TRANSFER FEE MARKET IN THE ENGLISH PREMIER LEAGUE: A STUDY OF COMPETITIVE BALANCE

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TRANSFER FEE MARKET IN THE ENGLISH PREMIER LEAGUE: A STUDY OF COMPETITIVE BALANCE

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Economics

Abstract

The purpose of this study is to apply economic modeling to assess the impact that the transfer market in the English Premier League (EPL) has on the competitive balance of the league. This paper will explain the factors that contribute to the determinants of transfer fees and break them into acquisitions (players coming to the EPL) and requisitions (players leaving the EPL). The study will discuss the relevant theories behind the transfer market and relate them to studies of competitive balance providing motivation for the specific determinants in the study. An Ordinary Least Square regression technique is used to evaluate the performance of two models of competitive balance. The results show that the total transfer fees spent are insignificant in relation to competitive balance; however various aspects of the transfer market have a significant relation (positive and negative) to the competitive balance of the EPL. This supports the historical problem the EPL has with wealthy clubs dominating the league.

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED
UNAUTHORIZED AID ON THIS THESIS

Signature

DEDICATION

This work is dedicated to my parents. Without their guidance as healthy and supportive role models, I would not have become the person I am today. I would also like to thank Aju Fenn; my advisor, friend, and fellow sports enthusiast who is always up for economic discussions and humor. Your guidance and enthusiasm in this process has helped produce a successful thesis that was mentally demanding and a joy to write.

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CHAPTER I

INTRODUCTION

The formation of English Association Football began in 1863 and was solidified by 1888. With the league creation, came the system of transfer fees as well. The initial system was a form of indentured servitude that tied a player to his club until that same club allowed him to move elsewhere. The transfer fees were founded to protect the original club from a loss of service after a transfer. This monetary compensation for the loss of service has been continually re-defined throughout the years in Europe and has been implemented to effect leagues such as the English Premier League (EPL).[1]

Today, the system of transfer fees is a highly regulated, publicized business. One of the best ways to introduce the transfer market is through an example. In 2003, Cristiano Ronaldo was playing for Sporting Lisbon (a top soccer club in Portugal) when he played against Manchester United (top 5 EPL team) in a pre-season friendly match. Sir Alex Ferguson (manger of Manchester United) was persuaded by his players to transfer Ronaldo to Manchester United on the plane ride home. Cristiano Ronaldo was under 23 at the time and was still

[1] Carmichael & Thomas, "Bargaining in the transfer market: theory and evidence," 1468

under contract at Sporting Lisbon. Thus, a transfer fee was required to be paid. In this case, the transfer fee would need account for Ronaldo's potential talent, loss of service and educational expenses that Sporting Lisbon would incur for losing him. Another factor in the fee was the fact other top European clubs were courting Ronaldo at the same time. The transfer fee agreed upon between the two clubs was £12,240,000, of which Ronaldo saw nothing. The fee was paid from the front office at Manchester to the front office at Lisbon. Since his debut for Manchester United on August 16th, 2003 against the Bolton Wanderers; he has accumulated 230 appearances, 86 goals, helped Manchester to one FA cup win, placed 1st in the EPL in the 2006-2007 season, and placed 3rd in the race for the 2007 FIFA World Player of the Year.[2]

Within this story there are hidden pieces of talent assessment, legal implications, labour fees, and the competition they have produced. These elements excite the relation of professional sports and economics. The purpose of this paper is to study the relationship the system of transfer fees has to the competitive balance of the EPL.

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[2] Source: http://www.manutd.com

CHAPTER II

LITERATURE REVIEW

This chapter is committed to reviewing the past and most current literature regarding the system of transfer payments utilized in European professional soccer (hence forth: football). Transfer fees for players (laborers) are unique to professional football in Europe and can be applied to issues of bargaining power, the Coase Theorem and ultimately to competitive balance. The literature selected is primarily focused on the English Premier League (EPL) due to the fact that in 2005 the EPL had the largest payroll, revenue and broadcast revenue among the "Big Five"* European Leagues.[1] The chapter will begin by reviewing literature on the history and applications of the transfer market. After establishing the idea of transfers, the chapter will progress into reviewing the newly published literature that surrounds the Coase Theorem and its application to the Champions League. This chapter will conclude by reviewing relevant articles concerning competitive balance within the EPL.

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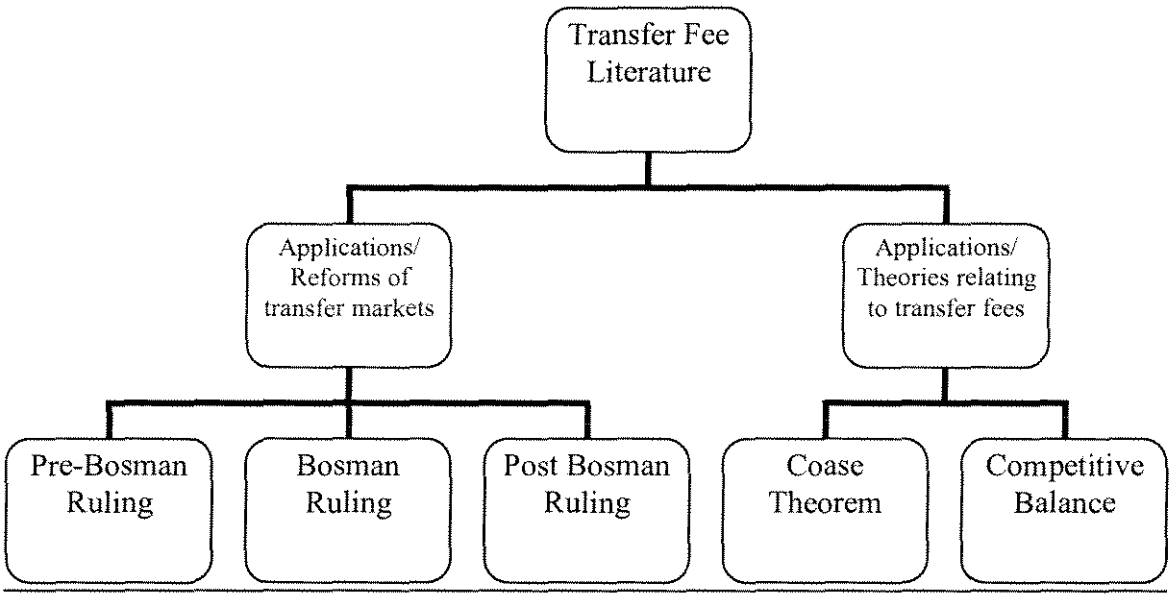
* Big Five are the EPL, Italian Serie A, German Budesliga, Spanish Primera Liga, and French Ligue 1

[1] John Vrooman, . "Theory of the Beautiful Game: The Unificaiton of European Football." *Scottish Journal of Political Economy* 54, no. 3, July, 2007: 328

Ultimately the goal is to assess shifts in competitive balance within the framework of the Bosman and the recent "Monti" augmentation to the system of transfer fees.

FIGURE 1.1

DIAGRAM OUTLINING ELEMENTS OF RELEVANT SCHOLARLY LITERATURE



Transfer Fee Scholarly Literature

Bosman Ruling

Transfer fees in the EPL were established shortly after the league's creation. Initially, players had to sign a re-registration agreement prior to every season; upon signing, the players would be under contract as long as the team wanted their service. This agreement left the players no say in their future employment. If the player did not sign the contract they could not join another club until their current club gave permission. Usually this permission was granted only if the new club was willing to "facilitate purchase of a replacement or to service the (originating) club's debt."[2] This financial compensation disallowed a free market of player movement and was the original 'retain and transfer'[3] system.[4]

The growth of this transfer system is shown in Simmons' article in 1997 which discusses transfer fees in its beginnings and the evolution all the way up to the Bosman ruling in 1996. The Bosman ruling has in-effect, abolished the transfer system in Europe. The European Court of Justice decided that the two prior rules applicable to transfers were in violation of Article 48 of the Treaty of Rome, which deals with the free movement of labor.

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[2] Robert Simmons. "Implications of the Bosman Ruling for Football Transfer Markets." 1

[3] The retain and transfer system began in the FA (English Football Association) as a regulation in 1888. Clubs were required to register their players annually with the FA. These registrations became tradable commodities between clubs. Only the clubs would decide to retain the players on a yearly basis or transfer them to another club. The theoretical progression from this initial model is displayed in the theory chapter.

[4] Robert Simmons. "Implications of the Bosman Ruling for Football Transfer Markets." 1

"(a) prohibited a professional footballer from moving between clubs in different EU countries, on expiry of his contract, unless a transfer fee was paid to his (selling) club."[5]

"(b) restricted the number of foreign nationals from other EU member states permitted to play in teams in particular matches in domestic and European competitions."[6]

Furthermore, there were certain rules that the governing body, Football Association (FA), set up in response to the European Court's ruling. These rules ensure that neither of the provisions above are violated but still allow for transfer fees if the player's contract is not finished.

The article then addresses economic ramifications that may result from the Bosman ruling. Although these economic discussions are backed with some data, no regressions are utilized. Simmons briefly discusses the issues of small clubs losing transfer income, an emergence of higher and unequal salaries, reduction of transfer fees, and longer player contracts. These discussions reference scholarly work by other economists who have tested their effects. Simmons concludes by noting that the Bosman ruling is a step in the direction of free agency for footballers in Europe, however, the market and leagues will continue to adapt their current transfer fee policies to the implications of the ruling.[7]

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[5] Ibid

[6] Ibid

[7] Robert Simons. "Implications of the Bosman Ruling for Football Transfer Markets." *Institute of Economic Affairs*, 1997.

