

A PANEL COINTEGRATION APPROACH TO MODELLING THE SHARE PRICES OF FOOTBALL CLUBS¹

Engin Dumanlı², Deniz Parlak³

Abstract

Although equity valuation has been widely studied in the finance literature, very few studies have analysed the valuation of football club companies, which (due to their non-profit nature) significantly differs from the valuation of other institutions and thus requires different analytical techniques. This study contributes to the equity valuation literature on football clubs by proposing a valuation model based on the net market value of assets. Besides the market value of assets and liabilities, a number of proxy variables representing brand value, economic-wise management factors, investment sentiment in the market and a factor representing the value derived from the league in which the club participates are included in the model. The proposed model is tested with quarterly data from the 2011/12 season to the 2016/17 season on four publicly traded football club companies competing in the Turkish Super League, with panel cointegration regression tests revealing the statistical significance of the variables included.

Keywords: Equity Valuation, Share Value, Football Clubs, Sports Finance, Valuation Factors

FUTBOL KULÜPLERİNİN HİSSE FİYATLARININ DEĞERLEMESİNE PANEL EŞBÜTÜNLEŞME YAKLAŞIMI

Özet

Hisse senedi değerlemesi finans literatüründe geniş çapta incelenmesine rağmen futbol kulübü şirketlerinin değerlemesini çok az sayıda çalışma analiz etmiştir. Futbol kulübü şirketleri kar amacı gütmeyen yapıları nedeniyle diğer kurumların değerlemesinden önemli ölçüde farklılık göstermektedir ve bu nedenle farklı analitik teknikler gerektirir. Bu çalışma, varlıkların net piyasa değerine dayalı bir değerlendirme modeli önererek futbol kulüplerine ilişkin hisse senedi değerlendirme literatürüne katkıda bulunmaktadır. Modele, varlık ve yükümlülüklerin piyasa değerinin yanı sıra marka değerini, ekonomik yönden anlamlı yönetim faktörlerini, piyasadaki yatırım iştahını ve kulübün katıldığı ligden elde edilen değeri temsil eden bir dizi temsili değişken dahil edilmiştir. Önerilen model, 2011/12 sezonundan 2016/17 sezonuna kadar Türkiye Süper Liginde yarışan halka açık dört futbol kulübü şirketinin çeyreklik verileri ile test edilmiş, panel eşbütünleşme regresyon testleri dahil edilen değişkenlerin istatistiksel önemini ortaya çıkarmıştır.

Anahtar Kelimeler: Özkaynak Değerleme, Hisse Değerleme, Futbol Kulüpleri, Spor Finansı, Değerleme Faktörleri

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² Assist.Prof., Fenerbahçe University, Department of International Finance and Banking, engin.dumanli@fbu.edu.tr, ORCID ID: 0000-0003-2019-4714

³ Prof.Dr., Doğuş University, Department of Business Administration, dparlak@dogus.edu.tr, ORCID ID: 0000-0001-7203-0055

1. Introduction

Despite football news attracting considerable attention in written and visual media, studies on the valuation of football club companies (which require a specific approach due to their unique characteristics) are relatively limited in the academic literature. The main distinguishing characteristic of football club companies is their long debated objective whether it is profit maximisation or win maximisation. Fort (2015) states that estimating the potential trade-off between win and profit maximization is an important avenue for sports economics. The discussion about the aims of professional clubs is crucial to the valuation of football clubs that are structured as companies, since financially sound valuation is based on reasonably expected future cash flows to the equity holders. This study examines the valuation issue especially from the point of European clubs where profit maximization target is in the latter row. (see Sloane (2006) for a brief discussion about distinctions between the North American and European models of team sports.)

Sloane (1971) argued that the assumption of profit maximisation was inappropriate for the football industry, rather, a utility maximisation model seemed to fit the facts better. In line with this argument, European football reported a declining financial performance and position despite rising revenues in the first decade of the 2000s (Morrow, 2014) (Storm and Nielsen, 2012). Terrien et al. (2017) stated that “the utility function may be interpreted as the pursuit of sporting success subject to an acceptable level of financial losses.” Nevertheless, as a result of excessive spending and increasing borrowing that threatening the viability of clubs, UEFA had to introduce Financial Fair Play (FFP) rules in order to maintain the financial soundness of football clubs and the system in 2009. (UEFA, 2019)

Leach and Zymanski (2015) analysed whether being public has an impact on profitability of English football clubs. Their study showed that being listed on the stock exchange did not result a move towards profit maximising behaviour and thus it does not have a long-term effect on their profitability performances. Considering the increased losses during the study period, the same observation results are seem valid for the exchange listed Turkish football clubs subject to this study.

