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Franziska Prockl, M.Sc.

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Erstgutachter: Prof. Dr. Bernd Frick

Fakultät Wirtschaftswissenschaften, Universität Paderborn

Zweitgutachter: Prof. Dr. Robert Simmons

Economics Department / Management School, Lancaster University

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1 INTRODUCTION

"Soccer is now, by a large and constantly growing margin, the planet's favorite game."

(Kuper & Szymanski, 2014, p. 411)

The Economics of Major League Soccer (MLS) is the subject of this thesis. Not just because soccer is the 'planet's favorite game' but also because the situation in the North American (soccer) market is particularly interesting for research in the field of sports economics. The specific reasons will be detailed in subsequent chapters. In the following, I would first like to introduce sports economics as a research discipline and why it is worth to be researched.

"Sports Economics: It may be fun but what's the point?", a recent paper by Bryson, Frick, and Simmons (2015), illustrates the dilemma that sports economics often face: they are not fully taken seriously or at least are belittled compared to research from other, more established, economic disciplines. Based on the impact and myself being an aspiring sports economist, I would argue that this belief is completely wrong. According to (Bryson et al., 2015), sports economics is worth pursuing due to four factors:

1. "Sport is big business".

2. "Sport employs a lot of people."

3. "Sports matters quite a bit to participants and supporters."

4. Sports data "can shed light on fundamental economic questions".

This summary highlights, first and foremost, the value that sports economics research can deliver to different stakeholder groups from sponsors to governmental labor regulators, fans as well as athletes and sport managers, but also economists. Or as Cairns, Jennett, and Sloane (1986, p. 3) put it, the justification for sports research, in their case economics of professional team sports, stems from "a highly visible public position" and a replete area with analytical interest fueled by the "availability of statistical data providing greater scope for empirical work". The claim "to be distinguished and recognized as a distinct area of study lies in the scope it gives for fruitful analysis of relevance to a wide range of economic activity" (Cairns et al., 1986, p. 4). The research can be split into two objectives, because the exchange between the two disciplines happens in both directions. On the one hand, economic concepts help to understand sport-related phenomena better (as applied by e.g., Késenne, 1996; Kikulis, 2000).

On the other hand, sports data presents a good testing ground for economic theories (Kahn, 2000; Scully, 1974). This thesis provides ground for both. Economic theories are applied to understand the dynamics driving Major League Soccer's (MLS[1]) economics and data from MLS is used to test different economic concepts empirically.

Sloane (2015, p. 5), a pioneer in sports economics in Europe, further points out that "economics of sport has now come of age" while still "some important issues remain unresolved". This confirms that sports economics is, not only, a stand-alone research discipline by now, but also, still offers many subjects worth, and with a need, to be researched. This knowledge prepared the ground for the presented doctoral thesis.

The following introductory sections are divided by research area, research subject and research problem. The first section, 1.1, explores the broad field of (sports) economic theory and considers thesis' relevant research streams. section 1.2 then describes and discusses key issues concerning MLS as the main subject of analysis. Afterwards, section 1.3 carves out the identified research gaps and develops the research questions that this thesis aims to answer. The last introductory section, 1.4, explains the author's contribution to the scientific dissemination process of each paper presented within this thesis. In the following, the papers itself are found in Chapters 2 to 5. Finally, Chapter 6 features a conclusion across all conducted research, limitations of this thesis and an outlook towards future research avenues.

1.1 Research Area

On a broad level, the research presented in the following can be anchored within Organizational Theory. According to Slack and Parent (2006, p. 6), organizational theory deals with structure and design of organizations to "identify commonly occurring patterns and regularities in organizations" and to understand "their causes and consequences". For a deeper analysis of organizations, institutional theory provides suitable concepts, because "institutionalism purportedly represents a distinctive approach to the study of social, economic and political phenomena" (Powell & DiMaggio, 1993, p. 1). According to Selznick (1957, p. 17) an institution is "an organization infused with value". This is one definition but there are numerous others. Nevertheless, most of them have the common notion of something that is essential,

[1] Note that Major League Soccer is properly referred to as ''MLS'' not ''the MLS,'' in much the same way as Major League Baseball is referred to as ''MLB'' rather than ''the MLB.''

taken-for-granted, widely accepted and resistant to change (compare Washington & Patterson, 2011). Powell and DiMaggio (1993, p. 9) refer to the assumption of "most institutional economists" and elaborate "that actors construct institutions that achieve the outcome they desire". The desired outcome depends on the goals and objectives of an organization. And as Slack and Parent (2006, p. 5) postulate, "all sport organizations exist for a purpose". This purpose or goal can be manifold and can differ between stakeholders of the organization. "In North America, profit maximization is the clearly established objective" which is linked back to Noll (1974) who concluded that "there is no evidence that the prime motivation of the vast majority of the owners is any consideration other than profit" (Taylor & Gratton, 2002, p. 200). The goals and objectives of a sports league are manifested in the initial decisions the league makes with regards to format, hierarchy, multiplicity, membership and governance (Noll, 2003). First, this helps to differentiate one league from another and secondly, provides the baseline for discovering trends and explaining the behaviour and mechanisms behind league institutions.

The production of goods and services is at the heart of economics. For a sports league, production differs quite substantially from other industries and is therefore worth closer investigating. This is due to the close link between the labor and product market in sports. The product is the game and the game depends on competition and rivalry between teams that employ players to produce the on-field product (Rosen & Sanderson, 2001; Rottenberg, 1956). Or as Fort and Quirk (1995, p. 1265) express it, "sport leagues are in the business of selling competition on the playing field" which led to Neale's (1964) seminal work being coined as "The Peculiar Economics of Professional Sports". Cairns et al. (1986, p. 56) followed this thought and advocate that "the labour market holds a key position in the analysis of the economics of professional teams sports", which links back to one of the first papers that was presented at the intersection of sports and economic studies, Rottenberg's (1956) 'The Baseball Players' Labor Market' in the Journal of Political Economy.

