

**MEF UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES**

**EXCHANGE RATE EXPOSURE: EVIDENCE FROM
TURKEY**

M.A. THESIS

Tolga Canbazolu

Department of Economics

Economics and Finance M.A. Programme

İSTANBUL, 2020

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Tolga Canbazođlu, a M.A. student of MEF Graduate School of Social Sciences student ID 321806017 successfully defended the thesis entitled “EXCHANGE RATE EXPOSURE: EVIDENCE FROM TURKEY”, which he prepared after fulfilling the requirements specified in the associated legislations, before the jury whose signatures are below.

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FOREWORD

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ABBREVIATIONS

US:	United States
BIST:	Borsa Istanbul
CBRT:	Central Bank of the Republic of Turkey
REIC:	Real Estate Investment Company
EBITDA:	Earnings before interest, taxes, depreciation, and amortization
OPEX:	Operating Expenses
CR:	Cash Ratio
LR:	Leverage Ratio
FAT:	Fixed Assets Turnover

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EXCHANGE RATE EXPOSURE: EVIDENCE FROM TURKEY

ABSTRACT

This thesis study aims to measure effects of the fluctuation in the exchange rate on companies' stock returns based on financial statements of 330 firms that were traded on Borsa Istanbul between 2010 and 2019. In this study, exchange rate exposure was analyzed by dividing the firms into sectors based on the methodology of Adler and Dumas (1984) According to the baseline model, the coefficient of exchange rate appears as significant in 8 of 26 sectors for the extended model the coefficients are significant in 6 of 26 sectors. I further categorize firms based on favorable and unfavorable levels of liquidity, financial, profitability and turnover ratios, and measure exchange rate exposure across the two group of firms. The results of the ratio analysis are mixed. Firms with favorable levels of inventory to total asset, leverage, interest expense to sales, and foreign assets to total debt ratio and unfavorable levels of cash, liquidity, receivable turnover ratio are exposed to exchange rate movements. Moreover, firms with different export levels are not affected differently by exchange rate variations.

Key Words: exchange rate, exchange rate exposure, exchange rate fluctuation

DÖVİZ KURU RİSKİ: TÜRKİYE ÖRNEĞİ

ÖZET

Bu tez çalışması, 2010-2019 yılları arasında Borsa İstanbul'da işlem gören 330 firmanın finansal tablolarına dayanarak kurdaki dalgalanmanın şirketlerin hisse senedi getirileri üzerindeki etkilerini ölçmeyi amaçlamaktadır. Bu çalışmada, döviz kuru riski Adler ve Dumas (1984) yöntemine göre firmaların sektörlere bölünmesiyle analiz edilmiştir. Baz modele göre, döviz kuru katsayısı, 26 sektörden 8'inde anlamlı görülmektedir, genişletilmiş model için 26 sektörden 6'sında katsayı anlamlıdır. Ayrıca çalışmada şirketleri, tercih edilebilir ve edilmez likidite, finansal, karlılık ve ciro oranlarına göre kategorilere ayırarak bu iki gruptaki döviz kuru riski ölçülmektedir. Rasyo analizlerinin sonuçları olumlu ve olumsuz seviyede rasyo oranlarına sahip şirketler için döviz kuru riski aynı şekilde tutarlı olarak rapor etmemektedir. Stokların toplam varlıklara oranı, kaldıraç, faiz giderlerinin satışa ve yabancı varlıkların toplam borçlara oranı tercih edilen seviyede olan şirketler ve nakit, likidite, alacak devir hızı tercih edilmeyen seviyede olan firmalar kur hareketlerine maruz kalmaktadır. Ayrıca, farklı ihracat seviyelerine sahip firmalar kur değişimlerinden farklı şekilde etkilenmemektedir.

Anahtar Kelimeler: döviz kuru, döviz kuru riski, döviz kuru dalgalanması

1. INTRODUCTION

Exchange rates are known as the most important indicator affecting economic activities in the world markets. Foreign exchange rates exposure has been a major concern for companies participating in international trade since the implementation of the flexible exchange rate system. Non-stability and uncontrolled changes in the exchange rate have an impact on the general economy through its effects on the prices, interest rates, demand for goods and services, and changes in investments. Therefore, these changes eventually affect companies performance.