Pre-Bosman Ruling

Prior to the Bosman ruling, there were studies completed on the transfer market. In understanding the system fully, and its application to competitive balance, it is necessary to address prior studies to see how they have progressed along with the law. In Carmichael and Thomas, transfer data from the 1990-1991 season is examined in the framework of the two-person Nash bargaining theory. In determining transfer fees, Carmichael and Thomas utilized player age, experience, league appearances in the prior season, goals scored in the prior season, player position, and the buying/selling teams' attendance as well as their respective goal differential. The results indicated that the buyer and seller cannot be treated as having similar bargaining power. The seller was determined to have strengths in the areas of player characteristics, fan-drawing power, and the team's place in the division also played into the strength of bargaining power. The buyer was determined to have a positive relation with attendance and team success. These two determinants however, are unknown at the time of the transfer which leads to the buyer experiencing greater bargaining strength with a greater profitability linked to each transfer fee. Without knowing how much attendance or success the new player will bring, the transfer fee can be bargained lower in favor of the buyer. This leads to the general conclusion that the transfer market appears to be buyer, or demand led. The teams that

have the most profit also have the most money to bargain for new players. This leads to intense competition between the teams with the greatest league success competing for players.[8]

With constant bargaining for players, disputes naturally arise between buyers and sellers. The arbitration of transfer fee disputes is analyzed by Speight and Thomas in 1997. The article examines the arbitrated fees and the ultimate resulting offers in the English Football League. Speight and Thomas assume that fees for transfer are determined in the same manner as any human capital; a player's value is determined by their present discounted future value of the revenue that player will generate for his new club. Their regression ranged from 1985-1990 and utilized variables such as age, starts, goals and player appearances in the previous season. In the resulting study, the negotiators mediating the disputes were assumed to use the buyer and seller's league position, goal differential, goals scored, and fan attendance as the main vehicles in determining transfer fees. The mediation variables were regressed with the player's season variables against the transfer fee pre and post arbitration. Speight and Thomas determined that all arbitrations are treated differently; there are no set metrics used recurrently during arbitration. Speight and Thomas determined, given self interests being unique to each player transfer, there is no set quantifiable way to

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[8] Fiona Carmichael and Dennis Thomas. "Bargaining in the Transfer Market: Theory and Evidence." *Applied Economics* 25, 1993: 1467-1476.

assess all arbitrations. Conventional arbitration methods (labor-management disputes) cannot be used in the context of transfer fees.[9]

Carmichael, Forrest and Simmons use a regression platform to determine transfer fee rates. Carmichael, Forrest and Simmons use data from the 1993-1994 season of the English football league. Given certain constraints and that their data was collected before the transfer system was abolished (Bosman 1996); age, games played, as well as goals scored in club, cup, and international play were all significantly positively related to the transfer fee. Age squared, and if the selling club was from the second, third or fourth divisions were significantly negatively related to the transfer fee. Although this regression is not under the framework of the Bosman ruling, Carmichael, Forrest and Simmons state that the ruling has initiated an influx of high-profile European players at relatively low cost. Therefore, international play experience becomes more normal rather than a selling point given the new players themselves are international.[10]

Post-Bosman Ruling

The post-Bosman ruling has been an area ripe for study given the legal impact it has had on player movement in the professional European football world. In Feess and Muehlheusser, three systems of transfer fees are analyzed with respect to their impact on payoffs, contract lengths, training, and effort

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[9] Alan Speight and Dennis Thomas. "Arbitrator Decision-Making in the Transfer Market: An Emperical Analysis." *Scottish Journal of Political Economy* 44, no. 2, May, 1997.

[10] Fiona Carmichael, David Forrest, and Robert Simmons. "The Labour Market in Association Football: Who Gets Transferred and for how Much?" *Bulletin of Economic Research* 51, no. 2, 1999: 125-150.

incentives. The various systems are Pre-Bosman, Bosman, and the "Monti" system augmentation (currently in use). The Monti system has amended the Bosman era in two areas. The first is that a given player can leave their club before the contract is expired if they pay the club a fee for breach of contract and for educational expenses (depending on the player's age). The second implication of this ruling is that all contracts must have minimum length of 1 year and a maximum length of 5 years.[11]

In contrasting the Pre-Bosman, Bosman, and Monti systems, Feess and Muehlheusser examine contract length, player incentives, and size of investment under the constraints of each system. Feess and Muehlheusser determine that the Pre-Bosman system is inferior because it leads to lower investment and lower effort by the players. Under the Bosman system, the investment is higher than Pre-Bosman and Monti, but the effort is lower. A main factor in this ambiguous result is due to the restriction of the contract length. With an overall shorter length of contract, the teams are less likely to invest more money into developing players when they know those players will leave within a maximum of 5 years.[12]

In a later study, Feess and Muehlheusser exclusively examine the transfer system by focusing on the comparison of wages, profits, length of contracts, and investment incentives. They maximize the contract length in their model which reduces the payoff for the new club in renegotiations. The lower payoff can be

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[11] Feess, Eberhard and Gerd Muehlheusser. 140

[12] Eberhard Feess and Gerd Muehlheusser. "The Impact of Transfer Fees on Professional Sports: An Analysis of the New Transfer System for European Football." *Scandinavian Journal of Economics* 105, no. 1 2003: 139-154.

investment incentives. They maximize the contract length in their model which reduces the payoff for the new club in renegotiations. The lower payoff can be attributed to a moral hazard problem where if the player is locked into a longer contract they may perform poorly due to guaranteed wages. Secondly, the monopolistic actions taken by clubs prove that market-efficient transfers are not always carried out. Therefore with a longer contract, a player is more likely to move during their contractual period and must pay their club a fee for the breech of contract.

Feess and Muehlheusser also note that as the contract length becomes shorter, the payoff for the club in renegotiation is higher. With shorter contracts the players will generally have a smaller given amount of time left in their contract if they choose to leave; therefore they will pay less in the fees for the breach of contract shifting a larger sum to be paid by the acquiring club. Also, when players sign shorter contracts, the clubs are less willing to invest money into youth development programs fearing the investment in training will not be fairly compensated for when the players' short contracts have expired.

These articles showcase the tendency of individuals and clubs to derive maximum utility out their situations given the legal framework. According to Frick, individual European football clubs attempt to maximize utility (sporting success) as opposed to profits as seen with United States leagues. Transfer fees are unique to the labor market for footballers in Europe and can show, with an intrinsic value, how each club values this utility. Frick provides an overview of

labor market in major European leagues by highlighting the literature that concerns analysis of player salaries, contract lengths and transfer fees. Frick states that since the mid 1990's and the passage of the Bosman ruling, the number of remaining contract years is likely to be a major determinant of the transfer fees paid. Furthermore, he states that immediately following the Bosman ruling the average contract length increased by 20% among the European Leagues. Given the changes under the "Monti" system, Frick states that it is likely that the contract lengths have since gone down due to the mandatory limits set for contract lengths. Frick alludes to the fact these limits could change players incentives. In order to assess this impact Frick suggests analysis in the areas of variance of player salaries, career durations, and player discrimination.[13]

Coase Theorem-Transfer Fee Scholarly Literature

Szymanski's 2007 article is the first article of its kind that applies the Coase Theorem to the retain-and-transfer system. Most previous work with the Coase Theorem has been applied to Major League Baseball's reserve clause. Szymanski describes the Coase Theorem as "bargaining in an unrestricted market (with zero transaction costs) will produce full economic efficiency"[14] With sports leagues, there has been a constant push for more free movements of

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[13] Bernd Frick, "The Football Players' Labor Market: Emperical Evidence from the Major European Leagues." *Scottish Journal of Political Economy* 54, no. 3, July, 2007: 422-446.

[14] Szymanski "The Champions League and the Coase Theorem." 355

labor. This push is used to produce a greater distribution of player talent (economic efficiency) which should lead to greater competitive balance. Szymanski references the Champions League as a showcase of the top football talents in Europe suggesting it is more competitively balanced than any European domestic league. The highly talented members of the Champions League are all part of 50+ club domestic associations that have several divisions and large variances of talent. Szymanski states that teams who participate within the Champions League generate substantial revenues and fan exposure that their fellow domestic teams do not experience. Szymanski suggests this leads to extra funds for training youth as well as greatens the team's financial bargaining power in transfer fee agreements; small teams simply cannot compete effectively based on the disparity of transaction costs and revenue generation.[15]

Competitive Balance-Transfer Fee Scholarly Literature

This section of the chapter will highlight a small portion of literature that is geared towards the transfer markets and competitive balance. Bougheas and Downward set up a model of the transfer market where player salaries are determined by bargaining. They then use this model to re-examine the effects of cross-subsidization policies (which are assumed to better competitive balance). Bougheas and Downward discuss the problem of disincentive to invest in the youth programs for fear of another club taking those players before the original

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[15] Stefan Szymanski "The Champions League and the Coase Theorem." *Scottish Journal of Political Economy* 54, no. 3 July, 2007: 335-373.

on to say that with a multi-league team model, the transfer market can significantly effect the distribution of talent across the league, threatening competitive balance. Bougheas and Downward claim that this threat is due in part to teams who do not participate in acquisitions and transfers therefore feel the effects of negative externalities such as imperfect capital markets limiting the ability of poorer clubs to bid for transfers.[18]

Throughout this review, there has been mention of player statistics as driving factors in determining their transfer fees. In Carmichael, Thomas and Ward these same statistics are used to analyze competitive balance. In their paper, various individual skills are attributed to the team as a whole in an attempt to view competitive balance. The player skills such as effective shooting, passing, tackles, clearances and blocks are all positively related to a team's success. Conversely, the measures of indiscipline such as red cards contribute negatively to a team's success. As a general assumption Carmichael, Thomas and Ward note that sports teams must decide upon efficient allocation of production inputs and outputs to garner team success. This thought naturally leads into transfer fees; showing how much each team is willing to pay for a

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[16] Spiros Bougheas and Paul Downward. "The Economics of Professional Sports Leagues: Some Insights on the Reform of Transfer Markets." *Journal of Sports Economics* 4, no. 2, May, 2003: 87-107.

