Trakya Üniversitesi Sosyal Bilimler Dergisi 205
2025 Cilt 27 Özel Sayı (205-226)
DOI: 10.26468/trakyasobed.1515405 Araştırma Makalesi/Research Article

THE IMPACT OF BOARD STRUCTURE ON COST OF DEBT: A RESEARCH ON BIST MANUFACTURING SECTOR COMPANIES[1]

YÖNETİM KURULU YAPISININ BORÇLANMA MALİYETİ ÜZERİNE ETKİSİ: BIST İMALAT SEKTÖRÜ FİRMALARINDA BİR ARAŞTIRMA

Filiz ÖZŞAHİN KOÇ[*], Ali DERAN[**]

Geliş Tarihi: 12.07.2024 (Received) *Kabul Tarihi: 25.12.2024 (Accepted)*

ABSTRACT: The goal of this research is to investigate the impact of the board structure of firms on the cost of debt. Therefore, the data of 150 firms listed in the "Borsa Istanbul (BIST)" manufacturing sector between 2017-2021 are analyzed. "Panel data analysis" method is used in the study. It is found that gender diversity, board independence, size, return on assets, tangible assets, firm age, financial leverage and percentage of sales growth have an impact on the cost of debt. However, the gender of the chairman, board size and liquidity variables are found to have no significant impact on the cost of debt. While there are researches in the international literature that examine the effect of board structure on the cost of debt, there is a limited number of studies in the national literature on this issue in the Turkish sample. This research, which aims to research the relationship between the board structure and the cost of debt of firms in the BIST manufacturing sector, is thought to complement the gap in the literature.

Key Words: Cost of Debt, Board Diversity, Panel Data Analysis

ÖZ: Bu çalışmanın amacı, firmaların yönetim kurulu yapısının borçlanma maliyeti üzerine etkisini araştırmaktır. Bu amaç doğrultusunda, 2017-2021 yılları arasında Borsa İstanbul (BIST) imalat sektöründe faaliyette bulunan 150 firmanın verisi incelenmiştir. Araştırmada panel veri analizi yöntemi kullanılmıştır. Analizler neticesinde cinsiyet çeşitliliği, yönetim kurulu bağımsızlığı, büyüklük, aktif kârlılık, maddi varlıklar, firma yaşı, finansal kaldıraç ve satışlardaki büyüme yüzdesinin borçlanma maliyeti üzerinde etkisi olduğu bulgusu elde edilmiştir. Bununla birlikte, yönetim kurulu başkanının cinsiyeti, yönetim kurulunun büyüklüğü ve likidite değişkenlerinin borçlanma maliyeti üzerinde anlamlı bir etkisi olmadığı saptanmıştır. Uluslararası literatürde yönetim kurulu yapısının borçlanma maliyeti üzerine etkisini inceleyen çalışmalar bulunmakla birlikte, ulusal literatürde bu konuda Türkiye örnekleminde sınırlı sayıda çalışma yer almakta olup BIST imalat sektöründe yer alan firmaların yönetim kurulu yapıları ile borçlanma maliyeti arasındaki ilişkiyi araştırmayı amaçlayan bu çalışmanın literatürdeki eksikliği tamamlayacağı düşünülmektedir.

Anahtar Kelimeler: Borçlanma Maliyeti, Yönetim Kurulu Çeşitliliği, Panel Veri Analizi

[1] Bu makale, IERFM2024 Kongresinde sunulan bildirinin gözden geçirilmiş ve düzenlenmiş hâlidir.

[*] Dr. Öğr. Üyesi, Nevşehir Hacı Bektaş Veli Üniversitesi, filiz.ozsahin@nevsehir.edu.tr, ORCID: 0000-0002-0211-869X.
[**] Prof. Dr., Tarsus Üniversitesi, alideran@tarsus.edu.tr, ORCID: 0000-0001-5377-6740.

1. INTRODUCTION

Firms need financing in order to maximize market value, to achieve key objectives related to growth, profitability and sustainability, and to carry out routine business activities. This financing need is met through equity or foreign resources (borrowing). In this context, the main factor affecting the financing decision of firms is the cost of resources. In other words, firms compare the cost of equity with the cost of debt (COD)[1] when deciding from which sources they will meet their funding needs. In general, firms prefer to obtain the funds they need primarily from external sources (borrowing). This is because the cost of foreign resources is lower and less risky than the cost of equity (Özer et al., 2023: 218).

Cost of equity is defined as the opportunity cost of equity instruments and can be expressed as the maximum loss incurred by shareholders who provide equity to the firm as a result of foregoing other alternative investment areas. COD is defined as *"interest and other expenses incurred by an entity in relation to borrowings"* (TMS 23, Article 5). In the event that the funds obtained by companies from external sources are temporarily interest-bearing, such interest should be deducted from the COD (TMS 23, Article 13).

The COD as a percentage rate is the discount rate that equates the present value of the funds provided to the present value of the present and future payments made for these funds (Say and Doğan, 2022: 1582).

It is possible to mention several general and firm-specific factors that impact the COD of firms. One of these factors is the corporate governance approach of firms. This is because the functioning of corporate governance mechanisms and the structure of the board (BOARD) of firms are among the factors that financial institutions and organizations that provide financing to firms attach importance to. It is accepted that the reliability of financial statements, financial information and data presented by firms with effectively functioning corporate governance, internal control, internal audit and risk management structures will be at a higher level. This situation is reflected in the financial decisions of financial institutions regarding that firm. Studies in the literature support this idea. Li et al. (2016) state in their study that corporate governance has an effect on the financing COD, similarly, *"Fields, Fraser and Subrahmanyam (2012)"* state in their study that good corporate governance practices induce a decrease in the COD. Within the framework of these explanations, it is possible to state that the composition of the BOARD, which makes crucial strategic decisions regarding firm operations, is also important in terms of financing decisions. In this context, in recent years, many countries, especially in publicly traded firms, have adopted policies and regulations such as the inclusion of female members on boards of directors and increasing the

[1] "From now on it will be referred to as COD."

number of independent members. For example, *"the European Commission"* has decided that by 2020, at least 40% of the board of publicly traded firms should be female. Resembling policies have been presented in emerging markets, with Türkiye and Malaysia requiring boards of directors of publicly traded firms to disclose measurements and statistics on gender diversity, and India and Korea requiring the appointment of at least one female member to the boards of publicly traded firms (Aksoy and Yılmaz, 2023: 505).

In literature, studies reviewed by the effect of board structure on the COD in developed capital markets *"Pandey, Biswas, Ali, & Mansi, 2020; Usman, Farooq, Zhang, Makki, & Khan, 2019; Ghouma et al, 2018; Bradley and Chen, 2015; Fields, Fraser and Subrahmanyam 2012; Lorca et al., 2011"* and studies focusing on emerging markets *"Aksoy and Yılmaz, 2023; Basar, 2021; Thakolwiroj and Sithipolvanichgul, 2021; Zhai, 2019; Hashim and Amrah, 2016; Li et al., 2016"* are seen. In terms of Türkiye, there is a restricted number of researches in the literature, and this research, which goals to research the relationship between the board structure of firms in the *"BIST manufacturing sector"* and the COD, is thought to complement the gap in the literature. For this purpose, the effect of independent variables such as "the gender of the chairman, gender diversity in the board, number of board members, number of independent board members" and control variables such as "size, return on assets, leverage, percentage growth in sales, tangible assets, firm age, liquidity" on the COD is analyzed with a "panel regression model".