In general, labor economics can be split into different topics of interest. For example, worker mobility, investment in human capital, frictions from monopsonistic firms, discrimination, unions, or pay and productivity (see Ehrenberg & Smith, 2012). For sports economics, particularly the pay and productivity aspect is key due to the above described peculiarities. Many have followed Gerald Scully's (1974) seminal work on the marginal revenue product and wage determination with enhanced performance indicators, indexes over separate statistics,

for MLB. Since then, researchers have discussed the advantages and shortcomings of Scully's approach (see for example Bradbury, 2013; Krautmann, 1999) and provided many additions to the field of wage determination in general and in particular in the fruitful laboratory of sports, offering advanced productivity measures than are available in any other industry. With regard to existing literature, wage determination studies have been conducted for various sports with different goals in mind, from understanding the pay for performance relationship over to discrimination. While at the beginning the research was centered on North American sports, especially baseball (see Scully, 1974), today, European soccer has received much focus too. Relevant studies come from Szymanski (2000) for the English Premier League, Garcia-del-Barrio and Pujol (2014) for the Spanish league, Feess and Frick (2004) and Frick (2011) for the German Bundesliga, and Bryson, Rossi, and Simmons (2014) for the Italian Serie A. For MLS, initial salary studies have been published by Reilly and Witt (2007), Lee and Harris (2012), and Kuethe and Motamed (2010). These three studies provide a first orientation but are limited in their generalizability due short observation periods, one to three seasons, and are all timed right after one of the biggest disruption to the regulatory framework of MLS, the introduction of the Designated Player Rule, which will be explained in detail later.

Furthermore, with reference to Cairns et al. (1986, p. 56) "the impact of restrictive labour market controls have proved to be the primary research issue" including the "impact of controls on the distribution of playing talent" and "the impact of controls on players' salaries". Rosen and Sanderson (2001, p. F65) continue this discussion by highlighting that "in no other labour markets are employers collectively allowed to impose restrictions on payments to workers". This is enabled by the structure of sports leagues. "Owners of teams have an incentive to construct tournament structures that may actually diminish the playing success of their own team in order to make a more attractive contest" and "collusion among the owners is necessary to make a more attractive product for fans" (Szymanski, 2011, p. F1). As mentioned before, the product in sports is a special entertainment good that is only as good as the two teams competing (Rottenberg, 2000). In line with this, Sanderson and Siegfried (2011, p. 151) conclude that "contests between poorly matched competitors would eventually cause fan interest to wane and industry revenues to fall". Considering the prime incentive of profit maximization in North American sport leagues this would be a major issue. In general, "the problem of maintaining financial viability for teams located in weak-drawing markets is a major one for sports leagues" (Fort and Quirk, 1995, p. 1296). The solution advocated by many, especially the league officials, are regulations that guarantee a certain level of competitive

balance in a league. Késenne (2000, p. 56) explains that competitive balance in a sport league "depends primarily on the distribution of playing talent among teams" and "is an important element affecting public interest and the financial health of the industry of professional sports teams". Competitive balance, and the interest it generates with fans, links back to the initial uncertainty of outcome hypothesis by Rottenberg (1956). The more uncertain a game outcome, the more it appeals to fans, hence is an important factor to influence attendance (and with that revenues). Recent research has questioned this postulate as empirical findings show a more complex picture based on fan preferences and situational context (Forrest, Beaumont, Goddard, & Simmons, 2005; Humphreys & Zhou, 2015; Pawlowski & Anders, 2012). For now, I would like to conclude that competitive balance's impact should be rightfully questioned, but that team quality stands as an important factor. A team's quality brings up a differentiating factor between open (promotion-relegation) leagues, as in Europe, and closed (fixed membership) leagues as in North America. In theory, teams in a promotion-relegation system should have a greater incentive to improve their quality as they are punished for bad performances and experience a financial loss from relegation (Noll, 2003). In closed leagues, relegation is no threat and teams are even rewarded after finishing last with more money to bring back competitive balance in line with revenue-sharing agreements. This raises the question about the consequence and efficiency of league rules in closed league systems. Or as Késenne (2000, p. 429) frames it:

"It is rather the irrational behaviour of owner and managers, who do not realize the negative effect of an unbalanced competition and who are bidding up top player salaries in a free agency player market, that makes these regulations necessary."

Yet, the question which league rules have an effect e.g., on competitive balance in the Northern American sports market, has not been answered conclusively until today. Therefore, it is also a core topic of this thesis.

To generate a first understanding, not just about regulation in MLS, but also about MLS's structure, institutional practices, and other relevant dimensions, as well as its positioning within relevant markets, I provide an introduction to the main research subject in the next section.

1.2 Research Subject: Major League Soccer

Slack and Parent (2006, p. 5) put forward the following definition: "A sport organization is a social entity involved in the sport industry; it is goal-directed, with a consciously structured activity system and a relatively identifiable boundary." MLS is such a sports organization, created with the purpose of delivering top level professional soccer to fans in North America. MLS's "activity systems" have been consciously structured to establish the league operation, run teams and develop players and have been adapted over time to fulfill MLS's goals. Boundaries are set by employment status, hence people working for the league or the teams who are complemented by the players contracted to compete in different teams. By that, they are set apart from other sport leagues in North America or soccer leagues in other countries. In North America, MLS stands next to the Big Four team sports organizations and, as all organizations, embedded in an organizational field, is "subject to attendant institutional pressures for change" (O'Brien & Slack, 2004, p. 36). Since its inauguration in 1996, various changes have occurred and different dynamics have influenced the image, the economics, and sportive success of the league, while the overarching goal has not changed. The league aims for profit-maximization[2]. This is partly in contrast to MLS teams that have rather a dual mission. Next to profit, MLS teams strive for wins and ultimately becoming MLS champion (Coates, Frick, & Jewell, 2016). In the North American market, sociocultural conditions favor more traditional North American sports like football, baseball, basketball, and hockey over the most popular sport in the world, soccer. The Guardian (Turner, 2014) listed three sources of pressure for MLS that keep its revenues lower than other North American Sports: operation time, number of teams, and international competition. MLS just became a 'toddler' with playing its 22nd season in 2017 which is decades apart from the NBA (founded in 1946), NFL (1920), NHL (1917), and MLB (1903). The league operates with 22 teams in 2017 compared to 32 in NFL and 30 in MLB, NBA and NHL each. And, MLS is up against strong competition in the international soccer market. With reference to Kuper and Szymanski (2014, p. 411), "Soccer - notably European Soccer - is inheriting the globe" while the United States, and many other countries, still has to catch up, but at least according to the authors, they are fast closing this experience gap. This can be illustrated with MLS player's market values, which are far-off from the top-divisions in Europe like the English Premier League, La Liga, or Bundesliga. This

[2] Profit maximization is generally assumed in North America, while Utility maximization, hence "maximizing success subject to a budget constrain", is the analytical starting point in Europe (see Cairns et al., 1986, and Szymanski, 2001, F2)

keeps MLS from hiring the best players in the world and reaching a better, in terms of performance, position in the soccer universe. Still a young league, the development of market values is an interesting reference point to benchmark the quality of teams. Chapter 2 therefore discusses the development of market values for MLS and evaluates the source of crowd wisdom generated market values.