The FFP rules, aiming to limit the spending of clubs in their budget, have successfully reduced losses over the last decade (UEFA, 2019). However, these rules can only help to cure the loss-making nature of clubs and do not make them financially sensible investments unless their management strategy is oriented towards profit rather than sporting success. When it comes to profit-making football club companies (of which there are very few) they tend to retain these earnings, either to lower their high debt finances or to finance their new player transfers, rather than pay dividends. This renders both absolute valuation models based on discounting cash flows and many of the relative valuation models, including price-to-earnings and price-to-sales ratios, inadequate for the valuation of football club shares. Even the price-to-book value ratio is unsuitable because many clubs have negative book values on their balance sheet.

Although the amount and the consistency of profits far from justify the equity values of publicly traded clubs that do not provide any financial return to equity holders, still there exists a significant interest in the ownership of these clubs, especially those with a strong brand name, wide supporter base and a

history of sporting success. As a result, the source of value for football clubs is assumed to be determined not by future cash flows but by undisclosed intangible assets.

One of the undisclosed intangible assets for a football club is the value of its potential outgoing transfer revenues, which are not presented on its balance sheet. However, what is disclosed as an intangible asset (assuming it is composed of player transfer costs only) on a club balance sheet is the remaining balance from the amortisation of historic player transfer costs. The magnitude of the difference between the potential outgoing transfer revenues and the reported intangible assets figure is an important hidden value that is estimated to be a crucial determinant of share value.

Another feature contributing to the value of football clubs is their brand value, which (in line with International Financial Reporting Standards (IFRS)) is not disclosed on balance sheets unless purchased from a third party (IFRS 9 Financial Instruments, 2018). Since football fans stick to their brands and hardly change their clubs, brand loyalty is stronger for football clubs when compared to other industries, and this makes club brands highly valuable. Hence, their brand is thought to be an important value contributor for football club companies.

Given the inapplicability of absolute and relative valuation techniques due to the lack of positive cash flows, an asset-based valuation model that aims to mark to market all the assets, including the undisclosed intangibles, emerges as a suitable tool to estimate football club equity values. Hence, the aim of this study is to develop an asset-based relative valuation model for football club companies by proposing measurement criteria for undisclosed intangibles and mark-to-market criteria for all disclosed assets. While the model includes some independent variables that were introduced in previous studies, it proposes new variables as well, which increases significantly the model's predictive power.

The study contributes to the existing literature by proposing an alternative tool for determining the equity value of football clubs. The model is tested by employing a co-integrating regression approach using a fully modified least squares method on the panel data, and all variables were found to be significant predictors of football clubs' equity value. Although the model is not definitive and has limitations, it is thought to be useful given the paucity of valuation tools applicable to football clubs.

2. Theoretical Background

Studies on football club valuation are very limited in the finance literature. Early attempts aimed to uncover the factors that affect the price and trading volume of publicly traded sports companies. Brown (2001) studied the data for the Boston Celtics, the first publicly traded American sports team, and found that game results have a significant impact on returns, trading volume and volatility and showed that unexpected game results created abnormal returns. Vine (2004) also studied the factors that affect the share value of clubs competing in American football, basketball, baseball and hockey leagues and found that revenue is the key driver behind the valuation of sports franchises. Zuber et al. (2005) examined the game-related performance of 10 publicly traded English Premier League teams and concluded that the market is insensitive to game results in terms of both price movements and trading volume, and the football club share investors appear to derive value from merely holding the shares. Scelles et al. (2014) aimed to estimate the determinants of firm values of European football clubs for eight years between 2005 and 2013 and concluded that the value of players, operating income of sports club companies,

new ownership, clubs' assets (including stadium age, club ownership type, number and income of supporters) and past sport performance are significant factors in determining the value of sports clubs. The authors propose that revenues are a better basis upon which to calculate value than profits since revenues are a good indicator of a club's cash-generation capacity.