The study is essential as it is one of the limited study performed in Türkiye in this area and ensures results on the relationship between the board and the COD. The structure of the board of directors of companies is substantial the institutions that provide credit. Because companies with women on the board of directors are seen as less risky by financial institutions and are seen to have lower debts. In addition, the formation of the board of directors is also important with respect to determining and implementing the policies to be implemented in the company (Aksoy and Yılmaz, 2023: 505). The situations in question are also important for the motivation of the study. The study also ensures evidence that lending institutions and organizations consider firms with women on the board as less risky and provide lower cost financing to these firms.

2. LITERATURE REVIEW

In literature, the impact of board structure on the COD has been analyzed in *"Aksoy and Yilmaz (2023); Malakeh (2021); Stefany and Joni (2020); Zhai (2019); Hashim and Amrah (2016); Bradley and Chen (2015); Ranti (2013); Fields et al. (2012); Lorca et al. (2011); Anderson et al. (2004)"*; the relationship between capital structure and board characteristics has been examined in *"Thakolwirroj and Sithipolvanichgul (2021); Alves et al. (2015); Heng et al. (2012)"*; the relationship

between the gender of managers, gender diversity and financing decisions – COD has been studied in *"Datta et al. (2021); Miah (2020); Pandey et al. (2020); Usman et al. (2019)"* and the impact of corporate governance practices on the COD has been analyzed in *"Aldamen and Duncan (2012)"*. A limited number of researches were found in the national literature. Table 1 reports the researches in the aforementioned literature and the results obtained from these studies.

Table 1. Some Studies in National and International Literature

Author(s)/Year	Purpose of the Study	Sample	Methodology of the Study	Results
Anderson et al. (2004)	To examine the relationship between board characteristics, integrity of accounting reporting and the COD.	1993-1998 data of firms traded on the US S&P stock exchange	Multiple Regression Analysis	There is an inverse relationship between the size and independence of the board and the COD. It is concluded that firms with an independent audit committee have lower cost of debt.
Lorca et al. (2011)	To examine whether the board affects the COD in a Spanish sample.	Data on non-financial firms listed on the Spanish stock exchange for the years 2004-2007	Regression Analysis	It is observed that ownership structure and board activities affect lenders' risk assessments of firms as they reduce agency costs and information asymmetry. Moreover, a non-linear relationship between board size and COD is found.
Aldamen and Duncan (2012)	To investigate the impact of good corporate governance practices on the reported COD in an Australian sample.	Data on companies listed on the Australian Securities Exchange (ASX) as of June 30, 2007	Regression Analysis	It is found that firms with good corporate governance practices have lower cost of debt.
Fields et al. (2012)	To analyze the relationship between board quality and COD in the context of bank lending cases	2003-2005 data of companies traded on the US S&P stock exchange	Multiple Regression Analysis	Firms with higher board quality, i.e. larger, more independent and better-informed boards of directors, have lower cost of debt than other firms.
Heng et al. (2012)	To examine the relationship between the board and the firm's capital structure in Malaysia, an emerging market.	Data on 75 non-financial Malaysian firms listed on the Kuala Lumpur Stock Exchange (KLSE) for the years 2005-2008	Multiple Regression Analysis	It is concluded that board size and board independence have negative and positive correlations with the debt/asset ratio, respectively.

Ranti (2013)	To examine the effects of board size and CEO duality on firms' capital structure in a Nigerian sample.	Data of 40 firms listed on the Nigerian stock exchange for the years 2006-2011	Regression Analysis	It is concluded that firms with inadequate corporate governance tend to use more debt to reduce agency problems due to the small size of the board (fewer members on the board).
Alves et al. (2015)	To empirically analyze the relationship between board composition and capital structure.	2006-2010 data on 2427 companies from 33 countries listed worldwide obtained from Bloomberg database	Panel Regression Analysis	It is concluded that firms with a larger proportion of independent directors on the board prefer financing through long-term borrowing.
Bradley and Chen (2015)	To determine whether firms' board independence reduces the COD	2002-2006 data of firms traded on the US S&P stock exchange	Panel Regression Analysis	It is concluded that the COD decreases as board independence increases.
Hashim and Amrah (2016)	To determine whether there is any difference in the relationship between board, audit committee effectiveness and COD between family and non-family firms in the Sultanate of Oman.	Data of 68 financial and non-financial firms traded in Muscat Securities Market for the years 2005-2011	Ordinary Least Squares Regression Analysis	It is found that there is a negative relationship between board effectiveness and COD for all family and non-family firms. In addition, audit committee effectiveness has an impact on the COD within the scope of family firms.
Usman et al. (2019)	To investigate whether gender diversity on boards of directors is important for lending institutions and organizations	Data from 2009-2015 for all A-share firms listed on the Shanghai and Shenzhen stock exchanges	Ordinary Least Squares Regression Analysis and Heckman Two Stage Regression Analysis	It is concluded that firms with women on the board borrow from lending institutions and organizations at lower interest rates than firms without women on the board.

Zhai (2019)	To examine the effect of board characteristics on the cost of debt financing in a Chinese sample.	Data for the years 2011-2017 for companies with Class A shares traded on the Shanghai and Shenzhen stock exchanges	Regression Analysis	There is no relationship between the size of the board and the cost of debt financing. It is pointed that there is a positive relationship between duality and the cost of debt financing when the chairman of the board and the general manager are not separate individuals (duality). However, there is a negative relationship between the ratio of female board members and the cost of debt financing.
Miah (2020)	To examine the evidence that firms with women at the top obtain lower interest rate debt.	Data on companies listed on the Australian Stock Exchange (ASX) for the years 2007-2016	Multiple Regression Analysis	It is concluded that the COD of firms with female senior managers is lower than that of firms with male managers.
Pandey et al. (2020)	To investigate whether the presence of women on the boards of directors of firms listed on the Australian Securities Exchange (ASX) has an impact on the COD.	Data on 1600 firms listed on the Australian Securities Exchange (ASX) for the years 2004-2016	Regression Analysis"	It is found that the presence of female board members is quite high in the sample firms and there is a negative relationship between female board members and the cost of debt.
Stefany and Joni (2020)	To investigate the impact of firms' board characteristics on the COD in a sample of Indonesian firms.	Data on 777 listed companies in Indonesia for the period 2016-2017	Multiple Regression Analysis and Generalized Method of Moments Model	Board size is found to have a negative significant relationship with the COD. On the other hand, it is concluded that the presence of women and independent members in the board has no relationship with the COD.

Datta et al. (2021)	Examining the relationship between senior managers' gender, gender diversity and financing decisions with evidence from debt structure decisions.	Data on firms with female CEOs and CFOs in the US sample for the years 1992- 2014	Panel Regression Analysis	Firms with female senior executives are found to prefer short-term debt financing and benefit from higher corporate credit ratings.
Malakeh (2021)	To examine the impact of the board of directors on the COD and the moderating effect of ownership structure on this relationship.	Data on SMEs in a European sample of 8742 observations for 2013- 2018	Ordinary Least Squares Regression Analysis	Board size and ownership structure are negatively related to the COD. In addition, board independence and board gender diversity are positively related to the COD.
Thakolwıroj and Sithipolvanichgul (2021)	To examine the relationship between board characteristics and capital structure of firms	Data on listed companies on the Stock Exchange of Thailand for 2015-2017	Regression Analysis	It is found that the cost of debt financing decreases as board independence increases. As the percentage of executive ownership increases, the level of leverage and debt financing increases. In addition, there is a negative relationship between board size and board meetings and capital structure.
Aksoy and Yılmaz (2023)	To research the impact of board characteristics on the COD of non-financial firms in Turkish capital markets.	2016-2020 data of 211 non-financial companies traded on Borsa Istanbul	System Generalized Moments Model Method	It is found that the COD and default risk perception decrease in firms with women as the chairman of the board and with women on the board. In addition, board independence and board size have no significant effect on the COD.