Turkey has suffered high inflation and depreciations over the last decades. There was also a series of currency crises during this period. For example, during 2018, the Turkish Lira suffered a huge devaluation, on a yearly basis losing more than 41% of its value against the US dollar. This case affected many firms negatively and cause them shrinkages. Understanding the extent to which firms and at what level are affected by changes in the exchange rate is an important issue. The impact of exchange rates on firms' stock returns has been defined in the macro-finance literature as exchange rate exposure. This study aims to measure effects of the fluctuation in the exchange rate on companies' stock returns, so called exchange rate exposure, based on financial statements of 330 firms that were traded on Borsa Istanbul between 2010 and 2019

International trade is the backbone of firms to produce, commercialise, and grow in modern economy. Due to the globalization of the business environment in the last decade, very few firms today can be completely classified as domestic firms. Exposure to exchange rates is a risk that an increasing number of exporting and importing firms face. Exchange rates could affect the company's value through different channels. An export--oriented company may benefit from a local currency depreciation, thorough competitiveness channel, as its product becomes more affordable to foreign customers. A firm that uses imported materials in its production may suffer from a local currency depreciation because of increased production costs. Consequently, its profits and therefore its firm value decreases. The movements in the exchange rates may also change the structure of the balance sheet and financial position of firms by changing firms' cash flows through different channels. In the second step, I analyse

how firms with different financial ratios and export levels are affected by exchange rate fluctuations.

My results based on sectoral data show that, according to the baseline model, the coefficient of exchange rate appears as significant in 8 of 26 sectors, while for the extended model the coefficients are significant in 6 of 26 sectors. The results of the ratio analysis are mixed. Firms with favorable levels of inventory to total asset, leverage, interest expense to sales, and foreign assets to total debt ratio and unfavorable levels of cash, liquidity, receivable turnover ratio exhibit positive and significant levels of exchange rate exposure. This indicates that these firms are exposed to exchange rate movements. In terms of foreign involvement, there is no significant coefficient for exchange rate has been reported indicating that the firms with different export levels are not affected differently by exchange rate variations.

This thesis has been organized as follows. The next section summarizes the literature on this topic. The third section describes the data. The fourth section explains the methodology and presents the results, the fifth section concludes.

2. LITERATURE SURVEY

Exchange rate exposure research has grown significantly since US adopted a freely floating exchange rate system in the early 1970s (Adler and Dumas, 1984). Since then, there has been many studies conducted in both developing and developed countries which stress exchange rate exposure and the factors affecting its magnitude and significance. These studies are conducted using both industry or firm-level data including different firm-level measures such as multinational status, foreign sales, export ratio which are important factors affecting the level of exposure.

Dumas (1978), Adler and Dumas (1980, 1984), and Hodder (1982) are pioneer studies investigating exchange rate exposure. In the context of these studies exposure to exchange-rate movement is the regression coefficient of the real value of the firm on the exchange rate assuming multivariate normality between the value of the firm and the exchange rate.

Jorion (1990) extends the previous studies by including an additional independent variable market return and based on a sample of multinational firms reports that when the company's export sales increase, exchange rate exposure is higher. On the other hand, Jorion (1991), by conducting a sectoral analysis document significant cross-sectional differences in the exchange rate exposure across U.S. industries. Choi and Prasad (1995) examine 409 multinationals' exchange rate sensitivity during the period 1978-1989. According to their results fluctuations in the exchange rate have an impact on firm values. More than half of the firms exhibit statistically significant coefficients for the exchange rate stressing a positive impact of dollar depreciation on firm returns. Bodnar and Gentry (1993) examine foreign exchange exposures at industry level in Canadian, Japanese, and US markets. The study reports significant exposure in 11 of 39 US industries (28%) over the period of the study. Moreover, by modelling exposure model as a function of industry characteristics, they document that the relation between exposure and industry characteristics is in line with economic theory.

He and Ng (1998) and Doukas et al. (1999) provide further evidence on Japanese firms' foreign exchange exposure. He and Ng (1998) document a significant exposure for 25 percent of the sample consisting 171 Japanese multinationals. The study also stresses that export ratio and hedging needs are also amongst the determinants of exposure. In addition, they report that highly leveraged, low liquidity, and smaller firms tend to have lower exposures. Doukas et al. (1999) also confirms that the association between exchange rate and stock returns are positively related with firm's foreign economic involvement and negatively related to its size and debt to asset ratio. In order to reduce the effects of currency fluctuation, exchange rate risk management plays a main role and is often associated with hedging activities. Hedging is a type of investment activity that aims to provide protection against future price risks. It reduces the threat of negative exchange rate moves through taking an offsetting position (Bekaert and Hodrick, 2009). The firms with higher debt to assets ratios are considered to have higher financial stress and therefore are more likely to engage in hedging activities. Therefore, these firms are expected to have lower exposure.

