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A Football Management Simulator

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Abstract

European professional football is suffering for its popularity. As the global demand for the sport has increased, the revenues involved has followed in its tracks. At the same time, the profitability of the industry has been falling. The rest of the introduction in in detail about possible theories explaining this. As these clearly hints towards a complex problem with similarities of an escalation archetype, the goal of the thesis was to develop a strategic management tool mainly based on the BSC and system dynamics simulation to improve understanding of the current, historical and future behavior of the system. This effort became into a working simulation model that reproduced the current situation of revenue growth and increasing demand. Finally, the author believes that the simulation clearly provide management with a better understanding of the problem.

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Introduction

European professional football is suffering for its popularity. As the global demand for the sport has increased, the revenues involved has followed in its tracks. At the same time, the profitability of the industry has been falling. This is widely accepted to be caused by win-maximizing mentalities, in contrast to being mainly profit-maximizing, such that the competition for talent has driven player wages rocketing upwards (Hamil & Walters 2010; McNamara et al. 2013; Millward 2013; Morrow 2013; Plumley et al. 2014; Senaux 2008; Solberg & Haugen 2010; Storm & Nielsen 2012). Storm and Nielsen (2012) sums up the situation in a good manner:

> *The problem is that expectations of increasing revenue and profit, at the level of individual football clubs prove to be illusionary for the majority of the clubs. It all adds up to a destructive sporting arms race at the aggregate level when the majority of the clubs strive to make it to the top. The result is a bloated demand for players and subsequently too high expenditures for all competitors involved. (p. 192)*

As long as the revenue keep increasing, there is always one club willing to pay a little extra to get the star players. Competing clubs then have the choice to accept this and lose their best players, along with superior sporting performance, or increase the amount of wages they offer the players. Figure 1 shows a simplified illustration of this escalation archetype.
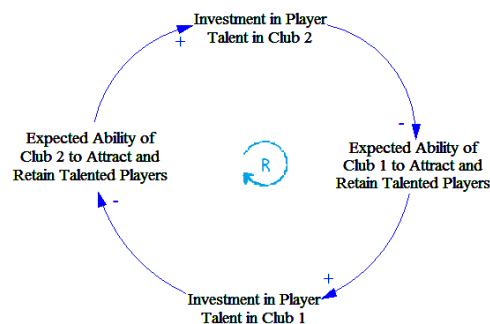
Figure 1: Escalation archetype.

Because of this, professional football clubs, especially European, are being operated on the brink of insolvency, with financially sustainable clubs rather being the exception. Capelo and Dias (2009) finds that there are clear financial challenges associated with competing at the top level. This is based on statistics, which implies that the most successful teams, with unusual exceptions, have not yet been able to implement and sustain an effective business model. Additionally, they find that there is a high level of indebtedness for big football teams across Europe and other federations. For the 80 teams in the Champions League and Europa

League, 65 percent have net losses. Over 15 year ago, Forrest and Simmons (2000) researched the relationship between pay and performance in different sporting sectors. They found that the "cost of success in the English Premiership has risen dramatically since 1992."(p.18) A vast amount of literature concerning sports management reports on the difficulties of managing these firms. Cunningham (2013) calls for a further reflection and analysis of theory in sport management, while Parent and Harvey (2009) points at the lacking ability to explain partnerships between sport organizations. Others recognize that there have been plentiful of good research on theory within sports management, but they conclude that the literature is walking along the same path and needs some sort of change of direction to extend its scope (Washington & Patterson 2011). According to Woratschek et al. (2014) there is need for a better understanding of sport-specific phenomena and more appropriate solutions to management problems. They suggest that this requires a new perspective on sports markets. Doherty (2013) states the importance of theory-building research, which is a process of establishing new variables and identifying relationships among existing ones. This can be achieved by extending existing theory from other disciplines that might have broader applicability. They all seem to agree on the fact that there is need for a better way to both create and measure value in a professional sport clubs. Sceptics may claim that the recent developments in theory of sports management is simply down to the fact that we can, and that sport nerds can play with data and make findings that are not easily transferred to the traditional business management literature. However, as Bryson et al. (2015) points out, sport is big business. People employed in sports and related activities represented 5.4 percent of the work force in 2007. He further points out that sport generated values of 407 billion euros in 2004.
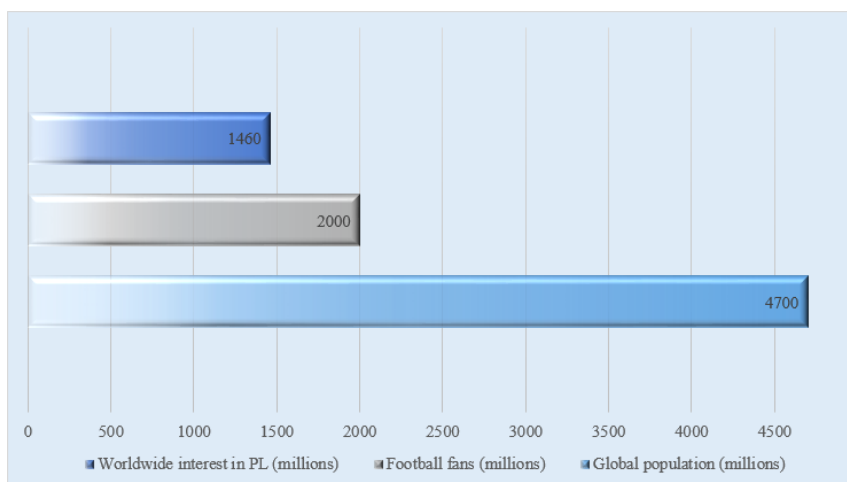

Figure 2: Worldwide interest in football. Adapted from Premier League 11/12 Season Review. (BPL 2012)

As in the case of European football, and especially in the Barclays Premier League (BPL), the vast amount of money involved are continuously increasing. Deloitte, which have an annual ranking of the highest earning clubs, clearly see this (Jones 2015):

> With almost half of the top 30 now made up of Premier League clubs, it is with great anticipation that we wait to see what the new round of Premier League broadcast deals, expected to be agreed in 2015, will yield. With the market expectation that another significant increase will occur, it is likely that the Money League will have a predominantly English appearance in the coming years (p. 4)

This can be underlined by the agreed broadcasting deal for 2016-19, which sums up to a staggering 5.14 billion pounds to be distributed between the clubs in the league over a 3 year duration (*BBC* 2015).
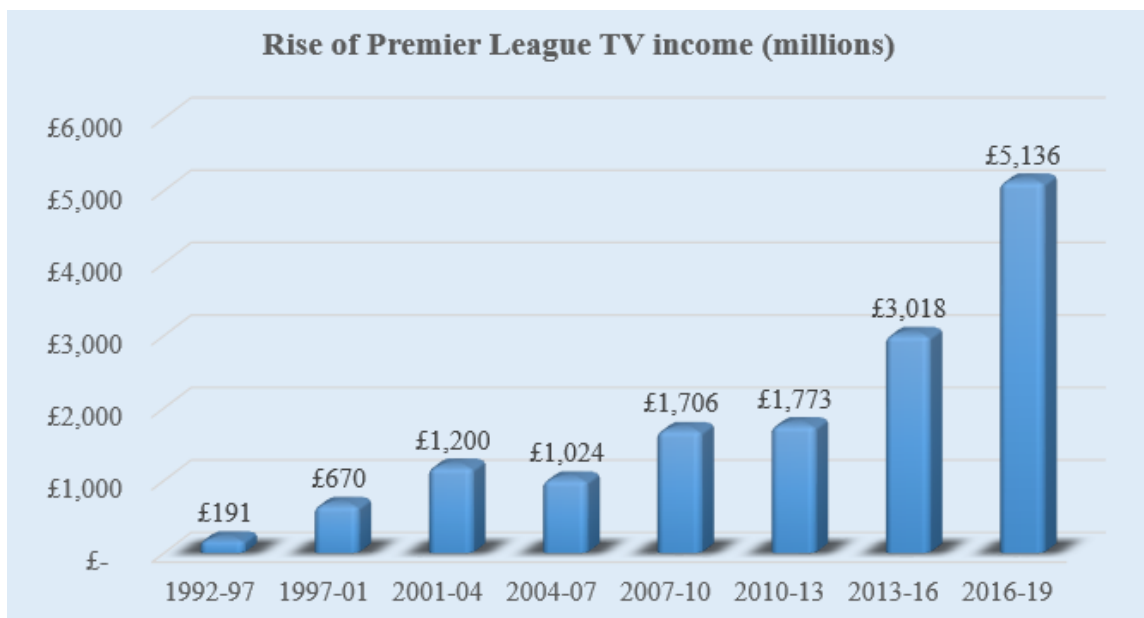
Figure 3: Adapted figure on rise of Premier League TV income. From BBC (2015).

For the reasons stated above, there has been a flood of foreign owners buying clubs in the countries that allows this corporate structure. The clubs in the BPL have a corporate structure bearing most resemblance with a "standard" business model, as opposed to the "socio-model" in Spain where the fans own the club (Murphy 2010). This makes the BPL attractive for foreign investors/ owners looking to make an investment in the club. The motivation for this is primarily financial, with the aim of increasing the value of the club and then selling it making a profit. In 2010, half of the BPL clubs had foreign owners. Nauright and Ramfjord

(2010) examines this surge of arrivals, mainly consisting of American owners. With ever more increasing television money because of the expanding global market, they observe the following:

While the structures of leagues differ between North America and England, it is clear that the trend is towards a globalized business model that began in North America and is sweeping the world as investors seek to maximize profits in diversified sport, entertainment, leisure, media and property portfolios. (pp. 438-439)

Russian and Middle Eastern groups of investors, sometimes characterized as financially irrational (Scelles et al. 2014), have entered the market in the recent years as well. The claimed financial irrationality might be a brand building strategy before the effects of Financial Fair Play (FFP) come in to play. The FFP is meant to be a regulation that will help the clubs participating in the European Cups to be financially sustainable. Lack of compliance to the rules will, at least officially stated, lead to exclusion of participation or other impairments. One could imagine that some of the owners assert significant control over the sponsorship money the Union of European Football Associations (UEFA) itself is collecting from e.g. the Champions League. In addition, these type of owners have access to some of the best lawyers in the world, which makes the process of placing bans/ restrictions on clubs that violate the rules a long and difficult one.

The recent corruption scandals in the international football association (FIFA) strengthens the argument for use of proper management and governance tools in sport management (*BBC News* 2015). The documentary "Dispatches – How to Buy a Football Club" sheds a light on this dark side of the football industry where a former captain, and at the time global ambassador, for Manchester United Football Club is heavily involved in an underground operation strictly conflicting with regulations from the governing body of association football in England (Sanders 2011).

Where to go

These challenges clearly signal the need for an approach better suited to the sports management as the usual frameworks for corporate governance and strategy is not universally applicable to these organizations. As could be expected, a number of academics have already supplied different models and perspectives supposed to manage these hurdles. (Kartakoullis et al. 2013) claim that football executives need to adopt a more holistic value-based outlook, going beyond purely financial perspectives. Capasso and Rossi (2013) have also taken notice, and focus their analysis on professional football teams because "...this special business

combination provides an evident example of companies whose performance cannot be evaluated considering only financial returns or shareholder value.*"*(p. 218) This is based on the fact that a substantial amount of assets for a professional football club are intangible (players, coaches, fan loyalty, global brand, talent development, scout network efficiency, etc.). They summarize this with: "A professional football team strategy requires a multi-constituency systemic approach to be effectively implemented and to correctly evaluate its performances."(p.216) Woratschek et al. (2014) propose a sport value framework(SVF) based on a service dominant logic developed by Vargo and Lusch (2004):

> *In our view, applying the SVF and considering sport events as platforms for co-creation will lead to new insights in sport management research and practice, as managing a platform (value network) is different from managing a production process (value chain). Therefore, researchers and practitioners should be open to breaking new ground and developing new management approaches.(p. 21)*

As most authors delivers some theoretical frameworks, few actually provide an operational method. The work of this thesis will be to build upon this and develop a method/ modelling simulation to better understand the underlying basis for value creation. As football clubs have many different aspects and perspectives to consider, it would be appropriate to be able to analyze them separately while capturing the causality between them. As Chelladurai (2013) agreeably puts it: "It is also quite satisfying when one is able to bring concepts from far-off fields as an explanatory tool in addressing a problem at hand."(p.22) Using a dynamic balanced scorecard(DBSC) to capture this complexity would be a plausible method. Examples of this is already illustrated by many different authors implementing the DBSC in case studies (Akkermans & Van Oorschot 2005; Barnabè 2011; Bianchi & Montemaggiore 2008; Capelo & Dias 2009). The method/model explained in the thesis will hopefully be applicable to other fields than football clubs, as most sport organizations operate under the same principles.

Problem statement

Develop a dynamic balanced scorecard that demonstrates how the use of system dynamics simulation can enhance long-term strategic management in professional football clubs.

Literature

The following literature reviews, along with basic information of football clubs and the football industry in general, presents the previous work that forms underlying logic and assumptions of the model.

Football-specific information and literature

To make the incentive for including this section clearer, suppose the reader of this paper are to step into the role as managing director, or a position of similar sorts, for a professional football club. The first task assigned by the board of directors involve the development of a computer simulation to guide the club with its strategic choices. Assuming he/she has minimal or no prior experience with the football industry, profound knowledge of every operational aspect is not required, but it is necessary to have a decent overall understanding of the system. This includes the basic structure, decision rules and flows of both information and physical entities. For starters, a football match consist of two football teams playing each other and the team that scores the most goals win, unless there is a draw. These teams compete with other teams in a league system, so a win is awarded with three points while a draw gives one. The winner at the end of the season is the club with the most points. There is eleven players on each team and the manager usually have three available substitutes per match. As different players will be unavailable at some point during each season because of injury and other factors, a manager need a playing squad with more than just 11 players. The football club can get players in two ways. One is from other clubs through buying them out of their existing contracts or signing them on a free transfer if their contract has less than six months remaining. The exclusive right to use players are called player registrations and the value of a player is often calculated based on the fee the club has to pay for this player registration. For professional clubs, the transfer fee is somewhat analogous to an investment in new production equipment. Most top European clubs also have their own junior academies where they develop young promising talents, and this is the other way of getting new players to the squad. As these players have no transfer fee associated with them, there is no cost of capital. However, it should be noted that few of these young players are promoted to the first team. On average, for every 20 aspiring footballers, only one of these make the cut. The manager has the opportunity to make changes to the team during what is referred to as a transfer window. This is when the trading of player occurs between teams. In most leagues, there are two of these. One during off-season and one mid-season. Different leagues have

different rules, but usually a team have to register 25 players accessible to use in matches. Junior players and players below a certain age are usually excluded from this rule.

Like most other organizations, professional football clubs are trying to capture and create value using different business models. Capturing value comes in the form of financial profit while value creation is assumed to be performance that is satisfactory to fans and other major stakeholders. As stakeholders have different interests and views of value constitutions, Slack and Parent (2006) writes about the importance of identifying strategic constituents/ stakeholders in professional basketball organizations and understand their value criteria. Table 1 provides a modified version with stakeholders and their criteria adapted for a professional football club. These criteria display what the different stakeholders find important and could serve as guidelines to identify segments in the football industry that should be taken into consideration when running a football club.

Table 1: Modified table for stakeholder criteria for football clubs (Slack and Parent 2006).

Stakeholders	Criteria
Owners	Profit, increased value of team
Players	Adequate salary, good working conditions
Supporters	Entertaining games, reasonable priced tickets, concessions
Community	Visibility through team activities, economic benefits for local businesses
Media	Newsworthy coaches and players
National Association	Compliance with rules, effort to promote a positive image of the game
Sponsor	Media exposure, high attendance

Senaux (2008) adds another dimension to this in his paper about using a stakeholder approach to football club governance in Europe that, according to him, "seems far more appropriate to analyse fully the complex environment of professional football clubs" (p. 5). He mention that other authors have found two typical attributes for stakeholders: power and legitimacy. They are fairly self-explaining, but nonetheless deserve an explanation. A stakeholder possessing value that is hard to replace for the firm, has leverage to influence decisions if it sees a reason for it. Claimant stakeholders consider themselves entitled to achieve attention so their own objectives can be met. Building on these, he goes on to explain the concept of urgency:

> *Urgency is the level of immediate attention demanded by the stakeholders. It is a combination of time sensitivity and criticality of the claim. Introducing this notion of urgency enables changing a static model into a more dynamic one where time is present, as well as changes in the attributes. It clearly appears that the potential relationship can be as relevant as the actual one. (p. 8)*

Summed up, a stakeholder with the urgency attribute needs attention, and needs it as soon as possible. Table 2 summarizes the set of attributes associated with a stakeholder classification.

Table 2: Table for stakeholder attributes and classification (Senaux 2008).

Types/Attributes	Power	Legitimacy	Urgency
Latent stakeholder:			
Dormant	X		
Discretionary		X	
Demanding			X
Expectant stakeholder:			
Dominant	X	X	
Dependent		X	X
Dangerous	X		X
Definitive stakeholder:	X	X	X

For the owner(s) of a football club, capturing and creating value (e.g. profit and increased value of the team) has significant importance. Certain industries have distinct recipes or ways of achieving this, as McNamara et al. (2013) points out. They draw comparisons between football clubs (or team sports in general), the movie industry, consulting and higher education. Executing strategies in these settings requires extended use of human resources instead of physical. These industries can be categorized as talent-based industries where competitive advantage is dependent on attracting the best talents. They specifically mention that there are four different business model approaches in the English Premiership Football, based on two value-creating resources and capabilities. These are the total talent of a team and the shared team experience being accumulated over time. These four business models and the results of their study can be seen in Figure 4.