As a consequence of the evaluation of the afore mentioned literature as a whole, it is pointed that "regression analysis" is utilized in the researches. In some of the studies[2] examining the impact of board structure, gender of managers and gender diversity on the COD, it is pointed that there is a negative relationship and

[2] "Malakeh (2021); Thakolwıroj and Sithipolvanichgul (2021); Pandey et al. (2020); Stefany and Joni (2020); Zhai (2019)"

effect. In some studies[3] in the literature, the finding that the board structure has no significant impact on the COD is seen in Table 1.

3. DATA, VARIABLE AND METHODOLOGY

The data set of the research consists of 2017-2021 annual data of 150 companies in the Borsa Istanbul (BIST) manufacturing sector. The data on the firms were obtained from the *"Public Disclosure Platform"* in April 2023, sustainability reports, integrated reports, financial statement, annual reports, and *"Datastream database"*.

During the research period[4], there are 205 firms operating in "BIST manufacturing sector". However, the data of 55 firms could not be reached during this period. In this context, the data of 150 firms were examined and this forms the limitation of the research. Knowledge on the variables utilized in the research is shown in table below.

Table 2. Knowledge on Variables

Variable Abbreviation	Variable Name	Calculating the Variable	Source
Log COD	Cost of debt	Log (Interest Expense / Total Debt Related to Interest Expense)	Özşahin Koç ve Deran (2024a); Özşahin Koç ve Deran (2024b); Palea and Drogo (2020)
GC	The Gender of the Chairman	Dummy Variable equal to 1 for Firms with Female Chairman and 0 for Others (Male Chairman)	Aksoy and Yılmaz (2023); Thakolwıroj and Sithipolvanichgul (2021); Pandey et al. (2020); Stefany and Joni (2020); Usman et al. (2019)
GD	Gender Diversity	Number of Female Members on the Board of Directors / Total Number of Board Members	Aksoy and Yılmaz (2023); Malakeh (2021); Usman et al. (2019); Zhai (2019); Pandey et al. (2020); Stefany and Joni (2020); Usman et al. (2019); Alves et al. (2015)
BIND	Board Independence	Number of Independent Board Members / Total Number of Board Members	Aksoy and Yılmaz (2023); Malakeh (2021); Lorca et al. (2011); Pandey et al. (2020); Stefany and Joni (2020); Usman et al. (2019); Alves et al. (2015); Aldamen and Duncan (2012)
Log BOARD	Total Number of Board Members	Log (Total Number of Board Members)	Aksoy and Yılmaz (2023); Pandey et al. 2020); Alves et al. (2015); Heng et al. (2012)
Log SIZE	Size	Log (Total Assets)	Aksoy and Yılmaz (2023); Malakeh (2021); Thakolwıroj and Sithipolvanichgul (2021); Miah (2020); Pandey et al. (2020); Usman, et al. (2019); Zhai (2019)
ROA %	Return on Assets	Net Profit / Total Assets	Aksoy and Yılmaz (2023); Datta et al. (2021); Malakeh (2021)
LEV %	Leverage	Total Debt / Total Assets	Aksoy and Yılmaz (2023); Datta et al. (2021); Malakeh (2021); Miah (2020); Pandey et al. (2020); Stefany and Joni (2020); Zhai (2019)
GROWTH	Annual Change in Sales %	Current Year's Sales Revenues - Previous Year's Sales Revenues / Previous Year's Sales Revenues	Aksoy and Yılmaz (2023); Malakeh (2021); Miah (2020); Stefany and Joni (2020); Usman et al. (2019); Alves et al. (2015); Bradley and Chen (2015)
TA	Tangible Assets	Tangible Assets / Total Assets (Assets)	Aksoy and Yılmaz (2023); Thakolwıroj and Sithipolvanichgul (2021); Pandey et al. (2020)
LQ	Liquidity	Current Assets /Short Term Liabilities	Aksoy and Yılmaz (2023)
Log AGE	Firm Age	Logarithm of the number of years since the foundation of the company	Aksoy and Yılmaz (2023); Pandey et al. (2020); Stefany and Joni (2020); Bradley and Chen (2015); Aldamen and Duncan (2012)

[3] "Aksoy and Yılmaz (2023); Stefany and Joni (2020)"
[4] "April 2023"

To research the effect of board structure on COD, COD is taken as the dependent variable; the gender of the chairman, gender diversity, board size and board independence are considered as independent variables and size, return on assets (ROA), financial leverage, sales revenue growth, tangible assets, firm age and liquidity are aforehand as control variables in this reserach.

The research model is as designated in Figure 1[5]

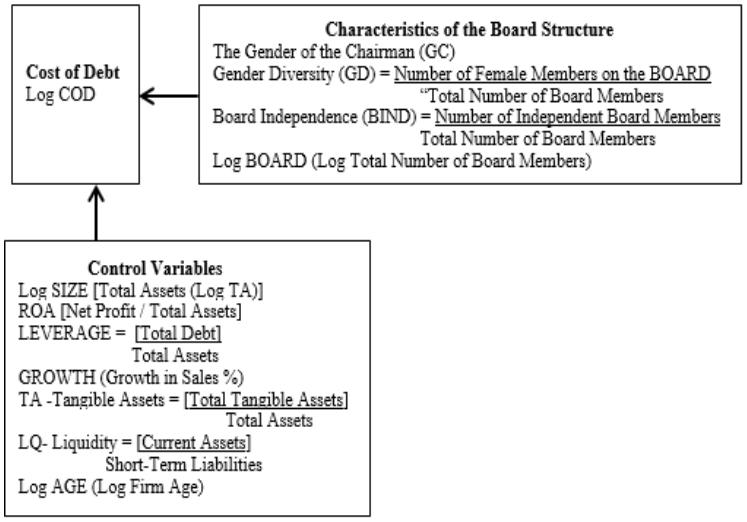

Figure 1. Research Model: The Impact of Board Structure on the COD

"Panel data analysis" methods were utilised in the study. "The panel regression model" to identify the effect of board structure on the COD is as follows:

$$LogCOD_{(i,t)} = \beta_0 + \beta_1(\mathrm{GC})_{(i,t)} + \beta_2(\mathrm{GD})_{(i,t)} + \beta_3(\mathrm{BIND})_{(i,t)} + \beta_4(\mathrm{LogBOARD})_{(i,t)} + \beta_5(\mathrm{Log}SIZE)_{(i,t)} + \beta_6(\mathrm{ROA})_{(i,t)} + \beta_7(\mathrm{LEV})_{(i,t)} + \beta_8(GROWTH)_{(i,t)} + \beta_9(TA)_{(i,t)} + \beta_{10}(LQ)_{(i,t)} + \beta_{11}(LogAGE)_{(i,t)} + \epsilon_t$$

In the model equations, *"i = 1,2,.....N denotes the number of firms (150 firms); t = 1, 2, 3, ...T denotes the time periods (5 years -2017 to 2021). NxT gives the total number of observations in the dataset (150x5 = 750)"* (Özşahin Koç ve Deran 2024a: 86; Özşahin Koç ve Deran 2024c: 677; Özşahin Koç vd., 2023: 1291;).

The hypotheses for the research model are as follows:

[5] "Concerted from the study of Özşahin Koç vd., (2023: 1291); Özşahin Koç ve Deran (2024a: 85); Özşahin Koç ve Deran (2024c: 677); Aksoy ve Yılmaz (2023: 510)"

Hypothesis 1: The gender of the board chairman has a significant effect on cost of debt.

