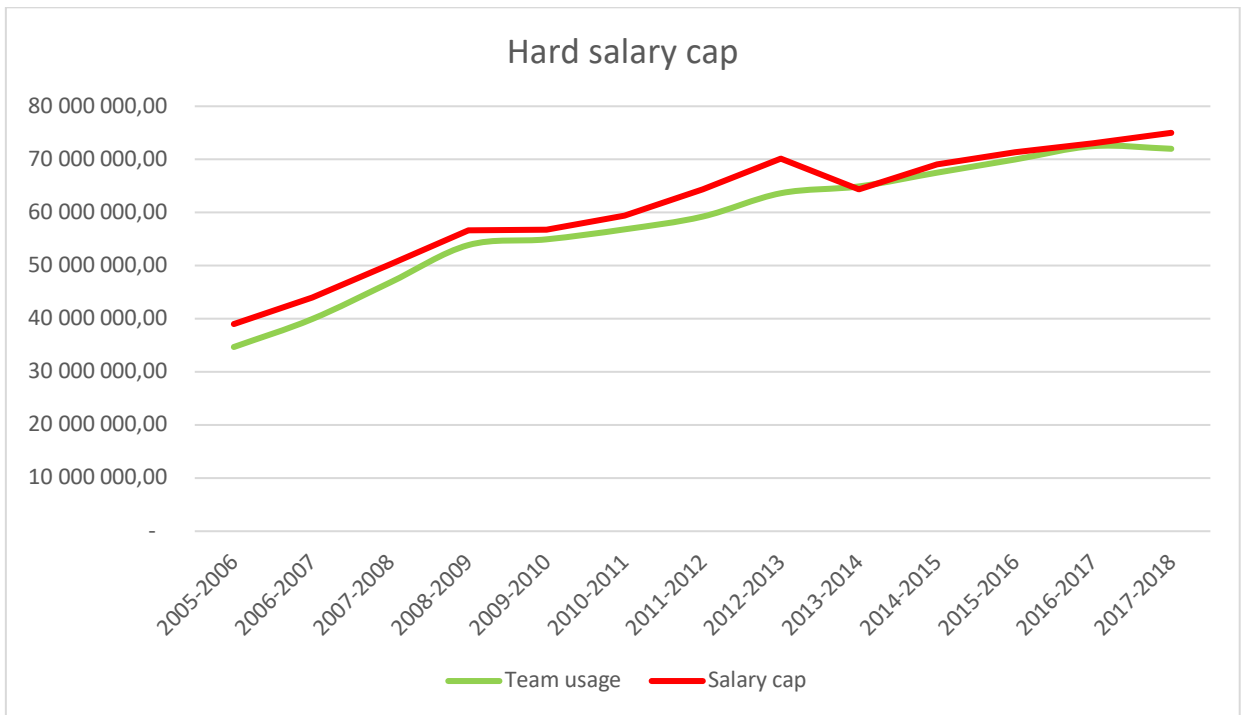
From table 1 it is visible that in the hard cap leagues the usage of salary cap is always under the salary cap. Though th usage of the salary cap is almost the whole time a few million dollars under the salary cap. For example the salary cap in the 2010-2011 was $64 300 000 in that season the team with the lowest salary cap was Colorado Avalanche with $49 559 700.00 that is only 77% used of the total salary cap. The fact that a team doesn't use the whole salary cap is normal as the team might be saving up to sign their new star players or the team is in a rebuilding phase. A rebuilding phase is common in every sport that a few teams in the league are ready to sacrifce a few seasons to get good young players that will be their core players for years to come. The highest spending team was the Philadelphia Flyers with $70 024 800.00 that is 109% of the salary cap. In the hard cap it is illegal to go over the salary cap so the reason for the salary usage being over the salary cap might be for two reasons. The first one being the data site calculated player bonuses to the salary cap as well. The second one being that players who are injured are calculated towards the salary cap, which is not done unless the player who was previously injured is activated from the injury list but in that case another player of the team must be moved down to their second team.

2.2 Soft salary cap

NBA uses the combination of soft cap and luxury taxes. In the 2014 season the NBA had a soft salary cap of $63 million for each team and the teams were allowed to spend over this amount but

in effect would have to pay penalties for every dollar they spend over the salary cap. (Huang 2016). Salary caps have many exemptions, the NBA's most known salary cap exceptions are named as Larry Bird Exception, the Rookie Exception and the Mid-Level Exception. The Larry Bird exception is named after the famous player Larry Bird and it gives the specific team the right to sign a player, who has been playing for them atleast 3 years, even if it exceeds the salary cap. The Rookie exception gives the team the right to sign a rookie to its first contract even if it surpasses the salary cap. The Mid-Level exception gives the team a chance to sign a player to the leagues average contract without it counting towards the salary cap. (Leeds and Allmen 2011). Salary cap exceptions are very complex, and they vary over time as player associations negotiate with leagues. Mostly these exceptions provide teams the possibility to exceed the salary cap. (Shorin 2017)