		External Market Value of Talent	
		Low	*High*
Internal Accumulated Shared Experience	*Low*	**Business Model 1:** 'B' Team Talent Low Shared Team Experience **Performance Expectations:** Theory • Low value creation • Low value appropriation Results • Low value creation • Moderate value appropriation	**Business Model 4:** 'A' Team Talent Low Shared Team Experience **Performance Expectations:** Theory • Moderate value creation • Low value appropriation Results • Moderate creation • Very low value appropriation
	High	**Business Model 2:** 'B' Team Talent High Shared Team Experience **Performance Expectations:** Theory • Moderate value creation • High value appropriation Results • Low value creation • High value appropriation	**Business Model 3:** 'A' Team Talent High Shared Team Experience **Performance Expectations:** Theory • High value creation • High value appropriation Results • High value creation • High value appropriation

Figure 4: Adapted figure of business model configurations by McNamara et al. (2013). Reprinted with permission.

They deduce that the two stable configurations are business models 2 and 3, as 1 and 4 are intermediate steps towards 2 and 3, respectively. More specific, business model 1 that is based on buying players with lesser talent with low shared team experience will at some point transition to business model 2, because the players will accumulate shared experience by playing together unless they are constantly replaced. The same applies for business model 4, except that the club buys premium talent and the eventual transition to business model 3 could take more time if the players being brought in get replaced before the team gets time to build experience. Therefore, if the owner/ shareholders of the club has less interest in value creation and/or is more risk averse then business model 2 with lower talent presumably gives as good a financial return as business model 3, but with smaller risk. Both of these transitions of the business models indicate a typical worse-before better scenario. The authors measure value creation as league points at the season end, value appropriation as annual profits divided by total annual sales, player talent as player value and firm specific talent (shared team experience) as the average number of actual playing minutes players in the team played with each other. Measuring the progress of these different variables in a professional football club is noticeably dependent on many of the standard financial components in normal companies, while having unique industry-specific characteristics. Regular components in the financial structure of all professional sport organizations are capital employed, operating cash flows, assets and return on capital employed (Kartakoullis et al. 2013). Rossi et al. (2013) claims that the main revenue streams come from ticket and season-tickets, stadium management, sponsorships, merchandising and broadcasting revenues. They also provide six typical costs: wages and salaries, intangible assets depreciation, financial costs, extraordinary expenses, other production costs and other depreciation. Among these, the salary of the players and coaches is by far the largest carrying cost. The main fixed assets are property and player registrations. Property (for example training ground and stadium) are tangible assets with minor difficulties in determining its value, because standard evaluation techniques for these are generally agreed upon. Intangible assets are usually more difficult to evaluate. Because intangible assets make up a substantial part of a football club's assets, this makes valuation of the entire club using a standard method even more challenging. Using a discounted cash flow method does not work very well because of the unpredictable, and often negative, cash flows involved. Consequently, revenue multiples are often used instead (Markham 2013). Forbes has an annual report where they compare the value of the biggest clubs, but their method is not publicly available. Several researchers have tried to develop a reliable valuation model (Markham 2013; Scelles et al. 2014; Vine 2004), as this would

reduce the uncertainties involved in sales of the clubs. The method proposed by Markham (2013) that is based on just five variables can be seen below.

$$Club\ Valuation\ = \frac{(Revenue + Net\ Assets)\ \times \frac{(Net\ Profit + Revenue)}{Revenue} \times (Stadium\ Capacity\%)}{(Wage\ Ratio\ \%)}$$

He explains the rationale behind the revenue figure as:

Revenue generation includes all the cash generated by the club in a financial year. It is extremely important within the football industry and the underpinning factor of UEFA and the EPL's financial controls. A club's revenue figure is added to its net assets as these underpin a club's ability to generate future revenue and consequently make up the backbone of the valuation model. (p.17)

For the wage ratio, he explains that: "Finally, the overall figure is divided by a club's wages to revenue ratio. This illustrates a club's ability to control its major expenditure and the lower the percentage the higher the club's final valuation." *(p.18)*

Scelles et al. (2014) tries to build upon this model by incorporating player valuations, operating income and new ownership. They also mention that club assets including stadium age, supporter numbers and income, club sponsorship type and past performances are variables that also should be taken into consideration as they have a significant impact on the club. Because of the previously mentioned large part of assets being intangible, many may find these methods too simple at first glance. Nonetheless, Kahneman (2011) argues that simple algorithms are often more predictive and accurate than the intuitive judgements from human experts (e.g. brokers).

Another important group of stakeholders are the customers. This group is divided into three parts: the sponsors, media and fans. How these stakeholders perceive the club is the focus of this perspective. Notice that they are also highly dependent upon each other. The sponsors are interested in exposure to potential customers through media coverage of the club. These potential customers, clearly, being football fans watching the club's matches broadcasted or in the stadium. Media companies that buy the rights from the football association to show league matches calculate their bid on the size of the perceived demand for matches broadcasted worldwide. This demand is significantly influenced by the overall attractiveness of the league compared to the individual clubs. Koenigstorfer et al. (2010) finds that the perceived competitive balance of the league is important to maintain a level of perceived attractiveness. Club brand is also a concept that stands central in this discussion of

attractiveness. As the commercial revenue of the top clubs are a big part of total revenues, brand management related to sponsors and fans becomes an important aspect in the strategic management.

According to Solberg and Haugen (2010), the European football industry differs from other industries regarding the trading of players and the consequences this might have. In the language of systems theory, path dependence has led to a pattern where big clubs with massive revenues continuously buy the best players from smaller clubs. In case of financial problems at the top, these problems might end up cascading downwards to the smaller clubs that are used to make a stable revenue out of this trading. Carmichael et al. (2011) also claim that that investment in players' skills will buy success on the pitch, with rich clubs becoming richer and spending more on players than less successful clubs. This makes for a typical feedback loop. They also mention that club revenue in a season mainly come from match day attendance, membership packages, sales of broadcasting rights and sponsorships deals. Likewise, Plumley et al. (2014) adds that on-pitch performance and financial performance are related, although there is uncertainty bounded to what is the cause and what is the effect. Figure 5 illustrates this reinforcing feedback loop.
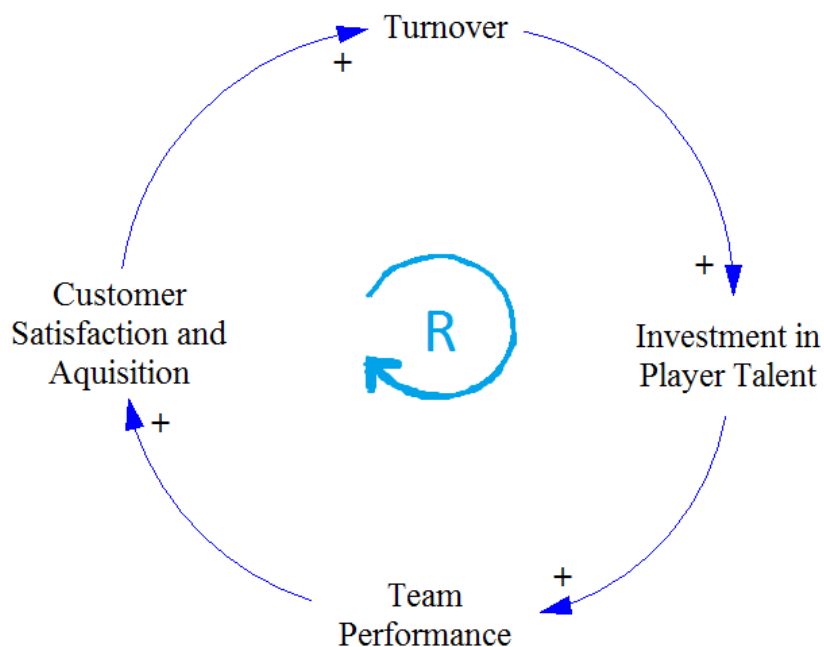

Figure 5: Reinforcing feedback loop in football clubs.

Bryson et al. (2014) finds that correlation between sales of broadcast rights and club payrolls is almost unity. The research was done on Italian clubs, but it is reasonable to expand this and

make the assumption that revenue in general and club payrolls are strongly correlated. That being said, there is a time delay to the causality as player agents take notice of a clubs recent rise in revenue and puts pressure on raising player wages when negotiating new deals.

The balanced scorecard

The balanced scorecard (BSC) is a performance measurement tool developed by Kaplan and Norton (1996) with the intention to give managers a more balanced view of how to effectively manage and implement their strategy. It contains financial and non-financial measures carefully identified as key performance indicators (KPIs). This means that managers are supposedly be able to track their strategy implementation by monitoring this chosen set of indicators. These indicators could be lagging or leading in nature, while a mix of both is to be strived for. The lagging indicators give feedback on the effect of certain causal relationships and are often financial in nature. The leading indicators are usually more obscure or hard to pinpoint as these, if the assumed causality is actually correct, convey the outcome one might expect if the goals of these indicators are achieved. Typical leading indicators is customer base, market size, etc. These indicators usually assumes that increased revenue is a consequence of the firm selling to more customers, while e.g. customer satisfaction contributes to selling more to customers the firm already have.

By default, the traditional BSC has four different perspectives with the *financial* perspective considered the most "important" perspective and can usually be found at the top of strategy maps. It is often described with how shareholders look at the firm. In simpler terms, it contains the financial goals that needs to be fulfilled for the shareholders to be satisfied. The financial perspective is mainly governed by the shareholder's policy for financial structure and the different financial objectives underpinning the strategy.

The next step is the *customer* perspective, or how the firm is viewed by the customers. It is assumed that if the firm can satisfy the customers, they will in turn be able to reach the goals in the financial perspective. This naturally brings up the next perspective; what *internal processes* must be in place in order to deliver a satisfactory customer proposition. The last perspective is then supposed to describe the *growth or innovational* changes the firm need for the identified internal processes to be established.

The BSC usually have about 5 indicators for each perspective, so the total amount of KPIs to be tracked by managers are usually around 15-20. As the BSC gained popularity among managers in the early 2000, Kaplan and Norton further developed it to include a strategy

map, which explicitly draws out the hypothesized causalities between the different perspectives and KPIs. This is enabling managers to better communicate the strategy down the organizational ladder, hopefully leading to better strategy implementation as employees are being made aware of how they are contributing and why they do. The BSC have been a success in management accounting literature and the authors has achieved praise for the modernization of the French tableau de bord. However, the management tool has also received some criticism, as no tool is perfect. The fact that managers can focus on such a few indicators have both upsides and downsides. Managers have to make sure the chosen indicators are in fact representative of performance, because there are many factors influencing the different indicators. Trusting blindly on the chosen few indicators may lead to a strategy implementation that has the characteristics of a train on the wrong tracks. Everything might be on track, but you end up arriving somewhere entirely different from what you had planned. The strategy map have also been on the receiving end of criticism. Norreklit (2000) accuse it of being too one-directional, as the chain of causality only leads upwards. Akkermans and Van Oorschot (2005) also point out that some of the indicators might be interconnected, which could bring about counterintuitive results in the process of implementation in the organization. Further, it fails to account for time delays. These weaknesses combine to illustrate that the BSC is rather static in its nature, but is nonetheless a popular strategy implementation tool for management. As a result of its popularity, literature on measuring financial and non-financial performance in more traditional organizations already exist in large numbers, but sporting specific literature regarding performance indicators are not that abundant. For that reason, one might also expect that existing literature lack some of the quality controls that articles in bigger academic journals achieve before publication. It is also worth mentioning that the BSC is not able to answer the question of what the competitors are doing, which is hugely important in the business world. That being said, the founders of the BSC actually propose the use of system dynamics simulation to enhance its usefulness (Kaplan & Norton 1996).

System dynamics

Jay Forrester, considered to be the father of system dynamics, has the following definition of system dynamics (Forrester 1999):

> "*System dynamics* is a professional field that deals with the complexity of systems. System dynamics is the necessary foundation underlying effective thinking about systems. System dynamics deals with how things change through time, which covers most of what most people find important. System dynamics involves interpreting real life systems into computer simulation models that allow one to see how the structure and decision-making policies in a system create its behavior."*(p.1)*

By creating simulation models one can gain insight into what is considered by Richmond (1997) to be the holiest of grails: high-leverage intervention points. These are places in a system where policy changes have the best chance of changing the state of the system towards a desired state. Meadows (1999) list places to intervene in a system in the following descending order of leverage:

1. The power to transcend paradigms
2. The mindset or paradigm out of which the system arises
3. The goals of a system
4. The power to add, change, evolve, or self-organize system structure
5. The rules of the system
6. The structure of information flows
7. The gain around driving positive feedback loops
8. The strength of negative feedback loops, relative to the impacts they are trying to correct against
9. The length of delays, relative to the rate of system changes
10. The structure of material stocks and flows and nodes of intersection
11. The sizes of buffers and other stabilizing stocks, relative to their flows
12. Constants, parameters, numbers

It is difficult not seeing some similarities between KPIs and leverage points. Both has the purpose of shifting a system from one state to another using some set of chosen variables deemed important in the system. Taking advantage of this knowledge, a manager might see that the third most powerful leverage point is the goals of the system and make sure these

align with the chosen KPIs such that policy changes have the greatest chance of changing the system towards the desired state.

A dynamic balanced scorecard

As introduced earlier, there is already a number of articles describing case studies of the development of a so-called 'dynamic balanced scorecard' using system dynamics simulation. Akkermans and Van Oorschot (2005) finds that use of simulation modelling was a good way to figure out the importance of time delays and accumulations, as well as testing the relevance of the chosen performance indicators. In most organizations, managers must handle these dynamic problems related to strategy development and the performance measurement associated with it. Using the concept of stocks and flows from system dynamics, Warren (1999b) presents a framework he calls a dynamic resource-system view (DRSV). The basic steps of applying this framework to practical cases being as follows:

- Clearly state the time-horizon associated with the firm's different strategic challenges
- Find the strategic resources the firm need to develop, defend and connect in order to get a competitive advantage.
- Of the aforementioned resources, pick out 3-4 tangible resources considered most important.
- For each of these tangibles, figure out what is influencing the flows in and out of the stock.
- After building a map of this system, identify the key decision-levers in it.

This apparently integrate well with the BSC and concept of leverage points, as the recurrent theme is on identifying and developing key resources/performance indicators (or whatever the academics of tomorrow end up calling it). As previously mentioned, the BSC is unable to capture what the competitors are doing. However, in a second article Warren (1999a) explains how the dynamics of rivalry can be captured using the DRBV. Because resources are finite, the firm can attain and develop its resources by ways of capturing potential resources before their competitors, or steal them if the competitors have already captured them. The tangible resources are obvious and somewhat straightforward to include and model, but many would argue that intangible resources would be correspondingly important for a firm's performance. In a similar article, Morecroft (1999) states that: "If we could understand more about all these tangibles and intangibles, -how they fit together, how they co-evolve over time, -then we would be in a better position to steer the firm along a sustainable growth path."(p.26)

In the third and last article in the series, Warren (2000) discusses how to measure and capture the dynamics of intangible resources and capabilities, based on the impression that intangible resources are often overlooked in strategic plans because they are perceived as undetectable, unmeasurable and/or unmanageable. To better illustrate the importance of the concepts, Table 3 show examples of intangible resources and how to measure and quantify them.

Table 3: Adapted table from Warren (2000) with examples on intangible resources. Reprinted with permission.

	Morale	**Reputation**	**Product functionality**
Measure	By survey	By survey	Fraction of user-needs met
Scale	0 to 1.0	0 to 1.0	0 to 1.0
Inflow drivers	Firm performance	Marketing	Product development
Outflow drivers	Work pressure	Service quality	Obsolescence

He divides intangible resources into two broad categories. The first regard the characteristics or "attributes" that is associated with a specific tangible resource. These associations, along with some self-produced industry-specific football examples, are represented in Table 4.

Table 4: Adapted table for tangible resources with associated examples of intangible resources (Warren 2000). Reprinted with permission.

Sectors	**Tangible resource**	**Associated intangible attribute resource**	**Useful measure**
Telecoms	Subscribers	- Subscriber quality	- Call volume: minutes/month
Retailing	Site locations	- Site quality	- Passing pedestrian traffic
Banking	Loans	- Size of loans	- Value € '000
Football	Players	- Player talent	- Wages per year
Football	Fans	- Fan quality	- Average retail consumption

The second type of intangible resources is what he calls indirect resources, which reflect e.g. customer's feelings or expectations about product quality. A change in an indirect resource may then lead to changes in flows of other strategic tangible resources.

Table 5: Adapted table of indirect resources from Warren (2000). Reprinted with permission.

Indirect resource	Changes driven by (for example)	Other resources flows affected by this indirect resource
Staff morale	- Work pressure	- Staff attrition
Reputation with customers	- Perceived product quality	- Customer acquisition
Investor support	- Financial performance vs. expectation	- Investment rate
Fan satisfaction	- Team performance vs. expectation	- Match-day revenue

Quality and reputation are important special cases, as can be seen in how customers respond to a change in perceived reputation or if their expectations are different from the actual quality of the product. Notice that acquisition of potential customers is affected by the perceived reputation/ quality of the product and not the actual state. This makes the awareness of time delays in perceived and actual states particularly important in these settings. Warren (2000) goes on to introduce the concept of capabilities in the context of these strategic resources: "Capability – the relative rate at which the firm is able to build a specific strategic resource, for any given availability of the other resources needed for that task."(p.54) This means that capabilities are what makes the firm able to accumulate and maintain their strategic resources, relative to external or internal benchmarks. If customers is a tangible resource, building on the previous example, then an associated capability would definitely be selling. A firm with a strong sales department compared to external benchmarks would then indicate a strong capability for customer accumulation.

Model development

Chelladurai (2013) has long tenure in the field of theorizing in sport management and his scholarly work is triggered by gaps or apparent insufficiencies in a topic. The work is then either a synthesis of existing perspectives or a reconciliation of opposing approaches. The method developed in this thesis will be more analogous to the former of the two. It will synthesize different topics based on previous research, but incorporated within a system dynamics framework considered great at gaining understanding of complex systems. Using system dynamic tools to map and simulate the relationship between the chosen important variables is thought to give managers the opportunity to expand their mental models. In his book about business dynamics Sterman (2000) recommend a method for development of system dynamics models. Consequently, the succeeding section is a modified version of his framework.