Despite the difficult conditions for MLS, the project can be deemed, at least currently[3], a partial success. After 20 years it is still in operation, contrary to its predecessor, the North American Soccer League (NASL) that folded after 17 seasons due to bankruptcy. Based on this failure, Francis and Zheng (2010) explore various learnings along the four categories of ownership control, audience appeal, media relationships, and long-term financial viability. These categories are also well suited to explain MLS's specific operation system in more depth.

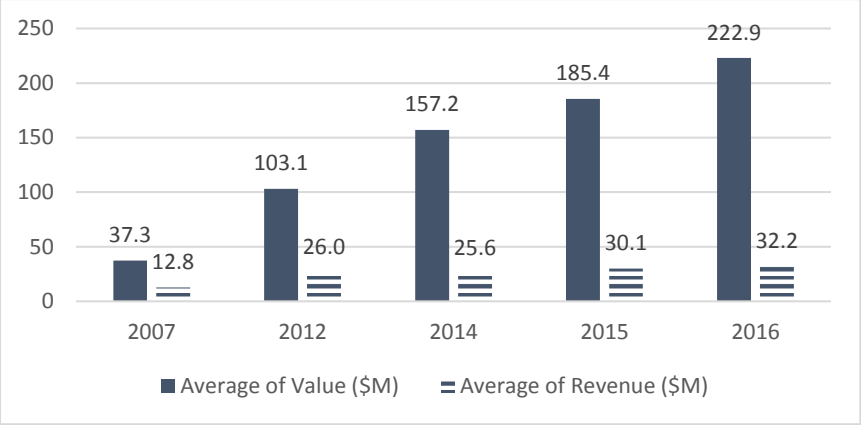
Firstly, I discuss ownership and control mechanisms. MLS is a single, limited liability company (single-entity). Club operators own a financial stake in the league (based on their initial investment). This means that all investor-operators succeed and fail together. MLS's profit is in turn paid out to the investors as pro-rata shares and losses can be written off. Investors are allowed to operate a league-owned team and team revenues are directed partly to the operators and partly to the league. In the end, however, all profits flow back to the operators in their role as league investors. The expenses are also split. While all operating expenses are the team operators' responsibility, the league pays for the general player salaries and awards General and Targeted Allocation Money (GAM, TAM) for additional player investments. GAM and TAM are supposed to increase the quality. Lastly, 'Soccer United Marketing' was established as a body to "sell soccer" on a wider range and to guarantee that the benefits from the growth are rewarded back to the league and investors. MLS's organizational set-up differentiates them noticeably from other North American sport leagues. The other leagues have team owners who function in a legal cartel and by that create healthy competition among themselves. For MLS, the implanted structure leaves substantial power with the league and forces the investors to collaborate to reach decisions and implement changes. The key management figure in the league is the commissioner of MLS, since 1999, the former NFL manager, Don Garber. With reference to Neale (1964), the firm 'MLS' is a natural monopoly like all professional sports

[3] Compare Noll (2003, p. 542) who noted the unsuccessful operation of MLS despite the popularity of soccer among young people and linked it back to the single-entity structure.

which carries advantages and disadvantages. MLS balances those well and avoids, e.g., the Louis-Schmelling paradox - one great boxer is nothing without an interesting competitor to fight against. By creating a league with multiple teams that compete while combining them under the one-entity umbrella of a league, MLS realizes the advantages of a monopoly. With this one-entity principle, MLS can dictate a tight regulatory framework (including roster limits, salary caps, transfer policies and player drafts), steer investments and expansions in the closed-league system, as well as keep control over player contracts that are exclusively negotiated with the league. Coates et al. (2016) also confirm the associated advantages and special circumstances MLS carries for research, including the result of "greater homogeneity in the quality of teams" and improved "league competitiveness" (p. 719). As typical in North America, competitive balance is a key concept and ideal that sport leagues strive for (Vrooman, 2000). MLS's competitive balance over time is therefore analyzed in one part of this thesis to provide evidence and value of the concept to MLS. Nevertheless, all equality and parity comes at a price. Twomey and Monks (2011) demonstrate the effectiveness of the monopsonistic structure in MLS to suppress salaries. They calculate that in 2007 MLS clubs only devoted 25 percent of their revenues to salaries on average, whereas other North American professional sport leagues (MLB, NHL, NBA, NFL) spend on average between 50 and 60 percent and European soccer leagues between 50 and 70 percent. Surprisingly, this number only increased in MLS slightly over time. In 2015, MLS clubs still spent on average only 27 percent of revenues on salaries[4]. This could be accomplished mainly due to an improving MLS revenue situation. Figure 1.1 displays the average team revenues and respective team values (to adjust for changes in team-count over the time) based on the numbers published by Forbes in five different years. Despite the numbers not being confirmed by MLS officially, as private company they are exempted from the reporting, they should be good indicators.

[4] Own calculations based on revenue numbers derived from www.forbes.com and player salaries from www.mlsplayers.org

Figure 1.1 Development of MLS's Average Value and Revenue

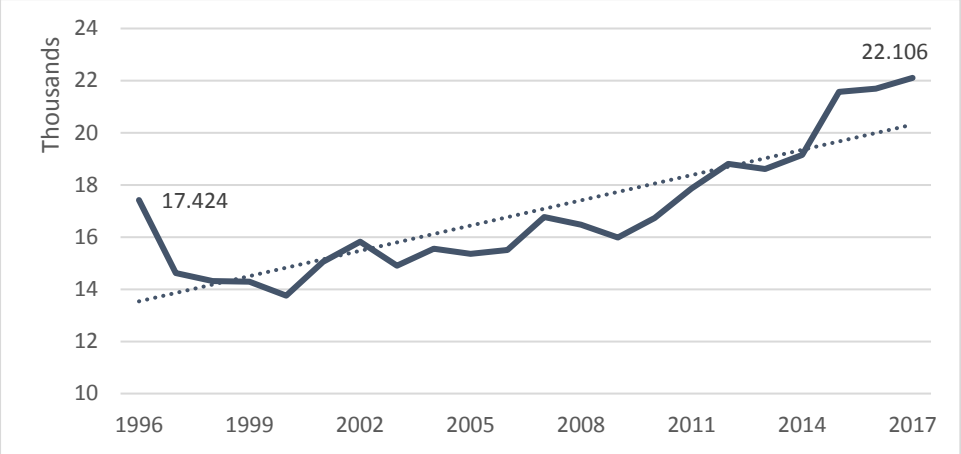


Overall, the league appears financially stable. It should be noted, however, that still about half of the teams recorded a negative operating income in 2016, according to Forbes. Based on this, it is probably understandable that keeping player wages under tight control is still an important pillar for financial improvement in MLS. Obviously, this system is not necessarily beneficial for MLS's key employees, the players. To ensure protection of player's rights and to partly balance the strong league, the Major League Soccer Player Association was formed in 2003. Due to this interesting set-up, that is very different from contracting and remuneration in other (soccer) leagues, and associated effects, one of this thesis's research topics is MLS's wage determination.