Khoo (1994) reviews the foreign currency exposure of Australian mining companies. He finds very weak evidence of exchange exposure and links this lack of exposure to the mining companies' extensive use of hedging. Nydahl (1999) examine the relationship between stock price changes and exchange rate fluctuations for Swedish companies. The results show considerable exposure on exchange rate for 26 percent of firms. Furthermore, the study shows that the level of export ratio significantly increases exposure, while hedging, by using derivatives, reduces exposure.

Muller and Verschoor (2007) examine the exchange rate exposure for Asian firms' stocks returns. 25 percent of firms have significant exposure to the US dollar and 22.5 percent to the Japanese yen for the period January 1993 to January 2003. The extent to which firms are exposed to exchange rate fluctuations varies with return horizons. As a consequence, short-term exposure seems to be relatively well hedged, while considerable evidence of long-term exposure is found. Their results suggest that, in contrary to US findings, highly leveraged firms and firms with lower quick ratio are more exposed to exchange rates. Similarly, firms with strong liquidity positions tend to have smaller exposures to exchange rate risk as these firms are profitable and have less incentive to engage in hedging activities.

In the literature there are also some researches which criticize the existing methodology such as Bortov and Bodnar (1994). They criticize earlier studies as they use an incorrect estimation model to explain the relationship between firm value and exchange rate movements. They suggest the inclusion of lagged variables into the model estimation. However, their results do not provide any evidence on the connection between firm value and exchange rate movements.

Dominguez and Tesar (2006) present evidence for exchange rate exposure based on a sample of eight industrialized and emerging markets. The study reports that exchange rate series, time horizon as well as firm size, multinational status, foreign sales, international assets, as well as competitiveness and trade at the industry level are important determinants of exchange rate exposure.

In the context of Turkish economy, Kiymaz (2003) investigate 109 firms which are traded on the Borsa Istanbul Stock Exchange during 1991-1998. According to his results, Turkish firms are noticeably uncovered to exchange rate risks and their earnings are affected considerably through exchange rate variations. Firstly, Kiymaz (2003) analysed how the currency risks could be priced at the level of firms with high inflation, using the monthly stock returns of 109 firms in the period between January 1991 and December 1998. Secondly, he investigated the exchange rate risk exposure across industries. Thirdly, the study compared companies' exposure to risk before and after the crisis. Kiymaz (2003) developed a regression model by using firms' international sales, import amounts and exchange rate data. As a result of his research, he revealed that firms engaged in foreign trade, especially the textile sector, were affected by changes in the exchange rate. He also found that exposure levels of firms' during the pre-crisis period were higher than after the crisis. Solakoglu (2005) based on capital market approach was used to determine the rate of exposure to foreign exchange risk of Turkish firms between 2001-2003. Exchange rate exposure, between 2001 and 2003 for Turkey is estimated using data at the firm level. The results show that the size of the firm and the share of export income in total income negatively affect the level of exposure to exchange rate effect. Larger firms and firms that are more dependent on export revenue are less exposed to exchange rate risk. The level of international activity, measured by the share of export revenue in total revenue and the share of import expenditures in total cost, appears to be important for firms that can be considered net exporters. The level of exposure was much higher for these firms than those considered to be net importers. In a more recent study, Ceylan and Sahin (2015), investigate the relationship between the exchange rate and stock prices have searched for Turkey's economy during the period of inflation targeting. In this study, long and short term relationships between dollar exchange rate and general index of stocks and sector indices are investigated based on monthly time series during 2006-2015 period. The results of the Johansen co-integration test, which is estimated to investigate long-term relationships, show that both the exchange rate and the stock price index move together in the long run. The results of the vector error correction model, which is predicted to predict short-term relationships, showed a one-way causal relationship from exchange rate to stock prices, across all sub-indices.

3. DATA AND DESCRIPTIVE STATISTICS

I use income statement and balance sheet data to measure the exchange rate exposure of 330 firms traded in Borsa Istanbul covering the period 2010-2019. The frequency of the data is quarterly. The firms in my dataset are grouped into sectors based on FINNET classification (See Appendix A). The sectors are classified as detailed as much. If a company operates in more than one sector, it has been categorized in the sector that has the largest share in revenues. I further aggregate sectors defined in FINNET classification because some sectors have few firms. So, the purpose of this merge is to have more observation numbers in a given sector. For example, in FINNET classification “Food” and “Beverage” sectors are classified separately, I have merged these sectors as “Food and Beverage”. Another example is “Retail and Wholesale Trade”. FINNET classification separately classifies these sectors as for "Retail Trade" and "Wholesale" but I have merged them as "Wholesale and Retail Trade". Sectors covered and the number of firms operating in the specific sector are presented in Table 3.1. Sectors based on FINNET classification is available at Appendix A.