[17] As known from Feess and Muehlheusser, beginning in 2001, the Monti system allows a maximum contract of 5 years. Also not the invariance proposition: "...if an unrestricted transfer market exists and capital markets are perfect, then free agency does not threaten competitive balance." Eberhard Feess and Gerd Muehlheusser. "Transfer Fee Regulations in European Football." *European Economic Review* 47, (2003): 645-668.

[18] Spiros Bougheas and Paul Downward. "The Economics of Professional Sports Leagues: Some Insights on the Reform of Transfer Markets." *Journal of Sports Economics* 4, no. 2, May, 2003: 87-107.

given skill set that will help improve their production outputs (competitiveness and team success). The last important drawing from this paper is similar to other studies in that Carmichael, Thomas and Ward see the emergence of an elite group of clubs who dominate the league. They see this as an important issue in the ensuing policy debate regarding league structure and organization.[19]

Having established through the literature that a team's revenue can be determinants of quality and quantity of transfers, it is essential to view a study in which assess financial performance. Szymanski and Smith use an empirical model that explains the way in which rents are competed away through maximizing behavior guided by production constraints. They utilize data from 48 English Football Association teams to develop a model that addresses revenue generation as well as the interplay between costs and wages. Szymanski and Smith show that the English Football Association is a mature industry.[20] Szymanski and Smith also suggest that this mature industry is entrenched in historical tendencies where by the market has trouble controlling corporate (powerful clubs) dominance. An application of this entrenchment is that this model can be used to show how much revenue it would take a club to move from a low league to the top league. Szymanski and Smith's model can also be utilized to assess the impact of various reforms and league structure changes.

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[19] Fiona Carmichael, Dennis Thomas, and Robert Ward. "Team Performance: The Case of English Premiership Football." *Managerial and Decision Economics* 21, no. 1, 2000: 31-45.

[20] Mature industries have to deal with declining demand and compete with newer technologically advance leisure activities.

utilized to assess the impact of various reforms and league structure changes. Given the Bosman and Monti rulings (reforms and structure changes), this model can be related to transfer fees by providing another view on the way in which resources are allocated.[21]

Conclusion

This chapter reviews the literature that pertains to this paper. Due to the fact that this type of study, relating transfer fees to competitive balance, has not been explicitly completed, there is a hole in the literature. The specific studies outlined all hint at aspects of the relation between transfer fees and competitive balance. Through this large cross-section of information this paper will extract theoretical suggestions made by the literature in generating a model that can support or oppose the link between competitive balance and the transfer market. Chapter III will highlight these theoretical suggestions and generate a basis for the explicit study preformed in this paper.

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[21] Stefan Szymanski and Ron Smith. "The English Football Industry: Profit, Performance and Industrial Structure." *International Review of Applied Economics* 11, no. 1, January, 1997: 135-153.

CHAPTER III

THEORY

This chapter is committed to setting up framework to analyze the system of transfer payments in the EPL and link them to competitive balance.

Literature on competitive balance is readily available; however, studies that explicitly link transfer fees to competitive balance are nonexistent. Given that transfer fees are unique to European football, the first section of this chapter will cover the theoretical reasoning behind the creation and ensuing history of transfer fees. Building upon this framework, the chapter will then examine the theoretical determinants of transfer fees.

In the second half of the chapter, competitive balance will be examined with the theoretical connection to transfer fees. This connection will promote the viability of data utilized in the regressions of Chapter IV. Throughout the chapter, the application of the Coase theorem to competitive balance in the EPL will be discussed. Finally this chapter will show the theoretical decision making behind the dependent variables in preparation for Chapter IV.

History of Transfer Fees: Changes in Theory

In the 1960-61 season, the maximum salary clause was abolished allowing players to receive a larger spectrum of competitive wages. In the 1963-64 season, the first assault was made on the transfer system. It was classified as an unreasonable restraint of trade. Relating to the Coase theorem, this accusation suggests that the system of transfer fees impedes economic efficiency. In defense of the system, the league claimed that "removal would be to the detriment of competition within the league in that restrictions prevented powerful clubs from taking all of the best players."[1] The clubs, without the prospect of transfer fees, would not want to develop their talent knowing they would not receive a transfer fee in the future.

In the 1977-78 seasons, the players were granted 'freedom of contract.' This allowed the players to negotiate a contract with a new club once their contract had expired with their current club. If the player's current club wanted to keep the player, they must offer the benefits and salary that is comparable to that player's best year. If the current club could not or did not want to offer these terms, the player was allowed to move to a different club without a transfer fee. If an offer was made, making a transfer fee inevitable, the clubs must negotiate a fee for the loss of service.

The clubs would not always come to an agreement of a fee and took their dispute to the Football League Appeals Committee (FLAC). This measure helps

[1] Simmons, Robert, "Implications of the Bosman Ruling for Football Transfer Markets." 2

to support the economically efficient market component of the Coase theorem. However, any judgment that is given by the FLAC is not an ultimatum and the clubs can continue to negotiate for a different fee.[2]

Before 1996, and the Bosman Ruling, players were transferred with two primary principles (this paper will only deal with the first): "A transfer fee would be payable even if a player had reached the end of his contract and wanted to change clubs."[3] Theoretically, the principle greatly limits the efficiency of the market by disabling the player's (laborer's) ability to move freely. The Coase theorem states that "with zero transaction costs, private and social costs will be equal."[4] With this gross divergence from the Coase theorem in the pre-1996 system of transfer payments; there is an immediate link that relates transfer fees post 1996 to competitive balance. This logic suggests that there is little competitive balance when transfer fees are ubiquitous in player movement.

The next augmentation to the system of transfer fees came during the oversight of European Commissioner Monti in 2001. "A player can leave his current club without its approval on paying a fee for breach of contract" and if the player is younger than 23, they must also pay a fee for educational and

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[2] ibid

[3] "The second principle: football leagues operated strict, protectionist controls on the number of foreign-born players who could appear in a team in a particular match."Simons, 1

[4] Szymanski, Stefan, "The Champions League and the Coase Theorem." 355

training expenses.[5] Under this system, a player is able to leave clubs with a considerably smaller fee. This releasing fee is paid only for breach of contract, educational experiences, and training. The fee does not account for 'loss of service'. Another aspect of this system is that the minimum contract length was changed from 1 year to 5 years. This causes each club to assess each signing they make with more scrutiny. No longer can clubs sign a player for one year just to raise their transfer fee value.

These augmentations (Bosman and Monti) shift power from the club to the individual player by greatly increasing player mobility and allowing for labour to move more freely through negotiations. With a more free movement of labour, talent should be better dispersed in the EPL. Competitive balance should theoretically be affected by these two great augmentations (Bosman and Monti).

Theoretical Determinants of Transfer Fees

Figure 2.1 shows the theoretical determinants of competitive balance as classified by transfer fees. Figure 2.2 is a discussion of the theoretical variables derived from these determinants for the creation of the model.

[5] Feess, Eberhard and Gerd Muehlheusser. "Transfer Fee Regulations in European Football." 1

