

How to Win the Premiership? A Network Analysis of Player Transfers in the English Football Leagues

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1. Introduction

Most small social groups are non-exclusive or non-static. Some members leave the group and new ones join (e.g. military units, organizations, companies, teams). Individual group members interact and knowing each other is a crucial component for the group. Studying the performance of social groups, however, these dynamics have rarely been taken into account so far. In this paper the question is discussed, how turnover of individual group members affects group performance. As an example, transfers of football players in the top four English football leagues are investigated.

At the beginning, some background information about football in England and the transfer market for players is given (chapter 2). In this context, some possible implications of the Bosman ruling, an influential European Court decision from 1995, are outlined. The next chapter presents theoretical considerations on team cohesion, transfer turnover, individual quality of team-members and team performance. From here hypotheses are derived. For this paper data on football player transfers in which at least one team from the top four English football leagues was involved by either getting or losing a player is used. In addition, end-of-year league tables from the season 1992/93 to 2006/07 are studied. The methods applied are descriptive analyses of network data and OLS regression (chapter 4). In chapter 5 results are given. Overall, the integration of new team-members seems to be costly and decreases group performance. Interestingly, the outflux of individuals does not matter. Teams seem to do well in replacing players. Concerning individual abilities, taking high quality individuals in a team turns out to be a valid strategy to increase group performance. However, the loss of individual quality does not cause insurmountable problems.

2. Background Information

The English Football leagues

England is considered the motherland of football (see Dunning 1971; Mason 1980; Murray 1996). The English founded their Football Association (FA) in 1883, became a member of FIFA (Fédération Internationale de Football Association) in 1905 and of UEFA (Union Européenne de Football Association) in 1954. Today, there are more than 41,000 clubs and 85,720 teams in the country. The talent pool from which English football coaches can choose their teams is very large. There are 5,500 professional players, 1,605,290 amateurs and 763,510 players under 18 years of age (see <http://www.thefa.com>).

The English football league system is a series of interconnected leagues for club football in England and has a hierarchical format with promotion and relegation between leagues at different levels.¹

Since 1992 higher level, professional, nationwide football in England is organized by the Premier League and the Football League. The Premier League is the highest

¹ For historical reasons a small number of Welsh clubs compete as well.

league in England and was formed on the 20 February 1992 by leading clubs in order to have commercial independence from the Football Association and the Football League. At its inception the league consisted of 22 teams, but was reduced to 20 teams in 1994. The Football League is the oldest professional league in the world and now feeds the Premier League.² At the moment it features 72 clubs that are hierarchically divided into three divisions, The Championship, League One and League Two.³ Each division has 24 teams.

Transfer market and Bosman ruling

In football a transfer market for players exists, which is something that we hardly find outside of sports. Employers pay a compensation fee to a previous employer for the loss of a worker's services. But even in sports this is not the normal case. For example, in North America labour markets for sportsmen and women are highly regulated (Fort & Quirk 1992; Vrooman 1995). Here, salary caps, draft regulations or reserve clauses exist. In many other cases transfer markets for players simply do not exist at all (e.g. cricket in Britain).

The transfer market for football in Europe has undergone a massive change in 1995 as a consequence of a European Court decision, to which is often referred to as the Bosman ruling. Prior to the Bosman case football clubs had considerable employment control over their players. Players were registered with clubs, and it was this registration which was transferred between clubs when a transfer was made. A fee would usually be demanded for the movement of players. It is this provision of a transfer payment, and also the inability of players to move freely between employers as and when they liked which differentiated them from other sorts of employees.

In 1990, Jean-Marc Bosman was a footballer playing for the Belgian first division side FC Liege who wanted to move to French side Dunkirk. FC Liege tried to stop the move by using the cross-border transfer ruling, which meant the clubs had to agree a fee before a player was allowed to transfer. FC Liege tried to make the move impossible by demanding a very high transfer fee for Bosman's services. Bosman protested against this decision and he filed suit against FC Liege, the Belgian football authorities, and the European football authorities, arguing that the football regulations on payment of transfer fees stopped EU citizens from having the human right of freedom of movement in employment.

In 1995 the European Court of Justice ruled in favour of Jean-Marc Bosman, deciding that the existing football transfer rules were in breach of the European Union law on the free movement of workers between member states. As a result, the European Union demanded that regulations concerning players' transfers and limitations on foreign players be amended almost immediately (see Thomas 1996). Quotas for the number of foreign players on a team had to be reformed as well.

² It was formed in 1888.

³ This means that the best teams in the Football League get promoted to the Premier League. Below the Football League is what is commonly known as "non-League football". This term is confusing, as it refers to those clubs outside the (Football) League, although they still play in organised league competitions. Many clubs in lower divisions are fully professional, and many other clubs are semi-professional.

Implications of the Bosman ruling

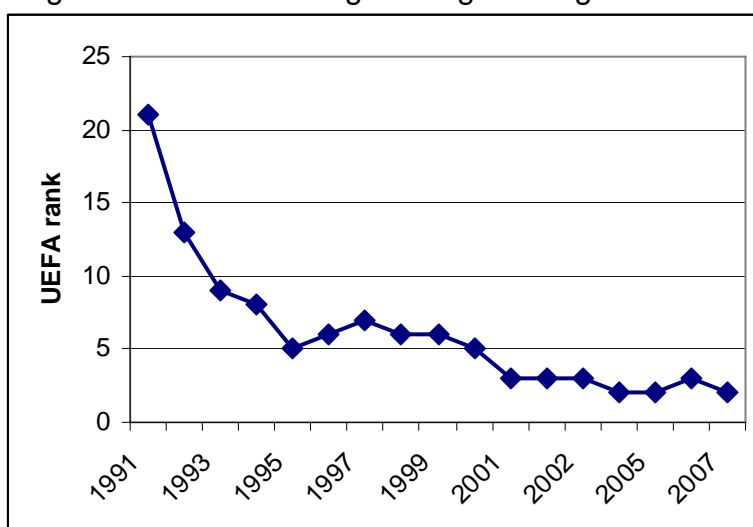
The key ruling of the European Court was that players who are out of contract should be treated as all other employees. This ruling essentially had two components. First, freedom of contract is guaranteed, meaning that players are allowed to transfer without financial compensation from one team to another at the end of a contract period. The second component is freedom of movement. This means that players have the right to provide their services to any team in the EU. Thus, football transfer markets had to be liberalized and quotas for players from EU countries abolished.

Foreign players

McGovern (2002) applies the concept of globalization to the labour market for football players and shows that from 1970 to 1995 the number of foreign players in England increased dramatically. The Bosman ruling in 1995 made transfers of players in Europe easier and could have therefore enhanced this general trend (see also Dobson & Goddard 2001).

After the Bosman ruling English teams were allowed to use the services of as many EU players as they liked. In fact, the arrival of satellite television revenue in the early 1990's enabled the newly launched Premier League to become one of the top buyers in the world (see Maguire & Stead 1998). At the same time the attractiveness of English football for foreign players increased in the 1990's. Not only were wages higher in England than in many other countries (Dobson & Goddard 2001), but also the UEFA ranking for league football in England increased from 21 in 1991 to 2 in 2007 (see diagram 1). A related argument is that as the overall quality of the league improved, it got more difficult for English football teams to find adequate players in the domestic market. Therefore one could expect an increase of players coming to England from EU countries from 1992 to 2006.

Diagram 1: UEFA ranking for English leagues



Note: This ranking is calculated by the UEFA for each national league on the basis of the performance of clubs in UEFA competitions in the last five seasons. It is used to determine the number of clubs from a league that will participate in competitions such as the UEFA Cup and the UEFA Champions League.

Source: <http://www.uefa.com>

One can even argue that the increase in numbers of incoming players from the EU should have been greater for teams in higher than in lower English leagues. An economic perspective on player recruitment would assume teams are unaware of where the “best” players are allocated (see e.g. Borjas 2004). Thus, they need to invest resources (time and money) to find the available opportunities (e.g. via scouting international leagues). Here, player search causes costs that increase with the time the player search takes. However, one can also assume that player search within the same league or country is cheaper than in foreign leagues (see also MacGovern 2002 for this idea). As teams in higher leagues have more incentives to hire good quality players because of higher financial revenues (e.g. qualification for the UEFA Champions League with guaranteed TV income), one can argue that they are willing to spend more money for player searches in foreign countries.

Some authors have shown that increasing numbers of European clubs have begun to import more and more players from a wider range of countries (see, for example, Boon 2000; Maguire & Stead 1998). In the middle of the 1990’s Boon (1996) also observed a trend that Premiership and Championship teams have started to substitute foreign talent for domestic talent.

Transfer fees

Simmons (1997) points out that such an influx of foreigners and excess of supply of domestic players would make it difficult for teams from lower English leagues to sell promising young players. Lower league teams should therefore receive less transfer fees for their departing players. Simmons (1997) also predicts that the erosion of quota restrictions on foreign players would reduce transfer fees, other things being equal.⁴

A related argument is made by Sanderson & Siegfried (1997) who say that the Bosman ruling should redistribute monopsony rents, manifested in the form of transfer fees, from owner and leagues to players. Therefore transfer fees should decline while individual player earnings should rise substantially. A contrary viewpoint is held by Antonioni & Cubbin (2000) arguing that a large scale transfer of wealth from clubs to players should not take place at all. They stress that the Bosman ruling has actually affected only a minority of potential transfers. Most players change teams before the termination of their contract with their existing team, and therefore the transfer requires the payment of a transfer fee, even under the Bosman rules. Furthermore, they apply new investment theory to show that teams would rather receive a transfer fee and sell a player than receive the stream of utility from the player during the remainder of his contract period.

⁴ Other consequences of the Bosman-ruling predicted by Simmons are: more unequal distribution of players’ salaries and longer and more complex contracts.

3. Theory and Hypotheses

In this paper we study types of transfers, but also investigate the relationship between player transfers and team performance. We also want to examine differences between higher and lower leagues. The majority of studies in this area concentrate on statistical modelling for score forecasting, as in Dixon & Coles (1997), Maher (1982) or Stern (1991), or on prediction of the players or team performance, like Bennet & Flueck (1983), Berri (1999) or Carmichael et al. (2000). However, we only found one paper by Savoia (2005) that explicitly considers transfers of players. In her analysis of handball in Italy, Savoia (2005) shows that getting players or coaches – and with them skills and information – from many different opponents increases team performance. In the next section we concentrate on three important aspects in this context: team cohesion, transfer turnover and player quality.