Hypothesis 2: Board gender diversity has a significant effect on cost of debt.

Hypothesis 3: Board independence has a significant effect on cost of debt.

Hypothesis 4: The number of board members has a significant effect on cost of debt.

Hypothesis 5: Firm size has a significant effect on cost of debt.

Hypothesis 6: Return on assets has a significant effect on cost of debt.

Hypothesis 7: Leverage has a significant effect on cost of debt.

Hypothesis 8: Sales growth percentage has a significant effect on cost of debt.

Hypothesis 9: Firm tangible assets have a significant effect on cost of debt.

Hypothesis 10: Liquidity has a significant effect on cost of debt.

Hypothesis 11: Firm age has a significant effect on cost of debt.

4. FINDINGS

Descriptive statistics include *"proportional distribution, frequency distribution, cumulative distribution, standard deviation, mean, coefficient of variation, variance, skewness and kurtosis of variables"* (Nakip, 2003: 236). Descriptive statistics specific to the variables of the study are reported in table.

Table 3. Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
Log COD	9.274	2.218	1.099	14.743	750
GC	0.733	0.260	0	1	
GD	0.179	0.166	0	6	
BIND	0.312	0.113	0	0.571	
Log BOARD	1.889	0.293	1.099	2.708	
Log SIZE	19.755	1.796	14.513	25.172	
ROA (%)	0.047	0.138	-2.051	0.587	
LEV (%)	0.579	0.325	0.084	4.401	
GROWTH	0.551	0.818	-0.776	12.745	
TA	0.308	0.179	0	0.82	
LQ	1.787	1.520	0.032	18.497	
Log AGE	3.674	0.562	1.099	4.477	

Table shows *"the means, minimum-maximum values, and standard deviations of the independent, dependent and control variables"*. In this framework, COD is considered as the dependent variable and it is understood from the table that the average value for the COD in the sample is 9% and the standard deviation is 2%. The gender of the chairman is a dummy variable and within the scope of the data obtained, it is found that the chairman of the BOARD is male in 695 observations and female in 55 observations. In the context of the gender diversity variable, it is concluded that 17% of the firms operating in the "BIST

manufacturing sector" have women on their boards. As the mean value of board independence is 31%, it can be stated that one-third of the BOARD of firms are composed of independent members. For the control variables, the mean values obtained for size, return on assets, firm risk within the scope of leverage, growth of sales revenue, tangible assets, and liquidity are 20%, 4%, 57%, 55%, 31% and 2%, respectively. Among the variables in the context of the analysis, *"the highest standard deviation is observed in the COD"* and *"the lowest standard deviation in the ROA"*.

Table 4. Correlation Matrix for Independent and Control Variables

	Log COD	GC	GD	BIND	Log BOARD	Log SIZE	ROA	LEV	GROWTH	TA	LQ	Log AGE
Log COD	1											
GC	-0.114	1										
GD	-0.126**	0.338	1									
BIND	0.008	-0.135	-0.019	1								
Log BOARD	0.478**	-0.038	-0.215**	-0.268**	1							
Log SIZE	0.435**	-0.014	-0.102**	0.001	0.276**	1						
ROA (%)	-0.098**	-0.050	0.028	0.090*	0.112**	0.120**	1					
LEV (%)	0.347**	-0.066	-0.026	-0.093*	-0.012	-0.041	-0.0562**	1				
GROWTH	-0.026	0.029	0.020	0.030	-0.030	0.099**	0.040	-0.063	1			
TA	0.062	0.141	0.005	-0.081*	0.113**	0.159**	-0.143**	-0.030	-0.058	1		
LQ	-0.428**	0.092	0.037	0.005	-0.084*	-0.155**	0.335**	-0.480**	0.052	-0.281**	1	
Log AGE	0.231**	0.012	-0.019	0.009	0.265**	0.177**	0.076*	0.059	-0.145**	0.141**	-0.130**	1

** significant at p<0.01; * significant at p<0.05

Table 4 shows a weak negative correlation between COD and gender diversity, return on assets and liquidity variables. However, there is a weak positive correlation between COD and board size, asset size, leverage and firm age. In addition, there is no significant relationship between COD and board independence, sales growth and tangible assets.

Firstly, in the study, *"unit and/or time impacts are examined by linear regression test to see if the pooled OLS method, one of the conventional static panel data analyses, is suitable for each model"*. Within the framework, the hypotheses were tested[6].

H_0 = *"There is no unit and/or time effect."*

H_1 = *"There is a unit and/or time effect."*

The outcomes show that if there is unit and/or time impacts in this model, it is not suitable for utilise "*pooled OLS"*.

[6] "In this section, in the presentation of tables, formation of hypotheses and interpretation of model results, Özşahin Koç et al., (2023); Özşahin Koç and Deran (2024a); Özşahin Koç ve Deran (2024c); Özşahin Koç ve Aydıngülü Sakalsız (2024) studies were used."

Test consequences of this model demonstrate that, H_0 is rejected since 0.0000<0.05. Since at least one of *the unit and/or time effects*, it is inferred that it is not suitable to carry out *"pooled OLS"* for the study model. Within this framework, if *the unit effect and/or time effect* is analyzed with F and LR tests, it is found that there is both a unit effect in the model *"F Test Statistic => Prob > F = 0.0000<0.05; LR test statistic => Prob >= chibar2 = 0.0000<0.05"* and time impact *"F Test Statistic =>Prob > F = 0.0030<0.05; LR test statistic => Prob >= chibar2 = 0.0123<0.05"*. According to the test outcomes, it can be stated that the Model is a *"two-way panel data model*". *"Hausman test"* was utilised to research which of *"the fixed impacts or random impacts estimators"* is valid in *"the two-way panel data model"* and this hypotheses were tested.

H_0 = There is no unit and/or time effect.

H_1 = There is a unit and/or time effect.

As the test statistic consequences are 0.0165<0.05, H_0 is rejected. It is concluded that *"there is a unit and/or time effect and the fixed effects estimator"* is viable for the model. As the valid estimator in this context of the model is fixed impacts, the *"Modified Wald Test"* was administered to specify the changing variance (Ün, 2018: 76-77). Considering this point, this hypotheses were tested.

H_0 = Heteroskedasity does not exist.

H_1 = Heteroskedasity exists.

Since the probability value is 0.0000<0.05, H_0 is rejected. It is concluded that there is variance in the model. In addition, Baltagi-Whu LBI, Bhargava, Franzini and Narendranathan's Durbin Watson (DW) tests were conducted to determine autocorrelation (Yerdelen Tatoğlu, 2020: 241). The following hypotheses were tested.

H_0 = No autocorrelation.

H_1 = There is autocorrelation.

In line with the test statistic consequences obtained "Bhargava et al., Durbin-Watson = 1.4824744; Baltagi-Wu LBI = 1.9479117", H_0 is rejected since 2 is less than the accepted critical value. It is designated that autocorrelation exists in the model. To determine if there is correlation between the units, Pesaran's Test[7] is applied and the following hypotheses are tested in this context.

H_0 = There is no correlation between units.

H_1 = There is correlation between units.

According to the test statistic results, since 0.0000<0.05, H_0 is rejected. It is determined that there is correlation between the units.

Due to the way with "variance, autocorrelation and inter-unit correlation" within the study model, the *"Driscoll-Kraay (1998) standard errors robust*

[7] "Pesaran's Test is performed when T<N."

estimator" was carried out. Within the scope, *"the panel regression"* outcomes achieved using *"the robust estimator"* are reported in table below.