Table 3.1: Sectors covered and the number of firms

Sector	Number of Firms
Food and Beverage	23
Textile, Wearing Apparel and Leather	17
Chemicals, Petroleum Rubber and Plastic Products	20
Electricity, Gas and Energy	17
Public Works	9
Wholesale and Retail Trade	12
Telecommunication	2
Law and Management Institutions	5
Banks	12
Insurance Companies	6
Financial Leasing and Factoring Companies	8
Holding and Investment Companies	28
Fabricated Metal and Other Manufacturing	15
Restaurants and Hotels	6
Sport	4

Real Estate and REIC	31
Medicine and Health Companies	7
Media and Communications	3
Agriculture, Forestry, Metallurgy and Paper Industry	15
Information Companies	11
Automat and Automotive Companies	18
Transportation Companies	9
Construction Companies	32
Venture Capital	5
Defense and Communication	6
Durable Consumption	9

As an exchange rate series I have used nominal bilateral exchange rate series, specifically Euro and Dollar. I calculate the basket which is the average of buying and selling prices of the dollar and euro exchange rate series. The exchange rate basket series are used to measure the foreign exchange exposure risk of companies and has been calculated by taking the average of EUR and USD nominal exchange rate series (See Figure 1). An increase in the basket exchange rate means a depreciation of the domestic currency.

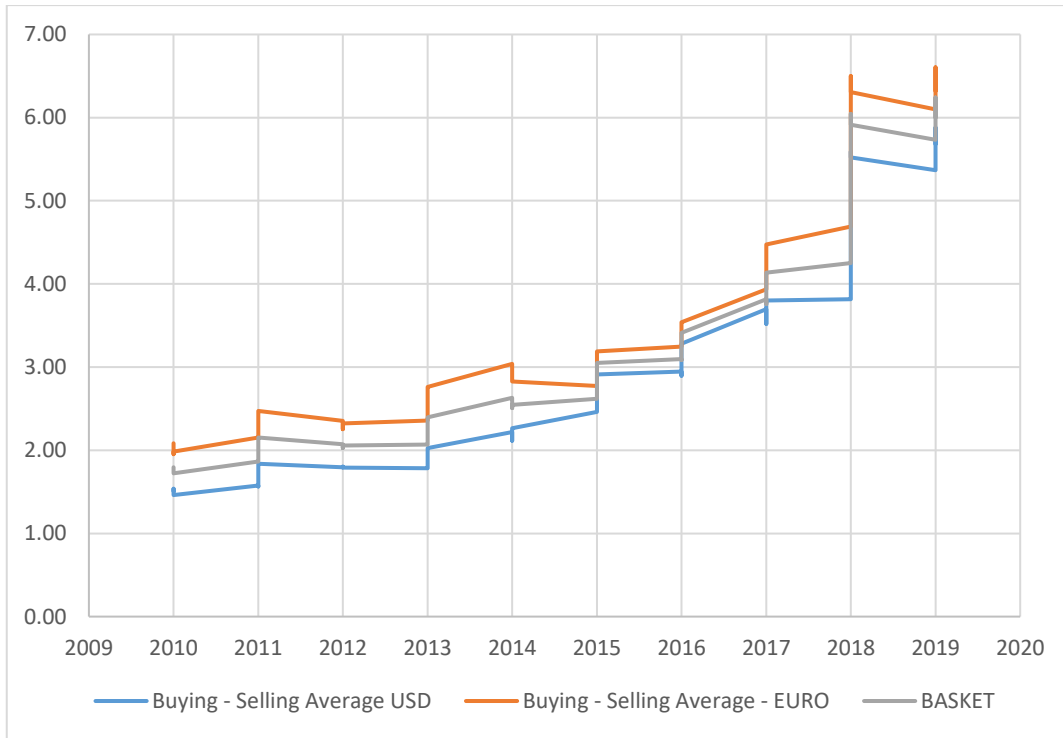


Figure 3.1: Exchange rate graph from 2010 to 2019

Market return is a proxy of how much income you will get from an investment that you made on a given stock index. These data allow you to clearly see your earnings and losses according to the amount of money you invest in and tells you that you are making a profit or loss (Hubbard and O'Brien, 2013). In order to measure market return, I take Borsa Istanbul Stock Market Index (BIST100). BIST 100 is the basic indicator used to measure the performance of the 100 highest stocks in terms of market and trading volume traded on Borsa Istanbul.