Secondly, revenue growth is also resulting from a growing audience. MLS attendance has risen until 2017 by 27 percent since its inaugural season in 1996, this is despite an initial drop after the first season and further ups and downs until 2014[5] (see Figure 1.2).

[5] Attendance numbers were collected from various sources including www.soccerstadiumdigest.com and www.mlssoccer.com

Figure 1.2 Average Attendance MLS, 1996 - 2017



Sung and Mills (2017) highlighted that already in 2015, MLS surpassed the NBA (average attendance: 17,809[6]) and NHL (17,503). Whereas, MLS was and is still behind MLB (30,246) and account for only one fourth of NFL's attendance (68,776). Anyhow, part of the observed attendance growth is explained by DeSchriver, Rascher, and Shapiro (2016) with a superstar effect, at home but also for away games. The special players they refer to are officially called designated players (DPs) and were introduced by Major League Soccer under a new rule in 2007. The DP rule allows teams to employ, by now, up to three players outside of the strict salary cap that the league imposes. Also, due to the impact of superstars regarding audience's appeal, one of the papers in this thesis investigates the background of MLS's superstars.

Thirdly, not just in the stadiums but also in front of TV, MLS is improving its ratings. The new television deal closed in 2016 with FOX, ESPN, and Univision helps with that. According to FOXbusiness.com (Barrabi, 2016), the contracts "are worth a combined $90 million annually –a threefold increase over its previous rights deal. Total television viewership of MLS games reached 30 million in 2015, up 50% from 2013". This advance likely supported the extension of the sponsorship agreement with adidas in the summer of 2017. The newly signed six-year deal brings $700 million and with that outgrows the broadcasting contract at an annual level (Smith, 2017).

And fourthly, the growing attraction of MLS is also a reason for new investors to join. Recently, the competition for expansion spots, which entitles a group/investor to operate a new MLS

[6] For NBA, one needs to keep in mind the limited stadium capacities for basketball arenas between 17,000 and 22,000. Similar limitations apply to NHL arenas.

team, is higher than ever. In 2017, 12 candidates bid for two new spots. Overall, MLS added LA FC to its teams in 2018 and has confirmed spots for Miami FC, under the lead of David Beckham, and Nashville FC plus one more team to be announced in Spring 2018. By 2020, the league will then consist of 26 teams. Circling back to Francis and Zheng's criteria, this is the last important aspect to avoid a NASL-like failure. Stable expansion and new money is a good and promising foundation for long-term financial viability of MLS.

1.3 Research Problem and Overall Contribution

To disentangle parts of MLS's economy is the primary goal of this thesis. Therefore, this thesis is centered around four topics which, on the one hand, help to close specific sports economic research gaps and, on the other hand, help to define and understand the institution Major League Soccer. The topics reach from the development of MLS player's market values, to MLS operations and the effectively achieved competitive balance, as well as salary structures and the impact of regulations in the process, and finally the special topic of MLS superstars and their value. Each topic tackles a unique aspect that describes only one facet of MLS. By combining these parts, a holistic view of this young and continuously changing sport organization, which tries to claim its position in the Northern American sports and international soccer market, becomes possible. Moreover, parts of the research also deliver insights into other fields than purely sports economics (e.g., decision economics, crowd wisdom, labor economics, superstar theories). As referenced before, sports economics research can serve as a laboratory and is well-suited to illustrate general economic problems. This enables knowledge contribution to an audience outside of sports and is a second goal of this thesis. In the following, the four topics are translated into concrete research questions this thesis aims to answer.

In its 1996 inaugural season, MLS was a league with 10 teams, two main investors and a single entity structure, which was new in team sports. Since then, the multiple changes incurred by the league, e.g., league size, soccer-specific stadium construction, and conference realignments, have shown "real growth in league popularity" (Jewell, 2017, p. 240). Another measure for the development of MLS is the overall league quality and respectively team quality that adds up to it. A better league quality helps attracting people and exciting them to see games of quality teams live (Vrooman, 2000). A team's quality is then, with regards to Humphreys and Zhou (2015, p. 7), "the ability of the players on the rosters". To compare the ability of players, the online platform www.transfermarkt.de provides market values for individual

soccer players. In short, the player's market values are determined via crowd wisdom of interested users. As transfermarkt.de is of European origin, not all MLS players were listed from the beginning. In consequence, I can use the increasing number of players' market values as an indication for the growing relevance of MLS as such. Furthermore, the players' market values can help to understand the development of market size and MLS team quality over time. And finally, with the fortunate availability of MLS data, I can also test whether the estimates by the crowd are precise by comparing them to salary data published in retrospect. This research immediately feeds back into this thesis' second goal, fueling discussions outside of the sports world with practical findings that can be applied beyond sports. Concretely, the emergence and development of crowd-generated information from an online community per se. Täuscher (2017), for example, affirms the growing importance of online crowd-content as source for value creation in firms. And Garcia Martinez and Walton (2014, p. 212) ask future researchers to "look at organizational appearance of crowdsourcing" to understand the working mechanism of such platforms. MLS data presents a suitable scenario to comply with this request. Hence, the first research question has the purpose to understand MLS better but also to provide a general understanding for the development of crowd wisdom.

(*i) How does online community-generated information emerge? How did the market values develop over time for MLS players? How precise are MLS player's market values generated by an online crowd?*

The first paper in Chapter 2 presents the findings to answer these research questions. As explained before, this topic is rooted in and relevant for different research streams. On the one hand, the findings deliver a general contribution to decision economics and the emergence and development of online crowd wisdom. On the other hand, sports economists can benefit from the goodness of fit evidence for the market values estimated by the online crowd on transfermarkt.de. Due to the unavailability of player salary data for many sports, a valid proxy can spur future research in the field of sports labor economics. More specifically for MLS, new information is compiled to comment on MLS's growing market size and team quality as well as the overall relevance of crowd wisdom for professional team sports.