Table 5. Panel Regression Results

Independent Variables	Standardized Beta Coefficients	T value	Standard Error	p
GC	-0.305	-1.41	0.216	0.231
GD	-0.841	-3.16	0.266	0.034**
BIND	0.973	3.04	0.320	0.038**
Log BOARD	0.028	0.12	0.240	0.913
Log SIZE	0.992	7.08	0.140	0.002***
ROA (%)	-1.922	-2.83	0.679	0.047**
LEV (%)	0.567	15.80	0.035	0.000***
GROWTH	-0.201	-7.85	0.025	0.001***
TA	-0.902	-3.28	0.275	0.030**
LQ	-0.120	-1.46	0.082	0.219
Log AGE	-2.845	-3.95	0.720	0.017**
	$R^2 = 0.333$			
	F= 14.08 (Prob: 0.0106)			
	N= 750			

*** significant at p<0.01; ** significant at p<0.05; * significant at p<0.10

Dependent Variable: Log COD

Independent Variable: GD, BIND, Log BOARD, Log SIZE, ROA, LEV, GROWTH, TA, LQ, Log AGE

As regards the results of the "panel data analysis", gender diversity has a negative impact on the COD at the 5% significance level. In this context, an increase in the number of female board members in the total BOARD decreases the COD. The board independence variable has a statistically significant impact on the COD variable at the 5% significance level. Among the control variables, return on assets, tangible assets and firm age are found to have a statistically significant impact on the COD at the 5% significance level. Table 5 shows that variables other than return on assets have a positive significant impact on the COD. In this context, it is possible to state that the COD of firms with high return on assets decreases. In addition, size and the leverage variable has a positive significant impact on the COD at the 1% significance level. On the other hand, the percentage of growth in sales has a negative effect on the COD at the 1% significance level. This is because an increase in the growth rate of sales decreases the COD. On the other hand, the gender of the chairman, the size of the BOARD and liquidity variables are found to have no effect on the COD. In the research conducted by Cohen (1988), it was stated that R^2 =0.26 explained variance at a significant level, R^2 =0.13 at a moderate level and R^2 =0.02 at a weak level. *"Within the scope, the coefficient of determination (R^2) value of the model of the current study is 0.333, which is a valid*

value for the variance explained to be considered sufficient and significant" (Özşahin Koç ve Deran, 2024a: 88; Özşahin Koç ve Deran, 2024b: 44). The F statistic shows the explanatory power of the model and in this context, it expresses the level of explanation of the dependent variable on the independent variable. It is statistically significant at the 5% level. In other words, the level of explanation of the model by the F statistic value is sufficient.

The rejection and acceptance status of the research model hypotheses as a result of the findings are as follows Table 6.

Table 6: Results of Hypothesis Testing in the Research Model

Hypotheses	Accept/Reject
Hypothesis 1: The gender of the board chairman has a significant effect on cost of debt.	Reject
Hypothesis 2: Board gender diversity has a significant effect on cost of debt.	Accept
Hypothesis 3: Board independence has a significant effect on cost of debt.	Accept
Hypothesis 4: The number of board members has a significant effect on cost of debt.	Reject
Hypothesis 5: Firm size has a significant effect on cost of debt.	Accept
Hypothesis 6: Return on assets has a significant effect on cost of debt.	Accept
Hypothesis 7: Leverage has a significant effect on cost of debt.	Accept
Hypothesis 8: Sales growth percentage has a significant effect on cost of debt.	Accept
Hypothesis 9: Firm tangible assets have a significant effect on cost of debt.	Accept
Hypothesis 10: Liquidity has a significant effect on cost of debt.	Reject
Hypothesis 11: Firm age has a significant effect on cost of debt.	Accept

According to the findings, some of the hypotheses were accepted while others were rejected.

5. CONCLUSION AND RECOMMENDATIONS

Firms need financing in order to achieve their main objectives and sustain their activities. They meet this financing need through equity or foreign resources (borrowing). The main factor affecting the financing source decision of firms is the cost of financing. The corporate governance functioning of firms and the composition of their boards of directors (the number of female members, the number of independent members, etc.) are very important both in the financing decisions to be taken by firms and in the financial decisions to be taken and

implemented by lending institutions and organizations regarding these firms. In this regard, this research investigates if the composition of the BOARD has an impact on the COD of manufacturing firms traded on the BIST for the years 2017-2021 in the Turkish sample.

The results of the research show that firms with gender diversity in the BOARD have lower COD. Similar studies in the literature *"Aksoy and Yılmaz, 2023; Pandey et al., 2020; Miah, 2020; Zhai, 2019; Usman et al., 2019"* have also found the same finding. The aforementioned situation proves that the presence of female members in the boards of directors is important for institutions and organizations that lend to firms. This may be because women's attitudes and behaviors towards risk are more risk-averse than men's, and they are also more interested in debt principal and interest repayments and debt reduction than men. Therefore, under the assumption that the risk of non-repayment of debt (default risk) will be lower in firms with female members compared to other firms, the confidence of financial institutions in these firms increases and the COD of firms decreases (Aksoy and Yılmaz, 2023: 517).

It is widely believed that independent board members are more useful and effective than other board members in making accurate financial decisions since they have more information about the internal and external environment of firms. This situation is important for the financial decisions of financial institutions and thus for the reduce in the COD of firms (Aksoy and Yılmaz, 2023: 513). In other words, as the number of independent directors on the BOARD increases, the COD of firms is expected to decrease. Contrary to popular belief, this study shows that the number of independent board members has a positive impact on the COD. Studies conducted by Aksoy and Yılmaz, (2023) and Bradley and Chen, (2015) also reached the same finding as this study.

In addition, it is pointed out that "size and financial leverage" variables have a significant and positive impact on the COD, while return on assets, tangible assets, firm age and percentage growth in sales variables have a significant and negative impact on the COD. It is supported by the findings that firms with higher return on assets will provide financing with lower COD. In addition, the tangible assets of the firm are an element of assurance for financial institutions and reveal the ability of firms to repay their debts. In this context, firms with more tangible assets are less risky in terms of debt repayments and therefore, they provide financing with lower COD. However, this study concludes that the gender of the chairman, the size of the BOARD and liquidity variables do not have any effect on the COD.

In this research, 150 firms listed in the "BIST manufacturing sector" could be encompassed in the analysis. Though this provides an idea to explain the relationship between board composition and the COD in Türkiye. Following

similar reseraches utilising different variables covering more companies and periods may lay in more pointed consequences.

In recent years, especially in developed countries, policies and regulations have been introduced to increase the number of women and independent members on the boards of publicly traded companies. *"The European Commission"* has set a minimum quota of 40% for female board members. In this scope, it can be suggested that firms should include policies for gender diversity in their boards of directors and improve the number of female members in the composition of the BOARD.

It is suggested that following studies should embrace a larger data; different variables; different sectors and indices; multiple country samples; and various data analysis methods.

Ethical Declaration

In this study, all the rules stated in the "Higher Education Institutions Scientific Research (Türkiye) and Publication Ethics Directive" were followed.

Ethics Committee

Approval The author declare that the research is one of the studies that does not require ethical committee approval.

Conflict of Interest and Funding

No conflict of interest and funding has been declared by the authors.

Authorship Contribution Declaration

All stages of the study were designed and prepared by the authors.

REFERENCES

Aksoy, M., & Yılmaz, M. K. (2023). Does Board Diversity Affect the Cost of Debt Financing? Empirical evidence from Turkey, *Gender in Management: An International Journal*, 38(4), 504-524.

Aldamen, H., & Duncan, K. (2012). Does Adopting Good Corporate Governance İmpact the Cost of İntermediated and Non-İntermediated Debt?, *Accounting & Finance*, 52, 49-76.