Regarding the techniques behind the valuation of sports companies, Thornton and Matyszczyk (2010) stated that present absolute valuation techniques should be used by adding some adjustments to reflect specific features of the clubs being valued. Similarly, Kızıltepe (2012) examined the valuation of four publicly traded Turkish football clubs and concluded that a discounted cash flow approach and other income-based approaches are appropriate for the valuation of sports clubs.

Opposition to these statements came from Markham and Solntsev. Markham (2013) analysed English Premier League clubs and stated that neither discounted cash flow techniques nor revenue multiples are appropriate for valuation as clubs in the United Kingdom are perpetually loss-making entities and therefore do not have any positive cash flow to equity to discount. The author suggested an alternative model where the value is determined by revenue, net profit, net assets, stadium attendance and wages-to-turnover ratio. The suggested factors were tested on the actual transaction values of clubs that faced an ownership change between the 2003-2004 and 2011-2012 seasons, and all were found to be statistically significant.

Similarly, Solntsev (2014) argued that most football clubs have historically been unprofitable and financed by private investors or municipal authorities. As their financial performance is highly volatile and unpredictable due to their dependence on sporting results, using a discounted cash flow technique is inadequate for their valuation, and a club's net assets figure could be considered as representing fair company value.

After summarizing the meager financial returns in the Premier League, Yueh (2014) reasoned why people buy football clubs and stated that it has nothing to do with money and simply because they are fans of the clubs they own or have strong ties with the local community. Also, for some countries with global ambitions, football is seen as an important way of expanding their brands, with many of these investments ultimately government backed through sovereign wealth funds.

KPMG (2016), an internationally recognised auditing and consultancy firm, issued a report on the valuation of football clubs in 2016 and reported that football clubs aim to maximise utility rather than profits and that the correlation between direct investments and sporting success is very low. Because of these peculiarities, KPMG suggested using the "enterprise value" technique for the sports clubs' rankings, where enterprise value is calculated based on five metrics: profitability, popularity, sporting potential, broadcasting rights and stadium ownership.

More recently, Prigge et al. (2019) studied whether stocks in football clubs are valued in line with the valuation of other capital assets in the capital market by analysing the share prices of 19 listed European football clubs from January 2010 to December 2016. Findings indicate that the majority of the football clubs in the sample are overvalued. They argued that this might be related to the motives of investors who are not purely financial investors and do expect extra benefits from investing in club shares. This

study once again indicates that the known financial valuation methods are not suitable for application to football clubs.

3. The Model

A number of previous studies on football club valuation have concluded that the equity valuation methods developed for profit-maximising entities are not suitable for football clubs due to their not-for-profit nature. Hence, the aim of this study is to develop an asset-based valuation method that would shed light on the club valuation issue. Since the main goal of football club firms is not profit maximisation, valuation of these entities should be similar to that of non-operating firms. However, unlike firms that have ceased operations, sports clubs have considerable undisclosed intangible assets due to their ongoing activities. Thus, an asset-based valuation model that marks to market all the assets, including the undisclosed intangibles a club possesses, would be a suitable tool to estimate sports clubs' equity value.

The asset-based valuation of equity simply takes into account the fair market value of all assets and deducts all liabilities of the entity. The least problematic part of this calculation is adjusting the book values of debts to the mark-to-market values. Since the IFRS 9 requires adjusting debt accounts to reporting date values, the book value of the total debt figure is assumed to be the mark-to-market value of total debts (IFRS 9 Financial Instruments, 2018).

Adjusting the book value of assets to mark-to-market values is a little troublesome for football clubs. The most important asset class on a club's balance sheet is fixed intangibles. The fixed intangibles of clubs consist of player transfer fees and are of particular importance. In most cases, this is the account in which the clubs make the most investment they can possibly afford. This is unsurprising given the clubs are sporting organisations and their management success is evaluated in parallel to their sporting success. On the other hand, this is the account that usually differs most from the market value because what they have spent for an incoming player transfer rarely mirrors what they may expect to receive for the same player should the player be subject to an outgoing transfer. Moreover, these transfer costs are subject to amortisation for the length of the player's contract with the club. Thus, the book value of fixed intangibles represents only the unamortised part of player transfer costs. Even more noteworthy, the expected transfer revenue from a home-grown player is not included in the accounts. Therefore, the fixed intangible account on a club's balance sheet far from represents the sum of the club's possible revenues in the event of player transfer. For this reason, instead of considering the remaining balance of player transfer costs, that is, the intangible fixed assets, the possible outgoing transfer value of players should be taken into account to better reflect the team's value.