Problem articulation

It seems like excellent financial results for shareholders and superior sporting performance is not simultaneously achievable for top European clubs. The model will base itself on a typical club in the BPL, because of the extensive amount of data available from it compared to the other big European leagues. FFP also imply that new owners with plans to inject capital/ cash into the club needs to provide a business plan for how they are supposed to get their return on capital from future cash flows. As the BSC is intended to be a strategy implementation tool, the model should be developed with an explicit strategy in mind. This will hopefully make decisions regarding boundaries clearer. When doing this, it is necessary to remember that mostly elements of the organization the board has influence over, endogenous variables, should be included (Richmond 1997). From the modeller's perspective, it is equally important to figure out which variables that ought to be included as exogenous as well as those to be excluded entirely. This essentially means that there is a trade-off between breadth and depth in the model.

The two apparent strategies that, at least on paper, seem reasonable to consider in professional football clubs consist of the two stable business model configurations mentioned earlier. They will be restated for the non-observant reader, but with additional explanations and assumptions in reverence of the observant one. Business model 3, hereby the A strategy, focus on buying expensive star players with massive talent to outperform the other clubs. This will in turn lead to better attendance at games, merchandize sales, etc. after an initial

period of rebuilding the squad. The assumed outcome of this was superior financial performance. Business model 2, hereby the B strategy, based itself on buying cheaper players with less talent. Because of the diminishing performance higher wages gives, this strategy offered decent financial performance as well. Different strategic themes and goals under these strategies bring about the identification of different KPIs and require that certain aspects and areas need more attention. For example, indicators for growth of fan base and revenue are expected to get more emphasis in strategy A. In a scenario where the club decides to invest heavily in tangible assets (e.g. new stadium, training facilities) a sustain strategy would give greater emphasis to e.g. debt ratios and cash flow.

The A strategy is chosen, as this is the most relevant scenario to explore taking into consideration FFP and the amount of foreign investors in BPL. There are key variables and concepts that needs to be addressed, and introduces the following step in the modelling process. To make the identification of important variables and perspectives easier, this section starts with a stakeholder analysis described in the literature above (Senaux 2008).

Stakeholder analysis

Shareholders:
This stakeholder group is perceivably the most obvious one. Not only do the shareholders have a legitimate claim on the club, but they also have the power to affect decisions of the board because they own a share of the club's capital. The shareholders needs constant attention, which makes this group a definitive stakeholder.

Players/ agent:
Because of the bloated demand for players, they possess a great deal of leverage in contract negotiations with the club. To achieve their objectives, which is usually higher wages, they can either sit out their contract to achieve higher wages in another club or let their agents start "rumor mills" in the media. Agents could be a stakeholder group of their own, but in this paper they are assumed to have interests equal to that of players. The club's players also have legitimacy, because of their central part in the organization. Many players spend their entire career in one club, (although quite rare these days) hoping to win trophies with the club they love. Players getting dissatisfied could negatively affect the team morale and therefore need a watchful eye by the manager. Consequently, this stakeholders group is also definitive.

Media:

The description of media covers the media companies that distributes the broadcasted matches, as well as social media and news companies. This group of stakeholders could also be separated into several parts, but it seems to add little value to the overall usability of the model to do so. Media are naturally interested in newsworthy teams and players. Usually these are star players and/ or big clubs with millions of followers worldwide. Providing coverage on these clubs are guaranteed to attract many viewers, which is important to increase the money that can be made from broadcasting deals. Given the steep growth for broadcasted matches, broadcasting revenue represent a considerable fraction of income for the clubs. Being media companies, the legitimacy attribute is by definition obvious for this group. Although this stakeholder have extensive leverage over the clubs because of the amount of revenue, the real driver of this revenue is the fans. It is therefore hard to characterize media as a definitive stakeholder, but they have to be recognized as very dominant considering the uninterrupted stream of news and the short time it takes for news to spread online.

National football association:

This stakeholder represent all the teams in the league and is understandably a group with much influence over the individual clubs. The legitimacy attribute is also a natural consequence of this embodiment. It governs the sale of TV-rights and how the share of this are to be distributed between the clubs, so league attractiveness through competitive matches becomes an important objective for this group in order to increase demand for televised games. Clearly, there is little need for urgency when dealing with this stakeholder, so it ends up with the classification as a typical dominant stakeholder.

Sponsors:

Sponsors and sponsorship deals represented in the football industry are getting larger by the year. Their objectives mainly consist of exposure to football fans watching games on TV and live in stadiums. The rising value of kit sponsorships is a testament to this. This also gives sponsors the power attribute because of the large amount of money involved. As the club they sponsor will be somewhat associated with their own brand, reputation of the club is also a factor that sponsors have focus on. Although this is a legitimacy attribute, it is interpreted as a potential attribute. Sponsorship deals are usually long-term, indicating little urgency. The aforementioned aspects would initially position sponsors as dormant stakeholders, but are

classified as semi-dominant because of their legitimate claim to represent clubs with a non-negative reputation.

Fans:

Unsurprisingly, fans want their team to maximize sporting performance subject to the club's financial constraints. Additionally, they want to watch their team's matches without feeling that they are paying for overpriced tickets. Entertaining games and/ or star players contribute to reduce this emotion, while higher ticket prices increases it. Being responsible for a large amount of the club's income through both ticket revenue and retail sales, fans are potentially a very powerful stakeholder group if their objectives are sidelined for a longer period of time. Examples of disgruntled fans can be seen in stadiums and on social media almost daily. They might complain about expensive ticket prices one day, while lack of ambition is the cause of frustration the next. Either way, fans need a watchful eye from the club. Because of this, they receive a classification as a semi-definitive type.

Local society/ authorities:

The only attribute this stakeholder usually possess is their legitimacy. They have little power to influence the club and does not need immediate attention. For football clubs, helping the local society could be a way to improve their reputation and give back to their local fans. Thus, this group is a discretionary stakeholder.

The results of the stakeholder analysis are summarized in Table 6.

Table 6: Results of stakeholder analysis.

	Power	*Legitimacy*	*Urgency*	*Type*	*Objectives*
Shareholders	Yes	Yes	Yes	Definitive	Increased value of club, superior sporting and financial performance
Players	Yes	Yes	Yes	Definitive	Higher wages, sporting success, good training environment
Media	Yes	Yes	Depends	Very Dominant	Newsworthy teams and players, demand for broadcasted matches,

	Power	*Legitimacy*	*Urgency*	*Type*	*Objectives*
National association	Yes	Yes	No	Dominant	League attractiveness, balanced competition, compliance of rules
Sponsors	Yes	Potentially	No	Semi-dominant	Exposure on TV and live matches, club attractiveness
Fans	Yes	Yes	(Yes)	Semi-definitive	Sporting success, reasonable ticket prizes, good players
Local society/ authorities	No	Yes	No	Discretionary	Economic benefit for local businesses, visibility to tourists

The next step combines the objectives of the most important stakeholders to find suitable perspectives for the BSC and identify initial key performance indicators assumed important for the chosen strategy. It seems appropriate to group the fans, media and sponsors into a shared customer perspective, as each provide substantial revenue streams into the club while they are also quite dependent on each other. Players are mainly responsible for generating this revenue and shareholders will receive return on invested capital because of it. As these two groups is also definitive stakeholders, it seems suitable to base a perspective on each of them. The last perspective provide an infrastructure that assist the other perspectives to realise most of their main objectives.

Objectives for the financial perspective is to grow the club while delivering excellent sporting performance. This is hypothesized to increase the value of the club and satisfy the shareholders and annual revenue growth is therefore identified as a key indicator. As described above, the three main sources of income is ticket sales, commercial revenue and broadcasting money. For the club to achieve the financial goals it needs to identify the main drivers of these streams. Growing the fan base is an important step, while also increasing the attractiveness of the club to improve the quality of the sponsorship deals. Both of these are dependent on each other as well as outstanding team performance to increase relative to

competing teams, which is naturally the main objective of the sporting perspective. A lagging indicator of how well the team is performing is the league placement while the quality of players in the club is the number one predictor of team performance. League placement and relative player wages (leading indicator) is therefore two key performance indicators for the sporting perspective. These three perspectives preserve important stakeholder objectives while progressing towards the overarching strategy. The last perspective will have focus on the recruitment and growth of players. Wage to turnover ratio keeps track of how much the club actually reinvests in player talent while level of shared team experience gives leading indications of how well the team play together. Figure 6 provides an illustration of how a standard BSC dashboard could look with the assumed KPI's.
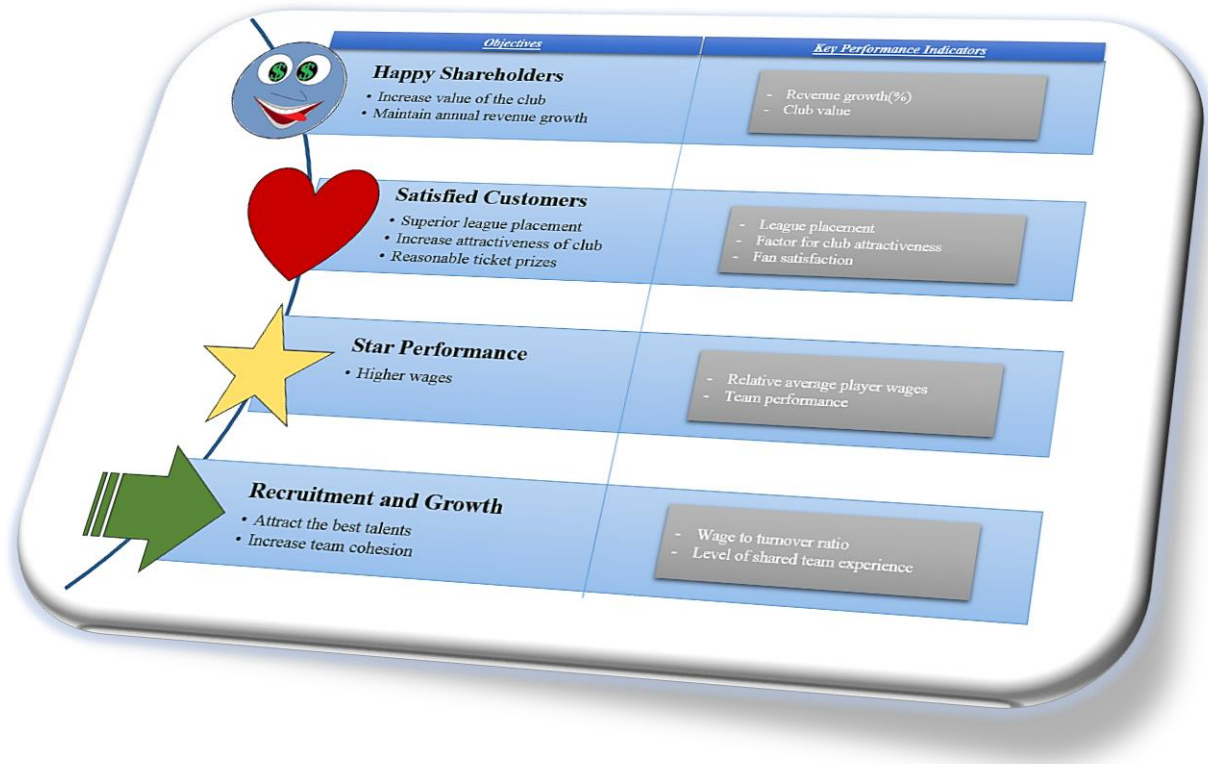

Figure 6: Example of a BSC dashboard.

As pointed out earlier, one of the weaknesses of the BSC is its rather static nature. That is, the causal relationships in the strategy map are usually depicted in one direction without feedback. Figure 7 illustrates this "static" strategy map if the club were to end the strategy process at this stage of the process.
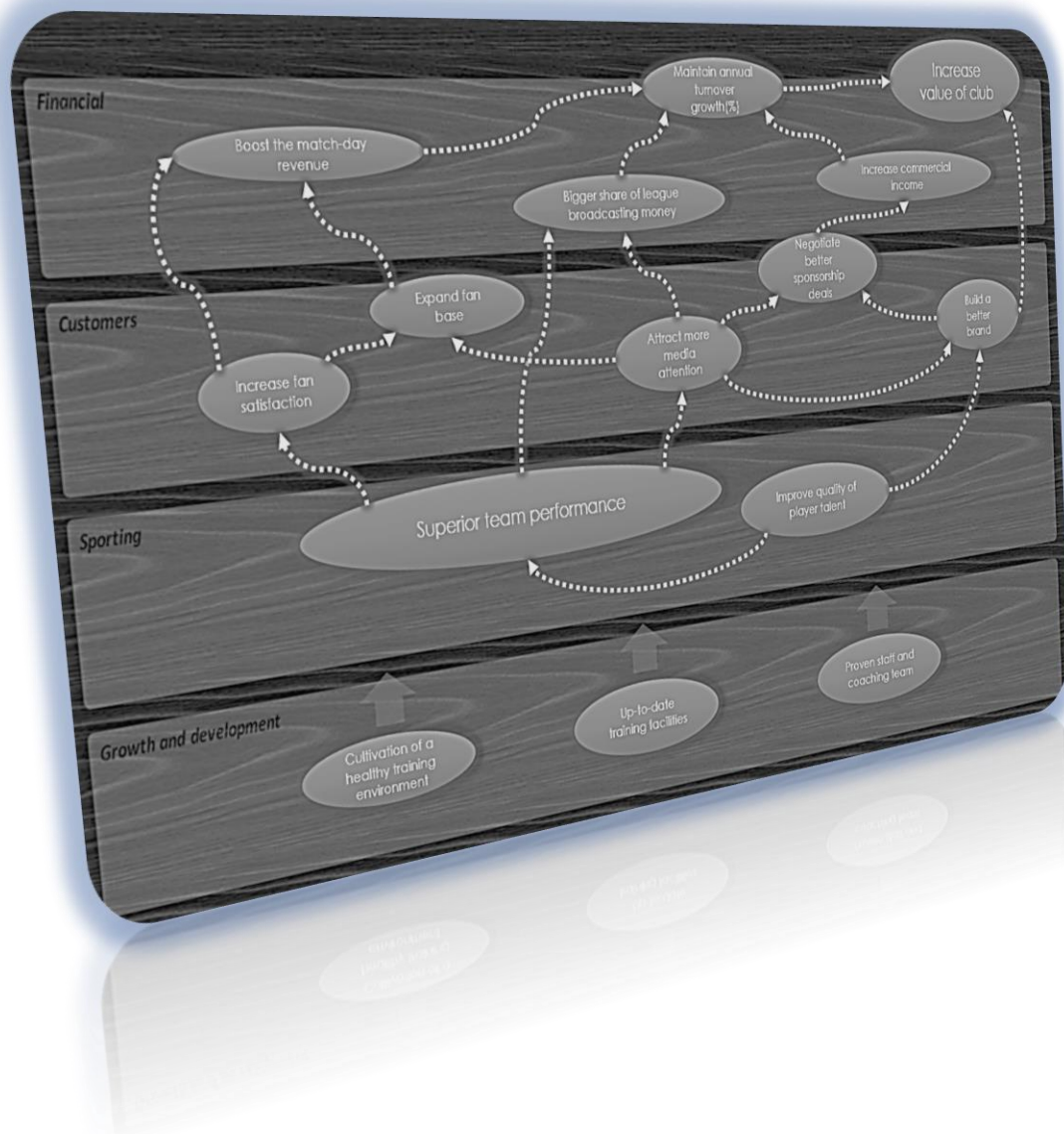
Figure 7: Example of a BSC strategy map.

Dynamic problem definition

Having developed an initial BSC, and recognized its inherent weaknesses, it follows naturally that the succeeding steps consist of investigating historical behavior of important variables and consider how their potential future development could affect the club. For behavior to be observable, the model should backtrack at least 15 year or longer. This enables comparison of the model to annual reports from football clubs or information based on periodicals regarding financial performance of football clubs. In order to observe different policy changes, an initial estimate for the length of the future strategic time horizon in the simulation was 10-15 years. Consequently, because estimates are in most cases wrong, the chosen time horizon for simulation is set to 20-25 years. As can be seen from Figure 8, the average player wages in

the BPL have risen proportionally with the increase in league broadcasting revenue (*BPL* 2015).
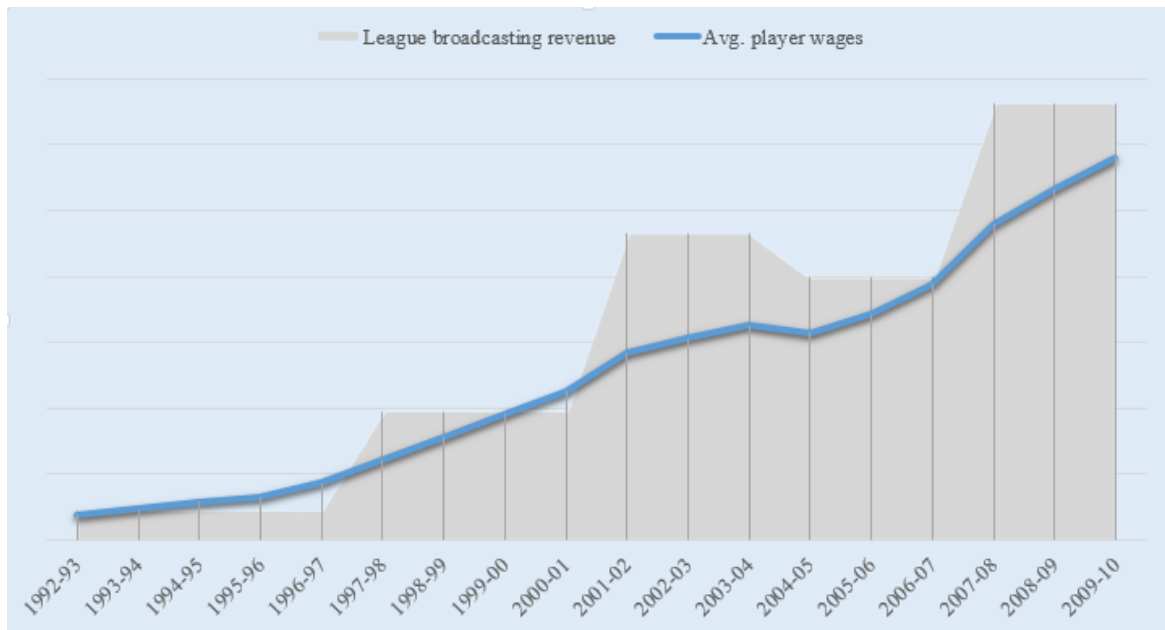

Figure 8: Historical average player wages and league broadcasting revenue. See appendix for details.