FIGURE 2.1

THEORETICAL INPUTS OF COMPETITIVE BALANCE IN THE EPL

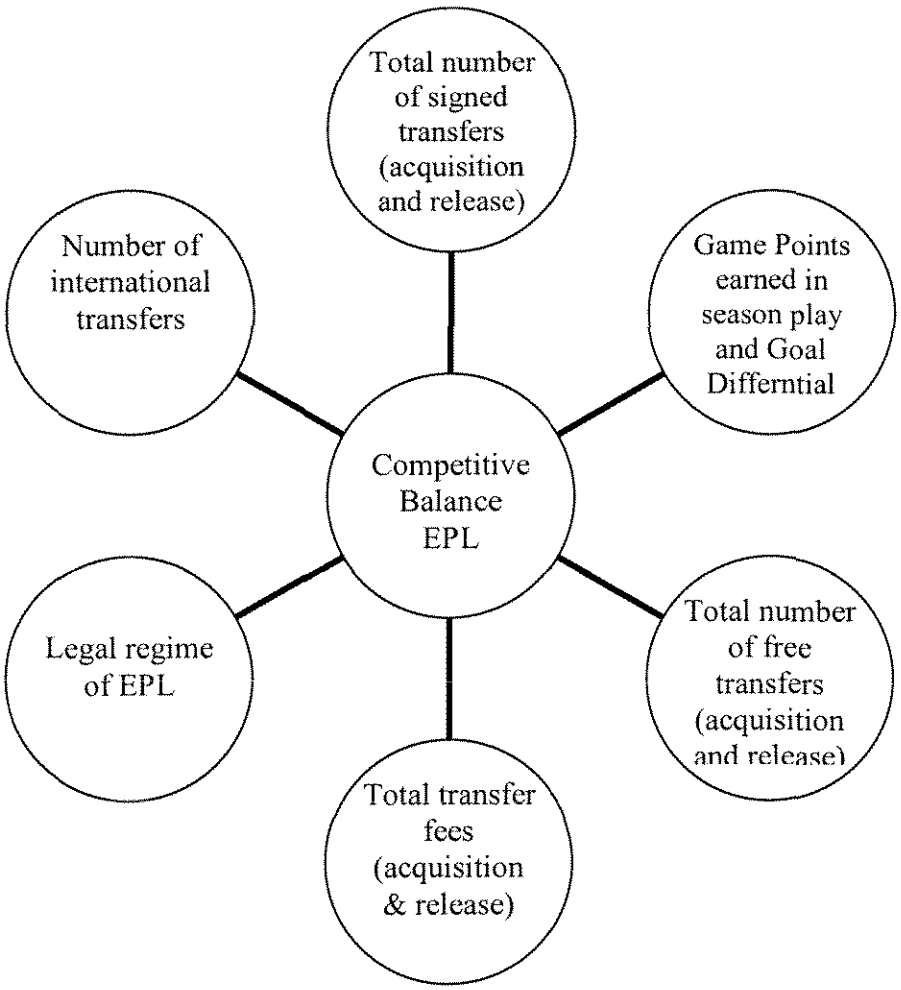

FIGURE 2.2

THEORETICAL VARIABLE INPUTS

Theoretical Variable	**Description**
Transfer fees	Linking the sheer sum of transfer fees to Competitive Balance (CB)
Free transfers	Number of transfers that are out of contract and did not require a fee
Signed Transfers	Number of transfers that sign with EPL clubs. (Players either coming from youth programs or were free agents)
International Transfers	Influential influx of international clubs' players in the EPL.
Legal Implications	Variable that specifies the legal regime for discussion of the Coase Theorem.
Relegation Qualification	Ensures the EPL relegation system is accounted for.

Motivation of FIGURES 2.1 & 2.2

Similar to signing bonuses and salaries of athletes in professional leagues around the world; transfer fees are a monetary assessment of several factors for each individual player acquired and released in the English Premier League. Previous studies on competitive balance have not explicitly studied the size, frequency, or amount of "free" acquisitions and releases in the English Premier

League. Studies concerning transfer fees and their relationship to clubs are laden with elements that draw a link to competitive balance but do not do so explicitly. The studies are primarily concerned with the way in which transfer fees are negotiated. There must be an understanding of the prior studies that highlight the way in which clubs bargain for and attain players in order to draw a link between the fees and competitive balance. Therefore, the next series of tables highlights the prior determinants of transfer fees between clubs.

In Carmichael and Thomas, a derivation of the Nash bargaining agreement was used to assess the bargaining power of clubs in the 1990-1991 English Football League.[6]

FIGURE 2.3

BARGAINING DETERMINANTS OF TRANSFER FEES

Negotiators	Determinants of transfer fees
Seller bargaining strength (releasing club)	player characteristics, crowd-pulling ability, club divisional status
Buyer bargaining strength (acquiring club)	Attendance, club playing success (short term and long term, team profitability

Speight and Thomas analyze the settlements of disputed transfer fees for end-of-contract players. These settlements are determined by the FLAC. As a third party assessing the market, the FLAC considers two sets of case facts for

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[6] Fiona Carmichael and Dennis Thomas. "Bargaining in the Transfer Market: Theory and Evidence." *Applied Economics* 25, 1993: 1467-1476.

each of the settlements (transfer fees). One is player characteristics and the other is club characteristics.

FIGURE 2.4

FOOTBALL LEAGUE APPEALS COMMITTEE DETERMINANTS

Case facts	Determinants of transfer fees
Player characteristics	Age, starts, career goals, career appearances, goals in previous season, appearances in previous season
Club characteristics	Buying and Selling club's attendance, league position, goal differential

In addition to these qualifications that determine transfer fees, Speight and Thomas admit that there are 'unobservable' characteristics that will have input into transfer fees. The unobservable metrics include wages, contract length, and salary.[7] Speight and Thomas do claim that this group of unobservable data may be correlated with the club characteristics listed above.[8]

Feess and Muehlheusser, classify the system of transfer fees in to three chronological regimes; Pre-Bosman, Bosman, and Monti. These regimes are analyzed to show their impact on payoffs, contract lengths and training effort and incentives.

[7] It was not until 2001 that teams had to report their contract lengths, wages and salaries to a governing body therefore, unobservable indicates that they were available for study.

[8] Alan Speight and Dennis Thomas. "Arbitrator Decision-Making in the Transfer Market: An Empirical Analysis." *Scottish Journal of Political Economy* 44, no. 2 May, 1997.

FIGURE 2.5

REGIME IMPLICATIONS FOR TRANSFER FEES

Regime Name	Impact relating to transfer fees
Pre-Bosman	lowest investment and lower effort
Bosman	highest investment, moderate effort
Monti	moderate investment, highest effort

Although there is no ideal competitive regime for players and clubs that has high investment and high efforts; the theory of competition in the market place has proven to undergo augmentations due to the legal implications of Bosman and Monti.[9]

Later, Feess and Muehlheusser study wages, profits, length of contracts and investment incentives in relation to the Monti regime. They replicate similar relation to transfer fees in their 2002 paper; "the new regime reduces a player's overall payoff because it increases the new club's renegotiation payoff, and under this new Monti regime there are less incentives to invest in the education of young talents because a new club benefits more from the initial club's investment." i.e. a high effort from the players and a moderate investment from the club.[10]

The first two studies (Carmichael and Thomas in 1993 and Speight and Thomas in 1997) relate various player, club, buyers, and sellers attributes in creating transfer fees. Many of these same attributes are used to study

[9] Eberhard Feess and Gerd Muehlheusser. "The Impact of Transfer Fees on Professional Sports: An Analysis of the New Transfer System for European Football." *Scandinavian Journal of Economics* 105, no. 1 2002: 139-154.

[10] Eberhard Feess and Gerd Muehlheusser. "Transfer Fee Regulations in European Football." *European Economic Review* 47, 2003: 645-668.

competitive balance. For example, Szymanski used FA Cup matches attendance data in an effort to assess competitive balance.[11] Fenn, Von Allmen, Brook, and Preissing assessed competitive balance and attributed it to league expansion, free agency, WHA competition (another US hockey league during 1972-1979), goal differential, amateur draft.[12] In Larsen, Fenn, and Spenner, competitive balance is attributed to player talent, strikes, expansion of the league, change in number of playoff teams, schedule length, team location, number of new stadiums, and introduction of free agency and the salary cap.[13] The determinants of competitive balance show a difference in league structure. There are pieces among these studies that cannot be applied in this paper's theory because the EPL does not have those elements.[14] However, as the theory provides; player attributes, goal differential, fan attendance, and team success are not limited to any one league and can be applied to competitive balance in Europe or the United States. Therefore, as an encapsulating variable, transfer fees theoretically align with competitive balance by encapsulating the individual elements of player characteristics.

Another theoretical problem is the fact that all professional leagues in the United States have a draft, revenue share, a free agency system, and/or a salary

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[11] Szymanski, Stefan. "A Market Test for Discrimination in the English Professional Soccer Leagues." *The Journal of Political Economy* 108, no. 3 June, 2000: 590-608.

[12] Aju J. Fenn, Peter Von Allmen, Stacey Brook, and Thomas J. Preissing. "The Influence of Structural Changes and International Players on Competitive Balance in the NHL." *Atlantic Economic Journal* 33, (2005): 215-224.

[13] Andrew Larsen, Aju J. Fenn, and Erin Leanne Spenner. "The Impact of Free Agency and the Salary Cap on Competitive Balance in the National Football League." *Journal of Sports Economics* 7, no. 4 (November, 2006): 374-390.

[14] Elements such as: variance in league size, strikes, and playoff size

cap. Again, three of these (salary cap, draft and revenue sharing) are not present in the EPL. These three main policies drive competitive balance and its theory in the United States but cannot be utilized in this study. Free agency, however, can be used to measure competitive balance in the EPL. Since the post-Bosman ruling has in-effect made a free agency in European football, the value of these transfer fees should theoretically be an assessment of all the factors that make a player beneficial to a team. The relative size of a transfer fee should indicate how competitive a team or league seeks to be through an individual player basis (see figures 2.3 and 2.4).

There are two distinct periods in history since the Bosman ruling that will impact the 'free agency' of the EPL. One is the period after the Bosman ruling (1995-2001) and the other is the period after the Monti regime changes (2001-2007) These periods, theoretically different, will be considered in the construction of the models.

Each transfer has an acquisition fee or release fee. Acquisitions are the monetary sums paid by any given club to become more competitive through the addition of players. Releases are the monetary sums obtained by any given club to become more competitive by the subtraction of players. This theoretical distinction will evidence whether the addition of players or the subtraction of players has a greater impact on competitive balance in the EPL. The models will reflect these two types of transfer.

Coase Theorem Applications and Concerns

The reasoning behind developing the theoretical history of transfer fees is that it shows a process in which legal action has been taken to increase competition levels in the Europe. The Coase Theorem was first explicitly stated by George Stigler: "with zero transaction costs, private and social costs will be equal."[15] The basic theory behind this theorem says that bargaining in an unrestricted market (zero transaction costs) will produce full economic efficiency. Specifically, in relation to sports "...The distribution of talent in a league will be independent of the initial property rights of players because wither through bidding or bargaining, players will end up on the team that values their services most."[16] Transfer fees are measures of the bidding and bargaining for talent to increase competition.

