The Effect of Financial Ratios on Stock Prices of BİST-Listed Football Clubs

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ABSTRACT

Manuscript type: Research paper

Research aims: When the financial statements of football clubs listed in BIST are examined, it is seen that they are in financial distress. The clubs continue their activities with negative equity. Their debts are five to six times more than their assets and their continuity is uncertain. The striking financial problems of football clubs have been the motivation of the study. In this regard, the aim of this study is to determine the effect of financial ratios on the stock prices of football clubs traded in Borsa Istanbul (BİST).

Design/Methodology/Approach: The stock prices and financial ratios of the listed football clubs, of Türkiye, for quarterly 2005-2021 periods were analysed using random effect analysis with the SAS 9.4 program. Data were obtained from "Stockeys" provided by Finnet Elektronik Publishing Ltd, and "isyatirim" website.

Research findings: As a result, the current ratio (CR) and debt to asset (DA) ratio were found to have positive effects on stock prices.

Theoretical contribution/Originality: The originality of this study is that it reveals the impact of financial analysis of football clubs, where sports performance is a priority for investors. The study also provides a critical perspective on the effects of financial ratios due to the remarkable financial structure of football clubs. Another contribution of the study is that it provides important information to both researchers and investors, due to the extensive literature review. Future researchers can further expand this research by using different financial ratios and considering different ownership structures of clubs and socioeconomic structures of board members.

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https://doi.org/10.22452/ajba.vol18no1.6

Practitioner/Policy implication: The findings offer valuable insights for investors, particularly those interested in the sports sector. The identification of financial ratios that positively impact stock prices can guide investment decisions.

Keywords: Financial Analysis, Financial Distress, Financial Ratios, Football Clubs, Going Concern, Investor Decision, Stock Price
JEL Classification: M40, M41, G10

1. Introduction

Football is indisputably the most popular sport in the world (Zhang et al., 2018; McDonagh, 2017). Although numerous sports have influenced people throughout history, none have achieved the universal popularity of football (Ongan & Demiröz, 2010). Football clubs continue to represent the cultural and emotional heritage of cities, inspiring enduring passion among fans. Beyond this cultural dimension, however, clubs have increasingly sought economically viable paths to success, with the last two decades witnessing a significant emphasis on the economic and financial dimensions of sport. Due to the growing interest in sports, the sports industry has seen remarkable developments over the past twenty years (Gratton & Solberg, 2007). In 2015, the sports industry accounted for approximately 3 per cent of global economic activity (Manoli, 2017). The commercialisation of sports clubs, traditionally non-profit entities, has led to the emergence of a new sector. Fédération Internationale de Football Association (FIFA), representing more countries than the United Nations, saw its revenue reach $4.642 billion in 2018, rising to a maximum of $7.57 billion during the 2019-2022 period (Reikin, 2021; FIFA, 2022). The high fees associated with sponsorship agreements, broadcasting rights for championships, and transfer and loan fees have transformed these clubs from local sports associations into high-capital public companies (Dimitropoulos, 2010; Dimitropoulos & Limperopoulos, 2014).

Such developments off the field have directly impacted on-field performance and contributed to the formation of "industrial football." In pursuit of funding to support investments aimed at enhancing sports performance, football clubs have gone public (Hagen & Cunha, 2019). As of 2021, 25 football clubs were listed on global stock exchanges. Among these listed clubs, two are based in the United Kingdom, one in Germany, three in Italy, four in Portugal, one in the Netherlands, one in France, five in Denmark, four in Türkiye, one in Poland, one in Sweden, one in China, and one in Indonesia. While

European countries predominantly feature on this list, two clubs from Asia are also represented. These publicly listed clubs disclose financial reports, drawing interest to their financial structures and performance (Ika et al., 2021; Perechuda & Cater, 2022).

Football clubs, like other businesses, are not only focused on maximising profits but must balance between achieving sports performance and profit maximisation to meet their objectives (Guzman, 2006; Guzman, 2010; Fort, 2015). Clubs' sustainable success in both sports and finance can positively affect their stock prices (Abbas, 2022). However, Clopton (2013) noted that clubs are often willing to sacrifice profits to enhance sports performance, with some clubs operating for extended periods under losses and negative equity.

Financial distress are prevalent in football clubs in major footballing nations like the United Kingdom (Hamil & Walters, 2010; Ika et al., 2021), France (Galariotis et al., 2018; Carin, 2019), Spain (Luis & Vazquez, 2000), Poland (Perechuda & Cater, 2022), and Portugal (Mourao, 2012). These studies highlight that clubs tend to have high leverage, face severe liquidity and profitability issues, and encounter increasing financial risk. A similar financial situation exists for football clubs in Türkiye. The four biggest football clubs in Türkiye, Beşiktaş, Fenerbahçe, Galatasaray, and Trabzonspor, reported debts of at least four times their revenue for the period of 1 June 2021 to 28 February 2022 according to the 9-month statement of financial position presented to Türkiye's Public Disclosure Platform (KAP, 2022). In the same period, these football clubs reported total losses of 1 billion, 121 million Turkish lira. Their total debts are increasing every year. It can even be said that these clubs are on the verge of technical bankruptcy. However, Szymanski (2016) explains that local or sometimes national governments, fans, and wealthy investors often step in to save clubs from bankruptcy. It cannot be said that investing in football clubs is always financially rational. Clubs tend to use profits to finance transfers instead of high debt or paying dividends (Dumanlı & Parlak, 2021). Prigge et al. (2019) stated that investors' motivations to value football clubs are not only financial. Accordingly, much of the academic interest has focused on the relationship between the stock prices of listed clubs and their sports performance (e.g., match outcomes and player transfers) (Renneboog & Vanbrabant, 2000; Ashton et al., 2003; Stadman, 2006; Deque & Ferreira, 2005; Samagaio et al., 2009; Benkraiem et al., 2009; Bell et al., 2012; Berument et al., 2013; Whitehead, 2014). Similar studies have been conducted in Türkiye (Temizel et al., 2013; Kaya

& Gülhan, 2013; Uludağ & Sigali, 2016; Çalışkan, 2016). Focusing on sports performance does not imply that investors disregard the financial statements prepared by football clubs. Regardless of a football team's strategic objectives, financial health is a prerequisite for the proper functioning of a club. Financial data provides existing and potential investors with information about liquidity, operations, profitability, and financial conditions. According to the Conceptual Framework for Financial Reporting, the primary users of financial reports are existing investors, potential investors, lenders, and other creditors (IFRS, 2018).