Alves, P., Couto, E. B., & Francisco, P. M. (2015). Board of Directors' Composition and Capital Structure, *Research in International Business and Finance*, 35, 1-32.

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2004). Board Characteristics, Accounting Report İntegrity, and the Cost of Debt, *Journal of accounting and economics*, 37(3), 315-342.

Basar, B. D. (2021). Corporate Governance, Cost of Capital and Tobin Q: Empirical Evidence from Turkey Listed Companies, *South-Eastern Europe Journal of Economics*, 19(1), 51-78.

Bradley, M., & Chen, D. (2015). Does Board İndependence Reduce the Cost of Debt?, *Financial Management*, 44(1), 15-47.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences, second ed. Routledge, New York.

Datta, S., Doan, T., & Toscano, F. (2021). Top Executive Gender, Board Gender Diversity, and Financing Decisions: Evidence From Debt Structure Choice, *Journal of Banking & Finance*, 125, 106070.

Driscoll, J. C., & Kraay, A. C. (1998). Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data. *Review of Economics and Statistics*, 80(4), 549–559.

Fields, L. P., Fraser, D. R., & Subrahmanyam, A. (2012). Board Quality and the Cost of Debt Capital: The Case of Bank Loans, *Journal of Banking & Finance*, 36(5), 1536-1547.

Ghouma, H., Ben-Nasr, H., & Yan, R. (2018). Corporate Governance and Cost of Debt Financing: Empirical Evidence From Canada, *The Quarterly Review of Economics and Finance*, 67, 138-148.

Hashim, H. A., & Amrah, M. (2016). Corporate Governance Mechanisms and Cost of Debt: Evidence of Family and Non-Family Firms in Oman, *Managerial Auditing Journal*, 31(3), 314-336.

Heng, T. B., Azrbaijani, S., & SAN, O. T. (2012). Board of Directors and Capital Structure: Evidence From Leading Malaysian Companies, *Asian Social Science*, 8(3), 123-136.

Kamu Gözetimi Kurumu (KGK), Türkiye Muhasebe Standartları (TMS) 23-Borçlanma Maliyetleri", https://www.kgk.gov.tr/Portalv2Uploads/files/DynamicContentFiles/T%C3%BCrkiye%20Muhasebe%20Standartlar%C4%B1/TMSTFRS2018Seti/TMS/TMS_23_2018.pdf (Erişim Tarihi: 18.12.2023).

Lorca, C., Sánchez-Ballesta, J. P., & García-Meca, E. (2011). Board Effectiveness and Cost of Debt, *Journal of business ethics*, 100, 613-631.

Li, L., Dong, F., Liu, Y., Huang, H., & Wang, S. (2016). The Effect of Corporate Governance on Debt Financing Cost of Listed Companies, *Journal of Systems Science and Complexity*, 29, 772-788.

Malakeh, C. (2021). Board of Directors and Cost of Debt: The Moderating Effect of Ownership Structure-Evidence From European SMEs (Master's thesis, University of Twente).

Miah, M. S. (2020). Does Female Representation in Top Management Affect Cost of Debt? A Study of Australian CEO Gender Perspective. In Does Female Representation in Top Management Affect Cost of Debt? A Study of Australian CEO Gender Perspective: Miah, Muhammad Shahin. [Sl]: SSRN.

Nakip, M. (2003). Pazarlama Araştırmaları Teknikler ve (SPSS Destekli) Uygulamalar, . Seçkin Yayıncılık, 1.Baskı, Ankara.

Özer, G., Çam, İ., & Çerez, S. (2023). Kurumsal Yönetimin Borç Maliyetine Etkisi: Borsa İstanbul'da Bir Uygulama, *Business and Economics Research Journal*, 14(2), 217-226.

Özşahin Koç, F., Atalay, E., & Deran, A. (2023). The impact of human resources practices on the financial performance of companies: the analysis of BIST 30 companies. *Karamanoğlu Mehmetbey Üniversitesi Sosyal ve Ekonomik Araştırmalar Dergisi*, 25(45), 1284-1297.

Özşahin Koç, F., & Deran, A. (2024a). Borsa İstanbul İmalat Sektöründe Yer Alan Firmaların Borçlanma Maliyetlerinin Finansal Performansa Etkisi Üzerine Araştırma, *Journal of Accounting and Taxation Studies*, 17(1), 73-98.

Özşahin Koç, F., & Deran, A. (2024b). The Impact of Carbon Emissions on Corporate Cost of Debt (COD): A Research on Borsa İstanbul (BIST) Sustainability Index, *Sosyoekonomi*, 32(60), 33-50.

Özşahin Koç, F., & Deran, A. (2024c). A Research on the Impact of Carbon Emissions on Financial Performance of Companies in the Borsa Istanbul Sustainability Index. *Alanya Akademik Bakış*, 8(2), 671-686.

Özşahin-Koç, F., & Aydıngülü-Sakalsız, S. (2024). Firmaların pazarlama, satış ve dağıtım giderlerinin toptan finansal performansa etkisi: BIST toptan ve perakende sektörü üzerine bir araştırma. Ömer Halisdemir *Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 17(4), 884–900.

Palea, V., & Drogo, F. (2020). Carbon Emissions and the Cost of Debt in the Eurozone: The Role of Public Policies, Climate-Related Disclosure and Corporate Governance, *Business Strategy and the Environment*, 29(8), 2953-2972.

Pandey, R., Biswas, P. K., Ali, M. J., & Mansi, M. (2020). Female Directors on the Board and Cost of Debt: Evidence From Australia, *Accounting & Finance*, 60(4), 4031-4060.

Ranti, U. O. (2013). The Effects of Board Size and CEO Duality on Firms' Capital Structure: A Study of Selected Listed Firms in Nigeria, *Asian Economic and Financial Review*, 3(8), 1033-1043.

Say, S., & Doğan, M. (2022). Kısa Vadeli Borçlanmanın Aktif Karlılığı Üzerindeki Etkisi: BİST Sınai Endeksi Örneği, *İşletme Araştırmaları Dergisi*, 14(2), 1581-1589

Stefany, S., & Joni, J. (2020). Board Characteristics and Cost of Debt: Evidence From Indonesia, *Jurnal Manajemen Maranatha*, 19(2), 141-150.

Thakolwıroj, C., & Sithipolvanichgul, J. (2021). Board Characteristics and Capital Structure: Evidence From Thai Listed Companies, *The Journal of Asian Finance, Economics and Business*, 8(2), 861-872.

Usman, M., Farooq, M. U., Zhang, J., Makki, M. A. M., & Khan, M. K. (2019). Female Directors and the Cost of Debt: Does Gender Diversity in the

Boardroom Matter to Lenders?, *Managerial Auditing Journal*, 34(4), 374-392.

Ün, T. (2018). Panel veri modellerinin varsayım testi. S. Güriş (Ed.), Uygulamalı Panel Veri Ekonometrisi (75-101. ss.), Der Kitabevi, İstanbul.

Yerdelen Tatoğlu, F. (2020). Panel Veri Ekonometrisi, Beta Yayınları, 5. Baskı, İstanbul.

Zhai, L. (2019, December). Impact of Board Characteristics on Debt Financing Costs. In 2019 International Conference on Economic Management and Model Engineering (ICEMME) (s. 665-668). IEEE.