In order to calculate the market return, I apply the following formula

$$\text{Market Return} = 100 \times \frac{(\text{BIST100 Indeks}_t - \text{BIST100 Indeks}_{t-1})}{\text{BIST 100 Indeks}_{t-1}}$$

Positive returns imply that the stock market is profitable.

The descriptive statistics on stock returns across different sectors for the period 2010-2019 are given in Table 3.2. The average market return has been recorded as 4.84 percent. During this period sport industry registered the minimum market return as 1.42%, while law and management industry's return was the highest and recorded as 8.69%.

Table 3.2: The descriptive statistics on stock returns across sectors

Sector	mean	p50	sd	min	max	N
Agriculture	4.18	1.05	20.48	-65.31	125.66	545
Automotive	6.55	3.39	22.62	-53.97	169.23	654
Banks	3.70	0.30	23.66	-34.87	293.81	488
Chemicals	5.57	2.68	23.71	-82.24	174.21	651
Construction	5.22	0.63	35.85	-79.91	678.93	1147
Defense & Com.	5.75	2.50	25.53	-41.96	163.04	219
Durable Cons.	7.17	1.12	36.14	-52.45	431.50	272
Electricity	3.44	0.14	24.82	-60.86	143.21	495
Fabricated Metal	5.40	0.64	25.84	-76.25	165.71	505
Financial Leasing	4.74	2.54	17.86	-58.61	110.45	289
Food & Beverage	4.49	-0.09	26.38	-78.67	189.23	791
Holding & Invest	5.16	-1.07	32.04	-70.00	344.83	964
Information	8.09	1.76	32.07	-46.28	253.49	309
Insurance	3.18	1.17	16.88	-29.61	110.34	205
Law & Man.	8.69	-1.52	57.88	-66.79	337.03	99
Media & Com.	3.35	-2.18	28.01	-39.57	126.67	111
Health	3.39	0.97	19.14	-33.44	110.30	184
Public Works	2.88	-1.67	27.88	-88.06	186.00	265
R. Estate & REIC	3.68	0.00	30.07	-71.43	540.38	1002
Restaurant - Hotel	3.35	-1.91	29.52	-69.68	172.69	218
Sport	1.42	-2.86	30.69	-46.12	194.69	151
Telecom.	2.22	1.30	11.99	-27.05	28.71	75
Textile	4.93	1.06	24.87	-49.56	260.74	554
Transportation	7.97	4.15	45.98	-86.65	625.71	280
Venture Capital	8.57	-0.87	59.31	-41.82	640.38	143
Wholesale & Retail	2.50	-0.25	24.21	-66.67	169.23	358
Total	4.84	0.78	29.29	-88.06	678.93	10974

I examine exchange rate exposure across firm with different characteristics. With this respect, I categorize firms with respect to their i) liquidity, ii) financial position iii) turnover, iv) profitability, v) export ratio (defined as exports divided by total sales), and vi) fx revenues. For each group, I use different measurements for robustness checks. The definitions of all these different measures are explained below under relevant section.

3.1 Liquidity Ratios

Liquidity ratio is used to determine the ability of the companies to pay its short term debts and whether the working capital is sufficient. If the company's liquidity is high it means that the company's assets can be converted into cash easily. Liquidity ratio of the company is an important measure for investment decision. Amongst liquidity ratios, I use the following measures based on the categorization of in Company Sector Database of the Central Bank of the Republic of Turkey (CBRT, 2019).

- i) **Current ratio** defined as the ratio of total current assets to short-term liabilities and indicate the level of liquid assets of the business to its liabilities with a maturity of less than one year. The higher the current ration the company is considered as more liquid.
- ii) **Cash ratio** shows how much of the firm's liquid assets and short-term debts can pay in case of worsening in market and economic conditions. It is calculated by dividing liquid assets plus marketable securities to short-term liabilities.
- iii) **Liquidity ratio (acid-test ratio)** determines whether the firm has sufficient short-term assets to cover its short-term liabilities without raising external finance. This ratio does not into consideration current assets which are difficult to liquidate such as inventories. This ratio is preferred to be around 1. The values above one is considered that the company is keeping the cash on hand. However, in some case the higher ratios can be industry specific.
- iv) **Inventories to total assets ratio** account for the parts of the assets that are linked to the inventory and calculated by dividing inventories to total assets. In general, a lower ratio is considered better. A high ratio indicates that more inventory is kept. Surplus inventory may result in increased stocking expenses, increased insurance costs, and losses due to the inventory's depreciation.