Different from manufacturing or trading entities, football clubs operate in the leisure industry and do not have other sizeable assets compared to the value of their players (fixed intangibles). At least, this is the case for the clubs examined in this study. Therefore, for the sake of simplicity, it is assumed that the book values for all other assets are a good proxy for their market values. Nevertheless, for an asset with considerable size, if it is known that its book value substantially differs from the market value, then it

should definitely be treated individually and marked to market. By adding up the mark-to-market values of all assets, we calculate the total market value of all assets on the balance sheet of a club.

Unlike non-operating companies (for which an asset-based valuation is suitable), clubs have another very important asset not found on their balance sheet: the value of the brand upon which all their activities are built. A non-operating company may have no or a considerably small brand value. But a football club builds its brand through sporting success, adopting and uplifting values and managing its relationship with fans, no matter whether these efforts overall result in a profit or not. Therefore, this study argues that the suggested model should include brand value as an important constituent of club equity value.

Brand Finance, an international consulting and research group, has been publishing a report each year for the 50 most valuable football club brands for more than ten years. The report discloses the brand values for the top 10 and only the ranking order for the rest. Their methodology involves “estimating the likely future revenues that are attributable to a brand by calculating a royalty rate that would be charged for its use, to arrive at a ‘brand value’ understood as a net economic benefit that a licensor would achieve by licensing the brand in the open market” (Brand Finance, 2021). The steps in the process briefly include the application of the royalty rate on football specific revenues and then calculating the post-tax present value of the brand revenues today. Since the reports do not cover all clubs included in the study and the data frequency is once a year, this source is not referred for brand value data. However, Brand Finance's methodology shows that brand value is highly correlated with revenue.

In this study, it is assumed that total revenues of a club is a good proxy for its brand value because the higher the brand value, the higher the number of fans, and the wider the club is known and supported. Consequently, it means more spectators and higher match day revenues and merchandise sales. Similarly, the higher the value of a club's brand, the higher the licensing fees, advertisement revenues and sponsorship income, since other brands will be more willing to be associated with the club. Accordingly, we consider revenue as a proxy for brand value, which should be a factor in the model.

Although profit is not the ultimate target for clubs, the importance of economic-wise management cannot be ignored for clubs either. It is assumed that management running the club with financially sound policies should contribute to the value of the club. For companies with a profit-maximising objective, the earnings figure (supported by cash flows from operations) that is taken into account for valuation purposes already contains this element. For football clubs, however, another measurement is needed to proxy the quality of economic-wise management. It is assumed that a cash flow item could be a proxy for the contribution of economic-wise management to the value of a club.

Apart from the factors specific to clubs, there are also some macro factors affecting the prices of assets in an economy. Investment appetite and/or market sentiment are common terms used to describe the overall investment tendency in securities markets. Accordingly, it is assumed that this investment sentiment has an effect on club shares as well, as it would for any other type of share. In organised markets, the general price levels are measured by indexes composed of prices of the securities traded in that market. Thus, a stock market index in which the shares subject to study are being traded should

be added to the model. Accordingly, the “Borsa Istanbul XU100 Price Index” is applied as a proxy for market sentiment in the model since all the shares included in the study are traded on Borsa Istanbul.

Another factor considered important is the one affecting the value of clubs following a relegation to a lower league or promotion to a higher one. In other words, club values do change depending on the popularity and revenue potential of the league in which the clubs compete. This factor is expected to be the same for all clubs participating in the same league. Thus, this factor should be included in the model with a constant term. This constant value is derived after running the statistical software to find the best-fitting coefficients of factors affecting the club value.

In addition to the constant term derived from the league, a persistence coefficient that is less than 1 may be applied on the constant term for those clubs likely to be relegated. In this case, the value derived from the league in which the club competes would not be fully reflected in the equity value of the club, while a persistence coefficient of 1 would mean that the club’s equity fully contains the value arising from the league constant.