Team cohesion

The question whether teams with greater cohesion are more successful has long been disputed in sport psychology (see for example Lenk 1969; Carron et al. 2002). Various researchers have addressed the connection between team cohesion and performance by utilizing a variety of sport types including golf (Widmeyer & Williams 1991), football (Westre & Weiss 1991), rugby (Kozub & Button, 2000), lacrosse (Matheson et al. 1996), baseball (Boone et al. 1997; Shields et al. 1995), and volleyball (Bird 1977). From this body of research, Widmeyer et al. (1993) suggest that 83 percent of the studies indicate a positive relationship between cohesion and performance. Although cohesion has been often used in research, as Siebold (1999) points out, it remains problematic as a concept and in its measurement. In this paper, we do not prefer one definition or measurement over the other. We simply want to point on how player transfers might influence team cohesion.

Transfer turnover

In this paper we argue that number of transfers has an effect on team cohesion. In particular we say that new players need to be integrated in a team. Football is a team sport in which players of a team interact with each other. Referring to learning theory (Skinner 1950) we suggest that players of a team have to adapt to new fellow teammates. They need to learn to anticipate the runs and passes of new players. At the same time transferred players need to adjust to their new environment. Not only, do they need to integrate themselves in a team, but also find a new home. Most often, football players changing teams move to another city or even country and consequently must adjust to changes in their private life as well.

Conversely, one can also argue that the number of leaving players affects team cohesion. Here, two positions can be held. First, the loss of players might have a negative effect on the overall mood of a team. Team cohesion might be disrupted when a player leaves. Second, one can argue that players who leave a team did not fit well in there anyway. They might have been trouble-makers or difficult characters. Following from this one would expect team cohesion to increase when players leave.

Even though we are mainly interested in the relationship between player transfers and team performance we acknowledge that one must account for the quality of transferring players as well.

Quality of players

The quality of a team cannot simply be reduced to the sum of the quality of its individual players, but still, it makes sense to assume that the quality of individual players has an effect on team performance. One can argue that teams with better players are more likely to perform well. In the analysis of football player transfers between teams one can further assume that the quality of players transferring from one team to another makes a difference in team performance. Consequently, the argument is set up that teams who lose a lot of individual quality when good players leave perform worse. As a corollary to this, one can argue that teams who get good players are more likely to increase their performance.

How can we measure the quality of individual players? A way to account for the individual quality of Premier League players would be to use individual performance indices such as the Opta or the Actim Index (see McHale & Scarf 2005). Both are commercial player monitoring systems that analyze all matches played in the Premiership. Over 300 distinct actions and outcomes for players, including kinds of shots, passes, tackles, saves, etc. are considered. These values are often used in fantasy football games.⁵ For example Tunaru et al. (2005) use such an index to determine a player's financial value to a club. Unfortunately, these indices are not available for all seasons from 1992/93 to 2006/07 nor are they available for lower leagues.

In this paper we favour another approach. Individual player quality is assessed by their market value. Thus, we use the transfer fee paid or received by a team as a proxy for player quality. Here, we assume that a good player also has a high market value. From this we can make the following prediction. On the one side the paid transfer fee should positively correlate with the performance of a team as it can be used as a proxy for the inflow of quality to a team. On the other side, the received transfer fee can be an indicator for leaving individual quality. Thus, it should negatively correlate with team performance.

Based on the theoretical discussion we formulate eight hypotheses.

H1: Intra-EU transfers hypothesis

The Bosman ruling from 1995 made intra-European transfers of football players easier. We expect to find an increasing number of players transferring from European to English teams and vice versa.

H2: Attractiveness of lower leagues hypothesis

A consequence of the Bosman.ruling is that lower English leagues get more attractive for players from teams in higher English leagues at the end of their career.

⁵ In fantasy football games, participants set up a "fantasy" team. These teams consist of real players from a league. Over the season participants receive points for the real performance of their players in the league.

H3: Missing team-mates hypothesis

When footballers leave a team, the remaining players cannot apply the same interactions in the game as before. Thus, the number of outgoing players should have a negative effect on team performance.

H4: Integration cost hypothesis

Football is a team sport and new players need to be integrated. The overall performance of a team is worse when many new players join a team.

H5: Difficult free agents hypothesis

Teams select new players on how they fit in a team. The chances to find players who fit in a team are higher when all potential new players are considered and not only those who can change teams without a transfer fee being paid (free agents). We expect to find that the integration costs for free agents (players who transfer without a transfer fee) are higher than for players who get bought out of an existing contract.

H6: Quality loss hypothesis 6

The money received from other teams for outgoing players can be used as a proxy for the quality of players leaving a team. We expect to find a negative relationship between money received through transfers and team performance.

H7: Expenses pay hypothesis

The money spent on new players can be used as a proxy for the quality of players joining a team and has a positive effect on a team's performance. We expect to find a positive relationship between money spent on transfers and team performance.

H8: League differences hypothesis

Both the effect of paid and received money per transfer on performance, is higher in lower leagues. Here, less money than in top leagues is needed to improve a team's performance.

4. Data and Method

For this paper a dataset was constructed that contains information about football player transfers in England from the seasons 1992/93 to 2006/07⁶. The dataset is limited to those transfers each year in which at least one team from either the Premier League, Champion League, League One or League Two is involved by either getting or losing a player. When a team played just a few seasons in these leagues then only the transfers made in these seasons are in the dataset, unless another team from the top four leagues in England was involved in a transfer too. For each transfer the date when a player effectively changes a team, the name of the player, as well as his origin and destination team is recorded. In many cases the transfer fees are available too, however, sometimes teams do not announce how much money they spend for a player and data is missing. Full information is available about whether or not a player was a free agent and could be transferred without a fee. In total, information about 11,782 transfers is used.⁷

In addition, a second dataset was constructed with all end-of-season league tables from 1992 to 2006. Normally, the football season in England starts in August and ends in May of the following year. Here, information has been limited to the Premier League, Champion League, League One and League Two as well. The end-of season rank of teams in lower leagues than the Premier League was computed by adding a team's position in their own league to the number of teams in higher leagues. The unit of analysis is team in a specific season. Adding all four leagues and 15 seasons up, overall, 1380 teams entered the dataset.⁸

Both datasets are combined on the level of teams in a season. Here, the assumption was made that transfers taking place during the summer break are related to the following season. Additionally, transfers taking place in May are accounted for the following season too, because players would not have many opportunities to alter a team's performance in that season. Usually, only a few matches take place in May. In detail, the number of incoming and outgoing players was computed for each team in a season. The number of both incoming and outgoing free agents was calculated too, as well as the average transfer fee paid or received per player.⁹

The data was gathered from several football internet sites. Most of the information comes from <http://www.soccerbase.com>, and has been double-checked with information available from the English Football Association (<http://www.thefa.com>) and the Official website of the Premier League (<http://www.premierleague.com>).

In the first part of this paper individual transfers are analyzed and descriptive results are given. Here, differences between the top four English football leagues are

⁶ For convenience, from now on only the year when a football season started is mentioned. For example 1992 always refers to the season 1992/93.

⁷ Loans of players in or players out are not considered in this dataset.

⁸ Most of the teams played more than one season in the top four English football leagues from 1992 to 2006. They have been entered in the dataset separately for each season.

⁹ By calculating the average transfer fees only those transfers for which the exact amount of money was available are used.

revealed. In particular, it is shown that after the Bosman ruling in 1995 the relative share of players coming from other EU countries to England increased dramatically in the higher leagues. The relative share of players leaving England for another EU country also increased. But still, there is a net-inflow of players from foreign countries to the top four English football leagues. An interesting finding for the lower leagues is that through the 1990's lower English leagues became highly popular destinations for players who leave the top four leagues. It is also shown that there is a net-outflow of players from higher English leagues to lower English leagues.

In the second part of the analysis the extended team information and OLS regression is used to estimate the effects of number of incoming/outgoing players and money involved in transfers on the performance of a team. The rank of a team in a season has been chosen as the dependent variable. Several models are presented that account for the number of incoming players, number of outgoing players, received transfer fee per player, paid transfer fee per player, and different types of transfers (free agent vs. paid transfer). The central finding is that the integration of new players is costly. Furthermore, taking on high quality players as measured by the average transfer fees seems to pay in terms of team's performance. Interestingly, the outflow of individual player quality measured by the received transfer fee does not seem to have an effect on a team's rank.

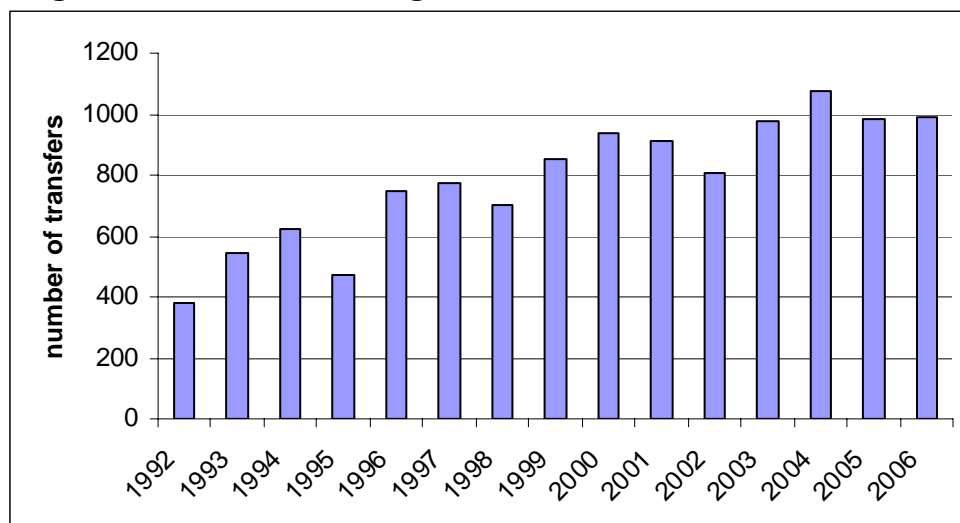
In the last section we discuss how to win the Premiership. It is shown that one should not mourn for free agents who leave a team. In general, it might even be a good strategy to let them go. However, getting new players for free without a transfer fee is not always a stroke of luck for a team. It seems to be costly to integrate new players regardless of whether or not they come for free. Based on these results it is further shown that transfers make only sense when teams invest money above a certain threshold. For the season 2006/07 at least 1,009,680 pounds must have been invested by a Premier League team in a single transfer so that the inflow of new quality out-weights the costs to integrate a new player. Additional 3,375,280 pounds of investment in transfers per player would have been needed in order to improve a Premier League team's performance at the end of the season by one rank.