As the growth in demand eventually diminishes while competition for player talent is greater than ever, clubs need to ask themselves the important question of how they plan to compete at the top level if they are too dependent on broadcasting revenue. Figure 9 provide an illustration of the relative interest in BPL compared to interest in football worldwide in 2011/12 (*BPL* 2012).
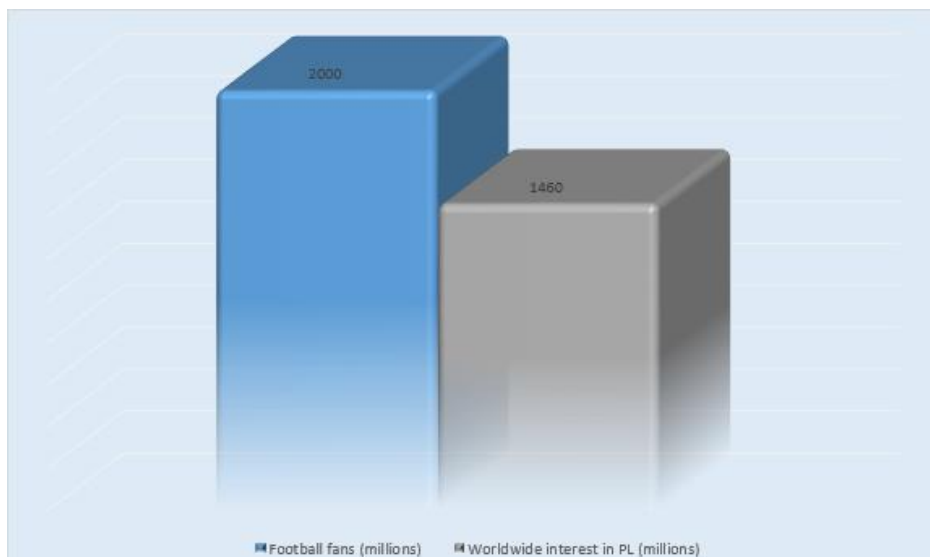

Figure 9: Adapted figure of relative interest in PL vs Worldwide. See appendix for more details.

One can also see that the average stadium utilisation, described as occupancy (*BPL* 2014), have slowly increased towards 95% during the last 20 years. This means that clubs will find it difficult to significantly develop their match-day income without drastically raising ticket prizes or expanding capacity. How capable the club is at bringing in ancillary revenue from the fans already going to matches is emerging as potential candidate for this.
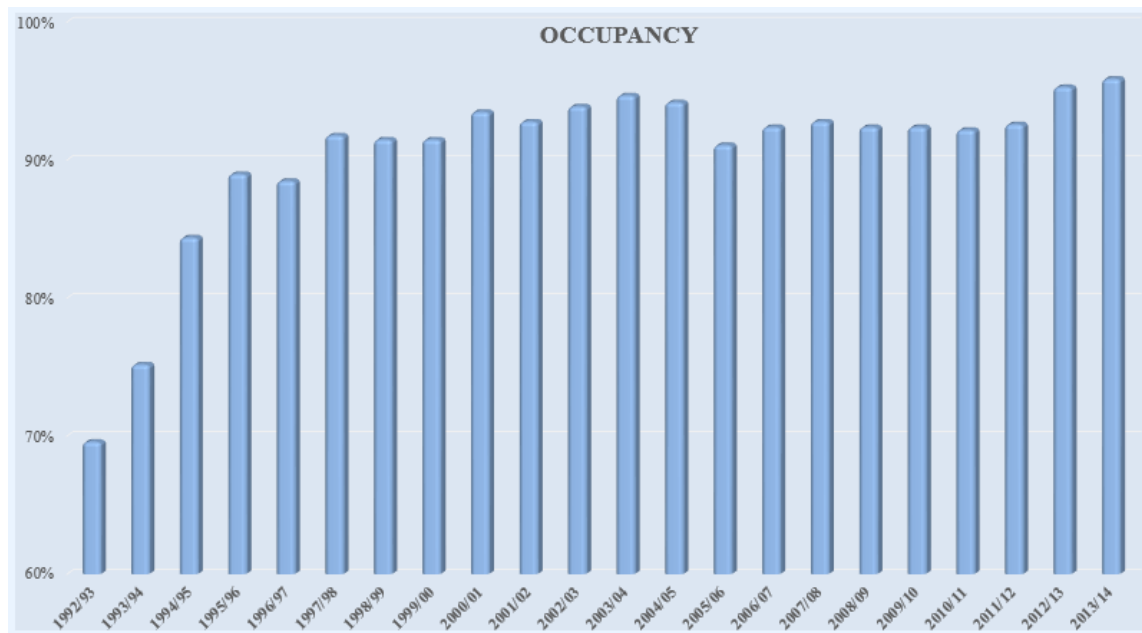

Figure 10: Adapted figure of average stadium occupancy in the BPL during the last 20 years (BPL 2014).

Formulation of dynamic hypothesis

Recall that, from the theories described in the introduction, most clubs cannot compete at the highest level while being financially profitable because of the overpayment for star players. As can be seen from the causal loop diagram in Figure 11, the three main feedback loops generating revenue are positive. As long as the revenue generated from league attractiveness increases, because of the increased competition, Figure 12 illustrates that the wage level of individual clubs will increase along with it.
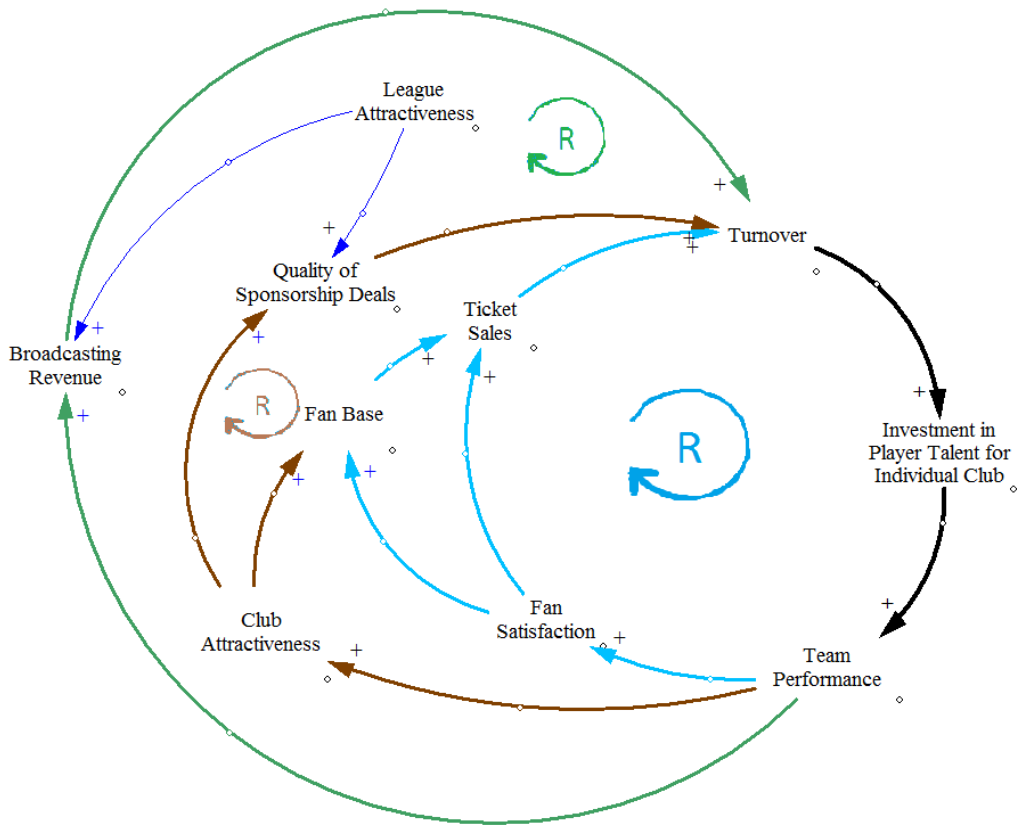
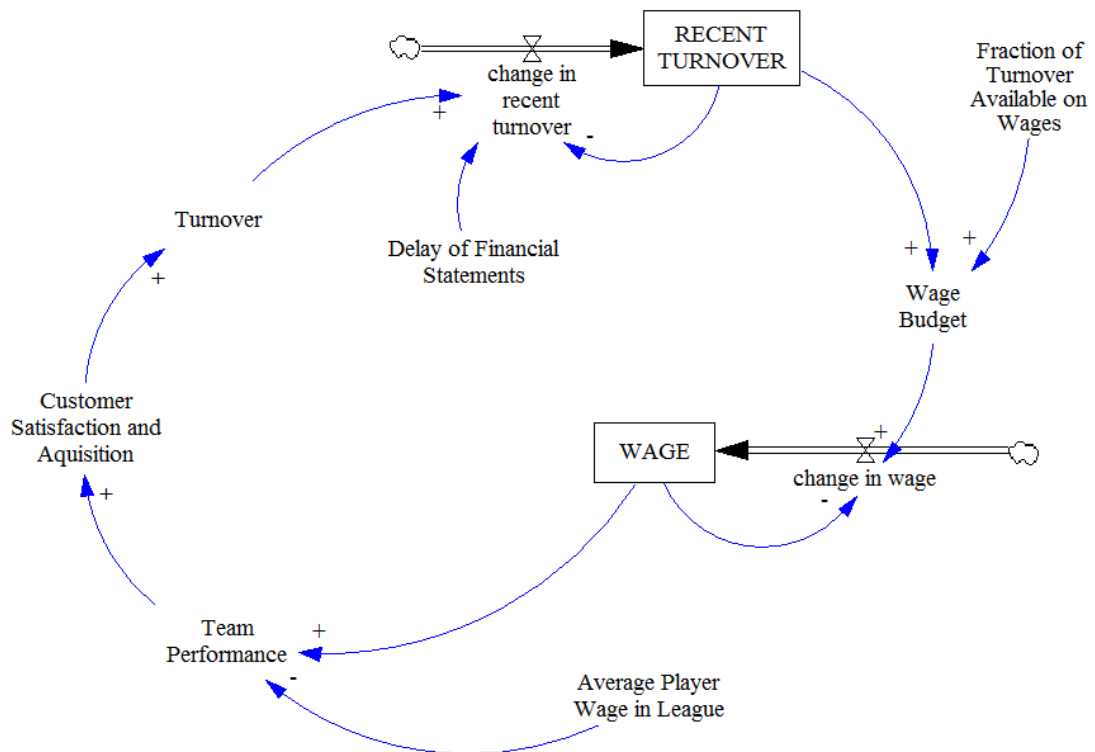*Figure 11: Causal loop diagram of dynamic hypothesis for individual club behavior.*

Figure 12: Stock and flow map of player investments in individual clubs.

Development of a simulation model

As all models by definition are wrong, the following section provides thoughts and reflections on estimation of model structure, behavioural relationships and decision-making. An important task will therefore be to find a balance between endogenous and exogenous variables that come in to question when making the model. These findings are summarized in a model boundary chart while the full model structure and its documentation are found in the appendix.

As have previously been established, the league placement is mainly dependent on the wage bill relative to the other clubs in the league, but there are also other factors affecting the outcome of this. How much experience the team have playing together, support of the fans, team morale, injuries on star players is important to consider as well. Of these, the relative wage of players and team experience are the only variables that influence team performance. The fractional improvement in performance relative to changes in wages of players is not proportional, which implies that the effect of average player wages on team performance is diminishing as wages increase.

On top of this, random factors affect the outcome of matches, and sometimes entire seasons, which makes a prediction of a team's league placement based only on tangible, quantified factors futile. Leicester City and Chelsea FC represent a perfect example of this. Last year, the newly crowned league champions of the 2015/16 season, Leicester City ended up as number 14 in the league, while the champions, Chelsea, ended up as number 10 this season (BPL 2015). The best perceived way to model this would be to add a random deviation to the league placement the model produces, but this is not included as these deviations will smooth out over the years.

Club supporters are assumed to be loyal to the club and not change their support to another competing club, given that the club performs within realistic expectations, as football fans are far more loyal customers compared to other industries.

League attractiveness have substantial impact on the total broadcasting revenue the league itself can generate. For the BPL, the broadcasting revenue is very evenly distributed, but the percentage differs somewhat from the top and bottom clubs based on team performance and the number of their matches being televised. The number of televised matches is to team performance is throughout and at the end of the season.

Commercial revenue is affected by the attractiveness of the league and club. Negotiating skills stand central in this segment, but it is assumed that the effect of these are somewhat small relative to the actual impact of the fan base, media coverage and so on.

Match-day revenue is usually affected by the global and local fan base, as well as the actual population in the nearby region. For example, the adjustment of ticket prizes will affect the long-term demand for tickets.

Broadcasting deals are usually three years in length and divided into equal payments to be distributed between the teams over this period. In the model, the size of these deals is influenced by league attractiveness, which makes it indirectly exogenous. The percentage of broadcasting money to be shared equally between the clubs in the league is based on calculations on BPL data, which is found in the appendix. The rest of the total broadcasting money is divided equally between merit payments and facility payments. The amount of revenue merit payments a club receives is dependent on its league position at season end, while facility payments is proportional to the number of televised matches of the team. Televised matches of a team club is obviously affected by the performance, but also of the club attractiveness. Attractiveness is based on how big the club's fan base is relative to the total football fans interested in the league.

The table of expected ticket price is based on the assumption that fans, being as loyal as they are, are less sensitive to minor increases in the ticket price relative to their expected ticket price. The expected ticket price itself is usually a function of many of the variables influencing the attractiveness of the club as well as the average ticket price for the other teams in the league. In the model it is assumed exogenous.

In the section of player transfers, the aim have been to give an overview of the aggregated flow of players. The manager obviously have information of a player decides to see out his contract, before he officially leaves the club. This makes the manager able to prepare potential transfer targets before the out-of-contract player leaves. The players out of contract is basically a function of the players coming in, with the average contract duration as a third order information delay because some players leave early while other stay longer. Agreeing contract extensions with players are included in this assumption. The concept of selling players is here assumed to be dependent of the club's transfer policy.

The trading of players and the entailing cash flows involved is obviously a big part of the financial management of football clubs. Player transfers between clubs in the same league

obviously affect the competitive balance within it. A question will be if the model should include the feedback of performance from other clubs through the trading of players, but this seem somewhat beyond the scope of this paper. The rivalry and competiveness of a league is actually critical to how attractive the league is and how it can compete with other leagues, so it should definitively be a topic for further research.

Another issue arises when considering how to take into consideration the different *transfer fees*. Acknowledging that the fee the club pays for a player is important with regard to the balance sheet, as the evaluation of intangible assets are based on this. *Depreciation and taxes* follow as a subject for discussion, as these are very important in the financial management of every professional club with substantial expenditures on these intangible player registrations. A detailed modelling of these elements is omitted because it adds too little value in the analysis of the long-term dynamic problem.

The prospect of *increasing stadium capacity* or building new stadiums is not included in the model, but is interesting to include in a potential improved model.

Most professional football clubs in the top European leagues have their own junior academies. As the players come through the ranks they do not cost the club anything except their wages. The issue will be to decide whether a detailed modelling of youth academies, scout networks and other youth related activities are beneficial for the overall usability of the model. Players developed "in-house" will not be listed in the accounting books, but clearly contribute to team performance.

How much detail should be emphasized for club staff is another thing to consider. Managers, coaches, medical personnel, administrative, etc. clearly contribute to how the club perform. However, this is assumed to be highly related to their pay. The change of managers when the club is having bad spells of performance is also argued to have minimal actual long term effects (De Paola & Scoppa 2011; Kern & Süssmuth 2005), which is why the concept of changing managers are ignored in the model.

External payments is fixed as constant fifteen percentage of the total broadcasting money. Parachute payments distributed over a couple of years to clubs that get demoted is included in these. External payments is overlooked in the model because the concept of demotion is ignored.

Table 7: Model boundary chart.

Endogenous	Exogenous	Excluded
League placement	Average player wage in league	Junior players
Player wages	Size of broadcasting deals	Transfer fees
Fan satisfaction	Global football fans	Stadium expansion
Change in recent turnover	League attractiveness	Depreciation and taxes
Value of club	Stadium expenses	Scout networks
Fan base	Staff wages	Demotion
Match-day income	Expected ticket price	Inflation
Commercial revenue		Hiring/ firing of managers
Broadcasting payments		Debt financing
Shared team experience		Participation in European Cups

To provide some insight about the flow of information and people, the following summary highlights relevant activity in different frames of time.

Per week:

Players usually come to the training grounds twice a day. E.g. one football session and one conditioning session. In the weekend's they play matches.

Per month:

Usually around four matches per month. At this stage, trends and/or changes in information flows (fan satisfaction, media publicity, player morale, etc.) becomes visible. This can start to affect the average attendance of games, club attractiveness or team performance if the rates of flow stay unchanged for a while. This will in turn feedback into the flow of information to make a positive feedback loop.

Per year:

From this point of view, flows of players in and out of the club will start to emerge as a noticeable pattern. As club and player usually start to renegotiate contracts before it runs out, managers will get good indications if a player will leave the club before the contract ends. To replace or make improvements to the playing squad, the club has scouts to identify players that has the preferred qualities and add them to a list of transfer targets. This list acts as a buffer and makes the task of having the right amount of players for each season easier. In addition, if the club wants to invest in many new and better players they have to sell or make sure they can pay out the contract of the players already in the club.

Testing

According to Sterman (2000), "model testing should be a process of controlled experimentation."(p. 716) If both the modeler and client are to achieve better confidence in the model, and the results it produces, testing is an essential part of every model development process. Before starting different tests, the model should initially be in a balanced equilibrium. This means that stocks remain unchanged for the entire simulation period and is only possible when the flows into the stock is exactly equal to the flows out of it, making the net flow equal to zero. A goal seeking feedback loop in equilibrium will have stocks equal to their desired values. It is also advisable to find algebraic expressions for the initial condition based on other variables and parameters such that the model always start in equilibrium regardless of the input. After this, one can test the model by applying different shocks to push the model out of equilibrium to see how it behaves.