However, with an increase in support, further complications arise. Due to not having a draft, revenue sharing, or a salary cap it is easy to see that the clubs that value players' services most also happen to have the deepest pockets. This problem suggests imbalance of competition in the labour markets and therefore an imbalance of competition in the league. Among the three mechanisms of competitive balance that the EPL is lacking, but is able to implement, is the salary cap. Below, the draft and revenue sharing concepts are discussed briefly in their relation to the EPL.

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[15] Szymanski, Stefan. "The Champions League and the Coase Theorem." 355

[16] Aju J. Fenn, Peter Von Allmen, Stacey Brook, and Thomas J. Preissing. "The Influence of Structural Changes and International Players on Competitive Balance in the NHL." 215

Draft

Players are raised and trained from a young age within EPL clubs. They typically play for their corresponding professional team until they are traded to another club. Therefore there is no need for a draft.

Revenue Sharing

Revenue Sharing is frequently related to the invariance principle. The principle states that revenue sharing does not affect the distribution of playing talent among profit-maximizing clubs. This idea indicates that whether there is a complete free agency where players can move with almost no transaction costs, or players are always subject to transaction costs as in the case of transfer fees; the players will be distributed in a manner that fosters competition.[17] Given this theory, revenue sharing does not need to be utilized in the EPL.

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[17] The invariance principle is not this simple. Since this paper is not focused on the Coase theorem, further information can be directed to: **Kesenne, Stefan. "Revenue Sharing and Competitive Balance: Does the Invariance Propostion Hold?" *Journal of Sports Economics* 6, no. 1 (February, 2005): 98-106.**

EPL Considerations of Competitive Balance Measures

Ties

The completely un-American "no winner" complication of tying games actually happens in Europe! By having ties, the possibility to use the standard deviation of win percentages within season and the cross-season variety are eliminated as measures of competitive balance in this study. The problem is that the measure assumes for each contest, a team either wins or loses (average win percentage is .5). This reasoning shows why this paper will not use the standard deviation of win percentages as a measure of competitive balance.

League Structure and Playoffs

The relegation system in the EPL comes into play when determining the correct measure for competitive balance. Unlike any United States League, at the end of each season in the EPL, the worst three teams in the 20 team league are relegated and must play in a lower league for the next season. Three new teams (top three in the second English League) take the place of the poorly performing teams and play in the EPL in the upcoming next season. By not having a continuous set league of teams to compare from year to year, the Gini co-efficient and the Lorenz curve cannot be utilized.[18]

[18] For further discussion of the Gini Coefficient refer to Appendix B

Competitive Balance Measures

This paper will use two measures to assess competitive balance. One is the Herfindahl-Hirschman Index of points (*HHIp*) and the other is the standard deviation the goal differential (*DEVgd*).

The deviation of Herfindahl-Hirschman Index of points is a measure that incorporates ties (point accumulation total has no deference to wins, losses, or ties) and is not concerned with championships or league structure (point values correspond to each season of league play).

The standard deviation of goal differentials will more closely align with player talent. Offensive players and defensive players help to better a team's goal differential. This measure shows no impartiality toward offensive players or defensive players, just player talent.

Conclusion

This chapter develops the influential theory relating to transfer fees and competitive balance. The goal of the testing will be to determine if, and what aspect of transfer fees influence competitive balance in the EPL. In Chapter IV, there will be detailed report of the data set, variable qualification, and necessary equations.[19] The testing in Chapter V will explain whether transfer fees are related to, or can determine competitive balance in the EPL.

[19] The data set is from the 1995-1996 season through the 2006-2007 season and concerns total transfer fees, number of free transfers, signed transfers, international transfers, goal differential, and point differential.

CHAPTER IV

DATA/METHODS

This chapter will describe the data set[1] and will outline an empirical model to test the hypothesis implied by the theoretical model in Chapter III. Two empirical models will be presented. One model will examine the determinants of the Herfindahl-Hirschman Index for points (HHIp). The second model will examine the determinants of the standard deviation of goal differentials (DEVgd).

This chapter will begin by first explaining the calculation behind the measures of competitive balance (dependent variables). Second, the corresponding independent variables will be discussed. Third, the relevant dummy variables will be described. Finally the method of Ordinary Least Squared regression will be covered.

[1] Transfer fee data was taken from the 1995-1996 season to the 2006-2007 seasons. Two separate legal regimes were in power and given that there are 20 teams in the league for the 12 years, there will be 240 observations

MODEL 1: Herfindahl-Hirshman Index for Points (HHIp)

In utilizing points as measure of competitive balance there is an inclusion of ties[2].

(3.1)

$$HHIp = \alpha_0 + \alpha_1 * PTOTAL_{af} + \alpha_2 * FREE_{af} + \alpha_3 * SIGNED_{af} + \alpha_4 * INTERNAT_{af} + \alpha_5 * REGLAT + \alpha_6 * LEGALSET + \alpha_7 * REGLAT + \alpha_8 * YEAR + \alpha_9 * TREND$$

(3.2)

$$HHIp = \alpha_0 + \alpha_1 * PTOTAL_{rf} + \alpha_2 * FREE_{rf} + \alpha_3 * SIGNED_{rf} + \alpha_4 * INTERNAT_{rf} + \alpha_5 * REGLAT + \alpha_6 * LEGALSET + \alpha_7 * REGLAT + \alpha_8 * YEAR + \alpha_9 * TREND$$

The two equations above are different in that one will analyze the players who are acquired into the EPL and the other will analyze the players that are released from the EPL.

[2] Points are included instead of Win Percentage. Win percentage assumes the teams are either winning or losing.

Dependent Variable

In this model, HHIp is the Herfindahl-Hirshman Index of team points from the ideal points distribution for any given period. The equations (3.3 and 3.4) are mathematical representations of the HHIp.

$$HHIp = \sum_{i=1}^{N}(MS_i)^2 \tag{3.3}$$

$$MS_i = \frac{POINTS\ OF\ TEAM_i}{TOTAL\ LEAGUE\ POINTS} \tag{3.4}$$

MS_i is the market share of the i^{th} team (firm). Market share is defined as points gained by a $team_i$ divided by the total league points.

Independent Variables

Below is a table where all of the independent variables are briefly described and the expected sign of the coefficients are included.[3]

FIGURE 3.1

MODEL 1 INDEPENDENT VARIABLES

PTOTALaf, PTOTALrf	Team's total transfer fees paid or acquired	(-)
FREEaf, FREErf	Number of "free" acquisitions and releases	(-)
SIGNEDaf, SIGNEDrf	Number of "signed" acquisitions or releases[4]	(-)
INTERNATaf, INTERNATrf	Number of acquisitions and releases from and to international clubs[5]	(-)
FA	Football Association (FA) Cup Winner	(+)
LEGALSET	Legal Specification (Bosman or Monti)	(-)
REGLAT	EPL relegation determinant	(+)
YEAR	Corresponding EPL Season	(+)
TREND	Trend Variable	(+)

$PTOTAL_{af}$ and $PTOTAL_{rf}$

In creating this variable, each team's total transfer fees are taken as a percentage of the total transfer fees in the EPL for any given year. The reason for

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[3] *af* = acquisition fee (to EPL) and *rf* = release fee (from EPL)

[4] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

[5] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

using a percentage instead of the sheer numbers is to account for inflation and a team's "market share" of the transfer fees. Therefore the results this paper can analyze the effect that each team has on competitive balance given an increase or decrease in the total transfer fees relative to their competitor's transfer fees

FREE, SIGNED and INTERNAT

These variables are theoretically thought to affect competitive balance and are different facets of the transfer market. By breaking down the types of transfers within the transfer market of the EPL, this paper will be able to analyze the varying individual effects on competitive balance.

Dummy Variables

FA (Football Association Cup Winner)

"The implication is that English association football leagues are bifurcated. A small group of clubs may contest the championship, but many stand no chance of winning."[6] To take this issue into consideration, this study will examine the top five teams in the EPL. If one of these top 5 teams wins the FA cup[7] this shows dominance not only in the EPL but also against all other teams in English Association Football. This small test will help to explain the data in Chapter V. This dummy variable will be qualified in this manner. (Equation 3.5)

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[6] Downward, Paul and Alistair Dawson. *The Economics of Professional Team Sports*. Routledge, London, 2000. 56

[7] The FA cup is held every year and is comprised of all teams in the English Football Association (in the 2007-2008 cup there were 731 entrants)

$$FA = \begin{cases} 1 \text{ if the winner of the FA cup was in the top 5 of the EPL} \\ 0 \text{ if the winner of the FA cup was not in the top 5 of the EPL} \end{cases} \quad (3.5)$$

LEGALSET (Transfer Fee Legal Setting)

Due to the implications of the Coase theorem, this paper will also take into account the legal setting in which the data is coming from. There are two main rulings that this paper has explained in detail in Chapters III and IV. One is the Bosman ruling and the second is Monti ruling or "era". Both have great impact on the legal process effecting transfer fees and therefore are important in their relation to competitive balance. [8] This dummy variable will be qualified in this manner.