Existing and potential investors apply the two main methods, technical and fundamental analysis, to make decisions about investing in stocks. Fundamental analysis is generally done at micro, industrial, and macro levels (Ma et.al., 2018; Wijaya & Sedena, 2020). For the purpose of the study, fundamental analysis is from a micro-level perspective: a method used to calculate the true value of stocks based on the economic indicators and financial statements (Bodie et al., 2014). Evaluating a company's performance with financial ratios has become traditional for analysts, creditors, investors, and financial managers (Delen et al, 2013). Accounting-based data such as financial statements and financial ratios provide important insight and facilitate assessments for investors to make stock investment decision (Horrigan, 1995; Basu, 1997). Since the 2000s, studies have focused on the relationship between financial ratios and stock prices/returns, Initial studies measuring the effect of financial ratios on stock prices/returns were conducted in the late 1960s (Ball & Brown, 1968; Beaver 1968). As the number of countries with developing capital markets has increased, the relationship between financial ratios and stock prices/returns continues to be a focal point in academic studies. These studies have revealed a significant relationship between various financial ratios and stock prices/returns (Table 1).

The high leverage and negative equity structure of football clubs that produce financial statements have been a motivating reason to investigate the relationship between the financial ratios of the clubs and their stock prices/returns.

In addition, it is a timely study considering the financial problems that sports clubs face globally. Focusing on Turkish football clubs will add value to the literature due to the unique financial pressures in this sector. At the same time, it has been found that there is a gap in studies examining the relationship between stock price and financial ratios only. This study seeks to answer the question: What is the effect of financial ratios on stock prices, except the sports performance?

The study is expected to guide investment decisions by determining the financial ratios that positively affect stock prices. It can also be a source for football clubs planning to initial public offering. Another important contribution of the study is that it presents a comprehensive review of the literature by emphasising the basic financial ratios examined in relation to stock prices in various sectors.

Section 1 presents previous studies that measured the effects of financial ratios on stock prices or stock returns in different sectors. Section 2 presents background of Turkish football clubs. In section 3, the quarterly 2005-2021 financial data and stock prices of four publicly listed football clubs in Türkiye are discussed. The data are analysed by random effect model with panel data analysis method. The study is completed with a discussion and conclusion.

2. Background of Turkish Football Clubs

The most popular sport in Türkiye is football. The football economy in Türkiye has grown by approximately 5 times in the last 10 years. Factors such as new sponsorship investments, the increase in broadcasting revenues, and betting revenues have directly affected this growth. (Aktifbank, 2016). Turkish football ranks thirty-seventh among 210 countries in FIFA's December 2021 world rankings (FIFA, 2022). The Turkish Super League is the seventh highest revenue-generating league in Europe with 670 million euros in the 2019/2020 season (Deloitte, 2021).

Although there are many football leagues in Türkiye, the teams that attract attention in Türkiye and compete in European cups are included in the "Spor Toto Super League". There are 20 teams in the Super League in the 2021/2022 season. Beşiktaş (founded: 1903), Galatasaray (founded: 1905), Fenerbahçe (founded: 1907) and Trabzonspor (founded: 1967), the four most successful sports clubs with a history of more than 100 years, are called the "big four" (TFF, 2022).

The big four of Turkish football began to incorporate in the 1990s. Trabzonspor established Trabzon Sportif A.Ş. in 1994, Beşiktaş established Beşiktaş Gymnastics Club Sports Equipment and Sports Investments Industry and Trade Inc. in 1995, Galatasaray established Galatasaray Sportif Sinai ve Ticari Yatırımlar A.Ş. in 1997 and Fenerbahçe established Fenerbahçe Sportif A.Ş. in 1998 (Aydin et al., 2007). In the 2018/19 season, 8 out of 18 teams continue their operations as stock companies. In addition to the big four, Antalyaspor, Çaykur Rizespor, Göztepe and Kasımpaşa have stock

company status (TFF, 2022).

Turkish football clubs that do not want to lose the advantages of being an association are conducting their activities through the companies they have established. In this way, they both benefit from the advantages of being an association and generate commercial income through the company in accordance with the new football economy (Devecioğlu et al., 2012).

Galatasaray and Beşiktaş's shares were offered to the public in 2002, Fenerbahçe's shares in 2004, and Trabzonspor's shares in 2005 (Zeren, 2013).

3. Literature Review

In recent years, many studies have been undertaken to investigate the roles and relationships of financial ratios in predicting stock returns/stock prices. Such studies continue to be carried out today and it is seen that the subject remains timely and still arouse scientific curiosity. Different financial ratios have been used to test stock returns/stock prices in different studies. When the literature is examined (Table 1), it is seen that there is no consensus on the financial ratios that affect stock prices.

Accounting information is important information as it enables investors to review their expectations for future results (Han et al., 1992). In different studies conducted in China, Qatar, the United Arab Emirates, Iran, Sri Lanka, Kenya, England, and South Africa, it was reported that while investors are making decisions, accounting information and annual reports are their primary important sources of information (Chen et al., 2001; Alattar & Al-Khater, 2008; Al-Zarouni, 2009; Mirshekary & Saudagaran, 2005; de Zoysa & Rudkin, 2010; Alfraih & Almutawa, 2014; Grace & Ambrose, 2013; Al-Maliki et al., 2015; Berry & Robertson, 2006; Stainbank & Peebles, 2006). The most important annual reports are general purpose financial reports (Biswas & Bala, 2016; Dang et al., 2019; Stainbank & Peebles, 2006). The results of such studies on investor decisions are summarized below (Table 1). Abbreviations of financial ratios are given in the appendix.

As the main source of publicly available information, it is argued that information in financial statements increases market efficiency (Gao, 2007) and has strong effects on firms' actual decisions and resource allocation in the economy (Zaidi &Tahir, 2019).

Table 1: Literature Review Between Relationship Financial Ratios and Stock Price and Stock Return

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Banking	Veronica & Zuhroh (2021)	Indonesia	Panel Data Regression	ROA, ROE, BOPO			All Ratios
	Abdulmannan & Faturohman (2015)	Indonesia	Panel Data Regression	EPS, DPS, ROA, ROE, FA/TA			All Ratios
	Cahyaningrum and Antikasari (2017)	Indonesia	Multiple Linear Regression	P/B, EPS, ROA, ROE	P/B, EPS, ROA, ROE		
	Steyn (2019)	South Africa	Multiple Linear Regression	P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, ER, DA	P/E, ROE		P/B, DY, PCF, NPM, OPM, CR, ATO, DER, ER, DA
	Ma & Truong (2015)	Sweden	Multivariate Linear Regression and ANOVA	P/E, PEG, P/B, DY, DPS, EPS, RPS, NPM, EBITDA ROA, ROE, CR, DER, ER	DPS	P/E	PEG, P/B, DY, EPS, RPS, NPM, EBITDA, ROA, ROE, CR, DER, ER
	Alaagam (2019)	Saudi Arabia	ARDL	ROA, ROE, NPM	ROA		ROE, NPM
	Al Ajlouni (2011)	Jordan	Parametric Test	P/E, ROA, ROE, ROI			All Ratios
	Alswalmeh & Dali (2019)	Jordan	Ordinary Least Square Method	P/B, ROA, ROE, QR, STO, DER, ER	PB, ROA, ROE, STO, DER		QR, ER
	Al Kubaisi et al. (2017)	Jordan	Multiple Linear Regression and Stepwise Regression	B/M, DY, EY			All Ratios
	Hove et al. (2020)	Zimbabwe	Fixed Effects Panel Regression Model	EY, EPS, ROA, ROE, ROI	ROI	EPS, ROA, ROE	EY