Having explained the factors that are assumed to be effective in determining the equity value of clubs, the following valuation model is suggested:

$$\begin{aligned} \text{Equity Value of Club} &= \text{Persistence Coe.} \times \text{League Constant} \\ &+ \beta_1 \times \text{Brand Value} + \beta_2 \times \text{Team Value} + \beta_3 \times \text{Other Assets Value} \\ &+ \beta_4 \times \text{Economic-wise Management} + \beta_5 \times \text{Total Debt} \\ &+ \beta_6 \times \text{Market Sentiment} + e \end{aligned}$$

where $\beta_1, \beta_2, \dots, \beta_6$ are factor coefficients.

4. Data & Methodology

The proposed model is tested on four Turkish football clubs—namely, Besiktas (BJKAS), Fenerbahce FENER), Galatasaray (GSRAY) and Trabzonspor (TSPOR) with shares that are traded on Borsa Istanbul. These four clubs have the most fans in Turkey and the most championships in the Turkish Super League. The dataset is limited to four clubs because no other Turkish football club companies are listed on the stock exchange and hence do not disclose their financial statements. All four football club companies included in the study have similar organisational structures and operations as they engage solely in football activities. Since the shares are traded on the same market, the clubs are subject to the same regulations and apply the same financial reporting standards.

To maintain the homogeneity of other factors that could affect club values, clubs from other countries and / or exchanges were specifically excluded from the study. Thus, the formation of the Club value were tried to be explained only with the variables suggested in the model. If the model to be obtained in this way can predict the dependent variable powerfully, it is suggested that the model can be used as a relative valuation tool for new public offerings to be made in the same stock exchange or when comparing existing stocks for arbitrage opportunities.

The data cover the 2011/12 season to the 2016/17 season inclusive (four quarters for each season), amounting to 24 observations for each club and 96 observations in total. Each observation includes six independent variables that are assumed to be significant in determining the value of clubs and the

observed club value, which is the dependent variable. The independent variables are: Revenues for the last four quarters (trailing 4 quarters revenues); Team Value, which consists of the potential transfer value of players; Assets other than Fixed Intangibles (that is, Total Assets minus the book value of players), Total Debt and Free Cash Flow to Firm for the last 12 months.

The data are gathered from three different sources. All financial reports are obtained from Borsa Istanbul, Public Dissemination Platform (KAP Kamuyu Aydınlatma Platformu, 2018). Borsa Istanbul 100 Index values are taken from the bulletin data on the Borsa Istanbul website (Bulletin Data, 2018). Finally, Team Value figures are taken from Transfermarkt (2018).

All the clubs subject to this study have financial years starting on 1 June and ending on 31 May. Although these clubs' shares were offered to the public and began to be traded between 2002 and 2005, the structures of the companies differed from those of a football club and were not comparable to one another before the 2011/12 season. In the early 2000s, considering that a high valuation would not be possible with the net income of football branches, the parent associations of these clubs (except Beşiktaş) established companies such as a revenue sharing structure to attract investors, and offered to public. However, realizing that it was not possible to continue their football activities, whose expenses were already higher than their revenues, they transferred their football activities to their publicly traded companies until the end of the 2011/12 season. In this way, the public offered companies of these associations became football branches (or clubs) of them with very similar structures. Therefore, the earliest data were taken from the first quarter of the 2011/12 financial year.

Team Value figures are taken from Transfermarkt (2018). The website is a popular source in the football sector for viewing the likely transfer prices of players as well as the values of teams based on the total transfer value of players. The website revises team values twice a month. For each observation in the study, the most recent available team value is taken as an explanatory independent variable for the closing share price at the end of the day following the day on which the financial statements are disseminated.

For the remaining assets, book value is assumed to be a close proxy for the market value. Therefore, the book value of intangible fixed assets is deducted from the total assets of clubs to calculate the Assets other than Fixed Intangibles.

Another balance sheet item used as an independent variable in the model is the club's Total Debt. According to the IFRS, debt figures must be adjusted to reflect real values on the date of reporting (IFRS 9 Financial Instruments, 2018). Consequently, the book value of total debt is considered to be a good approximation of market value on the date of the balance sheet.

The dependent variable is the market value of the club's equity based on the closing share price on the day following the dissemination of its financial statements. It is assumed that the market is efficient and all the information is reflected in the prices by the end of the next trading day at the latest, following the dissemination of financials.