(3.6)

$$LegalSet = \begin{cases} 1 \text{ if the Bosman and Monti ruling are in effect} \\ 0 \text{ if only the Bosman ruling is in effect} \end{cases}$$

REGLAT (Teams in the EPL 1995-2007)

The EPL, similar to all football leagues in Europe has a relegation system. Therefore, this paper must account for these changes in the league structure. Given that the same 20 teams are not in the league year after year this dummy variable will consider all of the teams together but will only count the coefficients of the teams that are in the league each year. Spanning the 1995-1996 seasons, through the 2006-2007 seasons, there have been 38 different teams in the EPL. For any given year the dummy variable will work in the same manner for each

[8] This study only examines the 1995-1996 season to the 2006-2007 season. Within this timeframe there are only two legal regimes present, the only time when these legal regimes are not present is prior to 1995.

one of the 38 teams. Each team was assigned an arbitrary number (1-38). The corresponding numbers are shown in the table below.

FIGURE 3.2

RELEGATION DUMMY VARIABLE QUALIFICATION

ManUtd	1	*Bolton*	20
Newcastle	2	*Leicester*	21
Liverpool	3	*Derby*	22
AstonVilla	4	*Sunderland*	23
Arsenal	5	*Barnsley*	24
Everton	6	*CPalace*	25
Blackburn	7	*Charlton*	26
Tottenham	8	*Ipswich*	27
NottmForest	9	*Fulham*	28
WestHam	10	*Birmingham*	29
Chelsea	11	*Reading*	30
Middlesbro	12	*Portsmouth*	31
Leeds	13	*Bradford*	32
MKDons	14	*Wigan*	33
SheffWed	15	*WestBrom*	34
Coventry	16	*SheffUtd*	35
Southampton	17	*Wolves*	36
ManCity	18	*Norwich*	37
QPR	19	*Watford*	38

TREND and YEAR (qualifies data with time trend)

To track the changes of transfer fees and competitive balance over the span of the study, a time trend dummy variable is added. Figure (3.3) showcases the *YEAR* variable and its corresponding values. In regression, this variable was used with the *TREND* variable to add correct for first order positive serial correlation.[9] The TREND variable categorizes each of the 240 observations with a

1 for the first observation, a 2 for the second, and continues this process down to assigning a value of 240 for the two hundred and fortieth observation.

FIGURE 3.3

YEAR DUMMY VARIABLE QUALIFICATION

***YEAR* variable value**	**Corresponding EPL Season**
1995	*1995-1996*
1996	*1996-1997*
1997	*1997-1998*
1998	*1998-1999*
1999	*1999-2000*
2000	*2000-2001*
2001	*2001-2002*
2002	*2002-2003*
2003	*2003-2004*
2004	*2004-2005*
2005	*2005-2006*
2006	*2006-2007*

[9] Description and implications of Serial Correlation can be found in Chapter V

MODEL 2: Deviation of the Goal Differential (DEVgd)

In utilizing goal differential as a measure of competitive balance an inclusion of player talent (goal differential instead of deviation of points).

(3.7)

$$DEVgd = \alpha_0 + \alpha_1 * PTOTAL_{af} + \alpha_2 * FREE_{af} + \alpha_3 * SIGNED_{af} + \alpha_4 * INTERNAT_{af} + \alpha_5 * REGLAT + \alpha_6 * LEGALSET + \alpha_7 * REGLAT + \alpha_8 * YEAR + \alpha_9 * TREND$$

(3.8)

$$DEVGD = \alpha_0 + \alpha_1 * PTOTAL_{rf} + \alpha_2 * FREE_{rf} + \alpha_3 * SIGNED_{rf} + \alpha_4 * INTERNAT_{rf} + \alpha_5 * REGLAT + \alpha_6 * LEGALSET + \alpha_7 * REGLAT + \alpha_8 * YEAR + \alpha_9 * TREND$$

The two equations above are different in that one will analyze the players who are acquired into the EPL and the other will analyze the players that are released from the EPL.

Dependent Variable

In this model, another way to look at the completive balance is used. *DEVgd* is the deviation of goal differential for a given year. The equation (3.9) is a mathematical representation of the *DEVgd*.

(3.9)

$$DEVgd = \sqrt{\frac{n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2}{n(n-1)}}$$

$$n = number\ of\ teams\ x_i = the\ goal\ differential\ of\ the\ i^{th}team$$

Independent Variables

Below is a table where all of the independent variables are briefly described.[10] The expected sign of the coefficients are included.

FIGURE 3.4

MODEL 2 INDEPENDENT VARIABLES

PTOTALaf, PTOTALrf	Team's total transfer fees paid or acquired	(-)
FREEaf, FREErf	Number of "free" acquisitions and releases	(-)
SIGNEDaf, SIGNEDrf	Number of "signed" acquisitions or releases[11]	(-)
INTERNATaf, INTERNATrf	Number of acquisitions and releases from and to international clubs[12]	(-)
FA	Football Association (FA) Cup Winner	(+)
LEGALSET	Legal Specification (Bosman or Monti)	(-)
REGLAT	EPL relegation determinant	(+)
YEAR	Corresponding EPL Season	(+)
TREND	Trend Variable	(+)

[10] *af* = acquisition fee (to EPL) and *rf* = release fee (from EPL)

[11] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

[12] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

Dummy Variables

Model 2 will utilize the same dummy variables as Model 1. The *FA LEGALSET, REGLAT, YEAR and TREND* will be determined in the same manner discussed in the Model 1 section.

Regression Method

Ordinary Least Squared (OLS Regression)

Ordinary Least Squared regression will be used. This method is employed to minimize the sum of the error terms squared. Each error term can be defined mathematically as:

$$e_i = Y_i - (a + bX_i) \tag{4.1}$$

Having defined each error term as $Y_i - (a + bX_i)$, OLS can be described mathematically. Equation (4.2) is a mathematical representation of the sum of squared error terms for any given number of observations.

$$\sum_{i=1}^{n} e_i^2 = \sum_{i=1}^{n} (Y_i - a - bX_i)^2 \tag{4.2}$$

The two unknowns in the equation above are *a* and *b*. Through calculus derivation, *a* and *b* can be calculated in the following manner.

$$a = \overline{Y} - b\overline{X} \tag{4.3}$$

$$b = \frac{\sum_{i=1}^{n}(x_i - \overline{x})(y_i - \overline{y})}{\sum_{i=1}^{n}(x_i - \overline{x})^2} \tag{4.4}$$

The regression of this study will be multiple. There will be several independent variables that are thought to factor into competitive balance. Therefore this mathematical process described above will be utilized and completed by EViews 4.1 Student Version.

Conclusion

This chapter has given an overview of the empirical model used to test the relationship between the system of transfer fees and competitive balance in the EPL. The chapter examined Model 1 and Model 2 by displaying the respective calculations of the measures of competitive balance (dependent variables). Second, the corresponding independent variables were discussed and explained with mathematical equations where necessary. Third, dummy variables were given reason for inclusion. Finally, the method of Ordinary Least Squared regression was described mathematically to show its reasoning for use. The next

chapter will go in depth as to how these measures, variables, and regression methods are brought to life by using the data. Performance and evaluation of Models 1 and 2 will be examined.

CHAPTER V

RESULTS AND CONCLUSIONS

This final chapter will analyze the performance of the models developed in chapter IV. The Ordinary Least Squared regression results and significant determinants for model 2 will be discussed.[1] The next section will detail any econometric problems making specific references to the respective models. The final section will discuss the implications of the study and the opportunities for further research.

Ordinary Least Squared Results (OLS)

Model 2 OLS Results *DEVgd*

Figure 4.1 displays the results of Model 1 that coincide with the *DEVgd* variable for acquisition fees, and figure 4.2 displays the results that coincide with requisition fees. For each table, the t-statistics are displayed in parentheses below the reported coefficients and contain statistics that qualify each regression's goodness of fit.[2]. Variables that have a blank cell have been omitted from the regression.

[1] Model 1 ended up being a very poor measure of competitive balance compared to Model 2. Only model 2 will be discussed in this chapter. To see the results of Model 1, refer to Appendix C

[2] R-squared, Adjusted R-squared, and F-statistic

FIGURE 4.1

DEVgd ACQUISITION FEE REGRESSION RESULTS[3]

Variable Name	Description	Coefficient (t-statistic)
C		-
PTOTAL	Team's total transfer fees paid	-0.0321 **(-0.089)**
FREE	Number of "free" acquisitions	-0.0299 **(-3.448)***
SIGNED	Number of "signed" acquisitions[4]	-0.0283 **(-2.226)****
INTERNAT	Number of acquisitions from international clubs[5]	0.0215 **(2.186)****
FA	Football Association (FA) Cup Winner	0.399 (5.486)*
LEGALSET	Legal Specification (Bosman or Monti)	-0.356 (-5.641)*
REGLAT	EPL relegation determinant	0.000665 (0.377)
YEAR	Corresponding EPL Season Year	0.00211 (52.899)*
TREND	Trend Variable	0.00534 (12.628)*

[3] t-statistics in parenthesis
* indicates significance at the 1% confidence level
** indicates significance at the 5% confidence level
*** indicates significance at the 10% confidence level

[4] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

[5] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

FIGURE 4.1 CONTINUED

R-squared	**0.6020**
Adjusted R-squared	**0.5882**
F-Statistic	**38.654** [6]

This model fits the data well with an R-squared of .60. The t-statistics[7] are statistically significant in relating the independent variables to the *DEVgd* measure of competitive balance. The F-statistic[8] indicates that the conglomerated fit of the acquisition independent variables is statistically significant in explaining the dependent variable (*DEVgd*). This second model was used because of its solid R-squared and significant t-stats. Some specific considerations as to why this model produced significant results are discussed in the conclusion of this chapter.