5. Results

5.1. Description of transfers in England

The first diagram shows the overall number of player transfers in which a team of the top four leagues in England was involved by either getting or losing a player differentiated by season from 1992/93 to 2006/07. The number of transfers increased from 379 in 1992 to 991 in 2006. One can see a linear trend in this development. The maximum was reached during the season 2004/05 with 1075 transfers. There also seem to exist cycles of investment in new players. In 1995, 1998, 2002 and 2006 less transfers take place than one would expect from the overall increase in transfers.

Diagram 2: Transfers in England from 1992 to 2006

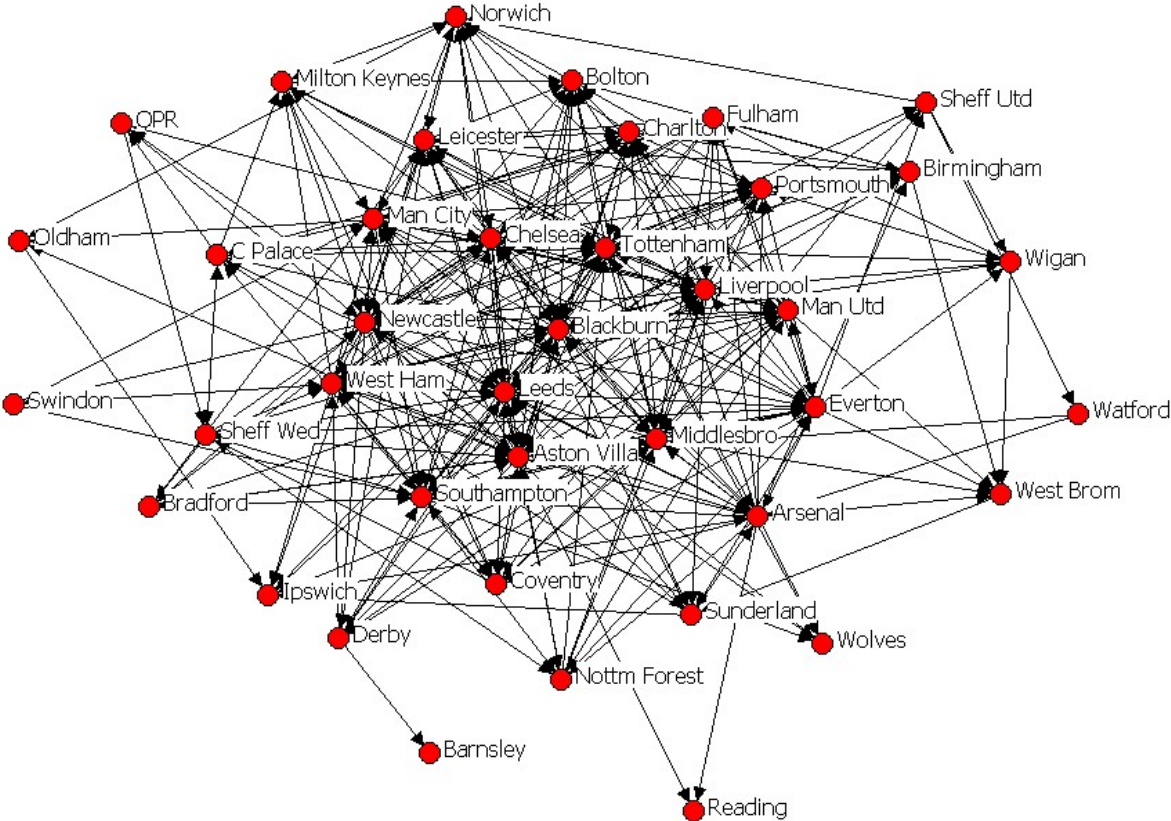


Total transfer from 1992 to 2006: 11756

Since the middle of the 1990's the Bosman ruling accounts for the observed increase of transfers. It made transfers cheaper (free agents) and abolished existing limitations of transfers within the European Union. One could also assume that football leagues became more professional and commercialized from 1992 to 2006. It can be suggested that under these conditions incentives have been produced for players and teams to transfer more often.

Next, the nature of player transfers in England from 1992 to 2006 is studied. As the number of transfers and teams involved is vast, a full graphical presentation of all transfers is impossible. Graph 1 provides insight into the information that has been collected for this analysis. Here, only those transfers are illustrated for which both the origin and destination team played in the Premier League at the time of the transfer. The nodes in this graph represent teams in the Premier League and the arcs at least one player transferring from one team to the other.

Graph 1: Player transfers from 1992 to 2006, Premier League teams only



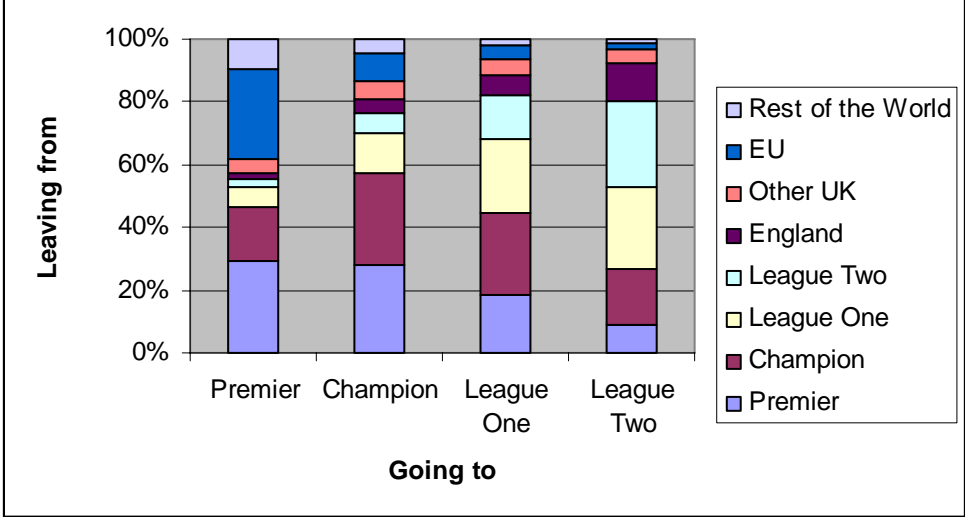
Another way to learn more about transfers in England from 1992 to 2006 is to find out more about the origin and destination of transferring players. In particular we ask the questions: where do players come from and where do they go to? These questions will be answered in the next two sections.

5.1.1. Where do players come from?

Looking at the origin of players entering English football (diagram 3), we observe clear differences between the leagues. The share of players coming from foreign countries to England is the highest for the Premier League. Here, the EU and the rest of the world account for 33% of all incoming players. In lower leagues this share declines and in League Two only 3% of new players come from outside the UK. Accordingly, the share of players coming from the Premier League is the highest for the Premier League itself (29%). In lower leagues this figure declines steadily and the relative share of new players entering a league who come from the Premier League is the smallest in League Two (9%). In this case one can say that the further apart two leagues are, the smaller the relative share of players transferring between these leagues. A somewhat similar pattern can be found for the relative shares of players who come from a team in the Champion League. The share of players from coming

from the Champion league is the highest in the Champion League itself (29%). In both higher and lower leagues the share gets smaller. This pattern also holds for players who come from League Two and lower English Football leagues. No clear differences can be found in the relative numbers of players originating from other leagues in the UK.

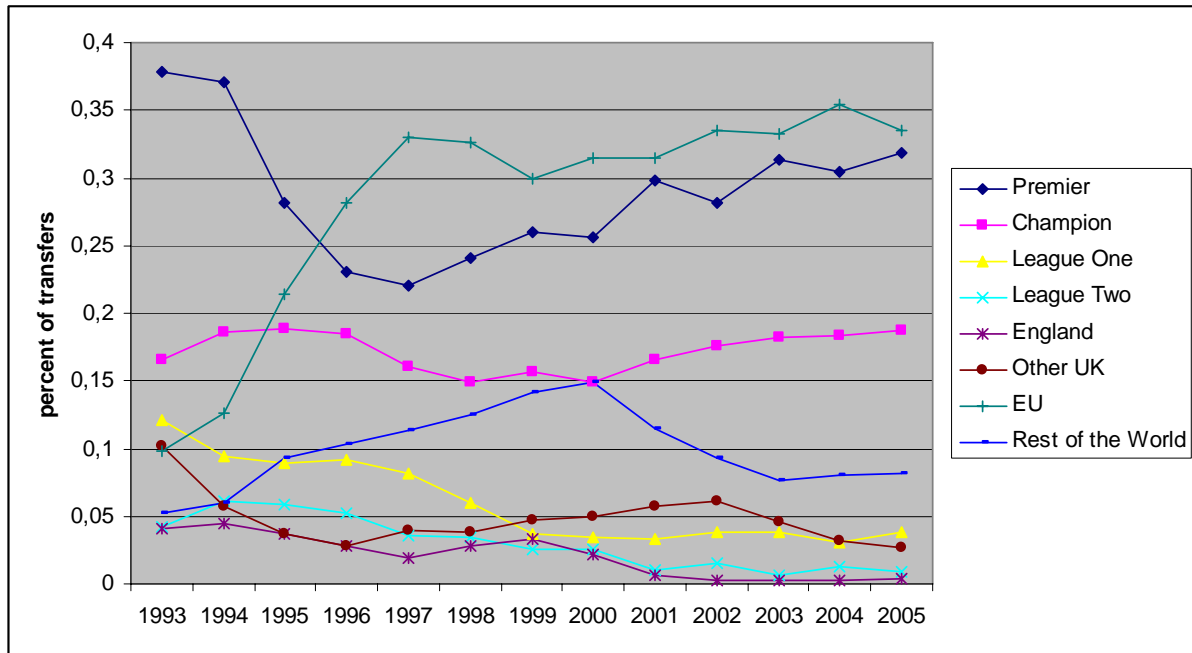
Diagram 3: Where do players come from?