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Insurance	Steyn (2019)	South Africa	Multiple Linear Regression	P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, ER, DA	OPM		P/E, P/B, DY, PCF, ROA, ROE, NPM, CR, ATO, DER, ER, DA
	Aktaş and Ünal (2015)	Türkiye	Regression	Cost Efficiency Ratios, Revenue Efficiency Ratios, Profit Efficiency Ratios	Cost Efficiency Ratios, Revenue Efficiency Ratios, Profit Efficiency Ratios		
	Zeytinoğlu et al. (2012)	Türkiye	Panel Regression	P/E, M/B, EPS	P/E, M/B, EPS		
	Al Maani et al. (2021)	Jordan	Multiple Linear Regression	ROA, ROE, OPM, CR, NWC	ROE		ROA, OPM, CR, NWC
	Al Nimer & Alslihat (2015)	Jordan	Multiple Regression	ROA, ROE, ROI	ROA, ROE, ROI		
Mixed	Benzvi (2021)	United States	Partial Least Squares Structural Equation Modeling	P/E, B/M, DY, EPS, ROA, ROE, ROI, NPM, CR, QR, ITO, ATO, RTO, DER, DC	P/E, B/M, DY, EPS, ROA, ROE, ROI, NPM, CR, QR	DER, DC	ITO, ATO, RTO
	Ball and Brown (1968)	United States	Regression	EPS	EPS		
	Barbee et al. (1996)	United States	Regression	B/M, DER	DER		B/M
	Basu (1977)	United States	Regression	P/E	P/E		
	Bhargava (2014)	United States	Dynamic and Static Random Effects Models	EPS, DPR, TOTAL ASSET, LONG TERM DEBT	EPS, DPR, TOTAL ASSET, LONG TERM DEBT		

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Mixed	Campbell & Shiller (2001)	United States	Linear Regression (simple efficient markets model)	P/E, DPR	P/E, DPR		
	Lewellen 2004	United States	Ordinary Least Squares regression	P/E, B/M, DY	P/E, B/M, DY		
	Ahsan (2013)	United States	CAPM Model, Fama and French 3-Factor Model, Carhart 4-Factor Model	ROE	ROE		
	Kelly et al. (2008)	Australia	Ordinary Least Squares Regression	P/E			P/E
	Banarjee (2019)	United Arab Emirates	Descriptive Statistics, Correlation Analysis and Regression Analysis	P/E, DY, EPS, ROE, DER	DY		P/E, EPS, ROE, DER
	Agustin (2019)	Indonesia	Panel Regression Analysis	EPS, DPR, ROA	EPS, ROA		DPR
	Jermsittiparsert et al. (2019)	Indonesia, Malaysia, Singapore	Multiple Regression Analysis	P/E, MPS, EPS, ROA, ROE, GPM, CR, QR, ATO, AG, ACP, APP, ROCE	P/E, ROA, ROE, CR, QR, AG		MPS, EPS, GPM, ATO, AG, ACP, APP, ROCE
	Auret and Sinclaire (2006)	South Africa	Ordinary Least Squares Regression	P/E, B/M	B/M		P/E
	Kagiri (2019)	India	Regression and Correlation Analysis	DPS, EPS, ROE, OCF	DPS, OCF		EPS, ROE

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Mixed	Anwaar (2016)	England	Panel Regression Analysis	EPS, ROA, ROE, NPM, QR	ROA, NPM	EPS	ROE, QR
	Zaheri & Barkhordary (2015)	Iran	Panel Regression Analysis	P/E, B/M, ROA, ROE, NPM, DA	B/M, ROA, ROE		P/E, NPM, DA
	Mirfakhr-Al-Dini et al.(2011)	Iran	Fuzzy Regression	P/E, DPS, EPS	EPS		P/E, DPS
	Musallam (2018)	Qatar	Weighted Least Square Regression	P/E, M/B, DY, DE, EY, EPS, ROA, ROE, NPM	DY, EY, EPS		P/E, M/B, DE, ROA, ROE, NPM
	Vedd & Yassinski (2015).	Latin America	Regression Analysis	ROE, QR, ATO, DER, CFOS	ATO, DER		ROE, QR, CFOS
	Lau et al. (2002)	Malaysia	Panel Regression Analysis	P/E, B/M, SG, CFP	P/E		B/M, SG, CFP
	Din (2017)	Pakistan	Ordinary Least Squares Regression	MR, EPS, ROS, ATO, DER, IR, TOBINQ	MR, ROS, DER, TOBINQ	EPS, ATO, IR	
	Khan et al. (2012)	Pakistan	Panel Regression Analysis	B/M, DY, EY	DY, EY	B/M	
	Tudor (2010)	Romania	Panel Regression Analysis	P/E, B/M, ROA, ROE	P/M, ROA, ROE		B/M
	Lau et al. (2002)	Singapore	Panel Regression Analysis	P/E, B/M, SG, CFP		SG	P/E, B/M, CFP
	Menike & Prabath (2014)	Sri Lanka	Multiple Regression Analysis	BVPS, DPS, EPS	BVPS, DPS, EPS		
	Wijesundera et al. (2015)	Sri Lanka	Ordinary Least Squares Regression	P/E, M/B, DY, EQPS, ROE	M/B, EQPS, ROE		P/E, DY
	Bayrakdaroğlu et al. (2017)	Türkiye	Panel Regression Analysis	ROA, ROE, NPM, OPM, GPM	NPM		ROA, ROE, OPM, GPM

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Mixed	Cengiz & Püskül (2016)	Türkiye	Panel Regression Analysis	ROA, ROE, NPM, OPM, GPM	ROE, GPM	OPM	ROA, NPM
	Işık 2019	Türkiye	Panel Regression Analysis	P/E, P/B, EPS, ROA, NPM, CR, QR, STO, RTO, DA,CLA	P/B, EPS, ROA, DA		P/E, NPM, CR, QR, STO, RTO,CLA
	Parlakkaya & Kahraman (2017)	Türkiye	Panel Regression Analysis	BVPS, EPS	BVPS, EPS		
	Taani & Banykhaled (2011)	Jordan	Multiple Regression Method and Stepwise Regression Models	P/B, ROE, NPM, QR, ATO, DER, CFOS, TOTAL ASSET	P/B, ROE, DER, CFOS		NPM, QR, ATO, TOTAL ASSET
	Alexakis, Patra, & Poshakwale, (2010)	Greece	Panel Regression Analysis	P/E, P/B, ROA, ROE, NPM, OPM, CR, ATO, DER, DA	ROE, OPM, CR, ATO	DER	P/E, P/B, ROA, NPM, DA
Petrochemical And Oil	Inyiama & Ugah (2015)	Indonesia	Panel Regression Analysis (Cross Section Time Series)	DPS, DC, EPS, NAVPS	NAVPS		DPS, DC, EPS
	Shawer & Al Ajlouni (2018)	Saudi Arabia	Multiple Regression Analysis and Cross-Section Time Series	ROA, ROE, NPM			ROA, ROE, NPM