Looking back on the process, the actual development went gradually over to what Warren (2014) describes as agile system dynamics. The process is explained in Figure 13
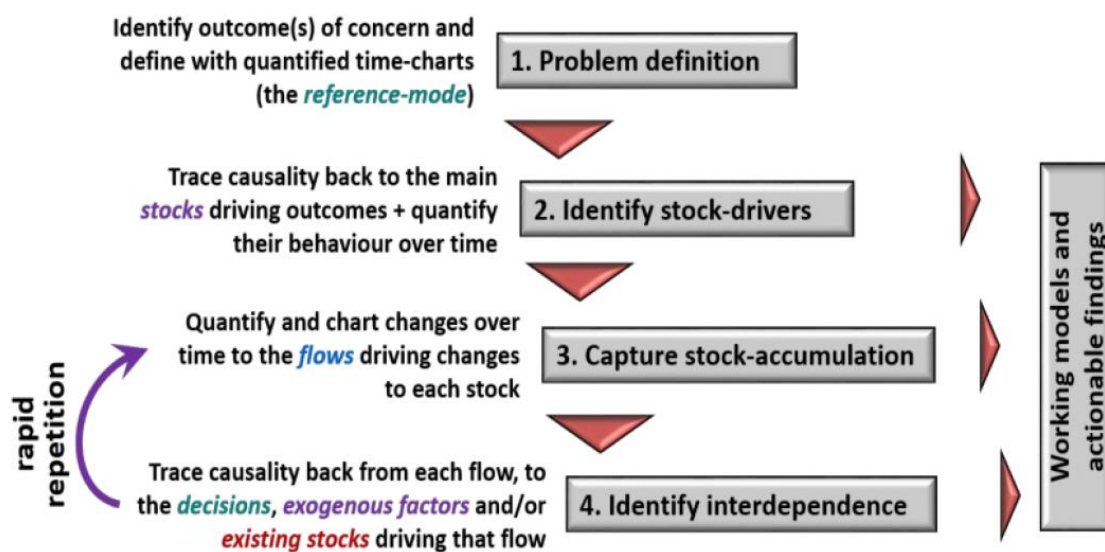

Figure 13: An agile model development process from Warren (2014:8). Reprinted with permission.

Results/ Policy design and evaluation

Figure 14 shows a base run of the simulator dashboard. The dark blue box contain variables regarding investment policies while the light blue have variables relating to wage policy. The variables in the gray box are exogenous to analyze the outcome of different scenarios based on changes in these.

Figure 14: Simulator dashboard.

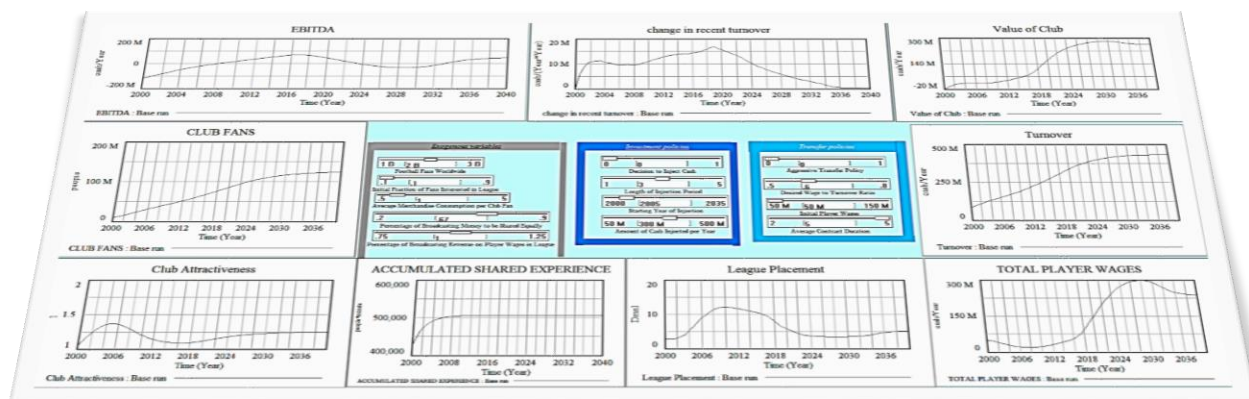## Cash injection

Figure 15 show a closer inspection of the variables related to an investment policy.
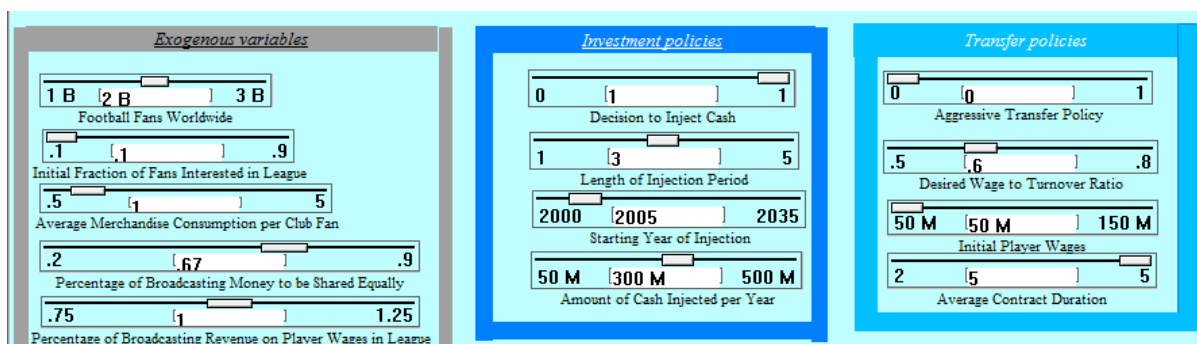
Figure 15: Variables related to investment policy.

The results of this policy and the comparison to the base run is seen in Figure 16. They show that an early investment initially increases league placement compared to the base run, along with a permanent increase in fan base and club value.
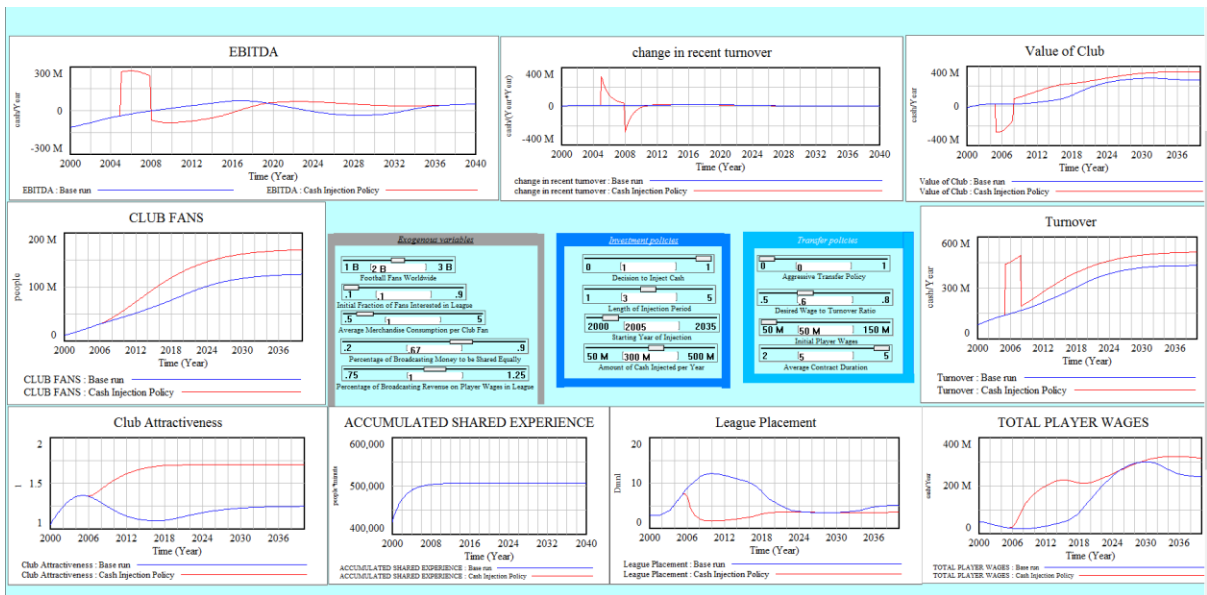
Figure 16: Dashboard results of investment policy.

Aggressive transfer policy during cash injection

Figure 17 outputs the results of having an aggressive transfer policy during the investment period. This mean that while the average player wages in the club is lower than that of new players, additional players are sold to make room for these new players and the effect of this is visible from the level of accumulated shared experience.
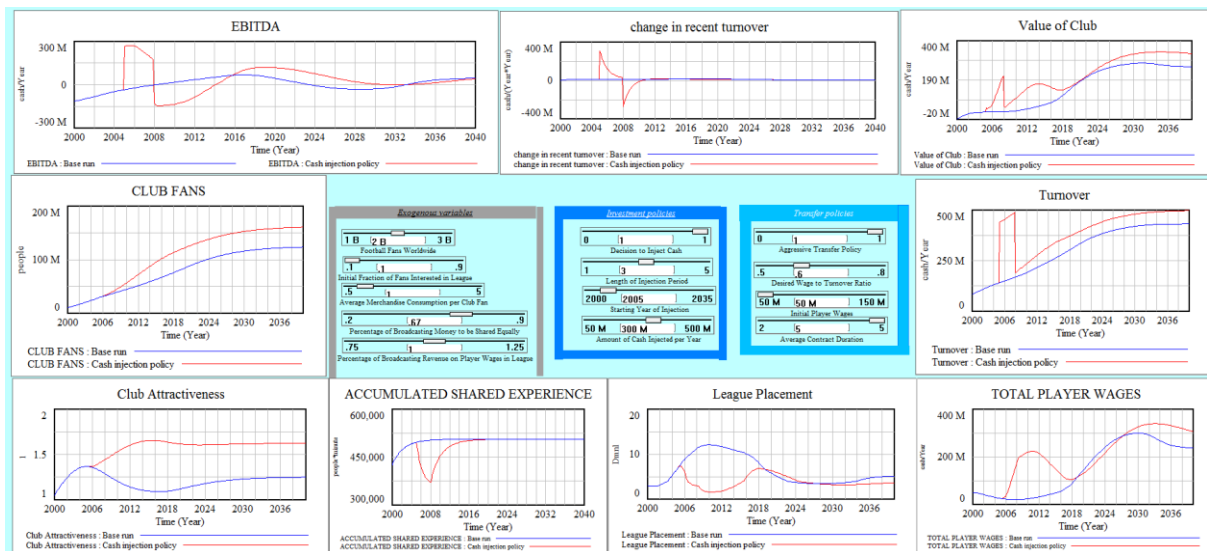
Figure 17: Dashboard results of aggressive transfer policy.

Wage policy

Interestingly, and possibly confirming that individual hopes of increased revenue raises competition, Figure 18 display the effects of raising the ratio of wages to turnover from 0.6 to 0.8.
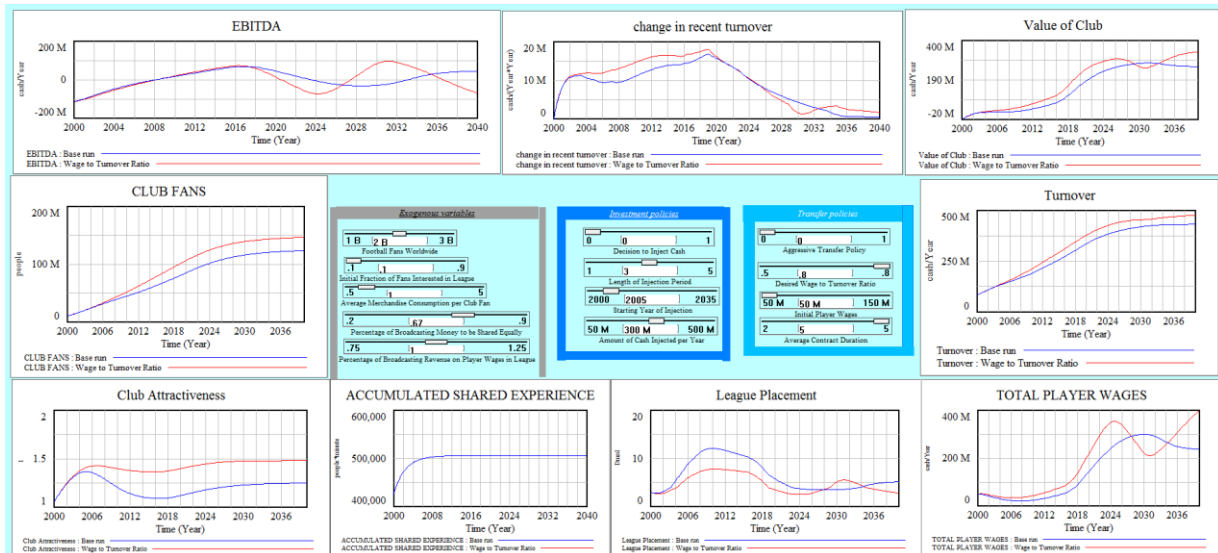
Figure 18: Results of changes in wage policy.

Example of scenario analysis

Figure 19 show how much the baseline is improved if the club somehow manages to improve the average merchandise consumption per fan from 1 to 1.5.
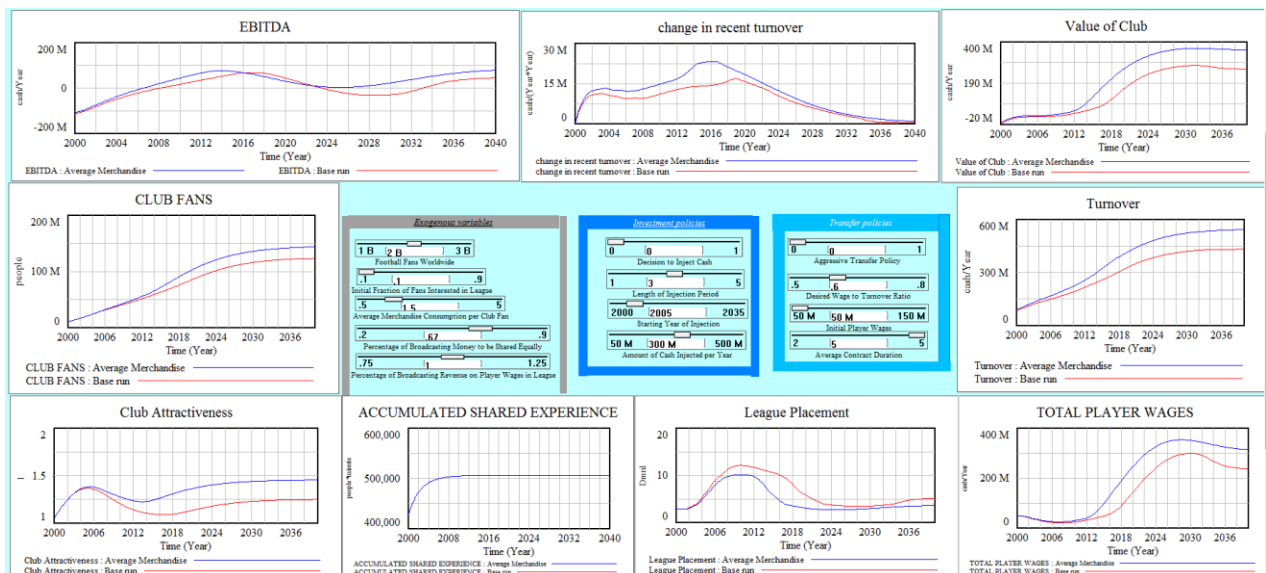
Figure 19: Scenario analysis of merchandise sales.

Conclusion

The first thing to acknowledge is that the model is flawed. As the process of wrapping the model and thesis up, the thought of going back and give the model "just one more tweak" have been of particular high frequency. This is also a valuable insight learned from the exciting, yet sometimes excruciatingly frustrating, modelling process. Finding the balance of depth and breadth in the model have been tough, but made the learning process even stronger.

As of current writing, there are aspects that still haunt the model/ author. It is lacking a realistic representation of financial management. This would immediately give external users better confidence in the model. Team morale is another obvious variable that deserves inclusion in the next edition of the model. The same goes for effects of supporter/ fan satisfaction on the team performance in home games. As strategy implementation is a continuous process, the model would clearly be improved if the user were prompted yearly to make decisions based on the available information based on the KPIs. Further, the transfer market is still not, in the author's opinion quite representable of the actual flows in player movement between clubs. Without doubt, this part have been the most challenging part to model. Including the possibilities of entry to European Leagues as well as demotion, and a better depiction of the fan base and the acquisition would make the model even better. Finally, rivalry between teams in the league is non-existent in the model, which adds height to the already elevated confidence hurdle. Given the discussion of weaknesses associated with the model, it is still visibly capable of producing results that provide additional insight for management. For example, increasing the fan merchandise consumption by just a small fraction is immediately obvious to improve financial performance. The author himself, being both an avid football and system dynamics fan, should have recognized this as a KPI early in the process, but still managed to overlook in the process. This clearly confirms theory stating the poor ability of humans to include processes and variables that develop over time in their mental models. Experimentation with different dashboard variables should be a live experience and can not be properly reproduced here.

Concluding remarks: The model *have demonstrated* how the use of system dynamics simulation can enhance long-term strategic management in professional football clubs.