APPENDIX

Appendix-1: BIST Manufacturing Sector List of Companies Inspected

Row	Code	Company Title
1	ACSEL	ACISELSAN ACIPAYAM SELÜLOZ SANAYİ VE TİCARET A.Ş.
2	ADEL	ADEL KALEMCİLİK TİCARET VE SANAYİ A.Ş.
3	AFYON	AFYON ÇİMENTO SANAYİ T.A.Ş.
4	AKCNS	AKÇANSA ÇİMENTO SANAYİ VE TİCARET A.Ş.
5	ATEKS	AKIN TEKSTİL A.Ş.
6	AKSA	AKSA AKRİLİK KİMYA SANAYİİ A.Ş.
7	ALCAR	ALARKO CARRIER SANAYİ VE TİCARET A.Ş.
8	AEFES	ANADOLU EFES BİRACILIK VE MALT SANAYİİ A.Ş.
9	ASUZU	ANADOLU ISUZU OTOMOTİV SANAYİ VE TİCARET A.Ş.
10	ARCLK	ARÇELİK A.Ş.
11	ARSAN	ARSAN TEKSTİL TİCARET VE SANAYİ A.Ş.
12	AVOD	A.V.O.D. KURUTULMUŞ GIDA VE TARIM ÜRÜNLERİ SANAYİ TİCARET A.Ş.
13	AYGAZ	AYGAZ A.Ş.
14	BAGFS	BAGFAŞ BANDIRMA GÜBRE FABRİKALARI A.Ş.
15	BAKAB	BAK AMBALAJ SANAYİ VE TİCARET A.Ş.
16	BNTAS	BANTAŞ BANDIRMA AMBALAJ SANAYİ TİCARET A.Ş.
17	BANVT	BANVİT BANDIRMA VİTAMİNLİ YEM SANAYİİ A.Ş.
18	BASCM	BAŞTAŞ BAŞKENT ÇİMENTO SANAYİ VE TİCARET A.Ş.
19	BTCIM	BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş.
20	BSOKE	BATISÖKE SÖKE ÇİMENTO SANAYİİ T.A.Ş.
21	BAYRK	BAYRAK EBT TABAN SANAYİ VE TİCARET A.Ş.
22	BRKSN	BERKOSAN YALITIM VE TECRİT MADDELERİ ÜRETİM VE TİCARET A.Ş.
23	BLCYT	BİLİCİ YATIRIM SANAYİ VE TİCARET A.Ş.
24	BRKO	BİRKO BİRLEŞİK KOYUNLULULAR MENSUCAT TİCARET VE SANAYİ A.Ş.
25	BRMEN	BİRLİK MENSUCAT TİCARET VE SANAYİ İŞLETMESİ A.Ş.
26	BRSAN	BORUSAN MANNESMANN BORU SANAYİ VE TİCARET A.Ş.
27	BOSSA	BOSSA TİCARET VE SANAYİ İŞLETMELERİ T.A.Ş.
28	BRISA	BRİSA BRIDGESTONE SABANCI LASTİK SANAYİ VE TİCARET A.Ş.
29	BURCE	BURÇELİK BURSA ÇELİK DÖKÜM SANAYİİ A.Ş.
30	BURVA	BURÇELİK VANA SANAYİ VE TİCARET A.Ş.
31	BUCIM	BURSA ÇİMENTO FABRİKASI A.Ş.
32	CELHA	ÇELİK HALAT VE TEL SANAYİİ A.Ş.
33	CEMAS	ÇEMAŞ DÖKÜM SANAYİ A.Ş.
34	CEMTS	ÇEMTAŞ ÇELİK MAKİNA SANAYİ VE TİCARET A.Ş.
35	CMBTN	ÇİMBETON HAZIRBETON VE PREFABRİK YAPI ELEMANLARI SANAYİ VE TİCARET A.Ş.
36	CMENT	ÇİMENTAŞ İZMİR ÇİMENTO FABRİKASI T.A.Ş.
37	CIMSA	ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş.
38	CUSAN	ÇUHADAROĞLU METAL SANAYİ VE PAZARLAMA A.Ş.
39	DAGI	DAGİ GİYİM SANAYİ VE TİCARET A.Ş.
40	DARDL	DARDANEL ÖNENTAŞ GIDA SANAYİ A.Ş.
41	DMSAS	DEMİSAŞ DÖKÜM EMAYE MAMÜLLERİ SANAYİ A.Ş.
42	DERIM	DERİMOD KONFEKSİYON AYAKKABI DERİ SANAYİ VE TİCARET A.Ş.
43	DESA	DESA DERİ SANAYİ VE TİCARET A.Ş.
44	DEVA	DEVA HOLDİNG A.Ş.
45	DNISI	DİNAMİK ISI MAKİNA YALITIM MALZEMELERİ SANAYİ VE TİCARET A.Ş.
46	DITAS	DİTAŞ DOĞAN YEDEK PARÇA İMALAT VE TEKNİK A.Ş.
47	DGNMO	DOĞANLAR MOBİLYA GRUBU İMALAT SANAYİ VE TİCARET A.Ş.
48	DOGUB	DOĞUSAN BORU SANAYİİ VE TİCARET A.Ş.
49	DOKTA	DÖKTAŞ DÖKÜMCÜLÜK TİCARET VE SANAYİ A.Ş.
50	DURDO	DURAN DOĞAN BASIM VE AMBALAJ SANAYİ A.Ş.

51	DYOBY	DYO BOYA FABRİKALARI SANAYİ VE TİCARET A.Ş.
52	EGEEN	EGE ENDÜSTRİ VE TİCARET A.Ş.
53	EGGUB	EGE GÜBRE SANAYİİ A.Ş.
54	EGPRO	EGE PROFİL TİCARET VE SANAYİ A.Ş.
55	EGSER	EGE SERAMİK SANAYİ VE TİCARET A.Ş.
56	EPLAS	EGEPLAST EGE PLASTİK TİCARET VE SANAYİ A.Ş.
57	EKIZ	EKİZ KİMYA SANAYİ VE TİCARET A.Ş.
58	EMKEL	EMEK ELEKTRİK ENDÜSTRİSİ A.Ş.
59	EMNIS	EMİNİŞ AMBALAJ SANAYİ VE TİCARET A.Ş.
60	ERBOS	ERBOSAN ERCİYAS BORU SANAYİİ VE TİCARET A.Ş.
61	EREGL	EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.
62	ERSU	ERSU MEYVE VE GIDA SANAYİ A.Ş.
63	FADE	FADE GIDA YATIRIM SANAYİ TİCARET A.Ş.
64	FMIZP	FEDERAL-MOGUL İZMİT PİSTON VE PİM ÜRETİM TESİSLERİ A.Ş.
65	FROTO	FORD OTOMOTİV SANAYİ A.Ş.
66	FORMT	FORMET METAL VE CAM SANAYİ A.Ş.
67	FRIGO	FRİGO-PAK GIDA MADDELERİ SANAYİ VE TİCARET A.Ş.
68	GENTS	GENTAŞ DEKORATİF YÜZEYLER SANAYİ VE TİCARET A.Ş.
69	GEREL	GERSAN ELEKTRİK TİCARET VE SANAYİ A.Ş.
70	GOODY	GOODYEAR LASTİKLERİ T.A.Ş.
71	GOLTS	GÖLTAŞ GÖLLER BÖLGESİ ÇİMENTO SANAYİ VE TİCARET A.Ş.
72	GUBRF	GÜBRE FABRİKALARI T.A.Ş.
73	HATEK	HATEKS HATAY TEKSTİL İŞLETMELERİ A.Ş.
74	HEKTS	HEKTAŞ TİCARET T.A.Ş.
75	ISKPL	IŞIK PLASTİK SANAYİ VE DIŞ TİCARET PAZARLAMA A.Ş.
76	IHEVA	İHLAS EV ALETLERİ İMALAT SANAYİ VE TİCARET A.Ş.
77	ISDMR	İSKENDERUN DEMİR VE ÇELİK A.Ş.
78	IZMDC	İZMİR DEMİR ÇELİK SANAYİ A.Ş.
79	IZFAS	İZMİR FIRÇA SANAYİ VE TİCARET A.Ş.
80	JANTS	JANTSA JANT SANAYİ VE TİCARET A.Ş.
81	KAPLM	KAPLAMİN AMBALAJ SANAYİ VE TİCARET A.Ş.
82	KRDMA, KRDMB, KRDMD	KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.
83	KARSN	KARSAN OTOMOTİV SANAYİİ VE TİCARET A.Ş.
84	KRTEK	KARSU TEKSTİL SANAYİİ VE TİCARET A.Ş.
85	KARTN	KARTONSAN KARTON SANAYİ VE TİCARET A.Ş.
86	KATMR	KATMERCİLER ARAÇ ÜSTÜ EKİPMAN SANAYİ VE TİCARET A.Ş.
87	KENT	KENT GIDA MADDELERİ SANAYİİ VE TİCARET A.Ş.
88	KERVT	KEREVİTAŞ GIDA SANAYİ VE TİCARET A.Ş.
89	KLMSN	KLİMASAN KLİMA SANAYİ VE TİCARET A.Ş.
90	KNFRT	KONFRUT GIDA SANAYİ VE TİCARET A.Ş.
91	KONYA	KONYA ÇİMENTO SANAYİİ A.Ş.
92	KORDS	KORDSA TEKNİK TEKSTİL A.Ş.
93	KRSTL	KRİSTAL KOLA VE MEŞRUBAT SANAYİ TİCARET A.Ş.
94	KUTPO	KÜTAHYA PORSELEN SANAYİ A.Ş.
95	LUKSK	LÜKS KADİFE TİCARET VE SANAYİİ A.Ş.
96	MAKTK	MAKİNA TAKIM ENDÜSTRİSİ A.Ş.
97	MRSHL	MARSHALL BOYA VE VERNİK SANAYİİ A.Ş.
98	MEGAP	MEGA POLİETİLEN KÖPÜK SANAYİ VE TİCARET A.Ş.
99	MNDRS	MENDERES TEKSTİL SANAYİ VE TİCARET A.Ş.
100	MERKO	MERKO GIDA SANAYİ VE TİCARET A.Ş.