Note: Other UK means Scotland, Wales and Northern Ireland; England means leagues in England lower than League Two.

One should keep in mind that these results refer to the whole period from 1992 to 2006. In the next diagram, the relative share of players entering the Premier League is examined in more detail. Here, three year gliding means of relative shares are presented to get an overall idea of trends in the last 15 years. A striking finding is that the relative share of players coming from the EU to the Premier League increased dramatically in the years after the Bosman ruling and somewhat stabilized at a high level in the last few years. Conversely, the relative number of players who transfer within the Premier League dropped down immediately after the Bosman ruling. In the late 1990's the relative share of these players rose, but did not reach the pre-Bosman ruling levels. Interestingly, players from other parts of the world got also much more popular in the 1990's. The three year gliding mean nearly tripled from 1993 to 2000. Since then, this share was cut in half again. Downward trends can be found for the share of players entering the Premier League coming from League One, League Two and lower English leagues. The relative number of players from the Champion League and other UK leagues remained more or less the same.

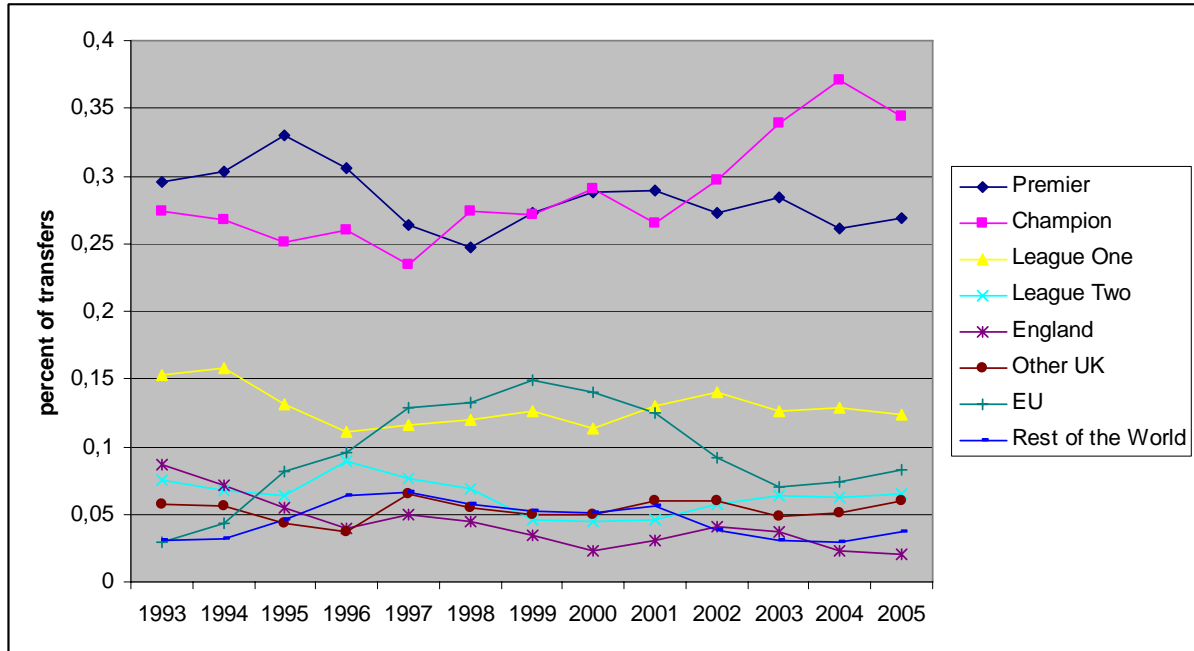
Diagram 4: Where do Premier League players come from?



Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

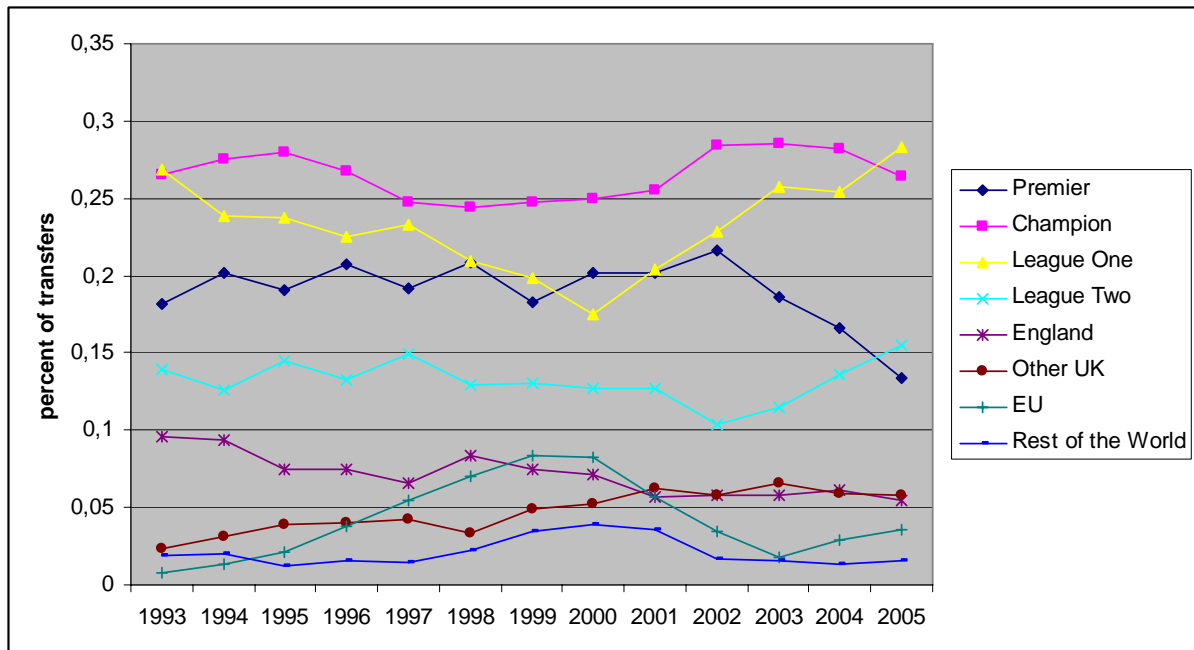
The next three diagrams show trends from 1993 to 2005 about the origins of players who enter the Champion League, League One and League Two. Generally, we see that these origins differ between leagues. Concentrating on trends, we can also find a massive increase of the relative number of players coming from the EU to both the Champion League and League One after the Bosman ruling. Interestingly, in both leagues, this figure declined in the second half of the considered period. Another interesting finding is that in all three leagues the relative share of players recruited from the inside their own league has recently increased. Aside from these findings it is difficult to find any overall trends. For the most part, the relative number of players transferring from one league to another has remained more or less constant over the last 15 years. In the next section we want to turn to the destinations of transferring players in a similar way.

Diagram 5: Where do Champion League players come from?



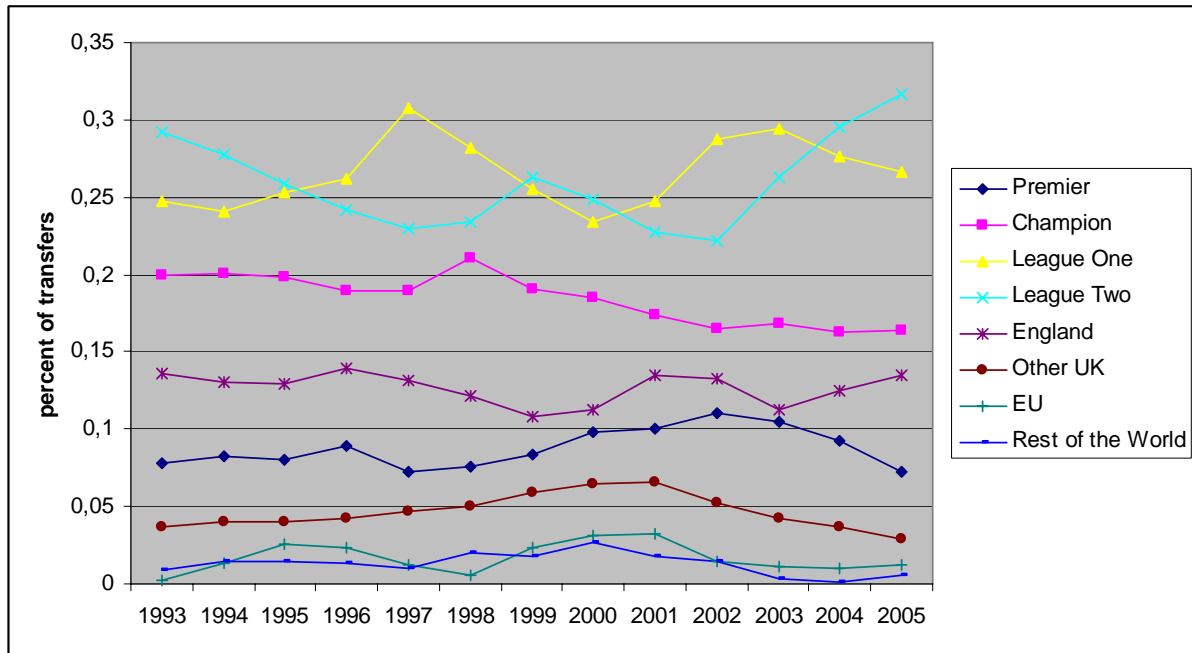
Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

Diagram 6: Where do League One players come from?



Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

Diagram 7: Where do League Two players come from?