Future research
Competition between top leagues and the how the different broadcasting policies is a very interesting topic that deserves further research

Appendix

Model structure
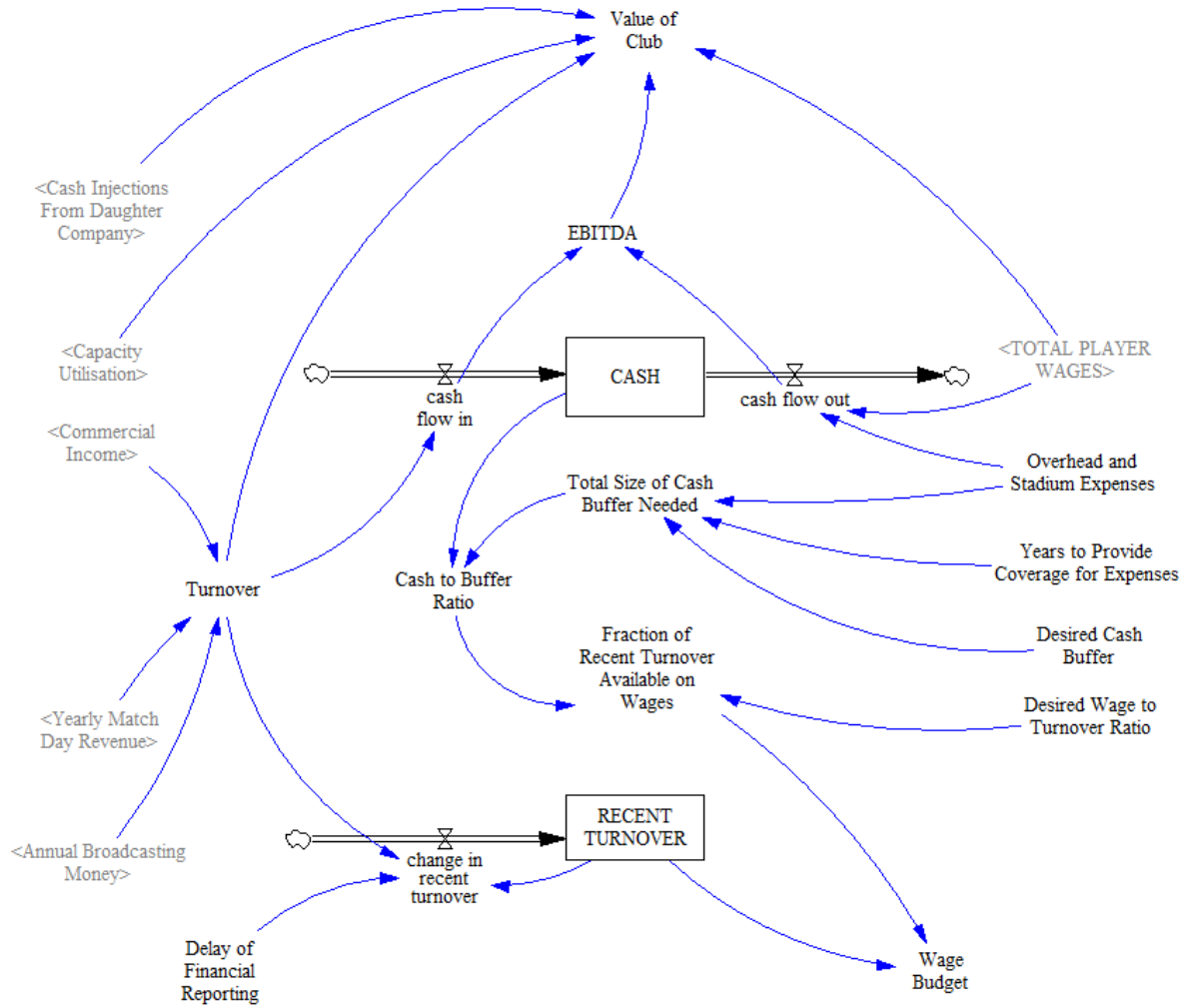
Figure 20: Financial sector.
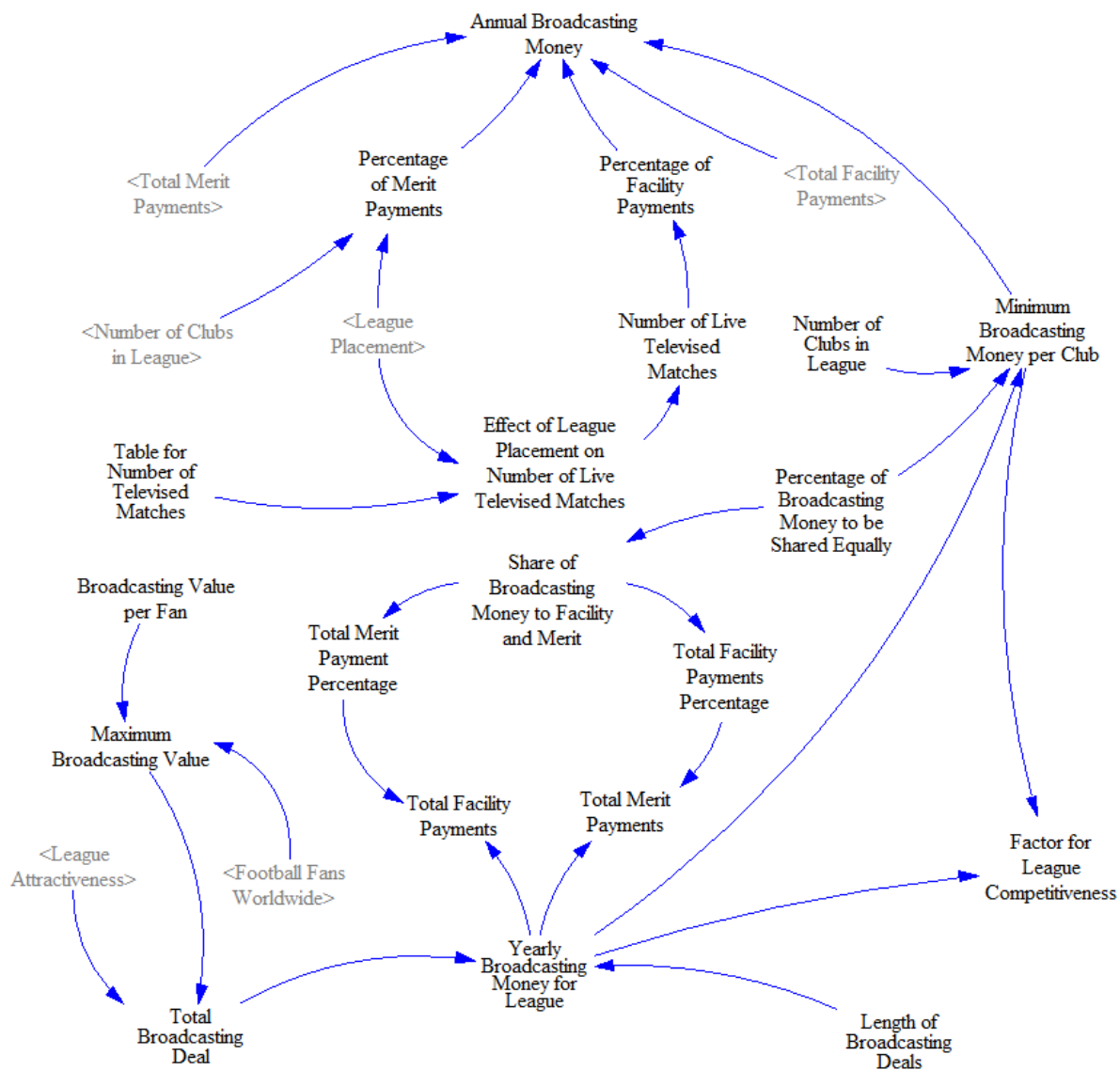
Figure 21: Broadcasting.
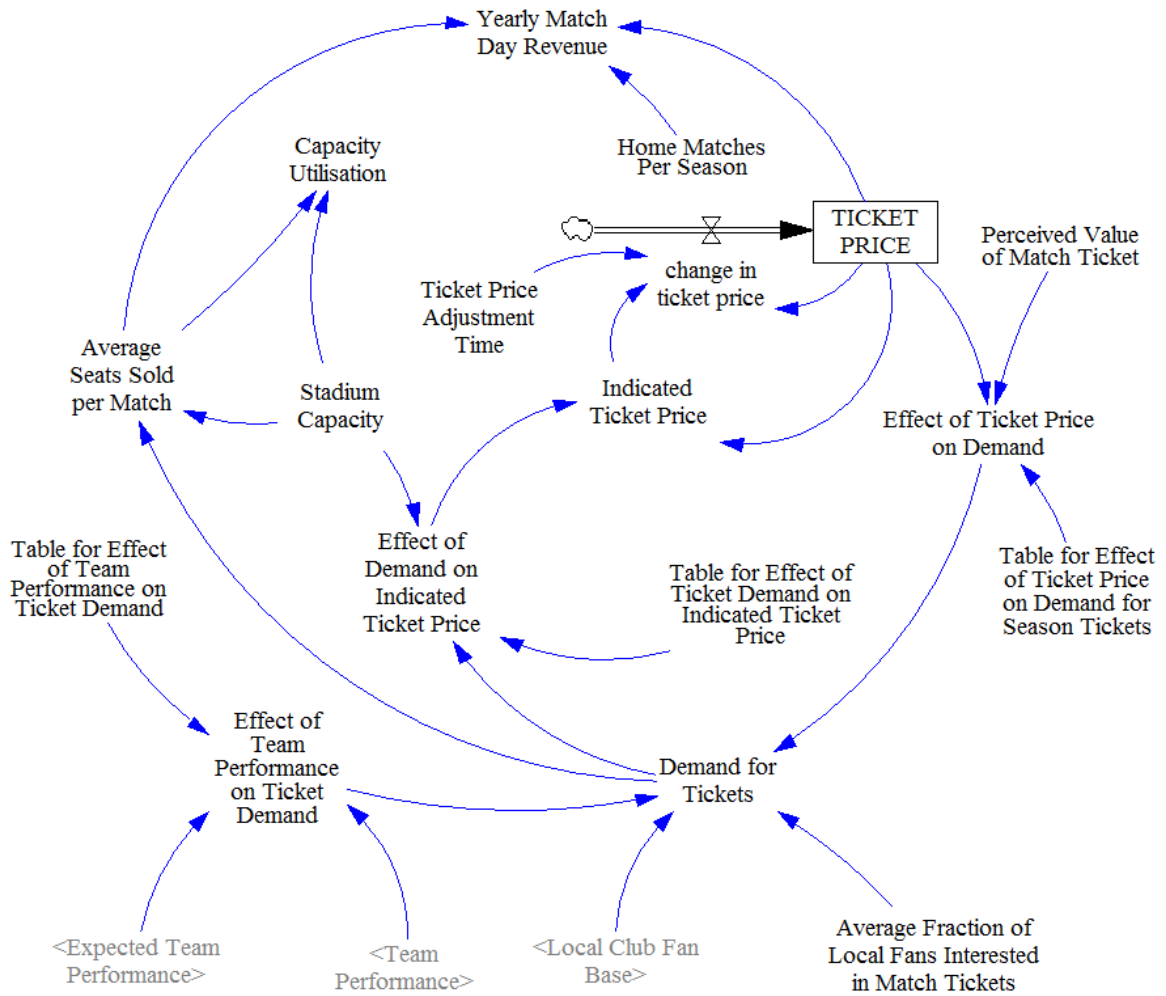
Figure 22: Match-day.
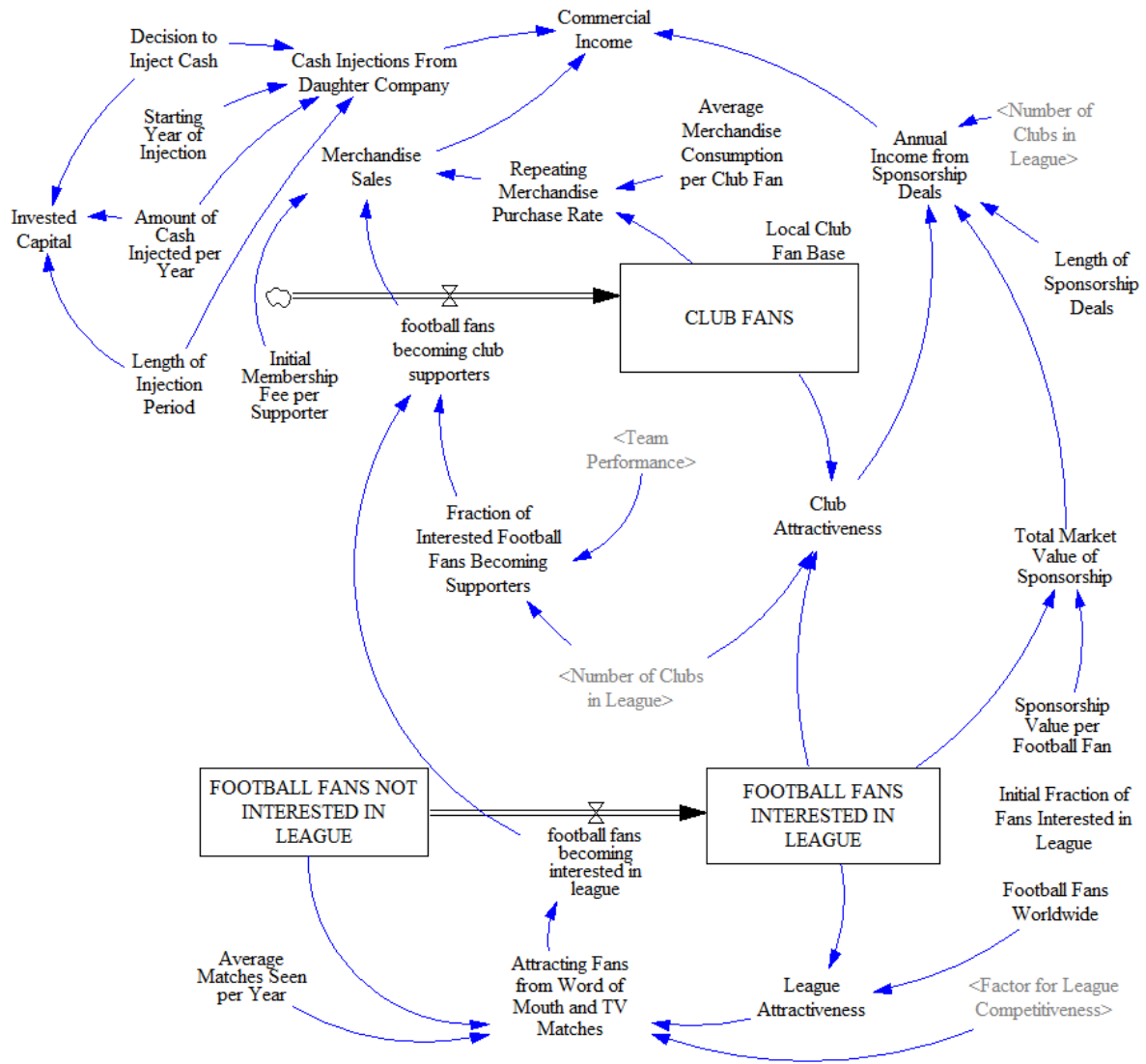
Figure 23: Fans and sponsors.
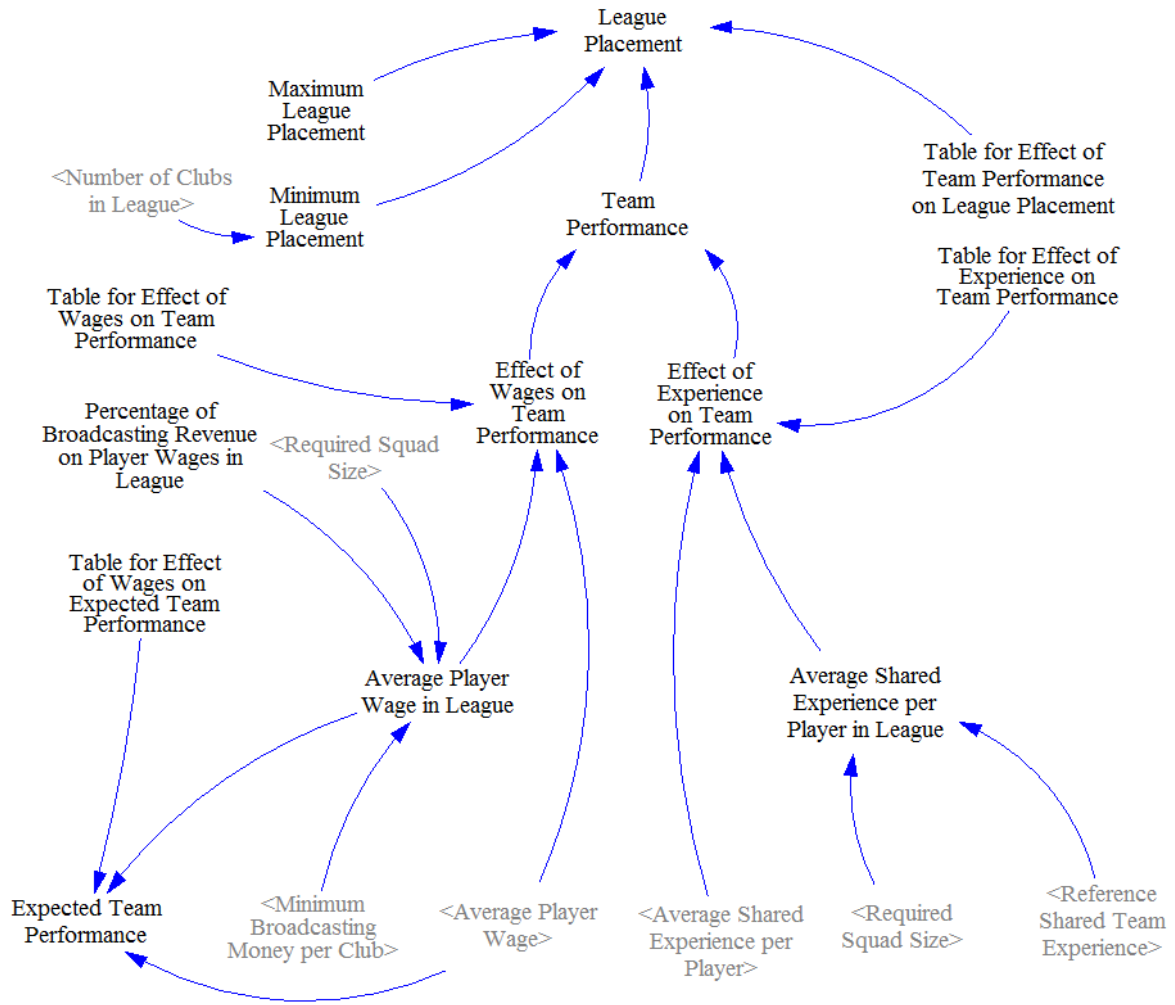
Figure 24: Sporting.
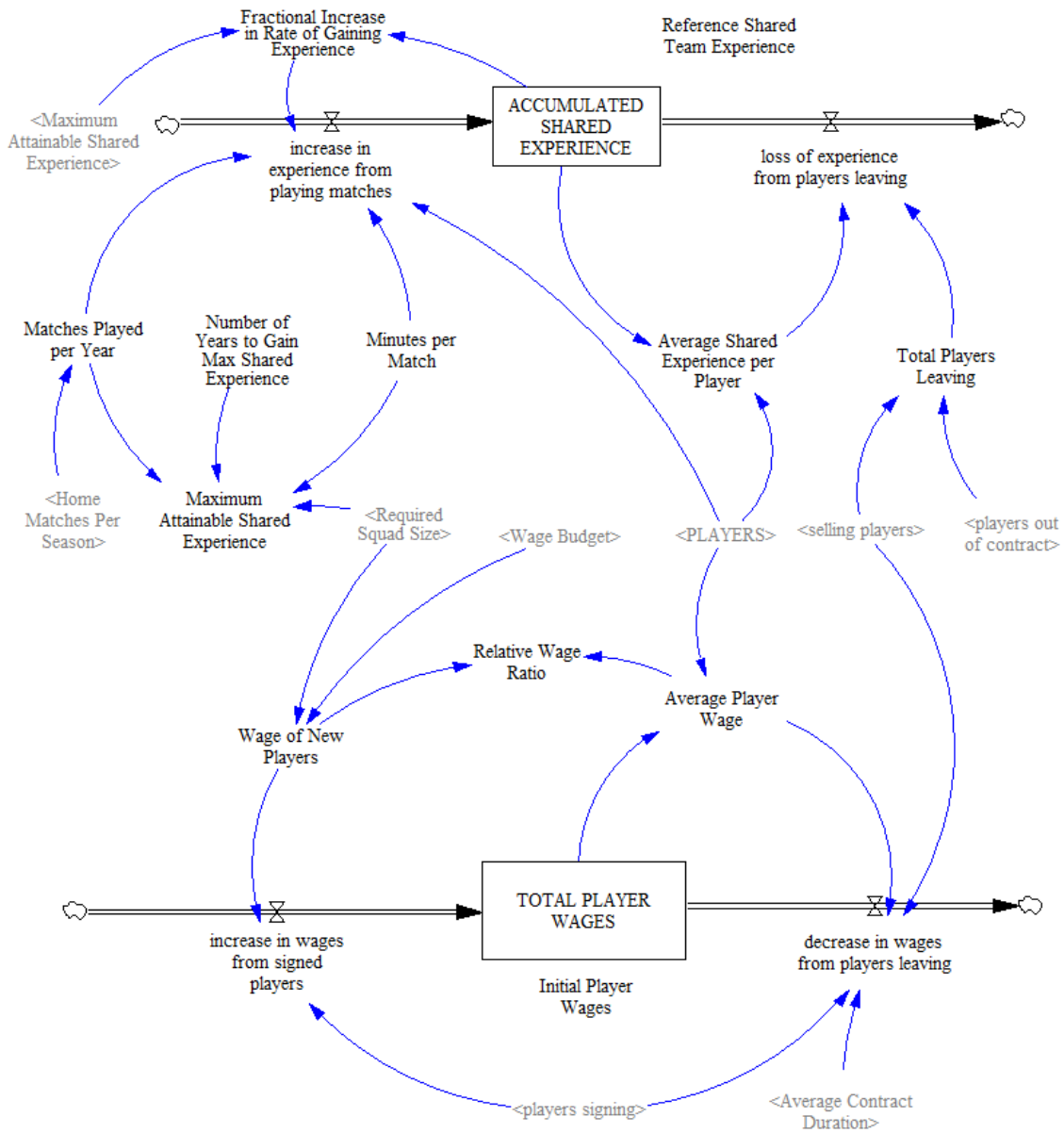
Figure 25:Player attributes.
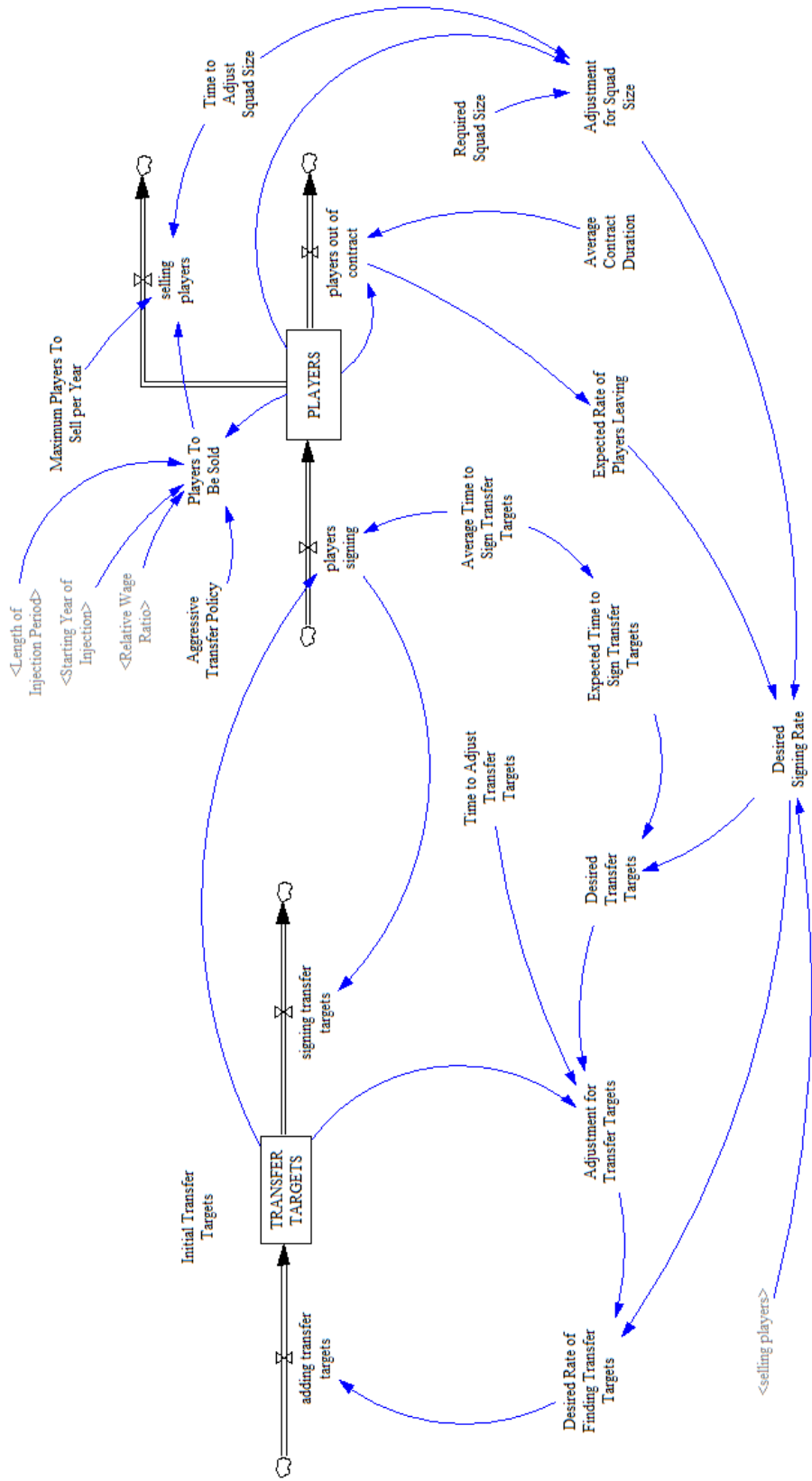
Figure 26: Transfer section.