101	MNDTR	MONDİ TURKEY OLUKLU MUKAVVA KAĞIT VE AMBALAJ SANAYİ A.Ş.
102	NUHCM	NUH ÇİMENTO SANAYİ A.Ş.
103	OTKAR	OTOKAR OTOMOTİV VE SAVUNMA SANAYİ A.Ş.
104	OYAKC	OYAK ÇİMENTO FABRİKALARI A.Ş.
105	OYLUM	OYLUM SINAİ YATIRIMLAR A.Ş.
106	OZRDN	ÖZERDEN PLASTİK SANAYİ VE TİCARET A.Ş.
107	PARSN	PARSAN MAKİNA PARÇALARI SANAYİİ A.Ş.
108	PENGD	PENGUEN GIDA SANAYİ A.Ş.
109	PETKM	PETKİM PETROKİMYA HOLDİNG A.Ş.
110	PETUN	PINAR ENTEGRE ET VE UN SANAYİİ A.Ş.
111	PINSU	PINAR SU VE İÇECEK SANAYİ VE TİCARET A.Ş.
112	PNSUT	PINAR SÜT MAMULLERİ SANAYİİ A.Ş.
113	PRZMA	PRİZMA PRES MATBAACILIK YAYINCILIK SANAYİ VE TİCARET A.Ş.
114	RODRG	RODRİGO TEKSTİL SANAYİ VE TİCARET A.Ş.
115	ROYAL	ROYAL HALI İPLİK TEKSTİL MOBİLYA SANAYİ VE TİCARET A.Ş.
116	RTALB	RTA LABORATUVARLARI BİYOLOJİK ÜRÜNLER İLAÇ VE MAKİNE SANAYİ TİCARET A.Ş.
117	SAFKR	SAFKAR EGE SOĞUTMACILIK KLİMA SOĞUK HAVA TESİSLERİ İHRACAT İTHALAT SANAYİ VE TİCARET A.Ş.
118	SANFM	SANİFOAM ENDÜSTRİ VE TÜKETİM ÜRÜNLERİ SANAYİ TİCARET A.Ş.
119	SAMAT	SARAY MATBAACILIK KAĞITÇILIK KIRTASİYECİLİK TİCARET VE SANAYİ A.Ş.
120	SARKY	SARKUYSAN ELEKTROLİTİK BAKIR SANAYİ VE TİCARET A.Ş.
121	SASA	SASA POLYESTER SANAYİ A.Ş.
122	SAYAS	SAY YENİLENEBİLİR ENERJİ EKİPMANLARI SANAYİ VE TİCARET A.Ş.
123	SEKUR	SEKURO PLASTİK AMBALAJ SANAYİ A.Ş.
124	SELGD	SELÇUK GIDA ENDÜSTRİ İHRACAT İTHALAT A.Ş.
125	SEYKM	SEYİTLER KİMYA SANAYİ A.Ş.
126	SILVR	SİLVERLİNE ENDÜSTRİ VE TİCARET A.Ş.
127	SKTAS	SÖKTAŞ TEKSTİL SANAYİ VE TİCARET A.Ş.
128	TATGD	TAT GIDA SANAYİ A.Ş.
129	TMPOL	TEMAPOL POLİMER PLASTİK VE İNŞAAT SANAYİ TİCARET A.Ş.
130	TETMT	TETAMAT GIDA YATIRIMLARI A.Ş.
131	TOASO	TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.
132	TUCLK	TUĞÇELİK ALÜMİNYUM VE METAL MAMÜLLERİ SANAYİ VE TİCARET A.Ş.
133	TUKAS	TUKAŞ GIDA SANAYİ VE TİCARET A.Ş.
134	TRILC	TURK İLAÇ VE SERUM SANAYİ A.Ş.
135	TMSN	TÜMOSAN MOTOR VE TRAKTÖR SANAYİ A.Ş.
136	TUPRS	TÜPRAŞ-TÜRKİYE PETROL RAFİNERİLERİ A.Ş.
137	PRKAB	TÜRK PRYSMİAN KABLO VE SİSTEMLERİ A.Ş.
138	TTRAK	TÜRK TRAKTÖR VE ZİRAAT MAKİNELERİ A.Ş.
139	TBORG	TÜRK TUBORG BİRA VE MALT SANAYİİ A.Ş.
140	ULUSE	ULUSOY ELEKTRİK İMALAT TAAHHÜT VE TİCARET A.Ş.
141	ULUUN	ULUSOY UN SANAYİ VE TİCARET A.Ş.
142	USAK	UŞAK SERAMİK SANAYİ A.Ş.
143	ULKER	ÜLKER BİSKÜVİ SANAYİ A.Ş.
144	VANGD	VANET GIDA SANAYİ İÇ VE DIŞ TİCARET A.Ş.
145	VESBE	VESTEL BEYAZ EŞYA SANAYİ VE TİCARET A.Ş.
146	VESTL	VESTEL ELEKTRONİK SANAYİ VE TİCARET A.Ş.
147	VKING	VİKİNG KAĞIT VE SELÜLOZ A.Ş.
148	YATAS	YATAŞ YATAK VE YORGAN SANAYİ TİCARET A.Ş.
149	YKSLN	YÜKSELEN ÇELİK A.Ş.
150	YUNSA	YÜNSA YÜNLÜ SANAYİ VE TİCARET A.Ş.

Source: Public Disclosure Platform (2023)