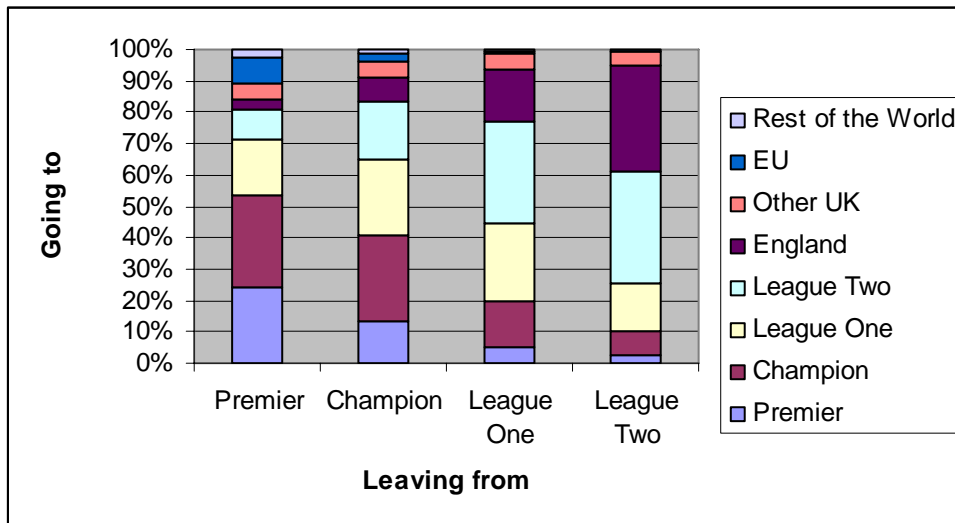
Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

5.1.2. Where do players go to?

When we focus on the destination of transferring football players who leave a team that plays in one of the top four English football leagues, we can produce similar diagrams as in the previous section. The first table gives us an idea of levels nature of outgoing transfers and shows us the relative shares of the destinations of transferring players. Of those who leave a Premier League team the vast majority transfer to another English team (84%). In lower leagues this share is even greater: 91% for Champion League, 93% for League One and 95% for League Two. This proportion rises even further when the Scottish, Welsh and Northern Irish leagues are not considered as foreign leagues. Overall, the EU and other foreign countries only seem to play a marginal role when football players leave an English team. Having a detailed look at the Premier League, players mostly get either a contract from other teams in this league (24%) or from the Champion League (29%). However, together a player's current league and lower leagues seem to be the most common destination leagues for a player. This pattern can also be found for the Champion League. Here, the most popular destination is the Champion League itself (28%) and League One (24%).

For those players leaving League One this pattern holds as well. The most popular destination is League Two (32%) followed by League One (25%). Even for League Two we can find the pattern, that the two most attractive leagues are the league in which a player played before and the league below. Once again no clear differences can be found in the relative numbers of players leaving to other leagues in the UK.

Diagram 8: Where do players go to?

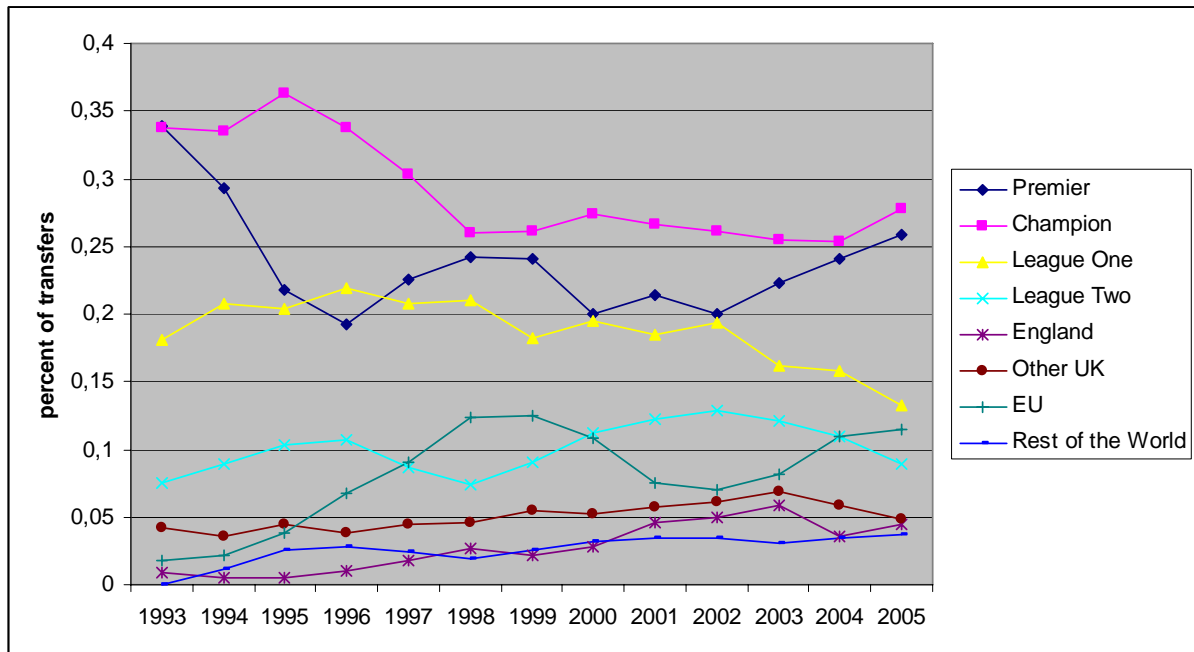


Note: Other UK refers to Scotland, Wales and Northern Ireland; England refers to leagues in England lower than League Two.

As before, in the analysis of transfer origins, the following tables show trends from 1993 to 2005 in the popularity of destinations separated by league. Diagram 9 shows the destination of Premier League players. Once again, we present three year gliding means of the relative share of players going to a particular league. As well as in the diagrams before, we can see an increasing share of players leaving to EU countries after the Bosman ruling. We can also see that the relative number of players going to other Premier League or Champion League teams decreases in the 1990's and stabilizes afterwards. In the case of the Premier League destination we can even see a slight increase recently. Corresponding to this League One is a less popular destination in recent years, while the share of players transferring to League One remained relatively constant in the first ten years of the considered period. Even though there is some variation, no clear trends can be found for the popularity of League Two and other UK leagues. At the same time the attraction of lower English leagues and leagues in other parts of the world increased for Premier League players from 1993 to 2005.

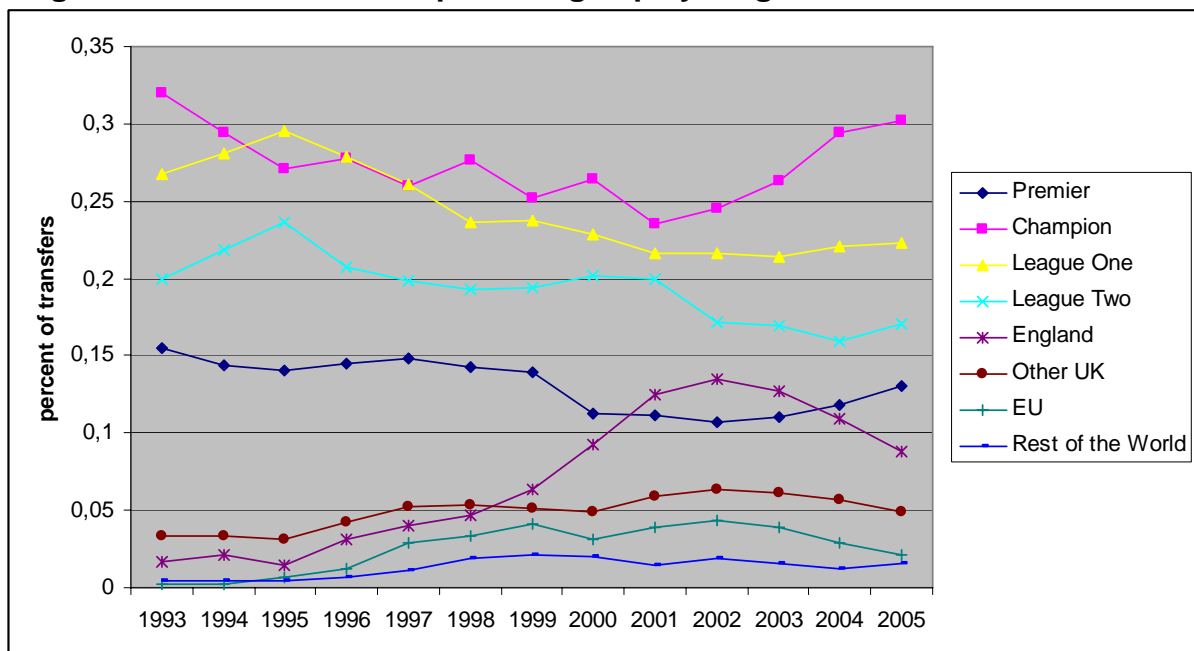
In diagrams 10 to 12 the popularity of leagues for players leaving the Champion League, League One and League Two from 1993 to 2005 is presented. Looking at the players transferring to EU leagues, we can see an increase after the Bosman ruling for the Champion League and League One. However, the relative share of these players remains very small and the EU does not seem to be a relatively less attractive destination for English players. An interesting finding is that the relative popularity of lower English teams increased tremendously from 1993 to 2003 in all three leagues. In the last few years this attraction has decreased somewhat. Aside from these general observations it is difficult to find overall trends in the popularity of league destinations for all three leagues.

Diagram 9: Where do Premier League players go to?