PTOTAL

This variable is statistically insignificant given its poor t-stat. This indicates that as the percentage of the total acquisition fees spent by any given team changes, the measure of competitive balance is not significantly impacted. As expected from prior theory, the transfer fees themselves have no input into the variance of competitive balance in the EPL.

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[6] See Appendix A for F-stat calculation

[7] Given the model's Degrees of Freedom (df. =239); the critical t-statistics are 1.6602 at the 90% confidence level, 1.9840 at the 95% confidence level, 2.2757 at the 97.5% confidence level, and 2.6259 at the 99% confidence level.

[8] Given the model has a numerator d.f. = 9 and a denominator d.f. = 230 the critical F-statistic is 2.4073 at the 99% confidence level.

FREE

The negative correlation indicates that as the total number of free transfers increases, the *DEVgd* becomes smaller and the competitive balance becomes better.

SIGNED

The negative correlation indicates that as the total number of signed transfers increases, the *DEVgd* becomes smaller and the competitive balance becomes better.

INTERNAT

Contrary to the expected coefficient, the positive correlation indicates that as the total number of transfers from international clubs increases, the *DEVgd* becomes larger and the competitive balance becomes worse. The international transfers to the EPL are among the best players in the world. To acquire these players, clubs either would need substantial financing to pay the salaries or be a high profile club (among the top 5 in the EPL). In the data collection, the top five teams generally had a larger percentage of the international acquisitions into the EPL each year than the bottom five.[9]

FA

The positive correlation indicates that if the winner of the FA cup is also in the top 5 of the EPL, the *DEVgd* becomes larger and the competitive balance becomes worse. This is to be expected seeing as if a team can be successful

[9] See Appendix D for the statistical representation of this claim

against all professional football teams in England, they will also dominate (be among the top 5) the EPL.

LEGALSET

The negative correlation indicates that as the legal environment increases its regulation of the transfer market, the *DEVgd* becomes smaller and the competitive balance becomes better. Also, in accordance with the Coase Theorem, the market of transfers becomes more efficient in creating a competitive league.

REGLAT/YEAR/TREND

As dummy variables, these measures add to the correlation of the study but are not theorized as inputs of competitive balance.

FIGURE 4.2

DEVgd REQUISITION FEE REGRESSION RESULTS [10]

Variable Name	Description	Coefficient (t-statistic)
C		-
PTOTAL	Team's total transfer fees acquired	-.0183 **(-0.0811)**
FREE	Number of "free" releases	0.00263 **(0.357)**
SIGNED	Number of "signed" releases[11]	-.0242 **(-1.591)**
INTERNAT	Number of releases to international clubs[12]	0.0187 **(1.368)**

[10] t-statistics in parenthesis
* indicates significance at the 1% confidence level
** indicates significance at the 5% confidence level
*** indicates significance at the 10% confidence level

[11] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

FIGURE 4.2 CONTINUED

FA	Football Association (FA) Cup Winner	0.417 **(5.768)***
LEGALSET	Legal Specification (Bosman or Monti)	-0.3963 **(-6.031)***
REGLAT	EPL relegation determinant	0.001 **(0.566)**
YEAR	Corresponding EPL Season Year	0.00207 **(49.495)***
TREND	Trend Variable	0.105 **(12.283)***

R-squared	**0.5938**
Adjusted R-squared	**0.5793**
F-Statistic	**37.358** [13]

This model fits the data well with an R-squared of .59. The t-statistics[14] indicate that only the *FA, LEGALSET, YEAR,* and *TREND* variables are statistically significant. These variables' relation to the competitive balance measure is the same as in the acquisition equation. The *FA* variable contributes to a worsening of competitive balance and the *LEGALSET* variable contributes to a betterment of competitive balance. The F-statistic[15] indicates that the overall fit of the requisition independent variables is statistically significant in explaining the dependent variable (*DEVgd*).

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[12] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

[13] See Appendix A for F-stat calculation

[14] Given the model's Degrees of Freedom (239); the t-statistics are 1.6602 at the 90% confidence level, 1.9840 at the 95% confidence level, 2.2757 at the 97.5% confidence level, and 2.6259 at the 99% confidence level.

[15] Given the model has a numerator d.f. = 9 and a denominator d.f. = 230 the critical F-statistic is 2.4073 at the 99% confidence level

Econometric Problems

Heteroskedasticity was detected using the White Test in EViews.[16] This indicated that the estimated coefficients were no longer of minimum variance. Therefore, one cannot be certain of the closeness of the estimated coefficients to the true coefficient values. This problem was corrected using the Heteroskedasticity Consistent Coefficient Covariance fix in EViews for the acquisition and requisition equations.

The model also indicated, through the Durbin-Watson statistic, that first order serial correlation exists.[17] In an attempt to fix this problem the *TREND* variable was included in addition to the *YEAR* variable. This attempt boosted the Durbin Watson statistic slightly, but the model still exhibits first order serial correlation.[18] Although there are patterns in the appearance of the residuals over time, the Jarque-Bera statistic for both equations shows that the error term is normally distributed giving validity to the t-statistics, F-statistics, and R-squared value.[19]

Conclusions and Comments for Further Research

The findings of this study provide motivation to discuss the statistical relation of the transfer market to competitive balance in the EPL. The acquisition equation exhibited a strong correlation to the model as a whole. The caveat to

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[16] Given the d.f = 239 the critical χ^2 value for 100 d.f is 135.81 at the 99% level. Before the fix, the output χ^2 value was 161.91 for the acquisition equation and 162.59 for the requisition equation indicating problems with Heteroskedasticity

[17] First order serial correlation means that the error variables are not independent

[18] For discussion of the first order serial correlation problem in detail see Appendix A

[19] Refer to Appendix A to see the Jarque Bera Statistic and Multicolinearity considerations.

the Coase theorem[20] held true in that when more legal framework was implemented, the better the competitive balance became. The transfer fees themselves proved to be statistically insignificant in both equations. This indicates that there are more influential monetary factors than transfer fees that alter competitive balance. A worthy study may include salary information for the players after their transfer, or taking each transfer fee as a percentage of each team's revenue. This way one could account for the gross divergence in funding of the EPL teams.

The sheer number of transfers (less international talents) contributed to a betterment of competitive balance as well. However, the influx of free and signed players correlated with competitive balance whereas when players left the EPL, no correlation was experienced with competitive balance. This leads to the thought that the players in the EPL are all of similar quality (at the time of the transfer); players that leave the EPL are not leveling the playing field because they are not considerably worse or better than their fellow players in the league.

As far as governance of the EPL is concerned, the only legal measure that has impact upon competitive balance is the transfer market. There is no conceivable draft due to the clubs having specific youth programs. The two measures that would be worth implementing are a salary cap, revenue sharing, or perhaps a cap on transfer fees. All of these legal measures would help to level the competition in the EPL.

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[20] If transaction costs are unavoidable, then legal framework can be set up to increase the efficiency of the market

The relegation variable was insignificant in both equations. Being uncorrelated to the competitive balance does not mean that this measure detracts from the excitement of the EPL. In this study, relegation was un-linked to competitive balance. Unlike any league in the United States, the most entertaining games to watch at the end of the season are generally the lowest ranked teams. This is because they do not want to be relegated to a lower division and therefore compete very hard. In the United States, the teams that do not have a chance of making the playoffs generally stop trying because they will still have revenues to count on (revenue sharing) and will still play the best teams in America in the upcoming season. The attendance and viewership of the desperate relegation games in the EPL would be another variable to include in future study. This would determine how relegation contributes to the competitive balance based on public interest.

This study's substantial results for the *DEVgd* model can be attributed to the fact that the independent variables were mostly focused on the individual player movement. The individual players can have a great impact on the goal differential from year to year. The problem with the *HHIP* measure in this study is that the points are determined by the team as a whole. Football, having 11 players on the field is very much a team sport. At this high level, one player (1 out of 11) may not alter the wins, losses, and ties but they certainly help keep out or score more goals. For example, an acquired goalie may have 25 saves in a game and let in 1 goal. If the team then loses 1-0, the points are no different than

when the team lost games before the transfer 4-0. With the new goalie, the points remain unchanged, but the goal differential improves.

Finally, talent develops over time, as evidenced by the unique Cristiano Ronaldo story in the Introduction. Therefore, another fold of this study could be to include various lag variables. For example, take a given year's transfers and regress them against a competitive balance measure that is 1, 3, or 5 years later. Since the the minimum contract length was set at 1 year with a maximum of 5 years beginning in 2001, this alteration would examine the development of talent as a factor in the competitive balance. To see the development of young talent, there could be another dummy variable included that qualifies the player's age at the time of the transfer.

The current limitation of this study is the lack of information making the inclusion of salary, revenues, profits, and resource allocation impossible at this time. Furthermore, the structure of the EPL is steeped in tradition, privilege and wealth. There is little transparency to the public and the compilation of EPL finances is private. Salaries are reported to FIFA, but are not made easily available to the public. In studies concerning the United States sports leagues, salaries have traditionally been a focal point in studying competitive balance. This cannot happen easily in this study.

This research helps distinguish the determinants of competitive balance in the EPL as it relates to the transfer market. With more financial transparency to the public, studies on competitive balance in the EPL should examine; transfer

fees qualified by another measure (such as salaries or gross club income/profit), total number of free, signed, and international transfers, a qualification of the legal framework, and an account for the relegation system. Being the first study of its kind (directly linking competitive balance to the transfer market through OLS regression) the results can be used as a stepping stone to insight further research and larger scale studies. By knowing the inputs that that heighten competition in a league that is watched by the entire world; the EPL can produce a more attractive product viewed by a greater fan base.