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Manufacturing	Wijaya (2015)	Indonesia	Multiple Linear Regression Analysis	B/M, DY, EY, ROA, DER	B/M, DY, EY, ROA		DER
	Allozi & Obeidat (2016)	Jordan	Multiple Regression Analysis	EPS, ROA, ROE, NPM, GPM, DER, DA, IR	EPS, ROA, ROE, GPM		DER, DA, IR
	Chan et al. (1991)	Japan	Panel Regression Analysis	P/E, B/M, PCF	B/M, PCF		P/E
	Arkan (2016)	Kuwait	Multiple Regression Model and Step-Wise Method	P/E, EPS, ROA, ROE, NPM, CR, QR, ATO, FATO, DER, DA, SDE	NPM, ROA, ROE		P/E, EPS, CR, QR, ATO, FATO, DER, DA, SDE
Food Industry	Arsal (2021)	Indonesia	Multiple Regression Analysis	DPS, EPS	EPS		DPS
Construction	Wijaya & Sedana, (2020)	Indonesia	Multiple Linear Regression	ROA, QR	ROA, QR		
	Jais et al. (2012)	Malaysia	Ordinary Least Squares Regression	P/E, P/NTAS, ROE, DER, EG	P/E, P/NTA, EG	DER	ROE
Mining	Gursida (2019)	Indonesia	Multiple Linear Regression	ROA, CR, DA	ROA		CR, DA
	Steyn (2019)	South Africa	Multiple Linear Regression	P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, DA, ROCE	P/B, DY, ROE, ATO, DER, DA		P/E, P/CF, ROA, NPM, OPM, CR, ROCE

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Telecommunication	Fauzi et al.(2021)	Indonesia	Multiple Regression Analysis	ROA, ROE, CR, DER, DA	ROA, ROE, DER, DA	CR	
	Steyn (2019)	South Africa	Multiple Linear Regression	P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, DA, ROCE	DY, ROE, DA		P/E, P/B, PCF, ROA, NPM, OPM, CR, ATO, DER, ROCE
Media	Ma et al. (2018)	China	Panel Data Analysis	BVPS, EPS, ROA, ROE, NPM, GPM, CR, QR, CASHR, ITO, CATO, ATO, RTO, ER, DA, FINLEV, OPLEV, DOTL, CMDR, DCR, NCFPS, ROCA, GROEPS, GROROE, NPGR	CATO, ATO, ROCA		BVPS, EPS, ROA, ROE, NPM, GPM, CR, QR, CASHR, ITO, RTO, ER, DA, FINLEV, OPLEV, DOTL, CMDR, DCR, NCFPS, GROEPS, GROROE, NPGR
Energy/Power	Ma et al. (2018)	China	Panel Data Analysis	BVPS, EPS, ROA, ROE, NPM, GPM, CR, QR, CASHR, ITO, CATO, ATO, RTO, ER, DA, FINLEV, OPLEV, DOTL, CMDR, DCR, NCFPS, ROCA, GROEPS, GROROE, NPGR	ROA, CR, QR, CASHR, ITO, ATO, DA, CMDR, NCFPS		BVPS, EPS, ROE, NPM, GPM, CATO, RTO, ER, FINLEV, OPLEV, DOTL, DCR, ROCA, GROEPS, GROROE, NPGR
	Ma and Truong (2015)	Sweden	Multivariate Linear Regression and ANOVA	P/E, PEG, P/B, DY, DPS, EPS, RPS, NPM, EBITDA,ROA, ROE, CR, DER, ER			P/E, PEG, P/B, DY, DPS, EPS, RPS, NPM, EBITDA,ROA, ROE, CR, DER, ER

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Steel	Ma et al. (2018)	China	Panel Data Analysis	BVPS, EPS, ROA, ROE, NPM, GPM, CR, QR, CASHR, IT, CATO, ATO, RT, ER, DA, FINLEV, OPLEV, DOTL, CMDR, DCR, NCFPS, ROCA, GROEPS, GROROE, NPGR	BVPS, EPS, ROA, ROE, NPM, GPM, CR, QR, DA		CASHR, IT, CATO, ATO, RT, ER, FINLEV, OPLEV, DOTL, CMDR, DCR, NCFPS, ROCA, GROEPS, GROROE, NPGR
Real Estate	Steyn (2019)	South Africa	Multiple Linear Regression	P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, ER, DA			P/E, P/B, DY, PCF, ROA, ROE, NPM, OPM, CR, ATO, DER, ER, DA
	Ma and Truong (2015)	Sweden	Multivariate Linear Regression and ANOVA	P/E, PEG, P/S, P/B, DY, DPS, EPS, RPS, NPM, EBITDA, ROA, ROE, CR, DER, ER	ROA	P/B	P/E, PEG, P/S, DY, DPS, EPS, RPS, NPM, EBITDA,ROE, CR, DER, ER
Investment	Arkan (2016)	Kuwait	Multiple Regression Model and Step-Wise Method	P/E, EPS, ROA, ROE, NPM, CR, QR, ATO, FATO, DER, DA, SDE	P/E, EPS, ROA, ROE		NPM, CR, QR, ATO, FATO, DER, DA, SDE
	Ma and Truong (2015)	Sweden	Multivariate Linear Regression and ANOVA	P/E, PEG, P/S, P/B, DY, DPS, EPS, RPS, NPM, EBITDA, ROA, ROE, CR, DER, ER	PEG		P/E, P/S, P/B, DY, DPS, EPS, RPS, NPM, EBITDA,ROA, ROE, CR, DER, ER

Sector	Authors (Year of the study)	Country	Method	Ratios used in the study	Results		
					Positive Correlation	Negative Correlation	No Correlation
Retail	Ma and Truong (2015)	Sweden	Multivariate Linear Regression and ANOVA	P/E, PEG, P/S, P/B, DY, DPS, EPS, RPS, NPM, EBITDA, ROA, ROE, CR, DER, ER	PEG, DY, EPS	P/S, DPS	PEG, P/B, RPS, NPM, EBITDA,ROA, ROE, CR, DER, ER
Service	Arkan (2016)	Kuwait	Multiple Regression Model and Step-Wise Method	P/E, EPS, ROA, ROE, NPM, CR, QR, ATO, FATO, DER, DA, SDE	P/E, EPS, ROA, ROE		NPM, CR, QR, ATO, FATO, DER, DA, SDE

Accounting information continues to be very important for the decision-making processes of bankers, but the relative importance and use of its components have changed (Berry & Robertson, 2006). Annual reports appear to be vital, if not only sufficient, sources of information for investment analysts (Vergoossen & Amsterdam, 1993).