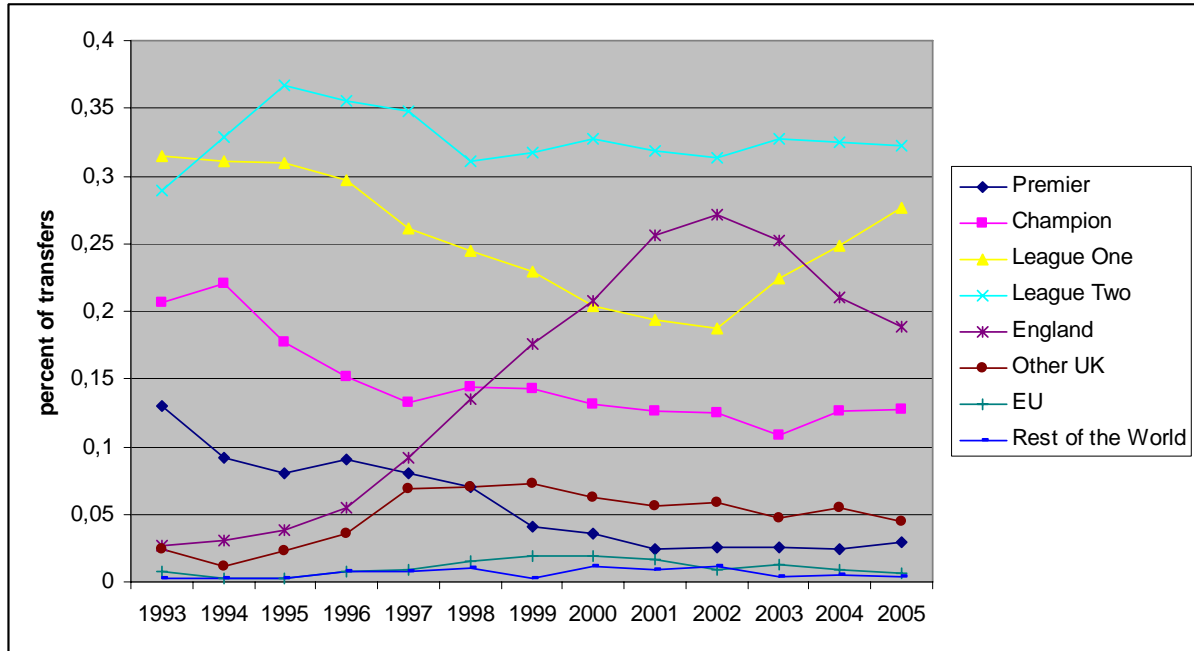
Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

Diagram 10: Where do Champion League players go to?



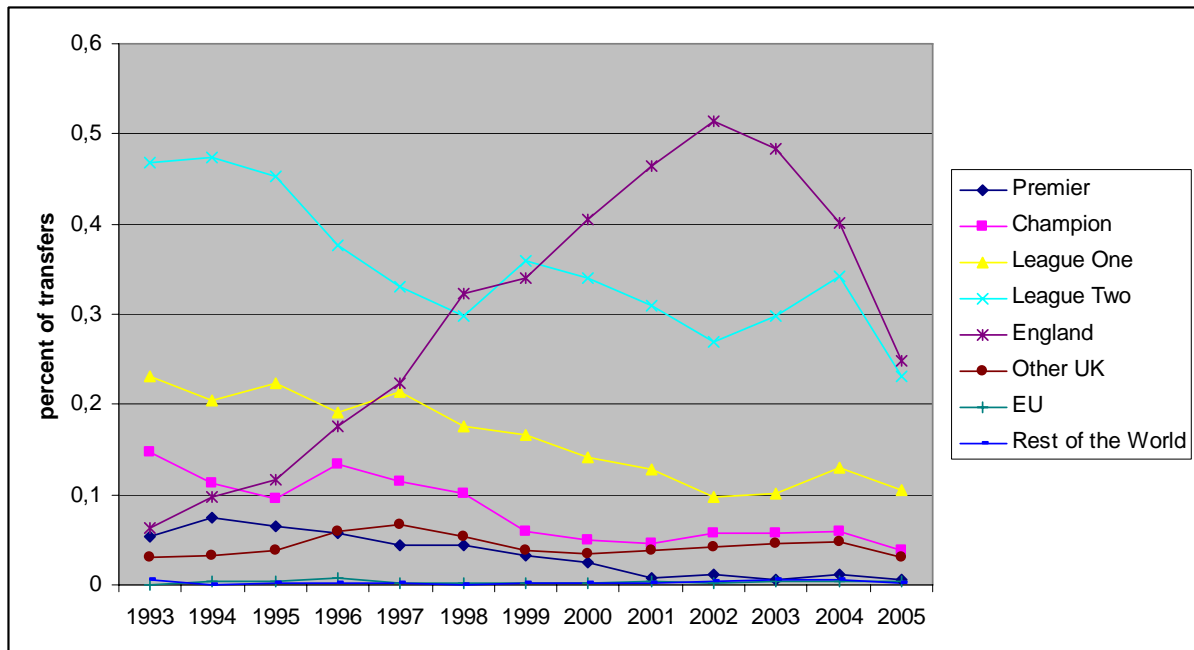
Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

Diagram 11: Where do League One players go to?



Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

Diagram 12: Where do League Two players go to?



Note: Here, three year gliding means of relative shares are presented. For example a value in 1993 correspond to the mean of relative shares in the seasons 1992/93, 1993/94 and 1994/95.

A summary of the results presented about the nature of transfers from and to the top four English football leagues can be found in Table 1.

Table 1: Number of transfers in England from 1992 to 2006

		Going To (B)							
		Premier	Champion	League One	League Two	Lower England	Other UK	EU	Rest of the World
Leaving From (A)	Premier	581	700	430	239	71	120	204	63
	Champion	343	729	627	488	197	129	69	39
	League One	121	318	563	726	367	112	22	13
	League Two	52	161	319	735	693	95	6	6
	Lower England	39	105	165	348				
	Other UK	95	136	114	121				
	EU	560	229	101	47				
	Rest of the World	192	110	49	33				

Based on this table, we now explore the net-inflow and net-outflow of players in a league. Here, we want to determine the ratio of the number of players leaving a league A to another league B. For this purpose table 2 has been produced which gives the following ratios:

$$\text{net-flow ratio} = \frac{\# \text{ players transferring from league A to league B}}{\# \text{ players transferring from league B to league A}}$$

This ratio will take the value one when inflow and outflow are the same. Values above one mean that more players transfer from league A to league B than the other way around. Values below one mean the opposite. For example Premier/Champion = 2,04 means that more than twice as many players transfer from the Premier League to the Champion League than expected when one assumes that outflow and inflow of players are the same. Here, we have a net outflow of players from the Premier League to the Champion League. Another reading example is Champion/EU = 0,30 which says that only one third of the number of players who transfer from the EU into the Champion League get transferred the other way around. Here, we have a net inflow of EU players in the Champion League.

Table 2: Net-inflow and outflow of players from 1992 to 2006

		B							
		Premier	Champion	League One	League Two	Lower England	Other UK	EU	Rest of the World
A	Premier	1	2,04	3,55	4,60	1,82	1,26	0,36	0,33
	Champion	0,49	1	1,97	3,03	1,88	0,95	0,30	0,35
	League One	0,28	0,51	1	2,28	2,22	0,98	0,22	0,27
	League Two	0,22	0,33	0,44	1	1,99	0,79	0,13	0,18

Reading example: Premier/Champion = 2,04 means that more than twice as many players transfer from the Premier League to the Champion League than expected when one assumes that outflow and inflow of players are the same.

Interpreting the results in table 2, we find further evidence for an earlier observation: there is a net inflow of players from higher leagues to lower leagues in England. For all top four English football leagues the number of players transferring to a lower English league exceeds the number of players transferring the other way around. Looking at the net-flow of players to leagues in Scotland, Wales and Northern Ireland (Other UK) the picture is a less clear. On the one side there are more Premier League players coming in than going out. On the other side less League Two players transfer to other leagues in the UK than vice-versa. Another distinct finding is that there is a heavy net-inflow of players from the EU and the rest of the world to the top four English football leagues.

5.2. Team cohesion and performance

In the next part of this paper OLS regression is used to estimate the effects of the number of incoming and outgoing players as well as the amount of the transfer fees on a team's performance. As outlined before, the rank of a team at the end of a season is used as dependent variable in all models. The team which wins the Premiership is assigned rank 1 and all other teams are assigned accordingly.¹⁰ All analyses have been carried out separately for the Premier League, the Champion League, League One and League Two.

Model 0 is a baseline model in which a team's rank in the previous season was entered as the only independent variable.¹¹ We can see that this single variable already explains a great deal of team performance. However, it should be noted that the fitness of this model varies considerably from league to league. In the highest English football league it explains up to 33% of variance of a team's performance, while the same model only accounts for 4% of variance in League Two. In all leagues the effect of last year's performance on the rank of a team is positive. Thus, good teams tend to stay good and bad teams tend to stay bad in the following season. Such an effect is not surprising. Even though up to one third of the players are new in a team each year, the majority of players stay with their team. In a way model 0 can therefore account for the remaining quality of players in a team. It also reflects the overall conditions for a team. Nonetheless, the effect is weaker in lower leagues than in higher leagues.

Model 0

	Premier	Champion	League One	League Two
Constant	5,025***	23,018***	47,072***	66,545***
rankLag	,504***	,298***	,170***	,181***
N	306	360	360	354
R ²	,334	,128	,045	,040

Dependent Variable: rank

*** p< 0.02, ** p<0.05, * p<0.1

In model 1 the number of outgoing and incoming players is introduced. By keeping the performance of a team in the previous season in the model we can control for the overall quality of a team. The goodness of fit improves for all leagues. The effect of last year's performance remains more or less the same as in model 0. Additionally, the newly introduced variables have a significant effect in the Premier League. In particular, the number of out-transfers has a negative effect on rank (-0,307), meaning that losing players interestingly increases a team's performance. The

¹⁰ The end-of season rank of teams in lower leagues than the Premier League was computed by adding a team's position in their own league to the number of teams in higher leagues.

¹¹ When a team was not in one of the top four English football leagues in the previous season, it was assumed that it performed best in the next lowest league.

number of in-transfers, however, is positively related to rank (0,398). Thus, the integration of new players seems to be costly and the overall performance of a team gets worse. Such an effect can only be observed for the Premier League. In lower leagues the number of transfers does not seem to be important. The effect of rank in the last season slightly declines in its magnitude in comparison to model 0.