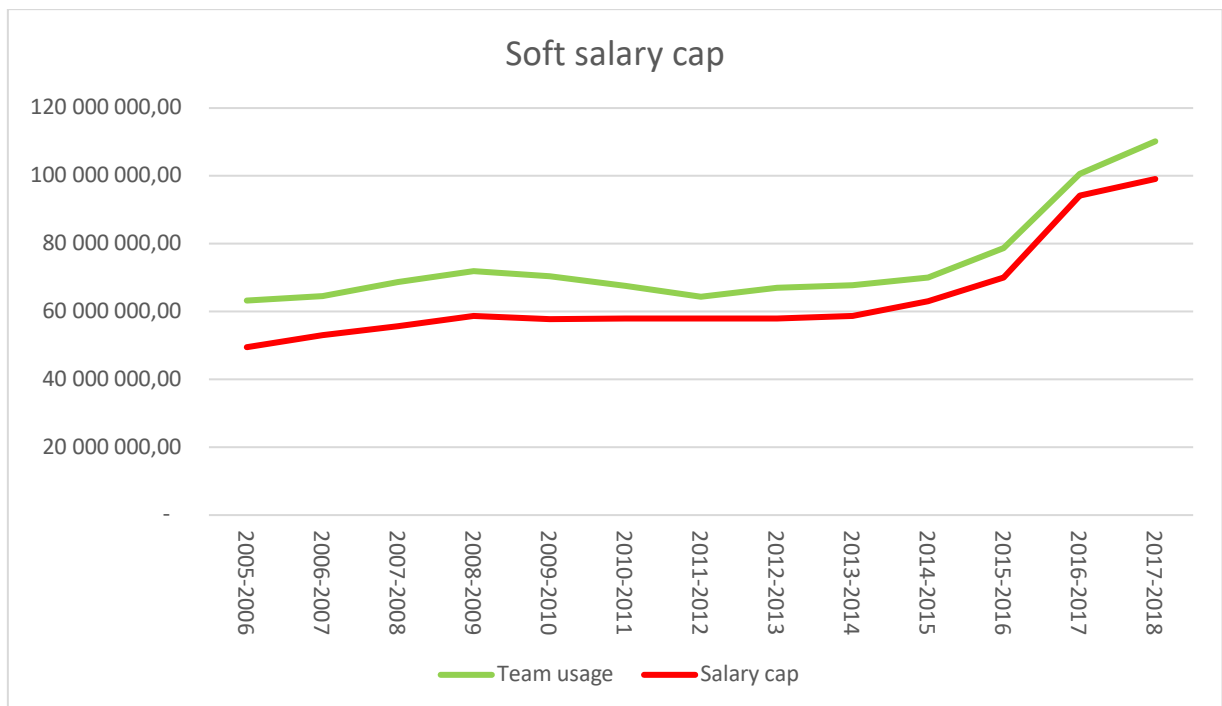Figure 2. The usage of salary in Soft salary cap model

Table 2 shows us that NBA teams on average use more than 5 million dollars on players salaries. from the beginning of 2005-2006 until 2017-2018 season a handful of teams have spent over the salary cap by 130%. Though the gap between the usage of salary cap and the actual salary cap has decreased as the salary cap has risen a lot from 2015 until 2018, the reason for the rise was a growth in popularity of basketball as well as a new TV-deal and negotiations between the NBA and NBPA. (Bontemps 2018) on average teams spent 120% of the salary cap on players.

2.3 Voluntary salary cap

In North America salary cap of sport leagues are strictly controlled by the league and agreements are expected to be followed. In European football league's on the other hand strict salary caps have not been enforced. In European football the biggest teams have formed voluntary contracts for a salary cap to limit spending. The voluntary salary cap in European football is not enforced by the leagues and it is voluntary to follow the rules (Dietl, Franck & Nüesch 2006).

In the mindset of becoming the best, hiring and keeping the best players, the payroll share of some clubs' total budget rose to unthinkable percentages. Due to those circumstances the G-14, the association of the 18 most successful clubs in European football, proposed a voluntary salary cap, that is different from the salary cap introduced and used in the major leagues in North America. (Késenne 2003.)

The G-14 did not see any major reason of enforcement of the salary, they rather decided to rely on selfenforcement. The G-14 faced a few flaws in the salary cap. Those flaws were that only a limited amount of all European football clubs agreed to the cap and it was in danger of becoming corrupted by other clubs that did not agree to limit their salaries. Second flaw was since international competitions among European football clubs is common the salary caps would have have to be Europe-wide. However, any Europe-wide system faces difficulties due to varying tax rates and administrative systems (Szymanski, 2003). With profit-maximizing teams the self-enforced salary caps increase clubs' importance of competitive balance. Additionally voluntary salary caps have to be self-enforced to limit player expenses (Dietl, Franck & Nüesch 2006). In a win-maximizing league a salary cap as proposed by G-14 in European football to ensure financial stableness, might have an negative impact on the talent distribution in teams and on the competitive balance in a league with small and large market teams as their financial states vary notably (Késenne 2003).