It has been determined that fundamental analysis and ratio analysis are the most common analysis methods, and investment analysts dealing with company analysis use annual reports since financial information is generally important for these analysis methods (Vergoossen & Amsterdam, 1993). Kheradyar et al. (2011) stated that financial ratios can predict stock prices/returns.

It is seen that studies examining the relationships between stock returns and financial ratios have mostly been conducted in developing countries. In particular, pioneering studies on this topic in developed countries have been conducted in the United States. In developing countries, however, the number of such studies is increasing with the development of the capital market. The sectors with the most research to date are mixed sectors. This is followed by financial institutions. Regression analysis has generally been used in these studies. The number of selected ratios in analysis also differs. When Table 1 is examined, the ratios most commonly used to measure the relationships between stock returns/prices financial ratios are respectively seen to be ROE, ROA, P/E (E/P), EPS, NPM, DER, CR, DY, ATO, P/B, QR, and DPS. Among these ratios, the ones

found to be most related to stock returns are respectively EPS, B/M, ROA, ROE, and ATO. In some of the studies in which small numbers of financial ratios were used, it is seen that relationships were determined. The most closely related ratios according to these studies are respectively ROI, M/B, DPR, BVPS, EY, and GPM. Thus, when the literature is examined, it is not possible to identify a consensus about general trends, although it is concluded that financial ratios are important.

4. Research methodology

In this study, four football clubs, namely Beşiktaş (BJK), Fenerbahçe, Galatasaray (GLTSRY), and Trabzonspor (TRBSPR), which are listed in the Sports Activities, Entertainment, and Game Activities sector of Borsa Istanbul, were analysed. Although these companies are involved in other sports activities such as volleyball and basketball in addition to football, the main activity of all four clubs is football. Apart from the fact that these football clubs are listed in the stock market, the fact that they are the top four clubs in Türkiye increases the importance of this study. An important difference of sports clubs from other companies is that their financial periods are from 1 June to 31 May in the following year. In other words, a special accounting period is applied. In this study, a total of 62 periods, from the last quarter of 2005 to the first quarter of 2021, were analysed. The reason for choosing the 2005 period as the beginning of the analysis is that Trabzonspor was opened to the public in the spring of 2005.

The market ratios of stocks and financial ratios used in this study were obtained from the web-based fundamental analysis software called Stockeys, provided by Finnet Elektronik Publishing Ltd. (Stockeys, n.d.). Data on daily stock prices were obtained from a "isyatirim" website (isyatirim, n.d.). The quarterly averages of stock prices were calculated in Excel based on the number of days they were traded in the stock exchange. In order to test the effects of financial ratios on stock prices, the following quarter's stock price averages were considered according to the reporting period. The effects of earnings per share and price to earnings ratio, which are frequently used market ratios, were not measured due to the fact that the clubs generally announced high losses in all periods. Return on equity, another frequently used profitability ratio, was also excluded from the analysis because equities were negative and the clubs experienced losses. The formulas and definitions of the analysed ratios are given in Table 2.

Table 2: Ratios Definition and Formula

Ratio	Formula	Definition
Return On Assets	Net Profit / Total Assets	This indicator informs how profitable the company is at making a profit on its assets.
Current Ratio	Current Assets / Current Liabilities	It is used to measure the solvency of short-term debts and to determine whether the net working capital is sufficient.
Market To Book	Market Value / Book Value	Book value determines the value of a company based on financial data. Market value is the value of a company based on the perceived value by the market.
Dept to Equity	Total Liabilities / Equity	The debt-to-equity ratio shows a company's debt as a percentage of its total market value. This ratio is an indicator of the debt the company uses to finance its assets.
Debt Ratio	Total Liabilities / Total Assets	The total debt ratio shows how much of the finance in assets is provided by foreign resources.
Asset Growth	(Ending Assets – Begining Assets) / Begining Assets) X100	Total assets of a company are an indicator of financial size.
Net Profit Margin	Net Profit / Revenue	The net profit margin shows how the company converts its sales into profit. It is a measure of both productivity and overall occupational health.
Operating Profit Margin	Operating Profit / Revenue	Operating Profit Margin is a profitability or performance ratio that reflects the percentage of profit a company produces from its operations before subtracting taxes and interest charges

The panel data method was used in this study. Data were analysed with the SAS 9.4 program. While stock price was taken as the dependent variable, the independent variables were return on assets (ROA), current ratio (CR), market/book (MB) ratio, debt equity ratio (DER), debt to total assets (DA), asset growth (AG), net profit margin (NPM), and operation profit margin (OPM). The total number of observations was 2,232.

5. Data Analysis

5.1. Descriptive Statistics

This research was undertaken to determine whether statistically significant relationships exist between certain financial variables (ROA, lnCurrentRatio, MarketBook, DebtEquity, lnDebtTotalAssets, AssetGrowth, NetProfitMargin, and OperationProfitMargin) and the stock prices of the top four football clubs in the Turkish Premier League for 2005-2021.

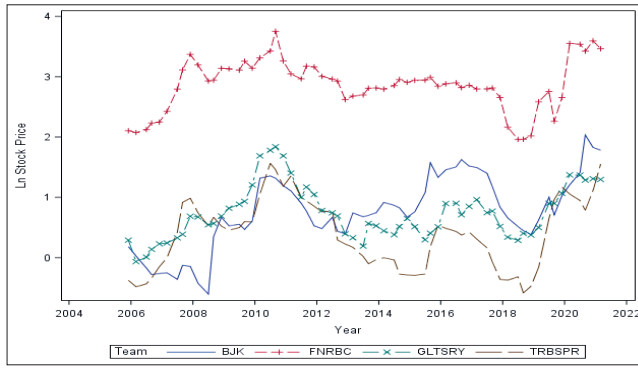
Table 3: Descriptive Statistics of The Variables