Documentation of model

(001)   ACCUMULATED SHARED EXPERIENCE= INTEG (

      increase in experience from playing matches-loss of experience from players leaving

,

      Reference Shared Team Experience)

Units: people*minute

(002)   adding transfer targets=

      MAX(0, Desired Rate of Finding Transfer Targets)

Units: people/Year

(003)   Adjustment for Squad Size=

      (Required Squad Size-PLAYERS)/Time to Adjust Squad Size

Units: people/Year

(004)   Adjustment for Transfer Targets=

      (Desired Transfer Targets-TRANSFER TARGETS)/Time to Adjust Transfer Targets

Units: people/Year

(005)   Aggressive Transfer Policy=

      0

Units: Dmnl [0,1,1]

(006)   Amount of Cash Injected per Year=

      3e+008

Units: cash/Year [5e+007,5e+008,5e+007]

(007)   Annual Broadcasting Money=

      Minimum Broadcasting Money per Club

      +

      Total Facility Payments*Percentage of Facility Payments

      +

      Total Merit Payments*Percentage of Merit Payments

Units: cash/Year

(008)   Annual Income from Sponsorship Deals=

        Total Market Value of Sponsorship/Length of Sponsorship Deals

        /Number of Clubs in League*Club Attractiveness

      Units: cash/Year

(009)   Attracting Fans from Word of Mouth and TV Matches=

        Average Matches Seen per Year*Factor for League Competitiveness*FOOTBALL FANS
        NOT INTERESTED IN LEAGUE*League Attractiveness

      Units: people/Year

(010)   Average Contract Duration=

        5

      Units: Year [2,5,1]

(011)   Average Fraction of Local Fans Interested in Match Tickets=

        0.15

      Units: seat/people [0.1,0.3,0.05]

(012)   Average Matches Seen per Year=

        5

      Units: 1/Year [1,10,1]

(013)   Average Merchandise Consumption per Club Fan=

        1

      Units: cash/(people*Year) [0.5,5,0.5]

(014)   Average Player Wage=

        TOTAL PLAYER WAGES/PLAYERS

      Units: cash/(Year*people)

(015)   Average Player Wage in League=

        DELAY3(Minimum Broadcasting Money per Club*Percentage of Broadcasting Revenue on
        Player Wages in League/Required Squad Size, 3)

      Units: cash/(people*Year)

(016)   Average Seats Sold per Match=

        MIN(Stadium Capacity, Demand for Tickets)

Units: seat

(017)   Average Shared Experience per Player=

        ACCUMULATED SHARED EXPERIENCE/PLAYERS

Units: minute

(018)   Average Shared Experience per Player in League=

        Reference Shared Team Experience/Required Squad Size

Units: minute [5000,20000,2000]

(019)   Average Time to Sign Transfer Targets=

        0.5

Units: Year [0.1,1,0.1]

(020)   Broadcasting Value per Fan=

        5

Units: cash/people

(021)   Capacity Utilisation=

        Average Seats Sold per Match/Stadium Capacity

Units: 1

(022)   CASH= INTEG (

        cash flow in-cash flow out,

            Total Size of Cash Buffer Needed)

Units: cash

(023)   cash flow in=

        Turnover

Units: cash/Year

(024)   cash flow out=

        TOTAL PLAYER WAGES

        +

        Overhead and Stadium Expenses

    Units: cash/Year

(025)   Cash Injections From Daughter Company=

        Decision to Inject Cash*Amount of Cash Injected per Year*PULSE(Starting Year of Injection

        , Length of Injection Period)

    Units: cash/Year

(026)   Cash to Buffer Ratio=

        MAX(0.4, (CASH/Total Size of Cash Buffer Needed))

    Units: 1

(027)   change in recent turnover=

        (Turnover-RECENT TURNOVER)/Delay of Financial Reporting

    Units: cash/(Year*Year)

(028)   change in ticket price=

        (Indicated Ticket Price-TICKET PRICE)/Ticket Price Adjustment Time

    Units: cash/(Year*seat)

(029)   Club Attractiveness=

        (CLUB FANS/FOOTBALL FANS INTERESTED IN LEAGUE)*Number of Clubs in
League

    Units: 1

(030)   CLUB FANS= INTEG (

        football fans becoming club supporters,

                FOOTBALL FANS INTERESTED IN LEAGUE/Number of Clubs in League

                +

                Local Club Fan Base)

    Units: people

(031)   Commercial Income=

   Merchandise Sales

   +

   Annual Income from Sponsorship Deals

   +

   Cash Injections From Daughter Company

   Units: cash/Year

(032)   Decision to Inject Cash=

   0

   Units: Dmnl [0,1,1]

(033)   decrease in wages from players leaving=

   DELAY3I(players signing*Average Player Wage, Average Contract Duration, 1.19e+007
)

   +

   selling players*Average Player Wage

   Units: cash/(Year*Year)

(034)   Delay of Financial Reporting=

   1

   Units: Year [0.5,2,0.5]

(035)   Demand for Tickets=

   Local Club Fan Base*Average Fraction of Local Fans Interested in Match Tickets

   *Effect of Ticket Price on Demand*Effect of Team Performance on Ticket Demand

   Units: seat

(036)   Desired Cash Buffer=

   5e+007

   Units: cash [5e+007,3e+008,5e+007]

(037)   Desired Rate of Finding Transfer Targets=

   Desired Signing Rate+Adjustment for Transfer Targets

   Units: people/Year

(038)   Desired Signing Rate=

       Adjustment for Squad Size

       +

       Expected Rate of Players Leaving

       +

       selling players

    Units: people/Year

(039)   Desired Transfer Targets=

       MAX(0, Desired Signing Rate*Expected Time to Sign Transfer Targets)

    Units: people

(040)   Desired Wage to Turnover Ratio=

       0.6

    Units: Dmnl [0.5,0.8,0.1]

(041)   EBITDA=

       cash flow in-cash flow out

    Units: cash/Year

(042)   Effect of Demand on Indicated Ticket Price=

       Table for Effect of Ticket Demand on Indicated Ticket Price(Demand for Tickets

       /Stadium Capacity)

    Units: Dmnl

(043)   Effect of Experience on Team Performance=

       Table for Effect of Experience on Team Performance(Average Shared Experience per Player

       /Average Shared Experience per Player in League)

    Units: Dmnl

(044)   Effect of League Placement on Number of Live Televised Matches=

       Table for Number of Televised Matches(DELAY1(League Placement, 5))

    Units: Dmnl

(045)   Effect of Team Performance on Ticket Demand=

> Table for Effect of Team Performance on Ticket Demand(Team Performance/Expected Team
> Performance)

Units: Dmnl

(046)   Effect of Ticket Price on Demand=

> Table for Effect of Ticket Price on Demand for Season Tickets(Perceived Value of Match
> Ticket/TICKET PRICE)

Units: Dmnl

(047)   Effect of Wages on Team Performance=

> Table for Effect of Wages on Team Performance(Average Player Wage/Average Player Wage
> in League

)

Units: Dmnl

(048)   Expected Rate of Players Leaving=

> players out of contract

Units: people/Year

(049)   Expected Team Performance=

> Table for Effect of Wages on Expected Team Performance(Average Player Wage
>
> /Average Player Wage in League)

Units: Dmnl

(050)   Expected Time to Sign Transfer Targets=

> Average Time to Sign Transfer Targets

Units: Year

(051)   Factor for League Competitiveness=

> Minimum Broadcasting Money per Club/Yearly Broadcasting Money for League

Units: 1

(052)   FINAL TIME = 2040

Units: Year

The final time for the simulation.

(053)   football fans becoming club supporters=

football fans becoming interested in league*Fraction of Interested Football Fans Becoming
Supporters

Units: people/Year

(054)   football fans becoming interested in league=

Attracting Fans from Word of Mouth and TV Matches

Units: people/Year

(055)   FOOTBALL FANS INTERESTED IN LEAGUE= INTEG (

football fans becoming interested in league,

Football Fans Worldwide*Initial Fraction of Fans Interested in League)

Units: people

(056)   FOOTBALL FANS NOT INTERESTED IN LEAGUE= INTEG (

-football fans becoming interested in league,

Football Fans Worldwide*(1-Initial Fraction of Fans Interested in League

))

Units: people

(057)   Football Fans Worldwide=

2e+009

Units: people [1e+009,3e+009,5e+008]

(058)   Fraction of Interested Football Fans Becoming Supporters=

Team Performance/Number of Clubs in League

Units: 1

(059)   Fraction of Recent Turnover Available on Wages=

Desired Wage to Turnover Ratio*(MIN(1, Cash to Buffer Ratio))

Units: Dmnl [?,?,0.1]

(060)   Fractional Increase in Rate of Gaining Experience=

        Maximum Attainable Shared Experience/ACCUMULATED SHARED EXPERIENCE

Units: 1

(061)   Home Matches Per Season==

        19

Units: 1/Year

(062)   increase in experience from playing matches=

        PLAYERS*Matches Played per Year*Minutes per Match*Fractional Increase in Rate of
Gaining Experience

Units: people*minute/Year

(063)   increase in wages from signed players=

        players signing*Wage of New Players

Units: cash/(Year*Year)

(064)   Indicated Ticket Price=

        TICKET PRICE*Effect of Demand on Indicated Ticket Price

Units: cash/seat

(065)   Initial Fraction of Fans Interested in League=

        0.1

Units: Dmnl [0.1,0.9,0.1]

(066)   Initial Membership Fee per Supporter=

        3

Units: cash/people

(067)   Initial Player Wages=

        5e+007

Units: cash/Year [5e+007,1.5e+008,1e+007]

(068)   INITIAL TIME = 2000

Units: Year

The initial time for the simulation.