Under the assumption of a certain league quality, another important factor, that can possibly attract fans, is uncertainty of outcome as explained in section 1.1. Also Rosen and Sanderson (2001, p. F49) confirm on a simple level again that "the noncooperative, competitive struggle to win is what makes sports so interesting to most people". Interest in turn can be used by an

organization to generate revenues from the sale of merchandize products, ticket sales, TV ratings or sales of Live Stream packages. In the recent literature the issue is expanded to reflect the underlying complexity of fan behaviour. Coates, Humphreys, and Zhou (2014) clarify fan's reference-dependent preferences (e.g. desire to see upsets) and loss aversion (e.g. favoring the home team to win) behaviour and in turn impact on live attendance. Uncertainty of outcome was empirically tested with differing results for attendance (Rascher & Solmes, 2007) and TV ratings (Buraimo & Simmons, 2009). Also for Major League Soccer a varying impact has been found (Paul & Weinbach, 2013; Sung & Mills, 2017). Apart from the importance of competitive balance to increase demand, organizations could have a second reason to impose it, league stability. As outlined before, stable growth of all teams is a key objective of MLS to minimize the risk for failure (of single teams, and the overall league) and to continuously attract investors. Likewise, the individual team operators also strive for a certain level of equality as they are all connected thru their investments in the governing league body. Consequently, the research question, which the second paper tries to answer in Chapter 3, can be summarized as follows:

(ii) What level of competitive balance does Major League Soccer achieve and how did it develop over time considering various rule changes?

The results for MLS are particularly interesting in the light of the European trend towards less balance (Pawlowski, Breuer, & Hovemann, 2010). Also, many studies discuss the competitive balance situation for the European soccer market, but there has been no study so far that compares it to the North American Soccer league.

Among the North American sport leagues, MLS is the one where athletes earn on average the least (see section 1.2 for a comparison of salaries in percent of revenue). The key difference for MLS is for sure the special governance. All player contracts are with the league directly. In addition, player movement is subject to approval by the league, minimum and maximum salary apply next to a salary cap, and no "free agent" mechanism is installed yet. As noted by Cairns et al. (1986, p. 37), "where labour market controls are in force some degree of exploitation is predicted". And for sure, MLS mechanisms avoid a rat race for the best players and substantial overbidding between teams. In comparison, Késenne (2006, p. 426) highlights the "serious financial losses" of European win-maximizing clubs also due to "reckless overpayment of professional players" and poor management. This well-known situation is also a likely driver for the strict regulations in place. Nevertheless, the growth of the league as such is also reflected

in a salary increase over the years. In MLS, part of the growth is most likely driven by changes in the regulations, some affect salary in a direct and some in an indirect manner, while another part is presumably driven by the installment of the MLS Players Association and the negotiation of Collective Bargaining Agreements every five years. As mentioned in section 1.1, various studies have investigated different wage settings, but for soccer almost exclusively linked to the European leagues. Whereas those studies often need to deal with a lack of trustworthy salary data[7], the situation in North America is comfortable as the Players' Union publishes salary information each year. Taken together with the previously mentioned circumstances, MLS presents a unique setting to contribute new knowledge on salary determination in soccer. Furthermore, Sloane (2015) specifically referred to the impact of salary caps as one of the key topics still to be resolved by research in the future. Consequently, paper three is set in this context and aims to investigate MLS's salary development under the tight regulatory framework that differentiates the league from others. The key research question is framed as follows:

(iii) How is wage determined in a regulated market environment compared to more open environments?

With a ten-year panel, the research investigates peculiarities of MLS's wage determination compared to European soccer leagues and the development of MLS's player salaries over time. The results of this study are supposed to help practitioners, MLS managers and the league, to understand the sensitivity of wage determination, and e.g., to form better teams in an efficient manner. Next, sports economists will benefit from the empirical results from wage determination in a profit-maximization league with strict regulations. Especially, the comparison with open European win-maximizing leagues shall close an existing research gap. For the wider audience of labor economists, the regulation aspect is the critical piece. The data availability from such markets is limited and even if MLS is set-up in a special way, e.g. exempted from anti-trust laws, this approach to test regulations at work and their impact on salaries should be superior to a purely experimental setting.

Another interesting aspect of the supply side in MLS is the exception for superstar players, called designated players, as mentioned before. For sports, Hausman and Leonard (1997)

[7] The exception is the Italian Serie A where the Gazetta dello Sport and other newspaper publish salary information on a semiregular basis.

highlight the enormous effect superstars can have on revenues. And Rosen and Sanderson (2001, p. F49) explain how "some star athletes develop personal followings that go well beyond their contribution to the quality of specific competition". This leads to the conclusion that an understanding of superstars and their value should be a worthwhile subject for any organization in order to optimize the supply side and human resources, as well as initiate relevant, lucrative, effects on the demand side.

The fourth research question this thesis aims to answer in Chapter 5 is therefore:

(iv) What characterizes a superstar and what superstar characteristics deliver value to an organization?

While the emergence of superstardom has been explained by Rosen (1981) and Adler (1985), Lucifora and Simmons (2003), for example, provided first empirical evidence for the existence of superstar effect in sport from the Italian Serie A. The struggle with superstar studies is often the unit of analysis – who is a superstar, and who is not. Taking the same criteria to identify stars and analyze them provides flaws by definition (Krueger, 2005). Here, MLS presents the opportunity to contribute to the general research on superstars with a unique setting of an already separated and clearly distinguishable group of stars, the designated players. For instance, Jewell (2017, p. 242) expresses that "the DP rule provides a bit of objectivity to the questions of what constitutes a superstar". The contribution of the fourth paper in this dissertation is therefore also twofold. First, to straighten out the popular topic of designated players in MLS, from a league benefit perspective. And secondly, to advance the superstar literature with an in-depth study of superstar characteristics.

Concluding this section, I like to summarize the overall contribution that the four related research topics deliver. Taken together, the findings of the thesis should be relevant to sport managers, academic researchers, interested fans and any other type of stakeholder. Sport managers have an interest in making their operations as efficient as possible and deliver on their targets. Insights from this work can help to diagnose problems more effectively, understand the mechanisms behind MLS better, and respond with adequate solutions. Academic researchers can use the empirical results to build new concepts, embed their research, and ground theories within real-life examples, while interested fans might simply enjoy the reading and get a better understanding of the mechanisms behind their favorite game. Finally, other stakeholders like sponsors or broadcasters can find relevant leads on how (or

with whom) to invest money more wisely and steer future negotiations in their preferred direction.