Football Clubs	N	Variable	Mean	Min	Max	Std Dev	Skewness	Kurtosis
BJK	62	lnStockPrice	0.754	-0.605	2.034	0.609	-0.214	-0.400
		ROA	-35.942	-140.160	7.560	34.230	-0.906	0.078
		lnCurrentRatio	-0.901	-2.526	1.082	0.783	-0.133	-0.165
		MarketBook	0.027	-23.880	56.910	9.611	3.398	20.394
		DeptEquity	-15.742	-1.790.190	3.698.610	731.159	2.113	10.683
		lnDeptTotalAssets	5.227	4.443	6.105	0.500	-0.068	-1.182
		AssetGrowth	21.090	-36.980	103.900	34.756	0.511	-0.582
		NetProfitMargin	-38.473	-251.180	25.950	43.858	-1.973	7.654
		OperationProfitMargin	-8.872	-107.650	49.960	29.094	-0.726	1.052
GLTSRY	62	lnStockPrice	0.740	-0.065	1.839	0.441	0.666	-0.026
		ROA	-1.694	-50.380	76.590	30.230	1.033	0.077
		lnCurrentRatio	-0.144	-1.561	2.850	1.406	0.965	-0.804
		MarketBook	-8.502	-186.970	102.677	33.510	-3.181	18.998
		DeptEquity	-461.340	-4.583.710	4.727.364	1.089.302	0.050	12.915
		lnDeptTotalAssets	4.360	2.177	5.613	0.896	-0.894	-0.621
		AssetGrowth	37.612	-56.820	321.350	72.132	2.883	9.584
		NetProfitMargin	-15.666	-176.040	207.900	80.599	1.048	0.718
		OperationProfitMargin	-8.373	-142.130	86.200	49.993	0.239	0.163
FNRBC	62	lnStockPrice	2.865	1.961	3.754	0.425	-0.395	-0.123
		ROA	9.294	-55.150	74.710	36.351	0.236	-1.360
		lnCurrentRatio	0.430	-1.833	2.837	1.280	0.161	-1.022
		MarketBook	3.463	-8.170	19.850	8.171	0.247	-1.549
		DeptEquity	-91.541	-576.270	956.630	278.508	1.244	2.906
		lnDeptTotalAssets	3.986	1.281	5.463	1.295	-0.647	-1.212
		AssetGrowth	31.586	-41.080	212.780	46.920	1.441	3.220
		NetProfitMargin	16.452	-104.860	129.000	65.296	0.253	-1.309
		OperationProfitMargin	17.669	-76.130	90.480	48.573	0.354	-1.315

Football Clubs	N	Variable	Mean	Min	Max	Std Dev	Skewness	Kurtosis
TRBSPR	62	lnStockPrice	0.392	-0.585	1.565	0.576	0.144	-0.958
		ROA	-2.838	-86.510	72.400	38.908	0.035	-0.991
		lnCurrentRatio	-0.533	-3.219	2.883	1.623	0.559	-0.760
		MarketBook	1.044	-40.420	112.290	15.839	5.546	41.733
		DeptEquity	-157.015	-2.881.730	1.111.405	466.967	-3.130	19.368
		lnDeptTotalAssets	4.263	1.275	5.616	1.170	-1.218	0.658
		AssetGrowth	27.458	-27.380	105.410	38.496	0.316	-0.948
		NetProfitMargin	-8.563	-202.900	161.130	95.604	-0.248	-0.918
		OperationProfitMargin	0.128	-176.770	93.580	79.787	-0.415	-0.974
Total	248	lnStockPrice	1.197	-0.61	Mar.75	1.106	0.664	-0.682
		ROA	-6.026	-140.16	76.59	37.927	0.121	-0.197
		lnCurrentRatio	-0.165	-3.22	Şub.88	1.397	0.522	-0.798
		MarketBook	-0.937	-186.97	112.29	9.466	-1.255	5.895
		DeptEquity	-175.256	-4583.7	4727.36	440.496	-0.407	4.051
		lnDeptTotalAssets	4.405	Oca.28	6.Eki	1.145	-1.147	0.279
		AssetGrowth	30.656	-56.82	321.35	37.918	1.500	4.899
		NetProfitMargin	-8.444	-251.18	207.90	70.244	0.477	-0.272
		OperationProfitMargin	3.018	-176.77	93.58	52.946	0.057	-0.263

Sample means, standard deviations, and skewness and kurtosis values of the selected variables for these four football clubs in the four quarters of 2005 and 2021 are reported in Table 3, with units of measurements noted next to the variables. From this table it is clear that for most of the variables data are normally distributed given that the skewness values are within the range of -3 to 3. A series plot for the four football teams is illustrated in Figure 1.

Figure 1: Series Plot of the Four Football Teams



5.2. *Poolability Test*

A poolability test is an F test of the null hypothesis that all fixed effects are jointly 0; it is performed by comparing fixed-effects estimates to those obtained from pooled regression. It can be applied across the teams and over time. The purpose of this test is to determine whether the same coefficients are applicable for all teams and times. There are many analytical tests available but the F test statistic was used in this study and the results are provided in Table 4.

Table 4: The Results of the F Test

F Test for No Fixed Effects			
Num DF	**Den DF**	**F Value**	**Pr > F**
3	54	68.55	<.0001

The F test yielded the impressive value of 68.55, which implies a rejection of the null hypothesis of constant effects for all teams in the dataset at the significance level of $p<0.0001$.

5.3. *Hausman Test*

The Hausman test is necessary while selecting the most appropriate panel regression model between the fixed-effects model and the random-effects model. The Hausman test was accordingly carried out in this study and the results are shown in Table 5.

Table 5: Hausman Test Results

Hausman Test for Random Effects			
Coefficients	**DF**	**m Value**	**Pr > m**
6	6	1.91	0.9275

As can be seen in the table, the Hausman test statistic for the one-way model as given by the SAS program was m = 1.91 with a significant p-value of 0.9275. The implication of this result is that we should accept the null hypothesis that asserts that the random-effects model is the appropriate model.

5.4. *Model Specification*

According to the results of the Hausman test, the most appropriate model for our data is the random-effects model. This model is used

to estimate panel data where explanatory variables may be unrelated between times and between individuals as the random-effects model assumes that there is a difference of intercepts for each individual and that intercepts are random variables. In the random-effects model, the differences between intercepts are accommodated by the error terms for each team. The advantage of using the random-effects model is the elimination of heteroscedasticity. The empirical regression equation for the random-effects model in panel data analysis is as follows:

$$Yit+1 = \alpha + \beta'Xit + ui + \varepsilon it \qquad \text{for } i = 1,2, ...,H \text{ and } t = 1,2, ...,T$$

Here, yit+1 is the dependent variable within the model (the stock price of the four football teams at time t+1); α represents the intercepts; β represents the coefficients of the vectors of parameters; Xit represents a set of variables for the ith team in the tth period; ui is the individual residual, which is the random characteristic of unit observation; and εit is the residual as a whole, where the residual is a combination of cross-section and time series. The set of independent variables includes ROA, lnCurrentRatio, MarketBook, DebtEquity, lnDebtTotalAssets, AssetGrowth, NetProfitMargin, and OperationProfitMargin. Therefore, the model may be written as follows:

$$Yit = \alpha + \beta 1\ ROAit + \beta 2\ lnCRit + \beta 3\ MBit + \beta 4\ DERit + \beta 5\ lnDAit + \beta 6\ AGit + \beta 7\ NPMit + \beta 8\ OPMit + ui + \varepsilon it$$

ROAit is the return on asset of firm i at time t, CRit is the current ratio of firm i at time t, MBit is the market to book ratio of firm i at time t, DERit is the debt to equity ratio of firm i at time t, lnDAit is the debt to asset ratio of firm i at time t, AGit is the asset growth of firm i at time t according to the t-1, NPMit is the net profit margin of firm i at time t, OPMit is the operating profit margin of firm i at time t, and ui + εit are the error terms.