2.4. Luxury tax

Luxury tax is a additional tax to the payroll of a sports team that exceeds the fixed cap limit set by the sports league. "The luxury tax was essentially designed to slow the growth of salaries and to prevent large-market teams from signing all of the top players within a league. The money derived from this tax is distributed among the financially weaker teams. The luxury tax thus aims to create a more balanced league, because redistribution among clubs counteracts financial imbalances."

(Dietl, Lang, Werner 2009) In North America, the NBA and MLB use a luxury tax system. The NBA introduced a luxury tax system for teams that exceed the average team payroll. The teams exceeding the cap limit have to pay the league a 100% tax on every dollar their payroll exceeds the tax level. (Ajilore, Hendrickson 2005).

In 1996 the MLB introduced the first luxury tax as part of its Collective Bargaining Agreement. The agreement forced the five teams with the highest payroll to pay a luxury tax of 35% for the first two years and 34% for the third year. From 2000 to 2002 a revenue-sharing system replaced the luxury tax, though MLB reintroduced the luxury tax system in 2003. With the reintroduction of the luxury tax the league set a fixed limits on payrolls for every year. The limit in 2007 was $148 million teams surpassing the limit are taxed at 22.5% for first year, 30% for the second year in a row and 40% for three or more years. (Dietl, Lang, Werner 2009).

2.5 Previous findings

This Thesis is based from a master thesis from Lipasti (2015) called "Salary Caps in Professional Team Sports - Balancing Competition or Balancing Costs in the National Hockey League? " The author investigates the impact of a salary cap to the competetive level in the NHL in the reguar season and playoffs. Since previous studies propose that a salary cap has two main motivations: first being to balance the competition and second to lower player costs (Kesenne 2000). The author researches first the relation between a teams payroll and their success.

The author used data from 2000-2001 to 2013-2014. The timeframe is divided mostly into two periods before and after the introduction of salary caps. To support his claim that salary caps raise competition he used different criteria to prove it. The criteria used were a average of teams payrolls. Standard deviation was used to measure the spread of teams payrolls and the diffrence in dispersion of payrolls of successful and non-successful teams. The third criteria was the Pearson product-moment correlation that shows if two variables are depended on eachother or not. The values it may get are between -1 and 1. Where -1 presents that there is a negative dependency on the other variable. Value 1 means that there is a perfect dependency. In the study, this criteria was used to indicate the relations between team payrolls and success (Lipasti 2015). A covariance criteria was also used to illustrate the change of two random variables and in the authors paper the covariance focuses on the relationship of payroll and success. When the author was researching

the regular season competition he used the Herfindahl-Hirschman Index. The index is used to measure the competitiveness of the regular season by illustrating the distribution of wins. In addition to the Herfindahl-Hirschman Index the Lorenzo curve and Gini coefficients were used. the Lorenzo curve shows the increasing distribution of the measured value. The Gini coefficient on the other hand illustrates the inequality of distribution of measured values.

To find the relationship between the payroll and success the author compares first the payroll dispersion before and after 2005 and found that before the introduction of salary caps in 2005 the payroll varied a lot for the champions. Though after 2005 winners of the league had a steady rise in payroll usage. To find out if the teams that spend the most on player salaries have the higher standing in the regular season the author compared the standings before and after the salary cap and the results were clear that teams that spend the most after the introduction of salary caps were at the top. When it comes to success teams are measured by their playoffs appearances. The teams with the most playoff appearances should also have the highest possibility of winning the championship. In the thesis the author asked if there has been a correlating change in the number of playoff raounds and payroll. From the authors results it is visible that the correlation between payroll and playoff rounds is positive when considering the whole league. Though the correlation of playoff teams payroll and number of playoff rounds was unstable.

When researching the regular season competition the author firstly researched if the Herfindahl-Hirschman Index (HHI) changed after the introduction of the salary cap. The result was that the HHI dropped after the 2005 when teams used the salary cap meaning that the distribution of wins during the regular season was more equal between teams and making it more competitive. Secondly he researched if the points earned during the regular season are earned equally after 2005. With the help of the Gini coefficient it is shown that the points gathered in the regular season are more evenly distributed among the league, due to the Gini coefficient decreasing. The third part the author researched was if the standings in the regular season are evenly distributed. The findings were that the standings became more even after 2005 , though from 2010 to 2014 the distribution of standings moved closer to the values that were before th introduction of the salary cap. To conclude the chapter of the regular season the author stated that with his findings the league became more balanced and competitive after 2005. (Lipasti 2015)

The playoffs will determine the champion of the league, but it will also give a economical booster for organisations who manage to play in them due to them having the chance to raise their ticket

prices and more people and fans will attend those games. When researching the competitive balance in the playoffs one has to consider that only 16 of the 30 teams in the league get to play in them. The author found that the distribution of playoff rounds and wins are not evenly distributed meaning that when looking at the playoffs where the best 16 teams of the league are playing is more imbalanced competitivly than the regular season.