Descriptive statistics on liquidity ratios are given in Tables 3.3, 3.4, 3.5, 3.6. For the first two measures, higher ratio means a more liquid company. For the third measure, a values close to one are preferred. For the fourth measure lower ratios are preferred. Venture Capital

Firms, Real Estate, Holding and Investment companies have higher liquidity based on the first two measures.

Table 3.3: The descriptive statistics on current ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	2.47	1.40	3.97	0.00	52.03	570
Automotive	2.04	1.54	1.99	0.00	17.64	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	2.32	1.59	2.51	0.00	22.81	760
Construction	1.89	1.54	1.41	0.00	17.07	1216
Defense & Com.	2.75	2.09	2.01	0.00	10.46	228
Durable Cons.	1.76	1.49	1.42	0.00	6.79	342
Electricity	3.18	1.12	5.16	0.00	49.61	608
Fabricated Metal	1.67	1.30	1.24	0.00	7.96	570
Financial Leasing	1.34	1.17	0.52	0.00	3.68	304
Food & Beverage	1.71	1.32	1.81	0.00	15.99	874
Holding & Invest	16.89	1.41	80.42	0.00	1118.38	1064
Information	2.65	1.45	4.41	0.00	28.34	418
Insurance	1.49	1.22	0.87	0.71	5.91	228
Law & Man.	1.33	1.26	1.52	0.00	7.04	190
Media & Com.	2.33	1.12	1.90	0.74	6.61	114
Health	1.65	1.42	1.61	0.00	8.62	266
Public Works	7.95	1.39	40.53	0.00	363.13	342
R. Estate & REIC	20.55	1.67	80.47	0.00	864.70	1178
Restaurant - Hotel	5.29	1.27	17.33	0.00	158.02	228
Sport	0.58	0.33	0.95	0.00	7.32	152
Telecom.	1.54	1.39	0.66	0.68	2.92	76
Textile	1.47	1.31	1.26	0.00	13.79	646
Transportation	1.41	0.92	3.58	0.00	46.32	342
Venture Capital	51.65	2.06	151.93	0.00	1336.89	190
Wholesale & Retail	1.36	0.96	2.96	0.00	34.38	456
Total	5.86	1.31	40.42	0.00	1336.89	12540

The current rate ratio table for the sectors during the period 2010-2019 is given in Table 3.3. The current ratio average of the sectors is 5.86 in the years investigated. Unlike businesses operating outside the financial sector, banks use different liquidity measures. The reason for this is the commitment to deposit money, which constitutes an important part of bank liabilities, at any time. For this reason, the current ratio of banks is 0. The average of the sports sector is below 1. This indicates that net working capital, defined as the difference

between a company's current assets and current liabilities, is negative and the company cannot pay its short-term debts with current assets.

The cash ratio table for the sectors in the period 2010-2019 is given in Table 3.4. Holding-investment companies and venture capital sectors have a highest cash ratio average amongst 26 sectors. Sport sector has the lowest cash ratio on average. In addition, standard deviation is particularly low with respect to the other sectors showing that the companies in this sector have closer ratios, and prices are more stable.