2 STUDIES OF THIS DISSERTATION

2.1 Information precision in online communities - Player Valuations On www.transfermarkt.de

Working Paper No. 37:2018-05, Working Paper Series Dissertations, Faculty of Business Administration and Economics, Paderborn University, Paderborn.

Link: https://econpapers.repec.org/paper/pdndispap/37.htm

The first *paper „Information Precision in Online Communities: Player Valuations on www.transfermarkt.de"* has been co-authored with my Ph.D. supervisor Bernd Frick. He initiated the project based on an identified research gap and data availability. Next, I conducted the data collection and processing, the literature review, finalized the estimations and wrote the initial draft of the working paper. In turn, Bernd Frick conducted the first estimations and edited the draft to produce the final version of the paper. Bernd Frick presented the paper in May 2016 at the "XI Gijón Conference on Sport Economics" (Spain), while I presented the paper at the "Football and Finance 2016" (Tübingen, Germany) and the "European Sport Economics Association 2016" (Groningen, Netherlands). Currently, the paper is under review at the "International Journal of Sports Finance".

The benefits of crowd wisdom / swarm intelligence in the form of superior decision making and problem-solving skills have recently been analyzed and discussed by researchers from various fields. The goal of this paper is to identify the relevance of crowd wisdom for professional team sports leagues by analyzing, first, the emergence of crowd wisdom on a particular online platform (www.transfermarkt.de) and, second, by documenting the precision of the collectively gathered information. The authors evaluate the emergence and diffusion of information on that platform over ten consecutive years and find a pattern similar to the one proposed by Bass (1969) in a now seminal study. Moreover, using player values as well as player salaries from Major League Soccer for the seasons 2006 thru 2015, it appears that values are excellent proxies for salaries that are not disclosed, but remain private and confidential in most leagues. These findings encourage researchers to use information from sources like transfermarkt.de in their empirical studies.

2.2 Perception Versus Reality - Competitive Balance in Major League Soccer from 1996 – 2016

Working Paper No. 36:2018-05, Working Paper Series Dissertations, Faculty of Business Administration and Economics, Paderborn University, Paderborn.

Link: https://econpapers.repec.org/paper/pdndispap/36.htm

The paper *"Perception versus Reality – Competitive Balance in Major League Soccer from 1996 - 2016"* is a project together with Dirk Semmelroth. While I started the project with an initial literature review and data collection, a joint discussion led to the final idea. For the paper, Dirk continued the literature review and finalized the data collection and we split the processing work to be done. In the following, Dirk focused on the choice and calculation of measurements for 'actual' competitive balance, while I estimated the regressions and different 'perceived' competitive balance statistics. Each of us wrote the corresponding main chapter. Writing the introduction and conclusion was an iterative process between the two of us. We like to express our gratitude to Robert Simmons who provided valuable comments on the method and related literature. The paper has been presented in a preliminary version at the semi-annual Ph.D. Seminar directed by Bernd Frick at Paderborn University. The paper has also been accepted for presentation at the "2018 Annual Conference of the Scottish Economic Society" (Perth, Scotland, forthcoming).

For different sports leagues, studies show the positive effect of competitive balance on fan interest and consequently revenues. Particularly for Northern American leagues, competitive balance is a core concept in the construction of such, also to ensure financial stability of teams. Nevertheless, most studies in the literature concentrate on measuring competitive balance in European football leagues. To enhance the existing literature, our paper analyzes competitive balance in Major League Soccer (MLS), a comparatively young and therefore still developing league. To encompass ex-post results, as well as the ex-ante perception of fans if a league or match is uncertain in its outcome, we distinguish between ´actual´ and ´perceived´ competitive balance. Based on compiled data for MLS from 1996 until 2016 we measure the ´actual´ level of competitive balance in MLS with several commonly used competitive balance measures. Considering the corresponding decimal odds predictions and team wage bill information from 2006 until 2016, the ´perceived´ competitive balance is measured using a seemingly unrelated regression and further explanatory statistics. While the results of the ´actual´ competitive

balance measurements indicate a league that becomes more balanced over time, the perception points towards an imbalanced league with clear favorites and reduced uncertainty of outcome.

2.3 Wage Determination in a Regulated Labor Market - Evidence from Major League Soccer

Working Paper No. 39:2018-05, Working Paper Series Dissertations, Faculty of Business Administration and Economics, Paderborn University, Paderborn.

Link: https://econpapers.repec.org/paper/pdndispap/39.htm

The paper *"Wage Determination in a Regulated Labor Market: Empirical Evidence from Major League Soccer"* is a joint work with Bernd Frick. In this work, I was responsible for the data collection, data processing, literature review, estimations and written draft, and revisions of the paper. Bernd Frick suggested the estimation strategy, wrote the first outline and provided essential feedback on the draft version. I presented preliminary versions of this manuscript in April at the "2017 Annual Conference of the Scottish Economic Society" (Perth, Scotland) and the "9th ESEA European Conference on Sport Economics" (Paderborn, Germany) in August 2017.

The North American top tier Major League Soccer presents a unique research setting to study a regulated labor market. Contrary to the situation in Europe, where player salaries remain private and confidential (the only exception here is "Serie A" in Italy), the player unions regularly publish this kind of information for each of the US Major Leagues. In this paper we use an unbalanced panel with detailed player-season-information from the seasons 2006 to 2016 to estimate a multi-stage salary model for MLS players. We differentiate in the analysis between regular and designated players (aka DP, a status unknown in Europe) due to their heterogenic profiles. For regular players we find that the impact of age on salaries follows an inverted u-shape with a very late turning point at 33.6 years. In addition, we find a statistically significant positive of last season's performance and career performance. Experience abroad yields a significantly higher salary as does tenure with the current team (controlling for team-specific fixed effects). Perhaps surprisingly, career length in MLS is negatively associated with salary. Also, the results suggest that local player suffer a pay discrimination compared to similar players from Western Europe, Central and South America. Thus, we confirm most of the findings that have been reported in previous research using data from European football

leagues (e.g. Lucifora & Simmons, 2003; Frick, 2007; Bryson et al., 2014). This finding alone is not straightforward considering the various regulations that help the leagues to keep especially salary budgets in check. The effectiveness of salary regulations, e.g. put in place via Collective Bargaining Agreements, is shown for two instances, as is the impact of a regulatory change.