The analyzed based on his findings that the introduction of the salary cap after 2005 in the NHL has made the league more competitvely balanced as points and wins are distributed among many teams. He also finds that teams who spend more on their players will in the long run have more success as the leagues salary cap is usually increasing annually, which makes a players long contract cheaper every year. The main findings of the introduction of salary caps were firstly, competition in the regular season became more balanced. Secondly, after the introduction of the salary cap in 2005 player costs decreased. Thirdly, success during playoffs is not as dependend on a teams payroll as the success in the regular season. The optimal level for the salary cap would be to balance both regular season and playoffs for both the NHL and the NHLPA.

The author recommends that to achieve a competitive league with economical benefits, the negotiation for the new collective bargaining agreement (CBA) should be started as early as possible. As past years have shown that the negotiations of the CBA may result in lock-out seasons. To reach a fair agreement the NHLPA and NHL should raise some important details. The NHLPA should raise the fact that the salary cap has managed to raise a franchise's value rapidly. The NHL on the other hand should highlight that players salaries have increased annually with the salary cap. Taking those details into consideration the author suggests that a narrower gap, meaning a higher lower limit and a lower upper limit in the salary cap, would consiquently lower the relation of player cost and teams success even if the leagues sales increases. (Lipasti 2015)

3. METHODOLOGY

This research investigates the NHL's and NBA's salary cap system and compares them to each other. It is important to note that even though the NFL and MLB were mentioned earlier they are not used in the empirical part of this thesis. The reason for not using those leagues is, because the MLB has no real salary cap for teams, although they have one for players and for the top spending teams they have a luxury tax. The NFL uses a hard cap like the NHL though the hard cap in the NFL calculates a specific timespan in which you may go over the salary cap if you have gone under it in a certain year. The reason I chose the NHL and NBA is because though one has a hard cap and the other a soft cap they are similar in the fact that they have a specific cap that teams have to follow and to see which salary cap model is more competetive they are the optimal leagues to compare.

This paper researches the regular season as well as playoffs and the champion of the given year. To fully understand if one salary cap model is more competetive than the other it is important to include both regular season and post season. The timespan of this paper is from 2005-2006 season until the 2017-2018 season, making it 13 seasons as a whole. The reason for the specific timespan is that before the 2005-2006 season the NHL didn't have a salary cap model and for that reason the data before the 2005-2006 season could not be used to compare it to the NBA's salary cap. In both leagues the playoff system is the same. All playoff rounds are a best of seven game series where the first team winning four games against the opposing team advances to the next round. In all the rounds the higher seeded team has a home court advantage, as they get to play one more game on home coourt than the opposing team. This system gives an competetive advantage to the team's players and also brings economical growth to team owners.

As previous findings have shown by Késenne (2000) and Larsen et al. (2012) that salary caps make leagues more competitive by evening out the amount of money teams can spend on players. That is why the author decided to compare the competetive level of two leagues. The authors hypotheses

is: is the hard salary cap model more competitive than the soft salary cap model. With the answers of this thesis the author wants to investigate if a hard salary cap model is applyable in the NBA.

It is important to note that every team has a certain amount of money to spend on players and if a team chooses to spend the whole amount on players or decide to save some salary cap space in order to sign their future top players is up to the team to decide. It is clear that in the regular season the team that used the most salary cap space should be on top of the standings and the team with the least amount spend on the bottom. Though when it comes to playoffs the salary cap hasn't had an big impact on which team advances in the playoff rounds.

The data for the empirical part of this thesis was compiled from a few different sites. The data for the NHL's regular season was compiled from nhlnumbers from where all the NHL teams salary usage was gathered from. The playoff and champions data for the NHL was compiled from NHL.com. The data about the salary cap was obtained from puckreport. The data for the regular season in the NBA was gathered from internet pages spotrac and hoopshype. From NBA.com the data about the champions and the playoffs was acquired.

The regular season was analyzed with regressions. where the dependend variable was the placings of the teams in both leagues. One tables with four models were done with regressions. in the first model the usage of the salary cap was compared to the placings of the team. In the second model in addition to the usage of salary cap the teams also teams in the hard cap were taking into account. In the third model the usage of salary cap, hard cap and salary cap were compared to the depended variable. In the 4 model all the same variable were used as in model 3 though all the 13 seasons were taking in to account in that model.

To find which league is more competitive in terms of the variety of champions and final appearances the author gathered data about the finalists and champions and made a table to see how many times a team has made it to the finals and how many times they have won the championship. The more variety of teams have finals appearances and championships the more competitive the league should be.

4. EMPIRICAL ANALYSIS

In this part the results of the data will be shown and analyzed. The empirical part will start by a descriptive analysis of the playoffs and the champions and finals appearances in both leagues. in the second part the the regular season will be analyzed. Simple regressions were used to analyze the regular season. Lastly the research question will be answered that would it be possible to adapt a hard salary cap also in the NBA.