Table 3.4: The descriptive statistics on cash ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	48.11	11.31	150.87	0.00	1499.01	570
Automotive	56.36	11.96	144.20	0.00	1111.64	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	88.76	35.08	176.94	0.00	1862.59	760
Construction	41.43	19.34	66.59	0.00	802.63	1216
Defense & Com.	62.23	37.85	73.84	0.00	454.20	228
Durable Cons.	26.91	9.68	43.08	0.00	240.50	342
Electricity	171.06	11.35	453.64	0.00	4753.69	608
Fabricated Metal	19.97	9.19	32.74	0.00	265.61	570
Financial Leasing	32.41	9.60	42.17	0.00	225.62	304
Food & Beverage	19.58	4.09	59.87	0.00	1510.74	874
Holding & Invest	1073.99	13.66	6502.51	0.00	101537.00	1064
Information	134.36	12.37	394.51	0.00	2307.88	418
Insurance	0.00	0.00	0.00	0.00	0.00	228
Law & Man.	28.55	2.62	69.16	0.00	491.23	190
Media & Com.	15.24	13.05	13.50	0.00	69.40	114
Health	50.74	8.80	83.82	0.00	482.36	266
Public Works	671.51	8.13	4018.33	0.00	36257.53	342
R. Estate & REIC	734.50	26.11	2763.05	0.00	29330.28	1178
Restaurant - Hotel	247.64	4.20	877.71	0.00	8581.41	228
Sport	2.88	1.85	4.22	0.00	36.27	152
Telecom.	76.87	50.88	60.28	15.73	204.59	76
Textile	21.64	7.48	63.23	0.00	922.01	646
Transportation	61.98	27.08	250.83	0.00	3448.37	342
Venture Capital	1010.60	10.19	2806.60	0.00	19011.72	190
Wholesale & Retail	34.22	11.74	143.18	0.00	2015.44	456
Total	236.81	10.60	2240.70	0.00	101537.00	12540

Table 3.5: The descriptive statistics on liquidity ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	1.61	0.81	3.15	0.00	38.15	570
Automotive	1.38	0.89	1.87	0.00	15.87	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	1.73	1.12	2.11	0.00	21.95	760
Construction	1.30	1.10	0.95	0.00	8.63	1216
Defense & Com.	1.95	1.35	1.43	0.00	7.30	228
Durable Cons.	1.29	1.06	1.07	0.00	5.15	342
Electricity	2.69	0.73	4.89	0.00	48.65	608
Fabricated Metal	1.02	0.86	0.84	0.00	5.90	570
Financial Leasing	1.31	1.14	0.51	0.00	3.62	304
Food & Beverage	1.04	0.80	1.27	0.00	15.11	874
Holding & Invest	16.41	0.99	79.00	0.00	1091.89	1064
Information	2.36	1.03	4.43	0.00	28.26	418
Insurance	1.02	0.78	0.99	0.14	5.61	228
Law & Man.	1.20	1.10	1.45	0.00	7.02	190
Media & Com.	1.97	0.96	1.64	0.46	5.30	114
Health	1.23	0.94	1.23	0.00	7.32	266
Public Works	7.52	0.79	40.43	0.00	362.71	342
R. Estate & REIC	18.38	0.78	77.66	0.00	864.47	1178
Restaurant - Hotel	4.58	0.60	17.32	0.00	158.02	228
Sport	0.54	0.27	0.94	0.00	7.28	152
Telecom.	1.40	1.30	0.63	0.51	2.89	76
Textile	0.88	0.68	1.05	0.00	12.07	646
Transportation	1.29	0.84	3.49	0.00	45.37	342
Venture Capital	51.13	1.13	151.55	0.00	1333.62	190
Wholesale & Retail	0.82	0.48	1.79	0.00	23.59	456
Total	5.20	0.88	39.57	0.00	1333.62	12540

The liquidity ratio table for the sectors in the period 2010-2019 is given in Table 3.5. For the liquidity ratio, fabricated metal and insurance companies' sectors are the sector with the preferred liquidity levels with an average of 1.02. The liquidity ratio is less than 1 in the sports and wholesale and retail sectors which shows that these sectors suffer from liquidity shortage.

Table 3.6: The descriptive statistics on inventories to total assets ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	37.03	34.43	14.49	3.64	90.75	561.00
Automotive	33.45	34.36	14.01	3.83	78.56	670.00
Banks	0.00	0.00	0.00	0.00	0.00	494.00
Chemicals	25.14	22.94	14.62	0.00	74.41	649.00
Construction	28.08	25.48	14.69	2.73	84.86	1172.00
Defense & Com.	21.23	21.75	13.60	1.10	54.37	225.00
Durable Cons.	25.31	24.97	7.98	4.94	48.69	283.00
Electricity	14.24	8.39	16.35	0.00	72.61	525.00
Fabricated Metal	34.86	34.32	13.50	5.76	81.63	531.00
Financial Leasing	0.09	0.00	0.30	0.00	1.35	301.00
Food & Beverage	30.81	26.68	17.77	0.00	90.50	791.00
Holding & Invest	13.01	6.57	16.94	0.00	76.02	992.00
Information	16.48	17.04	14.01	0.00	64.45	330.00
Insurance	0.00	0.00	0.00	0.00	0.00	228.00
Law & Man.	6.17	1.09	9.10	0.00	32.31	113.00
Media & Com.	13.77	9.77	11.07	0.00	45.92	114.00
Health	20.79	20.43	10.75	3.89	44.80	197.00
Public Works	18.09	11.50	18.99	0.00	91.58	288.00
R. Estate & REIC	25.29	5.35	31.36	0.00	98.09	1090.00
Restaurant - Hotel	15.63	3.72	24.91	0.00	90.85	225.00
Sport	5.32	3.32	6.05	0.00	21.46	148.00
Telecom.	1.64	1.40	1.02	0.46	4.03	76.00
Textile	39.26	39.66	18.11	3.75	89.14	581.00
Transportation	5.27	3.15	7.69	0.00	52.91	289.00
Venture Capital	4.25	0.00	9.32	0.00	39.99	158.00
Wholesale & Retail	37.53	43.00	26.16	0.00	90.12	394.00
Total	22.44	19.63	20.82	0.00	98.09	11425.00