A cointegration regression model with a constant was examined over the data set. The constant value is interpreted as the value originating from the league in which the clubs are participated. However, this

value is not expected to be reflected in all companies in the league in the same way. The four clubs examined in the study are longstanding and the most competitive participants in the Turkish Super League. Therefore, it is assumed that their values fully reflect the value arising from the league, and their persistence coefficients for League Constant are assumed to be 1. For teams that are likely to be relegated, it would be necessary to determine a persistence coefficient between 0 and 1, so that the value from the league is partially reflected. (For clubs that are sure to be relegated from the league, persistence coefficient = 0)

In the study, quarterly cross-sectional units were examined between the 2011/12 and 2016/17 seasons, inclusively. Since the number of observations for each variable is the same and the number of time periods is larger than the number of cross-sectional units, the approach is a long balanced panel. The study employs a cointegration regression approach in testing the model for the equity values of clubs.

The independent factors are either static figures (figures for a certain instant) or flow figures of the trailing 12 months. Therefore, seasonality is not a concern because the flow items (Revenues and Cash Flow figures) cover an entire season.

In order to balance the extreme fluctuations to a certain extent, log transformation for dependent variables is done. To ensure the stationarity of the variables, first differences are taken. Then, the panel cointegration tests concluded that cointegration exists (meaning there is a long-term relationship) among all the variables.

The abbreviation of variables used in the model are presented in **Table 1**.

Table 1. The Variables Used in the Model

Variable	Description
y	i th club market value at t th time
x _R	i th club revenues at t th time
x _T	i th team value at t th time
x _O	i th club assets other than fixed intangible at t th time
x _D	i th club total debt at t th time
x _F	i th club economic-wise management contribution at t th time
x _C	Common (Price Index) variable at t th time

Table 2 represents a sample of data employed to test the model. The table includes 2 quarters data for the 1st season out of 4 quarters for 6 seasons observed.

Table 2. Sample Data Set (Figures 1.000 TL except X_c)

Club	Term	Y	X _R	X _T	X _O	X _D	X _F	X _C
B	1Q1	328.800	116.118	309.954	111.751	417.595	-73.298	59.300
F	1Q1	1.162.500	130.628	297.708	55.456	63.339	55.683	59.300
G	1Q1	674.716	129.927	292.048	114.097	426.323	-30.464	59.300
T	1Q1	498.750	90.725	201.932	146.548	170.077	9.416	59.300
B	1Q2	262.400	150.103	272.774	127.386	452.058	-57.256	57.357
F	1Q2	950.000	186.492	271.645	90.915	63.110	-15.130	57.357
G	1Q2	490.703	144.418	279.651	75.242	415.809	-23.424	57.357
T	1Q2	317.500	129.382	189.832	165.515	169.527	-1.476	57.357

Notes: B, F, G & T represent BJKAS, FENER, GSRAY & TSPOR.
 1Q1 and 1Q2 represent 1st season, quarter 1 and 2.

Table 3 is the results of cointegrating regression model derived by using the panel fully modified least squares (FMOLS) estimation method on the panel data. Although the technique is relatively new, it is commonly used by economists to avoid spurious regression. The assumptions of the model are also examined, confirming the validity of the model. The estimated parameters of the independent variables used in the model are given under the heading "Coefficient".

Table 3. Cointegrating Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X _R	1.97E-09	5.18E-10	3.7999	0.0003
X _T	1.78E-09	6.99E-10	2.5441	0.0128
X _O	-8.06E-10	3.60E-10	-2.2357	0.0281
X _D	-6.19E-10	2.71E-10	-2.2832	0.0250
X _F	1.30E-09	5.64E-10	2.3014	0.0239
X _C	1.02E-05	4.91E-06	2.0717	0.0414
R-squared	0.76	Mean dependent var		19.97
Adjusted R-squared	0.73	S.D. dependent var		0.71
S.E. of regression	0.37	Sum squared resid		11.09

Taking into consideration the probability values for the independent variables, all the probability values are smaller than the $\alpha = 0.05$ significance level. Therefore, it can be stated that all independent variables in the model are significant and thus make a meaningful contribution to explaining the dependent variable.

Tests for residuals showed that residuals are stationary and come from normal distribution. There is also no multicollinearity to affect the results of the model adversely.