4.1 Descriptive analysis

When it comes to playoffs the spread of which teams make it into the playoffs is almost the same in both leagues. Every team has made the playoffs at least once in the last 13 seasons and only one team in both leagues have managed to play in every playoffs from the 2005-2006 season until the 2017-2018 season, which is a big accomplishment as both leagues competitive level has risen through the years and they have managed to keep a competitive team throughout 13 seasons. In both leagues almost 60% of the teams have made it to the playoffs more than 7 times which is an indicator that leagues are competitively balanced and that every team has a chance to at least get into the playoffs.

Figure 3 shows us how many times an NHL team has had a final appearance, meaning that they have won three playoff rounds and have made it to play for the Stanley cup. From figure 3 we can see that only 5 teams of the 18 teams that have made it to the finals in the last 13 seasons have been there more than once. One can say that the NHL is highly competitive as just under 60% of the teams in the league have made it to the finals.

Comparing figure 3 to figure 4 where the teams that have made it to the finals in the NBA are visible one can see that only 9 teams have made it to the finals. It is clear from comparing those two figures that the NHL has had more teams represented in the finals than the NBA, which would

reflect on the competitiveness within the leagues. As mentioned before the more teams are represented in playoffs or finals the more competitive the league is.

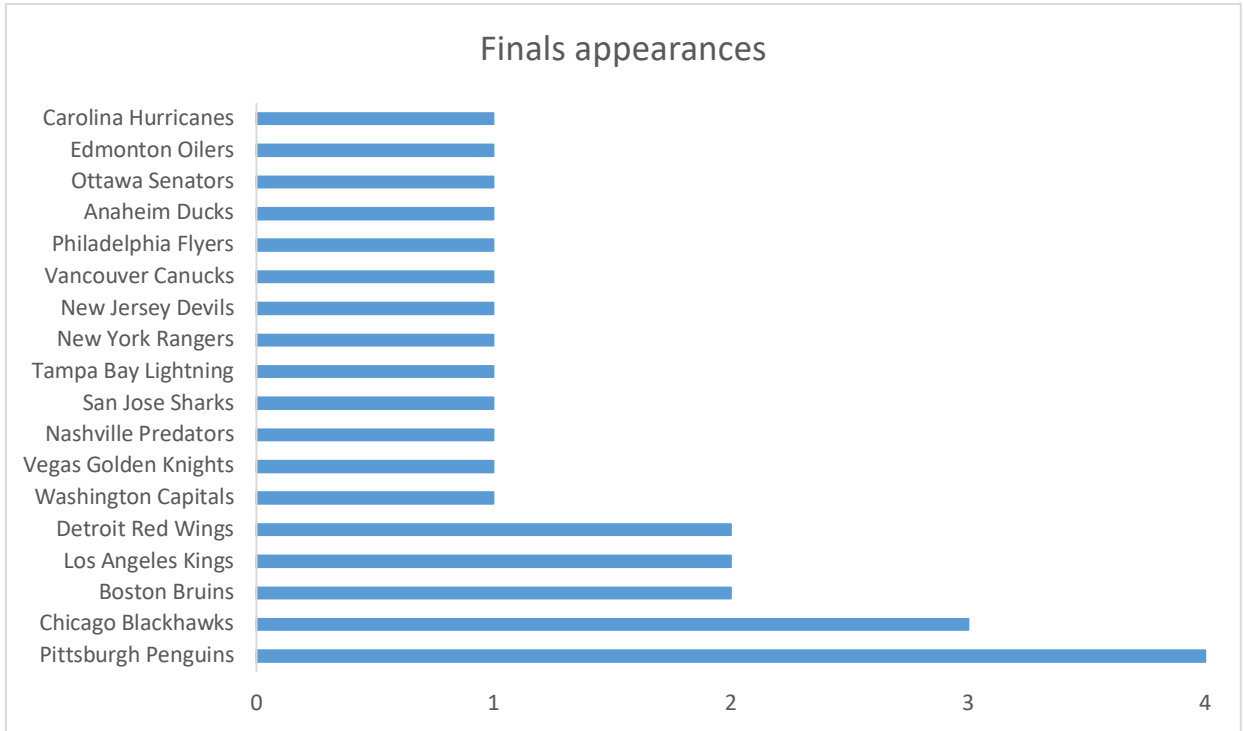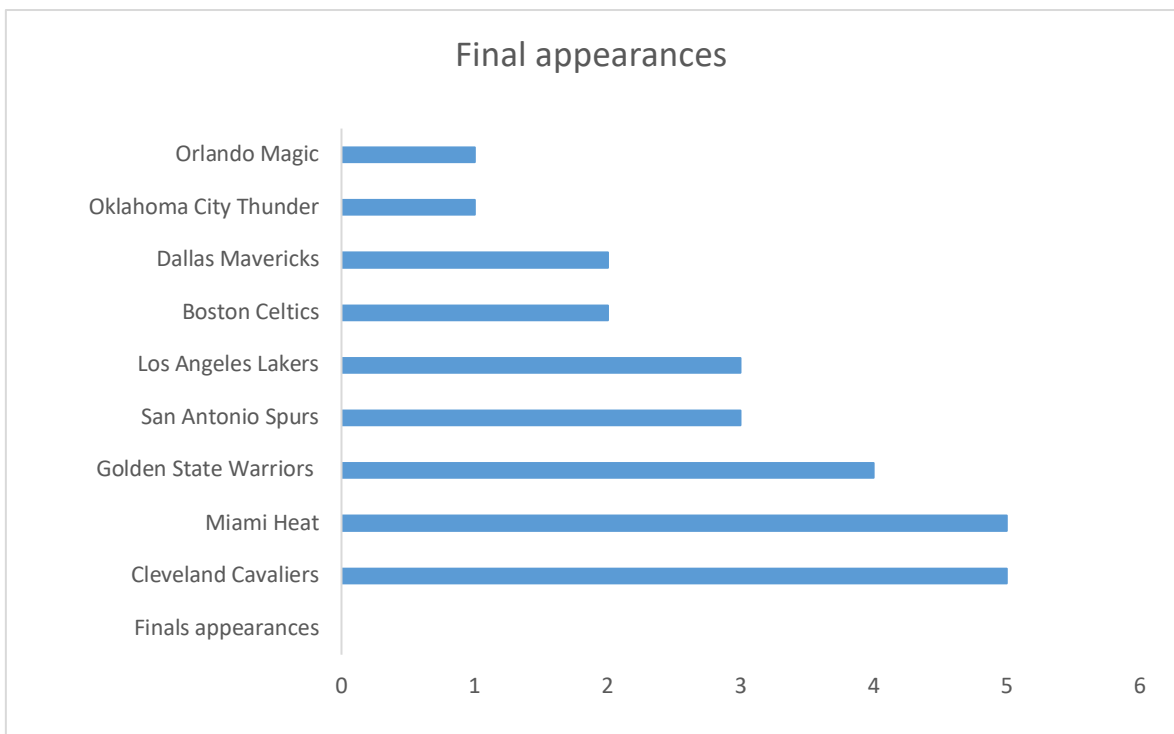Figure 3. Finals appearances of NHL teams