In contrast, the key driver of the unregulated DP salaries are club-specific fixed effects, explaining already 58 percent of the observable variation in player salaries. Next important drivers are career games played and the region of origin. Local superstar players earn a surprising premium over players from Western Europe, South America and the Carribean's. Neither for regular nor for designated players' positions are rewarded significantly different. This is a big difference compared to European leagues where Forwards are usually paid better.

2.4 The Superstar Code - Deciphering Key Characteristics and their Value

Working Paper No. 38:2018-05, Working Paper Series Dissertations, Faculty of Business Administration and Economics, Paderborn University, Paderborn.

Link: https://econpapers.repec.org/paper/pdndispap/38.htm

The paper *"The Superstar Code - Deciphering Key Characteristics and their Value"* is single-authored. The paper has been presented in preliminary versions at two different semi-annual Ph.D. Seminars directed by Bernd Frick at Paderborn University (Germany).

The purpose of the presented research is to advance the superstar literature on the aspect of superstar's characteristics and value. Typically, superstar research is faced with one problem: They apply the same criteria to determine who their superstars are as to describe them later because they lack "an objective measure of star quality" (Krueger, 2005, p.18). To avoid this complication, the author chose to study Major League Soccer's (MLS) designated players as this setting present a unique, quasi-objective, assignment of star status. MLS has formally introduced stars in 2007 under the designated player (DP) rule which delivers over 100 star-observations in the last ten years to investigate MLS strategy of star employment. The insights from this data set demonstrate which characteristics are relevant, whether MLS stars can be categorized as Rosen or Adler stars, and what MLS pays for and in this sense values most. A cluster analysis discovers a sub group of ten stars that stand out from the others in various categories, in this sense superstars. A two-stage regression model confirms the value stemming

from popularity, leadership qualities, previous playing level, age and national team experience but refutes other typical performance indicators like games played and goals scored or position. Overall, evidence for Rosen and Adler's theory is found, and an over the time change from hiring old and popular stars to younger but still leadership-prone stars.

3 CONCLUSION AND OUTLOOK

This thesis uncovers several factettes of the Economics of Major League Soccer. Relevant literature and the league's background as well as the league's situation, with respect to the local sports market and the international soccer market, were discussed in the Introduction and throughout the chapters. At the core, each chapter presented new empirical evidence to broaden and deepen the understanding of MLS as a league, contribute to sports economics' research, and provide new insights into other research disciplines from decision economics and crowd wisdom over to labor economics and superstar concepts. Each empirical analysis focuses on a challenge that MLS faces, has faced, or will face in the future as organization. The organizational context allows to extrapolate some empirical findings also to other settings. Notably, answers to the following research questions will expectantly not only support MLS officials but also league managers, investors as well as scientists and policymakers in their future decision making and research:

(i) How does online community-generated information emerge? How did the market values develop over time for MLS players? How precise are MLS player's market values generated by an online crowd?

(ii) What level of competitive balance does Major League Soccer achieve and how did it develop over time considering various rule changes?

(iii) How is wage determined in a regulated market environment compared to more open environments?

(iv) What characterizes a superstar and what superstar characteristics deliver value to an organization?

Chapter 2 contributes three main findings to the overall analysis. First, the emergence and diffusion of information on the online platform transfermarkt.de follows a Bass Model-like pattern. The Bass model is frequently used to describe product lifecycles, for example in marketing science. The curve rises gradually until a certain point (i.e., critical mass) is reached from which it increases sharply before it stabilizes around the peak. The detected emergence pattern particularly contributes new empirical insights to the research stream on collective intelligence and crowd wisdom in online communities. Secondly, the increasing availability of MLS players market values on transfermarkt.de can serve as a proxy to illustrate the growing popularity of the league. Specific growth drivers have been discussed and can be tagged to the

surge between 2010 and 2011. Thirdly, the MLS data shows how precise crowd-generated player valuations are compared to actual player salaries. The presented evidence allows researchers to judge the quality of information from sources like transfermarkt.de and in turn, use collectively gathered knowledge for empirical studies. Based on these findings, crowd-generated information should play an increasing role in research, e.g. for sports economics, in the future.

To provide another holistic view of MLS, Chapter 3 investigates different levels of competitive balance in MLS over the last twenty years since the league's inauguration. Competitive balance is a core concept for North American sports leagues, among others, to ensure parity between teams, foster financial stability of the league overall and keep the league attractive for fans. The latter refers to the longstanding hypothesis established by Rottenberg (1956) that uncertainty of outcome increases fan interest and with that revenues. To my knowledge, it is the first study to investigate competitive balance in MLS. Distinguishing between 'actual' and 'perceived' competitive balance, the findings vary between the two. While the results of the 'actual' competitive balance measures indicate that the league becomes more balanced over time, the perception points towards an increasing imbalance with clear favorites and reduced uncertainty of outcome. So, on the one hand, MLS managed to establish and keep league operations that achieve parity among teams within and across seasons. In comparison to European soccer leagues (except for the French Ligue 1), MLS is extremely balanced, especially across seasons. On the other hand, it seems that rule changes, e.g. the softening of the salary cap in form of an exceptions for certain star (i.e., designated players) salaries, convey a different image to stakeholders. Approximated with betting market predictions, the market is perceived to be more unbalanced than the actual results suggest. This might have negative consequences on MLS's future fan appeal and financial growth. To mitigate this, the league could focus on communicating the impact of rule changes more openly and elevate positive aspects. Researchers are asked to provide further evidence on the differing impact of rule changes on perception and actual results. Likewise, regulators of any sort should be aware of this potential difference and consider it in the regulatory process.

To add on to the notion of rule changes and impact of regulations in a closed labor market, Chapter 4 discusses wage determination in MLS. Surprisingly, wage determination for MLS's regular players (star players are separated due to immense earning differences and dissimilar profiles) and for players from less regulated European soccer leagues follow similar patterns.