There are some strong positive relationships between some variables (Table 3). However, when the independent variables are evaluated fundamentally, there is no causal relation affecting each other. For instance, the revenue of a company does not increase necessarily due to an increase in debt or vice versa. As a result, the correlations observed between limited variables are ignored.

Table 4. Correlations Between Variables

Correlation Probability	X _R	X _T	X _O	X _D	X _F	X _C
X _R	1.0000					
X _T	0.5687	1.0000				
X _O	0.7557	0.4074	1.0000			
X _D	0.8446	0.6835	0.7672	1.0000		
X _F	0.0894	-0.0333	-0.1847	-0.0136	1.0000	
X _C	0.3913	0.2225	0.3247	0.5333	-0.0912	1.0000

0.0001 0.0294 0.0012 0.0000 0.3770

In order for the obtained model to operate more consistently, it is important that the sample data are derived from similar entities. Among the four clubs studied, Besiktas, Fenerbahce and Galatasaray are most similar one-another and usually referred to as the “The Three Bigs”. Therefore, another model is derived using data that excludes the Trabzonspor observations. The results show that all the conclusions remain the same while the significance of the variables substantially improves, where all probabilities have fallen below 1% (**Table 5**). Therefore, using a model derived from similar clubs would work much better in predictions.

Table 5. Cointegrating Regression Results (without TSPOR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X _R	1.48E-09	3.98E-10	3.7034	0.0005
X _T	3.06E-09	5.05E-10	6.0567	0.0000
X _O	-1.02E-09	2.75E-10	-3.7222	0.0004
X _D	-8.96E-10	2.05E-10	-4.3727	0.0000
X _F	2.02E-09	3.90E-10	5.1744	0.0000
X _C	1.87E-05	3.43E-06	5.4491	0.0000
R-squared	0.63	Mean dependent var		20.27
Adjusted R-squared	0.58	S.D. dependent var		0.50
S.E. of regression	0.33	Sum squared resid		6.42

5. Findings

Confirming the general view that revenue is the most important factor in determining the equity value of clubs, the Revenue variable in the model is found to be the most significant one with a probability value of 0.0003. In fact, many analysts and researchers consider brand value as the main determinant of football clubs that report a net loss. Revenue is taken as a proxy for brand value since a stronger brand relates to a wider fan base in most cases, which directly affects the revenues. If a club has a wider fan base, it can generate higher revenues through broadcast rights, match day revenues, advertising and sponsorship income, etc.

The second most important factor is Team Value, with a probability value of 0.0128, making it almost significant at the level of 0.01. It appears that investment in talent to increase the likelihood of sporting success is an important value driver for investors. Higher team value also seems to be related to higher revenues to a certain extent. Table 3 represents correlations between variables and shows that the correlation between the Revenue and Team Value variables is 0.57, with a probability of less than 1%. Although the correlation between the variables may be viewed as problematic, it is ignored here considering its lack of direct causality. The brand and team values may be seen as complementing each other to build the club's reputation with some interaction in between.

The Economic-wise Management factor measures the contribution of the management through its practices and policies while running the club in a balance between sporting competitiveness and financial sustainability. To measure the success of the management in this sense, Net Profit/Loss,

Operating Profit/Loss and Free Cash Flow figures were tried as a proxy. The Free Cash Flow is the total of "Cash Flow from Operations" and "Cash Flow from Investments" derived from the cash flow tables. The trials revealed that only Free Cash Flow results in a meaningful relation with the dependent variable with a probability of 0.0239. That means that investors see the club's management as adding value to the club to the extent that the company leaves cash available to all capital providers (including debt providers) after all operating expenses have been paid and necessary capital investments have been made. Confirming the fact that clubs are not profit-oriented organisations, the Profit/Loss figures did not result in meaningful and significant coefficients in the trials.

The Borsa Istanbul XU100 Price Index was chosen as a proxy to reflect the general investment appetite of the investors in the market. Since this variable was the same for all clubs' observations at time t , it is named the common variable. The model confirms that the general investment atmosphere is effective in determining the equity values as predicted with a significance level below 5% (that is, 0.0414).

The financial leverage of the company is an important factor in valuing equity. In relation to this, while previous studies have used leverage ratios, the total debt and financial debt values are tested as proxies for leverage in this study. The trials revealed that the Total Debt figure was a better proxy for leverage and had a negative coefficient as expected, with a probability value of 0.0250.