5.5. Breusch-Pagan and White's Tests for Heteroskedasticity

The Breusch-Pagan test is designed to detect any linear form of heteroskedasticity. The general White test for heteroskedasticity can also be used for such cases. White's general test is a special case of the Breusch-Pagan test, where the assumption of normally distributed errors is relaxed. The results of these tests are illustrated in Table 6.

Table 6: Heteroskedasticity Test Results

	Heteroscedasticity Test			
Equation	Test	Statistic	DF	Pr > ChiSq
lnStockPrice	White's Test	47.36	44	0.3370
	Breusch-Pagan	14.05	8	0.0804

As can be seen from the table, the significant p-values obtained with both tests indicate that heteroskedasticity is not a problem.

5.6. Durbin-Watson DW Autocorrelation Test

The most often used test for first-order temporal autocorrelation is the Durbin-Watson (DW) test. The DW test measures first-order autocorrelation and it cannot be used to test for higher orders of temporal autocorrelation. It is applied to test null and alternative hypotheses that there are no correlations among the residuals and that the residuals are autocorrelated, respectively. A significant p-value for the DW statistic would suggest rejecting the null hypothesis and concluding that there is first-order autocorrelation among the residuals. The DW test was accordingly applied for our dataset and the results are illustrated in Table 7.

Table 7: Durbin-Watson DW Autocorrelation Test Results

Durbin-Watson Statistic for First-Order								
	White Noise vs. Positive Correlation			Random Walk vs. Stationary		White Noise vs. Negative Correlation		
DF	Statistic	Pr < DWLower	Pr > DWUpper	Pr < DWLower	Pr > DWUpper	Statistic	Pr < DWLower	Pr > DWUpper
1	0.93	<.0001	0.0003	0.0009	0.9710	3.07	0.9996	1.0000

The DW test value of 0.93 indicates the positive autocorrelation of the regression residuals.

5.7. Autocorrelation-Consistent Random Effects Model

The presence of heteroscedasticity and autocorrelation can result in inefficient and biased estimates of the covariance matrix in panel data analysis. Models that take changing variance into account can make more efficient use of the data. There are several methods that produce heteroscedasticity-consistent (HCCME) and heteroscedasticity- and autocorrelation-consistent (HAC) covariance matrices. In panel data analysis performed with SAS 9.4 software, the HAC option in the

MODEL statement of the PROC PANEL procedure was used to select the type of heteroscedasticity- and autocorrelation-consistent covariance matrix. Since the random-effects model employed in this study suffers from autocorrelation according to the results of the DW test with an estimation value of 0.93 and a p-value of 0.000, a one-way random-effects model with the HAC option was used to solve that problem and the results of the analysis are illustrated in Table 8.

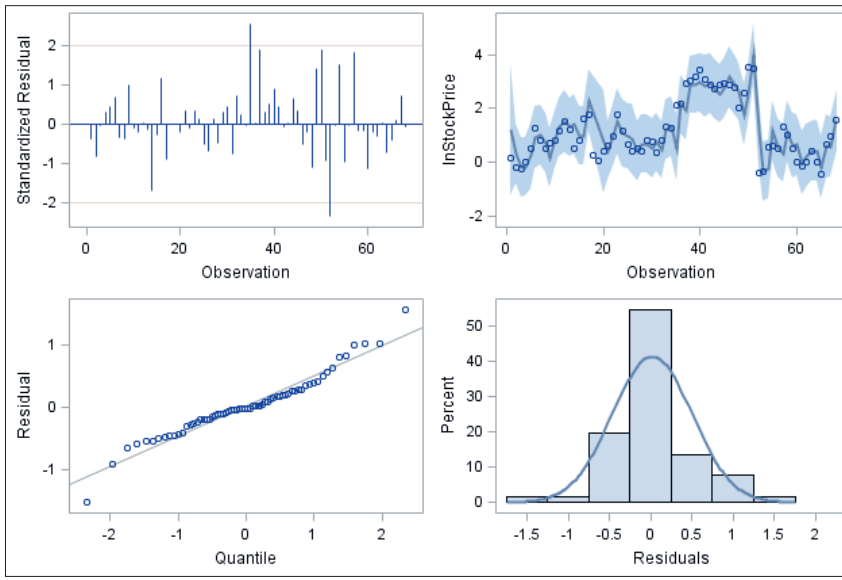
Tablo 8: Results of One-Way Random Effect Model with HAC Option

Variable	Parameter Estimates					
	Estimate	Standard Error	t Value	Pr > |t|	Fit Statistics	
Intercept	-1.76799	0.8956	-1.97	0.0535	SSE	9.8955
ROA	0.008793	0.00488	1.80	0.0771	MSE	0.1833
lnCurrentRatio	0.390619	0.1421	2.75	0.0081	Root MSE	0.4281
MarketBook	-0.01272	0.00654	-1.95	0.0568	R^2	0.8760
DeptEquity	0.000046	0.000145	0.31	0.7549		
lnDeptTotalAssets	0.568235	0.2213	2.57	0.0130		
AssetGrowth	-0.00092	0.00117	-0.79	0.4318		
NetProfitMargin	-0.00244	0.00239	-1.02	0.3128		
OperationProfitMargin	-0.00158	0.00235	-0.67	0.5053		

From the table, it is clear that the model achieved a coefficient of determination (R^2) value of 0.876. Thus, percent 87.6 of the variation in lnStockPrice could possibly be explained by the eight financial ratios as indicated in Table 8. The t-test results showed that the effects of lnCurrentRatio and lnDebtTotalAssets were statistically significant for lnStockPrice (p=0.0081 and 0.0130, respectively). These two variables have positive effects on lnStockPrice.

Fit diagnostics of the one-way random-effects model with the HAC option are illustrated in Figure 2. From the standardized residual plot of the model it can be seen that the residuals of lnStockPrice are fairly homoscedastic. The fit plot of the predicted versus observed values indicates that the model fits the data quite well. Looking at the QQ-plot of the residuals, it can easily be seen that the model conforms to normality reasonably well. This can be confirmed by looking at the histogram of the residuals. For this model, the residuals are normal; the overlay of the normal density curve fits the histogram well.