Model 1

	Premier	Champion	League One	League Two
Constant	5,597***	23,420***	45,286***	64,840***
rankLag	,434***	,282***	,178***	,174***
Number of Out-transfers	-,307***	n.s.	n.s.	n.s.
Number of In-transfers	,398***	n.s.	n.s.	n.s.
N	306	360	360	354
R ²	,378	,135	,052	,062

Dependent Variable: rank

*** p< 0.02, ** p<0.05, * p<0.1

A further extension is made in model 2. Here, information about the average transfer fee paid or received by a team is considered. The fitness of the model increases. In the case of the Premier League, the new variables account for another 5,3 % of explained variance. For the other leagues the improvement lies between 4,1 % (League Two) and 8,6 % (League One). Assuming that high quality players have a higher market value, the money received from other teams can be seen as a proxy for the outflow of player quality. Fascinatingly, this variable has no significant effect on the performance of a team, neither in the highest nor in the lowest league in this analysis. Accordingly, the paid transfer fees per player can be understood as a proxy for incoming player quality. This variable is highly significant in all four leagues and has a negative direction. The meaning of this finding is that spending more money on better players improves a team's performance. For example in the Premier League one additional pound invested in per transfer improves team performance by 5,58E-007. Thus, in order to improve by one rank a team in the Premiership would need to invest 1.792.115 (= 1 / 5,58E-007) pounds based on these figures. The effect of paid transfer fees per player on rank gets higher in lower leagues, meaning that less additional money is needed to be successful in the league. So, the additional investment needed to improve by one rank is 211.864 (=1 / 4,72E-006) pounds in the Champion League, 55.249 (= 1 / 1,81E-005) pounds in League One and 22.573 (= 1 / 4,43E-005) pounds in League Two.

Looking at the variables that we kept from model 1, the rank in the previous season is still highly significant, but further declines in the magnitude of its effect. Something similar can be found for the number of out-transfers. This variable has still a significant effect in the Premier League only, but the magnitude of this effect also diminishes (from -0,307 to -0,223). A striking variable is the number of in-transfers. While in model 1 this variable only had a significant effect on team rank in the Premier League, in model 2 significant effects can be found for all four leagues. This effect varies from 0,229 in League One to 0,332 in the Premier League.

Model 2

	Premier	Champion	League One	League Two
Constant	7,454***	26,998***	48,677***	67,976***
rankLag	,362***	,207***	,131***	,141***
Number of Out-transfers	-,223***	n.s.	n.s.	n.s.
Number of In-transfers	,332***	,247**	,229**	,290**
Received transfer fees per player	n.s.	n.s.	n.s.	n.s.
Paid transfer fees per player	-5,58E-007***	-4,72E-006***	-1,81E-005***	-4,43E-005***
N	306	360	360	354
R ²	,431	,206	,138	,103

Dependent Variable: rank

*** p< 0.02, ** p<0.05, * p<0.1

Model 3 gives us further insights about two different types of transfers. In particular, players can be free agents and transfer from one team to another without a transfer fee. Or, if they still have a valid contract, the new team needs to buy them out of a contract and pay a transfer fee. Overall, the fitness of the model improves slightly. In higher leagues the improvement is smaller than in the lower leagues. The differentiation between free agents and paid transfers for both outgoing and incoming players provides an interesting picture. Only the number of free agents coming in is significant in all four leagues. The effect of this variable on team rank varies from 0,360 (Premier League) to 0,559 (Champion League). Looking at the number of other incoming players for whom a transfer fee was paid (bought players), there is a significant effect on team rank in the Premier League (0,299). In all other leagues, this variable does not seem to be important for team performance.

A differentiated view on the number of players who leave a team, yields that for both the Premier League (-0,360) and the Champion League (-0,414) a negative effect of free agents on team rank can be found. This means that team performance gets better when free agents leave. However, such an effect cannot be found for League One and League Two. Instead, in these two leagues the number of player for whom another team pays a transfer fee to get them out of an existing contract positively relates with team performance. When these player leave, a team performs worse. This result was not foreseen from one of the previous models. One could argue that this merely reflects the fact that players from teams in lower leagues get poached/are recruited by teams in higher leagues. Thus, the loss of quality seems to be a crucial issue in lower leagues.

Model 3

	Premier	Champion	League One	League Two
Constant	6,953***	26,632***	48,655***	66,838***
rankLag	,385***	,215***	,128***	,149***
Free agents out	-,360***	-,414***	n.s.	n.s.
Sold players	n.s.	n.s.	,614***	,584***
Free agents in	,360**	,559***	,370**	,376***
Bought players	,299***	n.s.	n.s.	n.s.
Received transfer fees per player	n.s.	n.s.	n.s.	n.s.
Paid transfer fees per player	-5,24E-007***	-4,43E-006***	-1,70E-005***	-4,73E-005***
N	306	360	360	354
R ²	,441	,231	,166	,121

Dependent Variable: rank

*** p< 0.02, ** p<0.05, * p<0.1

5.3. How to win the Premiership

The following section concentrates on the results for the Premier League and elaborates on what the best strategy would be to win the Premiership based upon what has been presented so far. When we recall the results from model 3 we found significant effects of the number of free agents leaving a team, the number of free agents joining a team, the number of bought players and the transfer fee paid per player on a team's rank.

Free agents

The effect of outgoing free agents on team's rank is negative. In general, team rank changes by -0,360 when one free agent leaves. This result means that a team's rank in the Premier League gets better when free agents go. This could be because of those players who did not get a new contract from their team in time did not fit in the team anyways. Therefore their departure might even improve a team's cohesion.

On the other side the number of incoming free agents has a positive effect on team rank (0,360). In this context this means that a team's rank gets worse when free agents come in. Consequently, teams who get many free agents perform worse in the season. This effect could just reflect that it is difficult for players to adjust to new team-mates. It could also be the case that a team's cohesion is seriously disrupted by the integration of new players. As a consequence, teams could have a disadvantage in the Premiership. This interpretation is supported by the fact that the number of bought players shows a similar effect on team performance (0,299).

Based upon these results one should not mourn for free agents who leave a team. In general, it might even be a good strategy to let them go. However, getting new players for free without a transfer fee is not always a stroke of luck for a team. It

seems to be costly to integrate new players regardless of whether or not they come for free.

Bought players

As mentioned, the integration of bought players seems to be costly too. However, the effect on team performance (0,299) is a bit smaller in magnitude than the effect by number of free agents (0,360). From this one could conclude that bought players are easier to integrate into a team than free agents. A straightforward explanation for this could be that bought players are selected based on whether or not they could be expected to be a good fit for a team, while the selection of free agents depends more on what is available on the market. Nevertheless, it does not seem to pay to get new players. For both free agents and bought players a team's performance gets worse overall. Therefore, sticking with the players of the previous season is a better strategy.

Quality of players

One also needs to consider that additional players may decrease team cohesion, but they may also improve overall average player quality. This has been accounted for in the model by taking the transfer fees received and paid for players as proxy for their individual abilities.

Interestingly, while the loss of individual quality, measured via received transfer fee per player, does not seem to matter, getting good quality players increases a team's performance. Spending an extra pound per player pays by increasing the rank at the end of the season by $5,24E-007$. We can say that on average $1.907.911 (= 1 / 5,24E-007)$ pounds investment per player is needed to improve a team's rank in the Premier League by one. However, this figure does not tell us the whole story, as we have to account for the costs of integrating new players.

When does it pay to buy a new player?

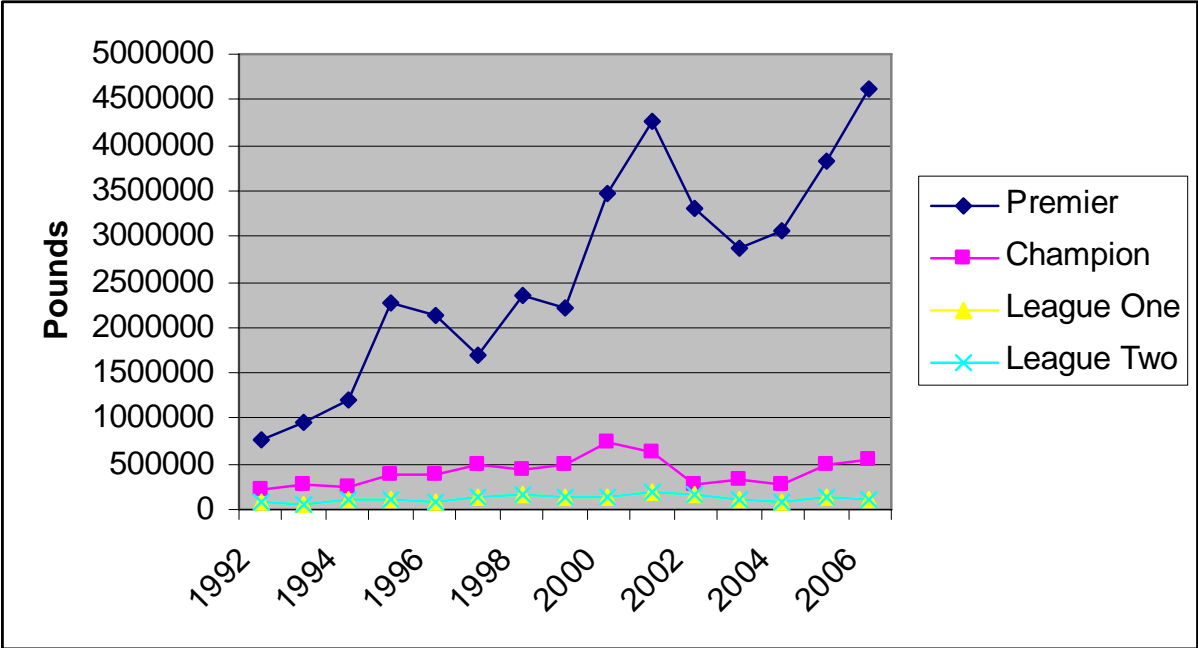
As a matter of fact, we can bring the costliness of new player integration and the benefits from getting good player quality together. To calculate the exact costs of player integration we can simply divide the rank deterioration caused by one new player (0,299) by the improvement of rank related to an extra pound investment ($5,24E-007$). By doing so, we can say that on average the integration of one player in the Premier League costs 570.731 pounds. Thus, the amount spent for a new player so that quality inflow out-weights the integration costs and that a team's performance increases by one rank is $2.478.642 (= 1.907.911 + 570.731)$.

This little exercise reflects what one would need to pay on average from 1992 to 2006 for an individual player to increase the team performance. To make more accurate suggestions on this matter one should consider that the money involved in football player transfers has changed within the last 15 years. In the following part we try to account for this.