Significant positive influence of last season and career performance, experience abroad, and team tenure is found. Age follows the typical inverted u-shape which means that first age increases salary but at a certain point the impact is turned. For MLS, this turning point is at 33.6 years, which is comparatively late. On a first look unexpected, career length in MLS is negatively associated with salary. This could have two implications, first, players are encouraged to leave the league to maximize salary, and secondly, the leagues quality is suffering because especially good players, that have the opportunity, will leave the league. More on and rather atypical, positions are not rewarded significantly differently in MLS. In Europe, forwards usually earn a substantial premium. This is a first indication for effective regulations in place that control salary levels for all regular players and across positions. Finally, the results suggest that local players earn less than comparable players from Western Europe, Central and South America. This fact should be taken seriously by the league as it might hinder successful local player development and can have, e.g., negative implications for future US national team performances and therewith, North American soccer's image in general. As seen in the introduction, other sports in North America pay far better than MLS and talented athletes might therefore choose a sporting career other than soccer if the prospects continue to be better. Nevertheless, soccer is the most popular sport amongst kids in the States but much youth play is unorganized (Kuper & Szymanski, 2014). First moves of MLS teams to turn this around have started. They cooperate with local youth teams and create MLS youth academies. Following this development closely, analyzing the background and career development, as well as the success and failure of MLS players might therefore be a relevant topic for future research. Furthermore, the effectiveness of salary regulations, e.g. put in place via Collective Bargaining Agreements, is shown for two instances with the MLS data, as well as the impact of a regulatory change. All in all, MLS successfully manages to keep salary budgets under control and with that suppresses player salaries. In one case, MLS refrains from suppressing player salaries, i.e. for star players. Consequently, Chapter 4 also compares the wage determination process of MLS's regular players against designated players. Substantial differences were found, e.g., in that 58 percent of the observable variation in DP's salaries are already explained by club-fixed effects in a basic regression model. This initial finding triggered additional questions towards the remuneration of star players in MLS that were in turn addressed in Chapter 5. Taken together, Chapter 4 shows that regulated markets are not per se different from open settings. At least, if the regulations are directed towards similar mechanisms that would also apply in open markets. In fact, the evidence from 10 years' MLS

shows that regulations are effective and the league can control salaries which in turn enables pay-discrimination of certain players. Probably the next pressing, in light of Player's Association's advocating, question for MLS in this context is a move to free agency, as seen in the other North American sports leagues. With the empirical evidence presented in this thesis researchers are able to build on to this and discuss the impact of a free agency system for MLS.

Lastly, Chapter 5 discusses superstar characteristics and their value to an organization. The insights are unique as most studies suffer from the fact that no objective superstar criteria are available at all. For MLS, the designated player status was introduced in 2007 and enables researchers to study a distinct group of stars. The analyses show that on cluster of 10 stars, approximately 10 percent of all designated players, stands out in terms of popularity, different performance achievements in relation to their career span, leadership and national team experience as well as previous club level, hence if the player played in a top-tier soccer league before joining MLS. This suggests that some designated players can be called *superstars*. Furthermore, the diversity among the over 100 analyzed stars is imense which led to four further clusters based on different characteristic combinations. Groups facilitate investigations into the different impacts of different star types. Based on this, I like to emphasize that stars are not a "one-size-fits-all thing" and the diversity should always be considered for future superstar analysis. Moreover, the preferences of MLS teams changed over time. In recent years, stars became younger and the individual diversity, in terms of a player's background, increased. Before, in the first "DP-seasons", MLS hired older players that almost exclusively came from top-tier clubs and were born in Western Europe or Argentina. This insight further illustrates that superstar characteristics are not a fixed concept but show dynamics. An analysis over time is desirable in this context as well as an understanding for the driving forces behind employer's varying preferences. That said, the final question for superstars was directed towards their value to teams. Building on the findings in Chapter 4, a sophisticated model with additional variables, along the criteria listed above, was build. Chapter 4 presented the results of a time-series, while I elected a cross-sectional approach for the thorough superstar value analysis. The latter was chosen because designated player contracts are usually fixed for more than one season in advance. Therefore, criteria to explain value, proxied with salary, should be timed at the entry of the contract. The results from the estimations show that superstars are valued for non-performance driven popularity, leadership qualities, top-notch previous employers, a certain age, and national team experience. This ties back to both key superstar theories from Rosen (1981), differences in talent "produce" superstars, and Adler (1985), popularity distinguishes

equally talented stars. In addition, no key differences were found between teams. Considering the findings in Chapter 4, where a big proportion could be contributed to the individual teams, this is unexpected at first. Nevertheless, it confirms that superstars are simply more diverse than regular players and a superficial analysis does not yield reliable results. Also, it can be refuted that the introduction of the Designated Player Rule favors big market teams out of proportion. Teams appear to find their fitting stars in different qualities and remunerate them as such. In line with this, Chapter 2 also shows that competitive balance merely decreased in the perception but not in actual terms after the rule was implemented. The perception might well be driven by certain teams hiring superstars while other teams "only" hire stars. Outside of sports, these findings might be interesting in a business context considering the current "war for talents" as key topic for Human Resource departments. Firms should be encouraged to identify and classify the characteristics of their own superstars and discuss the value they bring to the organization to direct future employment strategies.

Overall, this thesis has summarized the positive trend for MLS in the North America sports market, e.g., in the form of improved attendance and revenue growth. To that end, maybe the skepticism about the survival of the league among the strong incumbent major league sports in North America (see Mendelsohn, 2003), is embanked for the near future. Moreover, the special single-entity structure supposedly serves the organization MLS well so far. This seems to be despite the many negative factors that researchers have brought up in relation to single-entity structures. For example, Késenne (2014) concludes that "the single entity status of a league has nothing but undesirable consequences, in particular for supporters and players". Késenne refers to nonoptimal league sizes, the "violation of the basic right of an employee to choose his employer" (p. 812) and unnecessary monopolization of the market for broadcasting rights. For MLS, the results from the presented studies can neither fully confirm nor deny those effects collectively. This constitutes a main limitation of this thesis, e.g. due to unavailability of long-term and reliable broadcasting statistics. At the most, the apparent monopolization of the player's market seems unadvisable for MLS in the future. As of today, the competition abroad pays substantially more to players and therefore makes it hard for MLS to attract top talent and in turn, to fulfill the quality aspiration of the league. Thus, despite the growth and positive development of MLS, the disadvantageous comparison with successful European soccer leagues persists (Mendelsohn, 2003; Sung & Mills, 2017). In the focus of the discussion stands the on-field quality of competition. As outlined before, this is a particularly important aspect in order to retain and attract talented players for MLS. Further comparisons between the leagues

would help to determine weaknesses and further areas of improvement for MLS's development. To tackle this, one suggestion for future research would be to benchmark the market values of the leagues, not just as proxy for market size but also as a proxy for quality. Frick (2007), for example, refers to aggregated player market values to compare European Soccer clubs and US sport teams.

A final topic worth investigating, especially considering the current MLS expansion activities, is the question around the optimal league size, along the lines of team localities and welfare economics of sports teams, as discussed, for example, by Noll (2003). This topic for sure deserves treatment in the near future to guide the path of MLS to future success in the local sports market and in the international soccer market.

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