Figure 4. Final appearances in the NBA

To raise the championship trophy is every professional athlete dream. Having the chance to play for it is an honor though actually winning the championship is more difficult than imagined. In Figures 5 and 6 are the championship winning teams shown. In figure 5 are the champions of the NHL. From the 18 teams that have made it into the finals half of them have won one championship or more.

Figure 5. NHL Champions
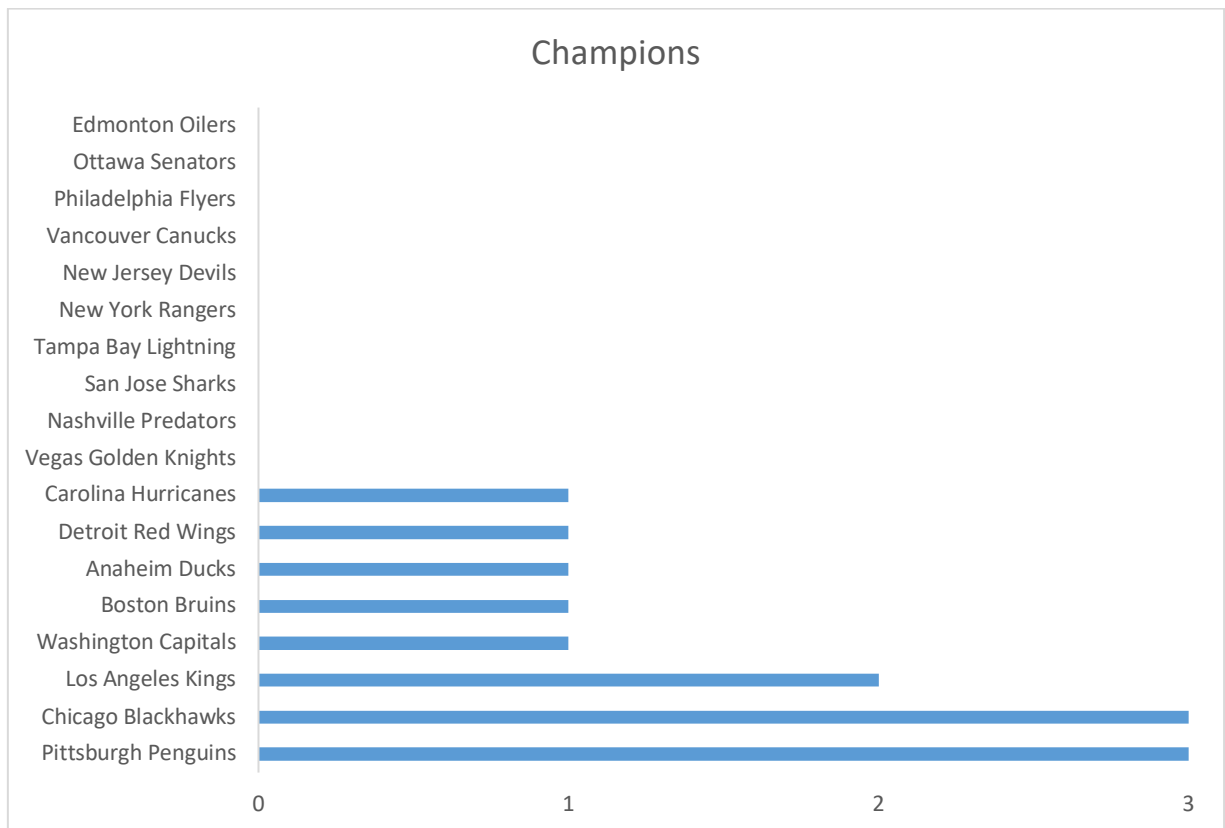
Two teams have dominated the NHL those are the Chicago Blackhawks and the Pittsburgh Penguins. The Pittsburgh Penguins have made it to the playoffs 12 out of the 13 times and out of those 12 times they have been to the finals 4 times and won it 3 times. In 2015-2016 and 2016-2017 they won the trophy back to back. Those accomplishments have made them the most dominant team in the salary cap era in the NHL alongside the Chicago Blackhawks. The Blackhawks on the other hand have made it to the playoffs 9 times though they have won the championship 3 times out of the 3 times they have been there.