The next table shows the development of mean transfer fees paid by teams in the Premier League, Champion League, League One and League Two for new players from 1992 to 2006. We can see a dramatic increase of financial investment especially

in the Premier League. The average money spent for a new player in the highest English football league reached its maximum in 2006 with 4.623.671 pounds. The overall mean of money spent on football players in the Premier League is 2.600.126 pounds for the period from 1992 to 2006.¹²

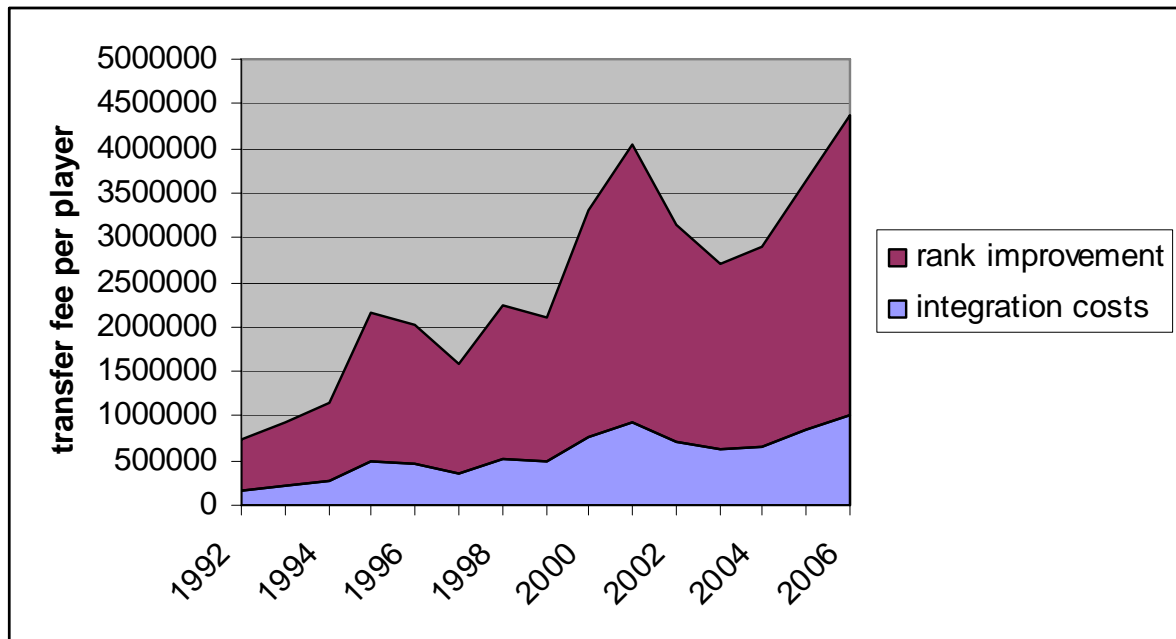
Diagram 12: Mean transfer fee per player from 1992 to 2006



We can correct for the change of average transfer fees when we make the assumption that the relative effect of financial investment in relation to the average money spent for a player has been constant from 1992 to 2006. Concentrating on the Premier League we can say that 73,3% (= 1.907.911 / 2.600.126) of the average transfer fee is needed to improve a team’s performance by one rank. In a similar way, we can also correct the cost for player integration by the overall increase of transfer fees. In this case 29,9 % (0,299) of the money which needs to be spend for a one rank improvement reflects the integration costs. Calculating these values for each year we come to the following graph which shows the actual money that is needed each year, so that the benefits of new quality out-weigh the integration costs and increases a team’s performance by one rank from 1992 to 2006.

¹² This value has been weighted for the number of transfers in each year.

Diagram 14: Costs for player integration and rank improvement



This diagram gives us an overview when it pays to invest in new players for the Premier League. In detail, the picture shows us the threshold when the benefits of incoming individual quality, measured by the transfer fee paid for a player, are higher than the costs to integrate this player. Table 3 gives us the exact numbers for each year from 1992 to 2006. Thus, in the season 2006/2007 a total of at least 4.384.959 pounds needed to be invested by teams in the Premier League for a new player on average in order to improve their rank by one.

Table 3: Costs for player integration and rank improvement

season	quality needed to improve one rank (pounds)	integration costs (pounds)	total (pounds)
1992	559647	167413	727060
1993	705440	211025	916465
1994	885363	264847	1150210
1995	1656837	495626	2152463
1996	1554463	465001	2019464
1997	1227432	367174	1594606
1998	1721732	515038	2236771
1999	1613594	482690	2096284
2000	2535331	758418	3293749
2001	3107019	929433	4036452
2002	2418797	723558	3142355
2003	2091961	625788	2717749
2004	2223998	665286	2889284
2005	2794486	835941	3630427
2006	3375280	1009680	4384959
Mean	1907911	570731	2478642

6. Discussion

The main aim of this study was to examine football player transfers in England from 1992/93 to 2006/07 and to investigate the relationship between transfers and team performance. A secondary aim in this context was to find out about differences between higher and lower leagues in England. For this purpose information about transfers was collected in which at least one team from the Premier League, Champion League, League One or League Two was involved. In total our dataset consisted of 11756 individual transfers.

One of the first aspects of the paper was to study the impact of the Bosman ruling on the number and types of transfers. In this context we hypothesized that

“The Bosman ruling from 1995 made intra-European transfers of football players easier. We expect to find an increasing number of players transferring from European to English teams and vice-versa.” (H1: Intra-EU transfers)

and

“A consequence of the Bosman.ruling is that lower English leagues get more attractive for players from teams in higher English leagues at the end of their career.” (H2: Attractiveness of lower leagues)

Indeed, we found that the overall number of transfers increased after the Bosman ruling. But, we cannot say how much this increase is really due to the Bosman ruling. There could have been alternative causes, e.g. globalization or commercialization. Nevertheless, we also find a massive increase in the relative share of players transferring from European leagues to teams in England. In the Premier League, Champion League and in League One this figure nearly tripled in the second half of the 1990's. Overall there seems to be a high net-inflow of players from foreign countries to England. An explanation for this could be the increasing attractiveness of the English leagues in terms of potential earnings and overall league quality. However, in the Champion League and in League One this share has recently declined. We do not have an explanation for this yet. Concerning the attractiveness of lower English leagues, the relative share of players transferring from the top four English leagues to lower leagues in England even quintupled in the years after the Bosman ruling. This finding is substantiated by our observation of a net-flow of players from higher to lower leagues. Thus, the freedom of contract guaranteed by the Bosman ruling seemed to have opened new labour opportunities for former top players. An explanation for this could be that lower English teams were able to make offers to otherwise resigning players when they did not have to pay transfer fees anymore. Alternatively, the high competition with foreigners for jobs in the top English leagues could have forced players to transfer to lower leagues.

In the second part of this paper individual transfer data was combined with information about performance of teams in the top four English football leagues from 1992/93 to 2006/07. On the level of team per season we analyzed the effects of number of transfers on team performance. In this context we formulated the following hypotheses:

“When footballers leave a team, the remaining players cannot apply the same interactions in the game as before. Thus, the number of outgoing players should have a negative effect on team performance.” (H3: Missing teammates)

and

“Football is a team sport and new players need to be integrated. The overall performance of a team is worse when many new players join a team.” (H4: Integration costs)

For all four leagues in the study, the latter can be found. The integration of new players seems to be costly after controlling for the quality of incoming players. Even though no evidence is given, we assume that team cohesion mediates between number of new players and team performance. The pure number of outgoing players, however, had a significant effect on team performance only in the case of the Premier League. Contrary to our hypothesis, teams with many outgoing players perform better. An explanation for this could be that those players who leave a team did not fit in there anyway. Therefore, their departure might even improve team cohesion. In a refined model, differentiating between free agents and players for whom a transfer fee was paid, we found differences between the leagues. In the case of the Premier and Champion League, the number of free agents leaving a team significantly increases team performance while the number of sold players does not seem to matter. For League One and League Two these effects disappear. Instead, the number of leaving players for whom a transfer fee was paid decreases team performance. This is what we would have expected to find in the first instance. An explanation for the differences between leagues could be that the relative quality of players to other footballers in their league is crucial. Lower league teams might have very good players from time to time who make a great career in professional football. However, their relative outstanding quality in relation to the average player in lower leagues makes their transfer a great suffering for the team. Accordingly, one can explain the absence of integration costs for incoming free agents in lower leagues. A consequence of the Bosman ruling was that former top players increasingly transfer to teams in lower leagues when they end their contracts. Based on this we can explain why free agents seem to be easier to integrate in lower leagues. It could simply be that the players in question are more experienced and professional coming from higher leagues.

Another hypothesis in this context was:

“Teams select new players on how they fit in a team. The chances to find players who fit in a team are higher when all potential new players are considered and not only those who can change teams without a transfer fee being paid (free agents). We expect to find that the integration costs for free agents (players who transfer without a transfer fee) are higher than for players who get bought out of an existing contract.” (H5: Difficult free agents)

This hypothesis could not be falsified for any league. In all cases we determined integration costs for the number of incoming free agents. At the same time there were no integration costs for players who got bought out of an existing contract for the Champion League, League One and League Two. Although in the Premier League

such costs do exist, they are smaller than the costs to integrate free agents. From this we conclude that free agents are generally more difficult to integrate in a team.

The last aspect of the paper was to examine the impact of incoming and outgoing individual player quality on team performance. Here, the hypotheses were:

“The money received from other teams for outgoing players can be used as a proxy for the quality of players leaving a team. We expect to find a negative relationship between money received through transfers and team performance.” (H6: Quality loss)

“The money spent on new players can be used as a proxy for the quality of players joining a team and has a positive effect on a team’s performance. We expect to find a positive relationship between money spent on transfers and team performance.” (H7: Expenses pay)

“Both, the effect of paid and received money per transfer on performance, is higher in lower leagues. Here, less money than in top leagues is needed to improve a team’s performance.” (H8: League differences)

While, getting high quality players measured by the average transfer fee seems to pay in terms of team’s performance, interestingly, the outflow of individual player quality measured by the received transfer fee does not seem to have an effect on team rank at all. From this finding we can conclude that getting good players is a reasonable strategy to improve performance. However, when players leave a team they do not seem to leave behind gaps that cannot be filled. It might be the case that other players take up their chances. Thus, one should not mourn too long for players who leave a team. Looking at the effect of paid transfer fee on team performance we found expected differences between leagues. In lower leagues additional investment pays more than in higher leagues.

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