Figure 2: Fit Diagnostic Plots for The Model



6. Discussion and Conclusion

The effect of financial ratios, which are widely used in fundamental analysis, was also revealed in this study. Ratio analysis was began to be applied systematically in 1919 (Sarıkamış, 2007). Literature review confirms that this analysis continues to be an important analytical technique in decision-making and providing useful information today.

In this study, the effects of eight selected financial ratios on stock prices were investigated by panel data analysis for listed football clubs in Türkiye. The analysis revealed that CR has a positive and strong relationship on stock prices. Although this finding is in line with other studies revealing that CR has a positive effect on stock prices (Benzvi, 2021; Jermsittiparsert et al., 2019; Alexakis et al., 2010; Ma et al., 2018), Fauzi et al.'s (2021), it is not compatible with the negative effect finding.

A relationship between CR and stock price is an expected result. CR provides an overview of the company's ability to meet its short-term obligations, the higher the percentage of the current ratio (CR), the better the company's liquidity level, thus providing a positive perception of the company's situation and increasing the value of the company in the eyes of investors (Hamzah et al., 2022). However, when the financial statements of football clubs are examined, it is

seen that "Other Receivables from Related Parties" (non-commercial receivables from the football clubs) have a significant portion within the current assets. In other words, non-commercial receivables positively affect the current ratio. This reality is also stated in the clubs' auditor reports as the basis of qualified opinion. It is explained in the basis that non-commercial receivables are high and the receivables do not create cash inflows. This situation is actually an indication that the clubs do not have the power to pay their debts.

DA also has a positive effect on stock prices, and this finding is similar to the conclusions of other studies reporting that DA positively affects stock prices (Işık, 2019; Steyn, 2019; Faruzi et al., 2021; Ma et al., 2018). Financial leverage is a financial tool that is widely used to improve a firm's rate of return and its value. However, financial leverage irrespective of its benefit to company, also creates financial risk to the company. If a highly levered company is unable to make sufficient Earning Before Interest and Tax (EBIT), such firm might have bankruptcy risks it may not be able to meet its interest obligations and also finance other expenses of the company (Adenugba et al., 2016).

On the other hand, as a result of the study, we think that the positive effect between DA financial ratios and stock prices is debatable. When the financial structure of football clubs is examined, it is seen that they try to continue their operations with negative equity, where their debts are five and six times more than their assets. It would not be wrong to say that there is uncertainty about the going concern of clubs that increase their debts faster than their income (Dietl & Franck, 2007). In this case, it is expected that there will be a negative or no relationship between DA and stock returns. The fact that investors do not perceive such a situation as a risk can be explained by the clubs' fan and member ownership model (The ownership model of all football clubs in Türkiye is fan and member ownership). A strong socio-economic structure of the board of directors can be reassuring for investors.

The study only focused to reveal the effect of financial ratios on stock returns. As mentioned above, the study revealed the positive effect of two financial ratios, CR and DA. This result shows that CR and DA can be taken into consideration to make investment decision in football clubs. However, since football clubs are in financial distress, using ratios while making investments may not be a rational behavior for investors.

In future studies, it is recommended that variables related to socioeconomic structures of board members and sports performance are taken into account in order to explain the positive effects of

CR and DA. A study examining the relationship between different ownership structures and stock returns will add value to the literature. It would be interesting to conduct studies to rationally and scientifically explain why high debt ratios has positive effects on stock prices. Furthermore, except the financial ratios used in the study, the effect of other financial ratios on stock prices can be investigated.

The findings offer valuable insights for investors, particularly those interested in the sports sector. The originality of the study is that it has revealed the effect of financial analysis of football clubs, where sports performance is a priority for investors. At the same time, while revealing the effects of financial ratios, this study has also presented a critical perspective by evaluating the results of ratio analyses on the financial structure of football clubs. This study is expected to provide a valuable perspective and serve as a source of information for individual and institutional investors who will invest in the sports industry.

The locomotive of the football industry is European countries. However, this study is also important for Asian countries. Because 46 of FIFA's 210 member countries are Asian countries. There are 18 Asian countries in the top 100 ranking. There is one football club from each of the two Asian countries traded on the stock exchange. This study is expected to be useful for users interested in the financial structures of football clubs in Asian countries.

Appendix

Abbreviation	Ratio	Abbreviation	Ratio
Price and Market Ratios		**Solvency Ratios**	
B/M	Book to Market	CLA	Current Liabilities/Assets
BVPS	Book Value per Share	DA	Dept to Assets
DC	Dividend Cover	DC	Dept/Capital
DE	Dividends Earning	DER	Debt-Equity Ratio
DPR	Dividend Payout Ratio	DOTL	Degree of Total Leverage
DPS	Dividend per Share	ER	Equity Ratio
DY	Dividend Yield	FINLEV	Financial Leverage
EPS	Earnings per Share	IR	Interest Rate
EQPS	Equity Per Share	OPLEV	Operating Leverage
EY	Earning Yield	SDE	Short-term Debt to Equity
M/B	Market to Book	**Cash Flow Ratios**	
MPS	Market Price per Share	CMDR	Cash maturing Debt Ratio

Abbreviation	Ratio
MR	Market Return
NAVPS	Net Asset Value per Share
P/B	Price to Book
P/E	Price to Earnings
P/NTAS	Price/Net Tangible Asset
P/S	Price to Sales
PCF	Price/Cash Flow
PEG	Price/Earning Growth
RPS	Revenue per Share
Profitability Ratios	
EBITDA	EBITDA Margin
ROE	Return On Equity
ROA	Return On Assets
ROI	Return On Investment
ROS	Return On Sales
NPM	Net Proft Margin
OPM	Operating Profit Margin
GPM	Gross Profit Margin
Liquidity Ratios	
CR	Current Ratio
NWC	Net Working Capital
QR	Quick Ratio
CASHR	Cash Ratio
DCR	Debt Coverage Ratio
NCFPS	Net Cash Flow per Share
CFOS	Cash Flow from Operation/Sales of Firm
OCF	Operating Cash Flow Ratio
CFP	Cash Flow Price
Turnover Ratios	
ATO	Asset Turnover
CATO	Current Asset Turnover
FATO	Fixed Asset Turnover
ITO	Inventory Turnover
RTO	Receivable Turnover
STO	Stock Turnover
Growth Ratios	
GROEPS	Growth Rate of EPS
GROROE	Growth Rate of ROE
NPGR	Net Profit Growth Rate
SG	Sales Growth
AG	Assets Growth
EG	Earning Growth
Other Ratios	
ACP	Average Collection Period
APP	Average Payment Period
ROCE	Return on Capital Employed
BOPO	Operational Costs on Operational Revenues
ROCA	Rate of Capital Accumulation
FA/TA	Fixed Asset /Total Assets

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