APPENDIX A

ECONOMETRIC CONSIDERATIONS

This appendix outlines the econometric qualifications of this study. Also, In the EViews regression program the F-Statistic was not given on the estimation output when the C variable was removed. A description of how the F-Statistic was calculated by hand in included. The F-Statistic was not calculated for the model 1 (*HHIP*) equations due to the insignificant t-statistics, high JB stat and positive first order serial correlation.

F-statistic Calculation

Equation (5.1) displays the way in which the F-Statistic was calculated for Model 2's acquisition and requisition fees.[1]

$$Fstatistic_{k-1,n-k} = \left(\frac{R^2}{1-R^2}\right) * \left(\frac{N-K}{K-1}\right) \tag{5.1}$$

$N = number\ of\ observations\ in\ the\ OLS\ regression \quad K = number\ of\ variables$
$R^2 = Goodness\ of\ fit\ output\ from\ OLS\ regression$

Durbin-Watson Test

The Durbin-Watson statistic for the acquisition and requisition equations in model 2 was estimated at 0.213 and 0.159 respectively. Given the number of

[1] Pindyck, Robert S. and Daniel R. Rubinfeld. *Econometric Models and Economic Forecasting*. 3rd ed. New York: McGraw Hill, INC, 1991. P.99

observations in this study (240) and regressors (9); the lower bound of the critical value was 1.71129 and the upper bound of the critical value was 1.86669 at the 95% confidence level. These two estimated Durbin-Watson statistics are both below the lower bound and therefore determine the model to have problems with first order autocorrelation.

This test shows that there is a systematic relationship among the errors. This problem can stem from various reasons. One deals with time series data. Errors in time series data can carry over from subsequent periods. Another consideration is misspecification; when a line is fitted to data that is not necessarily linearly related, there can be patterns of error terms. Groups of errors will emerge above the estimated line, then below the line creating strings of positive errors and then strings of negative errors. [2]

These causations of autocorrelation could be corrected by incorporating the lag-variables discussed at the end of Chapter V.

Jarque-Bera Test

This test assesses the non-normality of the error terms. The critical value for this test is 5.99 with 2 degrees of freedom at the 95% confidence level. The J.B. values for model 2 for the acquisition and requisition equations are 4.49 and 5.81 respectively. Given these values being lower than 5.99, there is no evidence of a non-normal distribution of errors.

[2] Kahane, Leo H. *Regression Basics*. Thousand Oaks, CA: Sage Publications, Inc., 2001. 127

Multicolinearity

Below, the independent variables are placed in a matrix with their respective correlations.[3] A correlation of greater than .5 notes a problem with multicolinearity. The variables that exhibit this problem were expected to be correlated (they all deal with time). See *YEAR, TREND,* and *REGLAT.*

FIGURE 5.1

CORRELATION MATRIX

	PTOTAL	FREE	SIGNED	INTERNAT	FA
PTOTAL	1.000	-0.194	-0.050	0.337	0.000
FREE	-0.194	1.000	0.152	0.264	0.037
SIGNED	-0.050	0.152	1.000	0.383	0.123
INTERNAT	0.337	0.264	0.383	1.000	-0.103
FA	0.000	0.037	0.123	-0.103	1.000
LEGALSET	0.000	0.243	0.310	0.056	0.529
REGLAT	-0.341	0.350	0.224	0.014	0.058
YEAR	0.000	0.260	0.442	0.159	0.389
TREND	-0.028	0.284	0.448	0.150	0.387

	LEGALSET	REGLAT	YEAR	TREND
PTOTAL	0.000	-0.341	0.000	-0.028
FREE	0.243	0.350	0.260	0.284
SIGNED	0.310	0.224	0.442	0.448
INTERNAT	0.056	0.014	0.159	0.150
FA	0.529	0.058	0.389	0.387
LEGALSET	1.000	0.165	0.857	0.854
REGLAT	0.165	1.000	0.195	0.242
YEAR	0.857	0.195	1.000	0.997
TREND	0.854	0.242	0.997	1.000

[3] Only the correlation matrix for the acqusiton equation is displayed, the requisition equation exhibits a similar matrix

APPENDIX B

GINI COEFFICIENT

The Gini co-efficient and Lorenz curve, in relation to sports, were originally used as a measure of championship variation. The percentage of league championships are on the vertical axis and the horizontal axis plots the cumulative percentage of team years in the league. For assessing the entire English Association football, this would be a plausible measure. However, given the fact that this study is focusing on the EPL exclusively, relegation complicates the matter. The number of teams in the league would be much higher than 20 (the number of team years in the league would steadily increase year after year). Another complication arises when knowing that the Gini co-efficient and Lorenz curve utilize championship data. The EPL does not have a championship tournament between the clubs in its division. The championship tournament in England is the FA cup in which all the teams from the English Football Association participate. Since this paper is limited to the impact of transfer fees within the EPL and not the entire FA, the Gini co-efficient and Lorenz are not the best fit.[1]

[1] Downward, Paul and Alistair Dawson. *The Economics of Professional Team Sports*Routledge, London, 2000. 247

APPENDIX C

Model 1 OLS Results *HHIP*

Figure 6.1 displays the results of Model 1 that coincide with the *HHIP* variable for acquisition fees, and figure 6.2 displays the results that coincide with requisition fees included are the goodness of fit. [1] For each table, the t-statistics are displayed in parenthesis below the reported coefficients. Variables that have a blank cell have been omitted from the regression.

FIGURE 6.1

HHIP ACQUISITION FEE REGRESSION RESULTS[2]

Variable Name	Description	Coefficient (t-statistic)
C		-
PTOTAL	Team's total transfer fees paid	-0.000216 **(-0.02)**
FREE	Number of "free" acquisitions	-5.51E-05 **(-2.111)****
SIGNED	Number of "signed" acquisitions[3]	6.40E-05 **(1.643)**
INTERNAT	Number of acquisitions from international clubs[4]	1.33E-05 **(0.517)**

[1] R-squared, Adjusted R-squared, and F-statistic

[2] t-statistics in parenthesis
* indicates significance at the 1% confidence level
** indicates significance at the 5% confidence level
*** indicates significance at the 10% confidence level

[3] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

FIGURE 6.1 CONTINUED

FA	Football Association (FA) Cup Winner	-0.000124 **(-.7943)**
LEGALSET	Legal Specification (Bosman or Monti)	0.000953 **(8.878)***
REGLAT	EPL relegation determinant	4.51E-06 **(0.845)**
YEAR	Corresponding EPL Season Year	2.68E-05 **(303.6352)***

R-squared	**0.4078**
Adjusted R-squared	**0.3899**
F-Statistic	**(N/A)**[5]

FIGURE 6.2

HHIP REQUISITION FEE REGRESSION RESULTS[6]

Variable Name	**Description**	**Coefficient (t-statistic)**
C		-
PTOTAL	Team's total transfer fees acquired	6.19E-05 **(0.0833)**
FREE	Number of "free" releases	2.47E-05 **(1.407)**
SIGNED	Number of "signed" releases[7]	4.41E-06 **(0.0982)**

[4] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

[5] These models lost their F-stat when the C variable was removed and due to their poor fit and insignificant t-stats, the F-Stat did not need to be calculated.

[6] t-statistics in parenthesis
* indicates significance at the 1% confidence level
** indicates significance at the 5% confidence level
*** indicates significance at the 10% confidence level

[7] "signed" acquisitions include transfers qualified as signed, nominal, and unknown. The numbers of nominal and unknown transfers in this group is less than 5% but are included for ease of regression and to ensure the total number of acquisitions. 95% make up actual signed players.

FIGURE 6.2 CONTINUED

INTERNAT	Number of releases to international clubs[8]	5.13E-05 **(1.412)**
FA	Football Association (FA) Cup Winner	-3.49E-05 **(-0.232)**
LEGALSET	Legal Specification (Bosman or Monti)	0.000825 **(6.277)***
REGLAT	EPL relegation determinant	5.83E-06 **(1.116)**
YEAR	Corresponding EPL Season Year	2.67E-05 (322.836)*

R-squared	**0.4045**
Adjusted R-squared	**0.3865**
F-Statistic	**(N/A)** [9]

[8] This is the number of international clubs participating in transfers with the EPL. The players' nationality is not accounted for or known.

[9] These models lost their F-stat when the C variable was removed and due to their poor fit and insignificant t-stats, the F-Stat did not need to be calculated.

APPENDIX D

FIGURE 7.1

INTERNATIONAL TRANSFER PERCENTAGES

SEASON	TOP 5 INTERNATIONAL TRANSFERS	BOTTOM 5 INTERNATIONAL TRANSFERS
1995-1996	**20%**	13%
1996-1997	25%	**31%**
1997-1998	18%	**30%**
1998-1999	**32%**	20%
1999-2000	**30%**	26%
2000-2001	**25%**	20%
2001-2002	17%	**30%**
2002-2003	**37%**	17%
2003-2004	**35%**	24%
2004-2005	25%	**33%**
2005-2006	**37%**	25%
2006-2007	**29%**	25%
AVERAGE	**27%** [1]	24%

Each percentage is found by taking the number of international transfers for either the top 5 or the bottom 5 and dividing them by the total number of international transfers for the given year. The larger percentages are bolded.

[1] Any 5 teams represent 25% of the league. Therefore, one can postulate that in a balanced league any five teams should have 25% of the international transfers as well. The averages for these 12 seasons show that the top 5 garner more than their "market share" of the international transfers and the bottom five garner less than their "market share" of the international transfers.

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