One of the most interesting results of the study is related to the Other Assets in the model representing the book value of assets of the clubs except the intangible fixed assets (the unamortised part of player costs). This variable aims to reveal the effect of the investments that the club makes in assets other than acquiring players on the equity value of the club. Surprisingly, the sign of the coefficient is negative and meaningful at the 5% significance level. This result indicates that club investors adversely value the investments made in areas other than in the team. It seems that investors would be happier if clubs had a higher valued team rather than owning assets like a stadium, land, training facilities, etc.

The average league constant value for the trial with four clubs is 161 million TL, while the trial with the Three Bigs resulted in a value of 105 million TL. Considering that the trial with the three more similar clubs improved the significance of the variables substantially, it may be inferred that being a participant in the Turkish Super League would add roughly 105 million TL to the value of a club, provided that it is not likely to be relegated from the league in the foreseeable future.

6. Conclusion

The present study aims to propose a new model for the equity valuation of football club companies. The model is based on asset valuation and takes into account the mark-to-market values of disclosed and undisclosed intangible assets, namely team value, brand value and the contribution of economic-wise quality management. While the study uses some independent variables that were also used in previous studies, some new variables such as Assets Other Than Fixed Intangibles, Total Debt (previous studies used leverage ratios), Free Cash Flow and Stock Exchange Price Index were also introduced. The model is tested by employing a cointegrating regression approach using a fully modified least squares method on the panel data, and all variables were found to be significant predictors of football clubs' equity value. As a test of robustness, considering that the top three clubs are more likely to be

comparable to one another, an alternative model test is done by excluding TSPOR data. The results show an increase in the significance level of the independent variables, as expected.

The study makes several important contributions to the existing literature. First, it provides investors with an alternative tool with which to judge the comparative fairness of the value of football club shares and hence has important policy implications. An interesting finding is that investors penalise clubs for investing in assets other than the team by affecting the share prices adversely. The implication of this finding is that to increase the value of shares, managers should minimise the investments made in assets other than the team. It appears that investors are happier if a club directs most of its resources to strengthen its team, since it is the main asset of a club that is assumed to reflect its sporting competitiveness. This finding also explains why clubs struggle to invest in infrastructure and the need for government incentives to make these investments.

Club managers should also direct the club so that its operational and investment activities together result in a positive cash flow. The model predicts that a free cash flow derived from operational and investment activities is positively reflected in club values, whereas tests with profit (loss) figures showed no significant relation. This result is consistent with the not-for-profit nature of football clubs.

Another implication of the study is the necessity to limit club borrowing. Since football clubs are not-for-profit entities, there is no Return on Equity concept for sporting entities. Therefore, from the perspective of clubs, borrowing is actually spending their future income with a discount today. In practice, clubs tend to overspend and turn to borrowing in order to achieve less-certain sporting success in the current season, leaving the burden to repay to the future (and to future managers). Accordingly, the total debt factor in the proposed model negatively reflects club share value. It clearly shows that debt is a value depreciating factor and should be limited, particularly for those clubs that is set up as an association where directors come and go with general meeting decisions and bear no responsibility for the debt they incur and leave to their successors. For a non-profit entity, overspending by borrowing, that is spending discounted future income, can only be justified if it is related to a project that will result in a positive net present value with the proceeds the project generates.

This study proposes investors an alternative tool with which to judge the comparative fairness of the value of football club shares. However, it is not a definitive and has limitations. Performing the study with a larger data set would benefit to the reliability of the model and tests using sports clubs from different leagues (but clubs from same league each time to control other factors) would enable to confirm or not the findings of this paper and assess whether they can be generalised or not. Moreover, the data used in testing should be updated continuously to reflect the current market dynamics. Nevertheless, considering the current paucity of methods available for valuing club shares, the model is thought to be a worthy one.

The frequency of the data used in the study was four times in a year. The limiting factor here with the least frequency was the financial data which is disseminated quarterly. Data for other variables could be obtained more often; for example, team values are updated twice a month on the Transfermarkt website. Therefore, a future study could use observations that are updated more often but are also unbalanced variables.

Finally, although the study focuses on football clubs due to their popularity, the concepts mentioned here may be applied to all other sporting entities that care sporting success over financial return and sustainability.

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