In the NBA 7 out of the 9 teams that have been to the finals have won the championship. Though in the NBA there have always been clear favorites to make it to the finals and win the

championship. The Los Angeles Lakers were the clear favorites in the seasons between 2007 until 2010. Then the Miami Heat were clear favorites until the end of the 2014. From 2014-2015 season the Golden State Warriors and the Cleveland Cavaliers have been to all the finals until the 2017-2018 season. From the 2007-2008 season the NBA's finals haven't been very competitive as only a few teams have dominated and leaving other teams little to no chance to challenge them.

Figure 6. NBA Champions
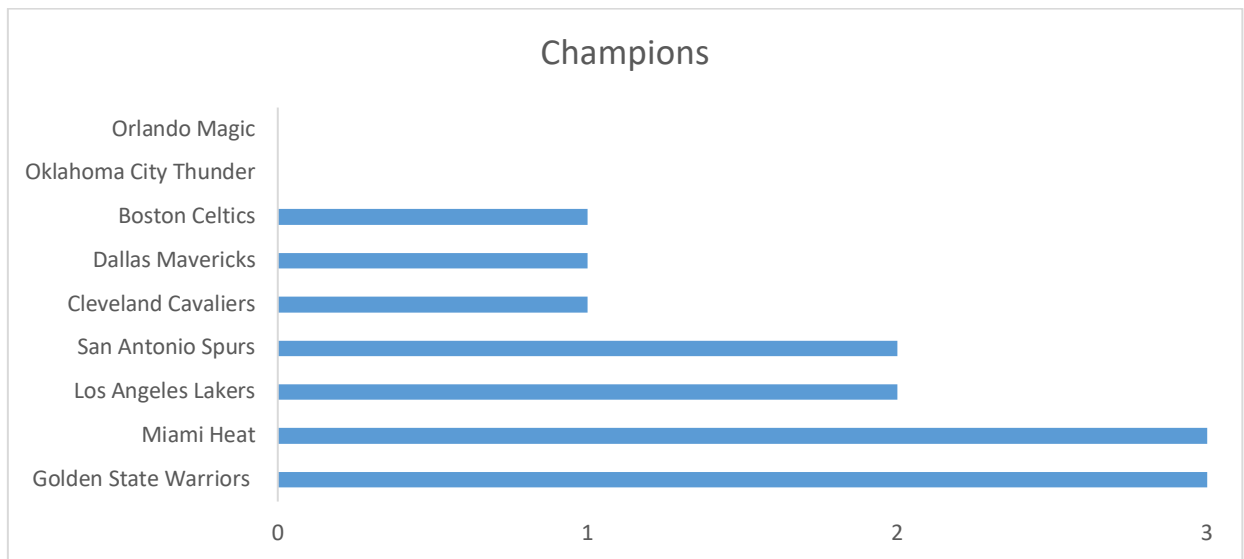
When looking at the figures 3 to 6 the NHL appears to be more competitively balanced which makes the sport more interesting to watch. With a more balanced league one can say that the salary cap model would be better than the other. Though in this case it is up to preference which model is better and which model should be used. Both leagues have had long experiences with the salary cap model and have modified it to fit their league in the way they see fit.

4.2 Regression analysis

In the first regression table I divided the table into four models with each being compared to the dependent variable, placing in the regular season. This is because of the aim is to find out if the usage of the salary cap and the salary cap model have an big impact on the teams.