(069)   Initial Transfer Targets=

        2

Units: people [0,10,1]

(070)   Invested Capital=

        Amount of Cash Injected per Year*Length of Injection Period*Decision to Inject Cash

Units: cash

(071)   League Attractiveness=

        FOOTBALL FANS INTERESTED IN LEAGUE/Football Fans Worldwide

Units: 1

(072)   League Placement=

        IF THEN ELSE((Team Performance < 1),

        MIN(Table for Effect of Team Performance on League Placement(Team Performance

        ), Minimum League Placement),

        MAX(Table for Effect of Team Performance on League Placement(Team Performance

        ), Maximum League Placement))

Units: Dmnl

(073)   Length of Broadcasting Deals==

        3

Units: Year [2,4,1]

(074)   Length of Injection Period=

        3

Units: Year [1,5,1]

(075)   Length of Sponsorship Deals=

        5

Units: Year

(076)   Local Club Fan Base=

        500000

Units: people [100000,1e+006,100000]

(077) loss of experience from players leaving=

   Average Shared Experience per Player*Total Players Leaving

Units: people*minute/Year

(078) Matches Played per Year=

   Home Matches Per Season*2

Units: 1/Year

(079) Maximum Attainable Shared Experience=

   Number of Years to Gain Max Shared Experience*Minutes per Match*Matches Played per
   Year*Required Squad Size

Units: people*minute

(080) Maximum Broadcasting Value=

   Football Fans Worldwide*Broadcasting Value per Fan

Units: cash

(081) Maximum League Placement==

   1

Units: Dmnl

(082) Maximum Players To Sell per Year=

   5

Units: people/Year

(083) Merchandise Sales=

   Initial Membership Fee per Supporter*football fans becoming club supporters

   +

   Repeating Merchandise Purchase Rate

Units: cash/Year

(084)   Minimum Broadcasting Money per Club=

   Yearly Broadcasting Money for League*Percentage of Broadcasting Money to be Shared Equally

   /

   Number of Clubs in League

   Units: cash/Year

(085)   Minimum League Placement=

   Number of Clubs in League

   Units: Dmnl

(086)   Minutes per Match==

   90

   Units: minute

(087)   Number of Clubs in League==

   20

   Units: Dmnl

(088)   Number of Live Televised Matches=

   Effect of League Placement on Number of Live Televised Matches

   Units: Dmnl

(089)   Number of Years to Gain Max Shared Experience=

   7

   Units: Year

(090)   Overhead and Stadium Expenses=

   1.5e+008

   Units: cash/Year [1e+008,2e+008,5e+007]

(091)   Perceived Value of Match Ticket=

   35

   Units: cash/seat [25,40,5]

(092)   Percentage of Broadcasting Money to be Shared Equally=

   0.67

Units: Dmnl [0.2,0.9,0.1]

(093)   Percentage of Broadcasting Revenue on Player Wages in League=

   1

Units: Dmnl [0.75,1.25,0.05]

(094)   Percentage of Facility Payments=

   0.0033*Number of Live Televised Matches

Units: Dmnl

Comment: Proportional to the number of televised live matches of the

team. The percentages are ranging from 3.33% to 8.5% per team

(095)   Percentage of Merit Payments=

   0.1*(1 - League Placement/(Number of Clubs in League+1))

Units: Dmnl

0.52% per league placement ==> Ranging from 0.52% (lowest) to

   9.52% (highest)

(096)   PLAYERS= INTEG (

   players signing

   -

   players out of contract

   -

   selling players,

      25)

Units: people

(097)   players out of contract=

   PLAYERS/Average Contract Duration

Units: people/Year

(098)   players signing=

   TRANSFER TARGETS/Average Time to Sign Transfer Targets

Units: people/Year

(099)   Players To Be Sold=

        MAX(0, Aggressive Transfer Policy*((PLAYERS*Relative Wage Ratio)-PLAYERS)

)*PULSE(Starting Year of Injection, Length of Injection Period)

Units: people

(100)   RECENT TURNOVER= INTEG (

        change in recent turnover,

            Turnover)

Units: cash/Year

(101)   Reference Shared Team Experience=

        425000

Units: people*minute

(102)   Relative Wage Ratio=

        Wage of New Players/Average Player Wage

Units: 1

(103)   Repeating Merchandise Purchase Rate=

        CLUB FANS*Average Merchandise Consumption per Club Fan

Units: cash/Year

(104)   Required Squad Size==

        25

Units: people [15,30,5]

(105)   SAVEPER =

        TIME STEP

Units: Year [0,?]

The frequency with which output is stored.

(106)   selling players=

        MIN(Maximum Players To Sell per Year, Players To Be Sold/Time to Adjust Squad Size

)

Units: people/Year

(107)   Share of Broadcasting Money to Facility and Merit=

          (1-Percentage of Broadcasting Money to be Shared Equally)

Units: Dmnl

(108)   signing transfer targets=

          players signing

Units: people/Year

(109)   Sponsorship Value per Football Fan=

          3

Units: cash/people [1,5,1]

(110)   Stadium Capacity=

          60000

Units: seat [30000,75000,5000]

(111)   Starting Year of Injection=

          2005

Units: Year [2000,2035,5]

(112)   Table for Effect of Experience on Team Performance(

          [(0,0)-(2,1.5)],(0,0.75),(0.269113,0.769737),(0.470948,0.796053),(0.648318

          ,0.848684),(0.819572,0.914474),(0.93578,0.973684),(1,1),(1.13761,1.03289),

          (1.29052,1.06579),(1.45566,1.07895),(1.67584,1.10526),(2,1.125))

Units: Dmnl

(113)   Table for Effect of Team Performance on League Placement(

          [(0,0)-(2,20)],(0,20),(1,10.5),(2,1))

Units: Dmnl

(114)   Table for Effect of Team Performance on Ticket Demand(

          [(0,0)-(2,2)],(0,0),(0.110092,0.280702),(0.17737,0.421053),(0.256881,0.526316

),(0.35474,0.605263),(0.440367,0.692982),(0.556575,0.72807),(0.703364,0.780702

),(0.770642,0.833333),(0.831804,0.877193),(0.917431,0.921053),(1,1),(1.50459

,1.17544),(1.98777,1.26316))

Units: Dmnl

(115) Table for Effect of Ticket Demand on Indicated Ticket Price(

[(0,0)-(2,2)],(0,0),(0.0550459,0.429825),(0.134557,0.640351),(0.244648,0.815789
),(0.342508,0.868421),(0.446483,0.868421),(0.562691,0.894737),(0.672783,0.903509
),(0.782875,0.921053),(0.899083,0.95614),(1,1),(2,2))

Units: Dmnl

(116) Table for Effect of Ticket Price on Demand for Season Tickets(

[(0,0)-(2,2)],(0,0),(0.220183,0.0350877),(0.360856,0.0438596),(0.477064,0.0789474
),(0.538226,0.114035),(0.617737,0.157895),(0.703364,0.307018),(0.740061,0.429825
),(0.795107,0.614035),(0.83792,0.789474),(0.905199,0.938596),(1,1),(1.5,1.5
),(2,2))

Units: Dmnl

(117) Table for Effect of Wages on Expected Team Performance(

[(0,0)-(20,2)],(0,0),(0.5,0.5),(1,1),(1.65138,1.34211),(2.56881,1.62281),
(3.79205,1.75439),(5.50459,1.85088),(7.52294,1.91228),(10,1.95),(20,2))

Units: Dmnl

(118) Table for Effect of Wages on Team Performance(

[(0,0)-(20,2)],(0,0),(0.5,0.5),(1,1),(1.65138,1.34211),(2.56881,1.62281),
(3.79205,1.75439),(5.50459,1.85088),(7.52294,1.91228),(10,1.95),(20,2))

Units: Dmnl

(119) Table for Number of Televised Matches(

[(1,0)-(20,30)],(1,25),(1.75535,23.1579),(2.80122,20.9211),(4.25382,19.3421
),(5.4159,18.5526),(6.69419,18.0263),(8.72783,17.2368),(10.5872,15.9211),(
20,10))

Units: Dmnl

(120) Team Performance=

Effect of Experience on Team Performance*Effect of Wages on Team Performance

Units: 1

(121)   TICKET PRICE= INTEG (

        change in ticket price,

          35)

Units: cash/seat

(122)   Ticket Price Adjustment Time=

        3

Units: Year [1,3,0.5]

(123)   TIME STEP = 0.125

Units: Year [0,?]

The time step for the simulation.

(124)   Time to Adjust Squad Size=

        0.5

Units: Year [0.1,1,0.1]

(125)   Time to Adjust Transfer Targets=

        0.2

Units: Year [0.1,0.6,0.1]

(126)   Total Broadcasting Deal=

        Maximum Broadcasting Value*League Attractiveness

Units: cash [?,?,5e+008]

(127)   Total Facility Payments=

        Total Merit Payment Percentage*Yearly Broadcasting Money for League

Units: cash/Year

(128)   Total Facility Payments Percentage=

        Share of Broadcasting Money to Facility and Merit/2

Units: Dmnl

(129)   Total Market Value of Sponsorship=

        FOOTBALL FANS INTERESTED IN LEAGUE*Sponsorship Value per Football Fan

Units: cash

(130)   Total Merit Payment Percentage=

        Share of Broadcasting Money to Facility and Merit/2

Units: Dmnl

(131)   Total Merit Payments=

        Total Facility Payments Percentage*Yearly Broadcasting Money for League

Units: cash/Year

(132)   TOTAL PLAYER WAGES= INTEG (

        increase in wages from signed players-decrease in wages from players leaving

,

           Initial Player Wages)

Units: cash/Year

(133)   Total Players Leaving=

        players out of contract

        +

        selling players

Units: people/Year

(134)   Total Size of Cash Buffer Needed=

        Overhead and Stadium Expenses*Years to Provide Coverage for Expenses

        +

        Desired Cash Buffer

Units: cash

(135)   TRANSFER TARGETS= INTEG (

        adding transfer targets-signing transfer targets,

           Initial Transfer Targets)

Units: people

(136) Turnover=

>   Annual Broadcasting Money
>
>   +
>
>   Commercial Income
>
>   +
>
>   Yearly Match Day Revenue

Units: cash/Year

(137) Value of Club=

>   Turnover*((EBITDA+Turnover)/Turnover)*Capacity Utilisation
>
>   /
>
>   (Turnover/TOTAL PLAYER WAGES)
>
>   -
>
>   Cash Injections From Daughter Company

Units: cash/Year

(138) Wage Budget=

>   RECENT TURNOVER*Fraction of Recent Turnover Available on Wages

Units: cash/Year

(139) Wage of New Players=

>   Wage Budget/Required Squad Size

Units: cash/(Year*people)

(140) Yearly Broadcasting Money for League=

>   Total Broadcasting Deal/Length of Broadcasting Deals

Units: cash/Year

(141) Yearly Match Day Revenue=

>   Average Seats Sold per Match*Home Matches Per Season*TICKET PRICE

Units: cash/Year

(142) Years to Provide Coverage for Expenses=

>   2

Units: Year [1,3,1]

Broadcasting data

Region	Population (millions)	Percentage of global TV-audience	PL Football Fans (millions)	PL Club Supporters (millions)
South and Central America	389	5.0%	78	21
North America and Caribbean	243	3.6%	34	7
UK	43	16.1%	21	15
Europe:	483	19.5%	100	42
Middle East and Africa:	738	22.6%	406	290
Asia and Oceania:	2810	32.5%	815	240
Global	**4706**	**99.3%**	**1454**	**615**

Season	Equal Share, £s	%	Facility Fees, £s	%	Merit Payment, £s	%	Overseas, £s	%	Central commercial, £s	%	Total, £s	% of total guaranteed	Guaranteed share per club
09/10	292,328,620	35%	168,088,832	20%	168,089,040	20%	202,452,240	24%	0	0%	830,958,732	60%	24,739,043
10/11	276,380,620	29%	158,918,884	17%	158,918,760	17%	358,531,900	38%	0	0%	952,750,164	67%	31,745,626
11/12	275,761,860	28%	158,563,140	16%	158,563,020	16%	375,292,880	39%	0	0%	968,180,900	67%	32,552,737
12/13	276,060,760	28%	158,735,330	16%	158,735,010	16%	378,634,520	39%	0	0%	972,165,620	67%	32,734,764
13/14	432,628,880	28%	259,577,700	17%	259,577,430	17%	525,916,340	34%	85,417,000	5%	1,563,117,350	67%	52,198,111
14/15	439,375,860	27%	261,428,440	16%	261,428,580	16%	555,147,420	35%	87,852,600	5%	1,605,232,900	67%	54,118,794

Season	Minimum Facility Fee	%	Maximum Facility Fee	%	Minimum Merit Payment	%	Maximum Merit Payment	%	Median Payment Per Club	% of total
09/10	6,275,550	3.73%	13,049,296	7.76%	800,424	0.48%	16,008,480	9.52%	42,805,918	5.15%
10/11	5,820,898	3.66%	13,548,306	8.53%	756,756	0.48%	15,135,120	9.52%	49,376,166	5.18%
11/12	5,776,662	3.64%	13,426,422	8.47%	755,062	0.48%	15,101,240	9.52%	50,082,430	5.17%
12/13	5,783,260	3.64%	12,961,615	8.17%	755,881	0.48%	15,117,620	9.52%	50,043,952	5.15%
13/14	8,648,108	3.33%	21,860,648	8.42%	1,236,083	0.48%	24,721,660	9.52%	80,431,361	5.15%
14/15	8,775,160	3.36%	21,477,152	8.22%	1,244,898	0.48%	24,897,960	9.52%	82,316,379	5.13%

Player wage data

OFFICIAL: The basic average annual pay of England's professional players since 1984

Average UK workers wage, £	Season		Top tier First Division	Second tier Second Division	Third tier Third Division	Fourth tier Fourth Division		Annual growth % First Division	Annual growth % Second Division	Annual growth % Third Division	Annual growth % Fourth Division
£9,984	1984-85		£24,934	£15,507	£11,261	£8,314					
£10,764	1985-86		£28,146	£16,970	£11,982	£9,206		11.41	8.62	6.02	9.69
£11,648	1986-87		£28,308	£17,237	£12,350	£9,139		0.57	1.55	2.98	-0.73
£12,740	1987-88		£28,722	£16,520	£13,740	£9,684		1.44	-4.34	10.12	5.63
£13,988	1988-89		£37,284	£20,072	£14,924	£11,128		22.96	17.70	7.93	12.98
£15,340	1989-90		£41,600	£23,920	£18,200	£12,480		10.38	16.09	18.00	10.83
£16,536	1990-91		£52,000	£29,120	£19,240	£14,040		20.00	17.86	5.41	11.11
£17,680	1991-92		£59,904	£33,592	£21,840	£15,860		13.19	13.31	11.90	11.48
	RENAMING		Premier League	First Division	Second Division	Third Division		Annual growth	Annual growth	Annual growth	Annual growth
£18,356	1992-93		£77,083	£40,728	£21,840	£16,640		22.29	17.52	0.00	4.69
£18,824	1993-94		£93,968	£47,358	£23,745	£17,190		17.97	14.00	8.02	3.20
£19,552	1994-95		£116,448	£51,480	£24,076	£19,760		19.30	8.01	1.38	13.01
£20,332	1995-96		£130,896	£52,000	£26,000	£21,840		11.04	1.00	7.40	9.52
£21,632	1996-97		£175,066	£56,680	£28,600	£20,540		25.23	8.26	9.09	-6.33
£22,828	1997-98		£244,908	£59,280	£34,060	£24,492		28.52	4.39	16.03	16.14
£23,660	1998-99		£313,959	£62,608	£39,104	£23,244		21.99	5.32	12.90	-5.37
£24,596	1999-00		£383,835	£71,500	£38,532	£25,272		18.20	12.44	-1.48	8.02
£26,000	2000-01		£451,274	£94,640	£52,416	£28,704		14.94	24.45	26.49	11.96
£27,300	2001-02		£566,932	£115,700	£50,336	£28,600		20.40	18.20	-4.13	-0.36
£28,132	2002-03		£611,068	£90,948	£59,488	£30,056		7.22	-27.22	15.38	4.84
£28,600	2003-04		£651,222	£92,300	£55,052	£42,472		6.17	1.46	-8.06	29.23
	RENAMING		Premier League	Championship	League One	League Two		Annual growth	Annual growth	Annual growth	Annual growth
£29,640	2004-05		£630,355	£109,746	£49,285	£33,968		-3.31	15.90	-11.70	-25.03
£30,784	2005-06		£685,748	£127,192	£48,776	£35,672		8.08	13.72	-1.04	4.78
£31,616	2006-07		£778,103	£152,620	£57,148	£28,860		11.87	16.66	14.65	-23.60
£33,124	2007-08		£960,377	£136,292	£51,064	£34,476		18.98	-11.98	-11.91	16.29
£33,540	2008-09		£1,066,391	£182,000	£75,400	£34,424		9.94	25.11	32.28	-0.15
£34,112	2009-10		£1,162,350	£211,068	£73,320	£38,844		8.26	13.77	-2.84	11.38

Sources: Figures from internal PFA union files. Except Premier League since 1992, numbers sourced by Sportingintelligence, and ratified as accurate

NB: All figures reflect basic pay. Typically increases 50-100 per cent with appearances / bonuses. Rates vary by clubs / eras. Graphic: Sportingintelligence.com

Figure 27: Average player wages in BPL.

Season	Avg. player wages	League broadcasting revenue	Total broadcasting revenue during period	Percentage of broadcasting revenue spent on individual player wages
1992-93	£77,083	£ 38,200,000		4.04%
1993-94	£93,969	£ 38,200,000		4.92%
1994-95	£116,448	£ 38,200,000	£ 191,000,000	6.10%
1995-96	£130,896	£ 38,200,000		6.85%
1996-97	£175,066	£ 38,200,000		9.17%
1997-98	£244,908	£ 167,500,000		2.92%
1998-99	£313,959	£ 167,500,000	£ 670,000,000	3.75%
1999-00	£383,835	£ 167,500,000		4.58%
2000-01	£451,274	£ 167,500,000		5.39%
2001-02	£566,932	£ 400,000,000		2.83%
2002-03	£611,068	£ 400,000,000	£ 1,200,000,000	3.06%
2003-04	£651,222	£ 400,000,000		3.26%
2004-05	£630,355	£ 341,333,333		3.69%
2005-06	£685,748	£ 341,333,333	£ 1,024,000,000	4.02%
2006-07	£778,103	£ 341,333,333		4.56%
2007-08	£960,377	£ 568,666,667		3.38%
2008-09	£1,066,391	£ 568,666,667	£ 1,706,000,000	3.75%
2009-10	£1,162,350	£ 568,666,667		4.09%

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