The result from the Table 1 shows the relationship between placing and usage of the salary cap. From models 1 and 2 it is clearly visible that the usage of salary cap influences the overall placing,

the higher the amount of salary cap spent, the lower the expected position of the team. More importantly, the type of a salary cap also plays a role, the coefficient estimate for the variable hard cap is negative and statistically significant at 1%. It means that when looking at NHL standings (NHL has a hard cap model in contrast to NBA) the teams that spend exactly the amount of the salary cap are expected to have a lower position at the end of the regular season. This result might be interpreted as teams in a league with hard caps face a tougher environment in which it is more difficult to win. In turn, this might be interpreted as leagues with a hard cap are more competitive.

Table 1. Hard cap regression, Model 1 & Model 2

| Variable | Model 1 | | Model 2 | |
	Coefficient	Std.error	Coefficient	Std.error
Const	26.91***	1.7	34.01***	2.26
use of salary	-10.76***	1.58	-15.86***	1.9
hard cap			-3.41***	0.73
Year	NO		NO	
N	781		781	
Adj. R2	5 %		8 %	

Note: ***$p < 0.001$; **$p < 0.05$; *$p < 0.2$; Dependend variable placing

Table 2. Hard cap regression, Model 3 &4

| Variable | Model 3 | | Model 4 | |
	Coefficient	Std.error	Coefficient	Std.error
const	35.21***	2.83	35.5***	3.72
use of salary	-15.98***	1.91	-16.26***	1.94
hard cap	-3.48***	0.73	-3.54***	0.76
salary cap	-0.164	0.232	-0.137	0.5.80
year	NO		YES	
N	781		781	
Adj. R2	8 %		7 %	

Note: ***$p < 0.001$; **$p < 0.05$; *$p < 0.2$; Dependend variable placing

In the next Models (3 and 4) I first add the ammount of salary cap to the regression and then added a year fixed effect as a robustness check (Model 4). The results in Table 2 shows that salary cap in itself does not predict team placing when used in addtion to the useage of salary cap and the type of the salary cap, as the coefficient for this variable is not statistically significant in both models. Importantly, nier inclusion of the amount of salary cap nor addition of year fixed effects did not alter the results from models 1 and 2, both variables use of salary and hard cap remained statistically significant at 1% while the size of coefficients remained virtually the same.

Therefore, the empirical results show that the type of salary cap is important and even a slight difference in the types of caps (as it exists between NHL and NBA) still could be associated with the level of competitiveness in the league. As expected, the league with hard salary cap (NHL) appears to be more competitive in contrast to the league with semi hard cap (NBA).

From my view of this research I would suggest to start applying some aspects of the hard cap to the NBA. One aspect would be to regulate how much a team can go over the salary cap. When that is regulated teams with lower cap usage are given the chance to sign big name players to their team. This will equal out the competitive gap between the best and the worst teams. In the 2015-2016 season of the NBA the Golden State Warriors had a record of 72 wins to 9 loses over the whole season and the worst team was the Philadelphia 76ers who only managed to win 10 games and lose 72 to minimize such an big gap the regulation of how much a team can spend over the salary cap would be optimal. A team should not be punished for drafting good players, but the leagues should look at different possibilities to get a higher variation of teams that get into the playoffs and make it far in them. Though different salary cap models make each league different and unique and to fully understand how a salary cap model works is time consuming and at times difficult. As mentioned I would suggest to restrict the luxury tax spending, meaning that a team should not have the possibility to spend over 150% of the salary cap for example.

CONCLUSION

The aim of this paper was to find which salary cap model, hard salary cap or soft salary cap, is more competitive. As well as would it be possible to implemant one salary cap model into many different leagues.

The regression table showed small competetitive edge for the hard salary cap as the fluctuatuion between the usage of the salary cap was higher compared to the soft salary cap. When different variables were added to the regression it had little to no impact on the placing. The usage of salary and hard cap had the biggest impact. As teams in a soft salary cap have the chance to pay their players more and can play them more on the field they have a better chance to impact the game in their teams favor, meaning that one player can win a game for a team in the NBA whereas in the NHL it comes down to the cohesiveness of the team. Teams who have used almost the acceptable amount or the exact amount of the salary cap have have on average a position fluctuation of 10 position. From the research of the post-season I found that the variation of the finalists is in the NHL higher than in the NBA as 18 teams of 31 made it into the stanley cup finals over 13 seasons whereas in the the NBA only 9 teams made it. From those findings one could say that the NHL is more competitive and the usage of salary cap has a smaller impact as every team are close in their salary expenses. Though when it comes to the championship winner the amount of teams that have won a championship in their league is 7 different teams have won in the NBA and 8 in the NHL. If post-season success would only be measured in championship won then both leagues are equally as succesful and competitive. Though experienced players have always had an big impact in championship games.

For further research I would suggest to look into how a single player might affect a teams performance and what kind of impact he might have in either a soft salary cap or a hard salary cap. This research could also be expanded into taking into account also the voluntary salary cap and looking at how football teams spending impact their standings in their league.

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