The inventory ratio table for the sectors in the period 2010-2019 is given in Table 3.6. This rate is higher in the textile, wholesale and retail, agriculture, and fabricated metal sectors since they work by holding more stocks. In sectors that do not require inventory such as financial leasing and telecommunication, this ratio is low. Companies operating in financial leasing and telecommunication sector have the lowest values. Even the highest ratio recorded in these sectors is lower than the average of all sample.

3.2 Financial Ratios

Second group measures the company's financial position. In this group I take the following ratios.

- i) **Leverage ratio** is defined as total debt to total assets and examines the relationship between the company's equity and debts. This ratio shows the distribution of resources used by companies to finance their assets. There are two ways companies can finance their assets; equity or debt finance. Borrowing, accelerate the growth of the company but also increases financing expenses. It also increases the risk that the company takes. The higher the leverage ratio, the the company is considered more risky.
- ii) **Equity multiplier ratio** is the ratio of total assets to shareholders' equity. The equity multiplier, therefore, captures the effects of how a company finances its assets, referred to as its financial leverage (Andrei et. al. 2010). Higher ratio meaning that, that assets are funding with more debt rather than equity therefore high equity multiplier is an indicator of company's dependency on debt for its financing which can make the company risky.

Table 3.7: The descriptive statistics on leverage ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	4810.65	5274.08	2274.26	174.22	10099.02	561
Automotive	5399.64	5489.00	2177.60	530.75	9549.91	670
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	4448.26	4208.74	2142.46	130.34	9289.93	649
Construction	4107.28	3730.56	2020.63	685.91	10412.33	1172
Defense & Com.	4737.53	5229.61	2024.95	969.33	8452.02	225
Durable Cons.	5583.69	6181.81	2090.32	1576.81	8653.24	283
Electricity	5007.05	5825.04	3073.82	443.05	21859.87	525
Fabricated Metal	5577.33	5481.36	2722.67	1062.62	17074.54	531
Financial Leasing	7835.49	8298.56	1642.51	2585.92	9680.52	301
Food & Beverage	5052.48	4926.66	2238.69	606.10	11834.83	791
Holding & Invest	4581.55	4741.43	2789.43	41.44	21546.90	992
Information	4621.71	4996.60	2620.87	222.60	8755.77	330
Insurance	7654.16	7662.42	1714.41	1042.37	9899.27	228
Law & Man.	4272.69	4153.44	1680.58	1360.82	8527.00	113
Media & Com.	4921.66	5323.77	2653.43	1421.17	8841.48	114
Health	4244.84	5015.92	2244.28	864.49	9615.37	197
Public Works	4999.62	5160.56	1990.55	599.02	9966.61	288
R. Estate & REIC	2977.26	2974.19	2542.01	5.88	10835.18	1090
Restaurant - Hotel	4315.48	4190.40	3259.70	63.16	12900.27	225
Sport	16673.71	16048.67	8777.36	1218.35	44789.09	148
Telecom.	5763.07	6120.98	1921.16	2854.67	8739.84	76
Textile	5442.59	5338.45	2312.67	694.77	34219.71	581
Transportation	6653.04	7118.53	1781.60	160.91	10378.33	289
Venture Capital	2349.85	1818.23	2362.77	11.22	8074.55	158
Wholesale & Retail	6547.52	6732.25	2940.08	550.55	18970.66	394
Total	4805.39	4746.27	3219.73	0.00	44789.09	11425

The leverage ratio is preferred to be low. On the other hand, low equity multiplier can be both risky and safe at the same time. Low values imply that the company has low debt, therefore it is less risky. On the other hand, higher values of this ratio may also signal company's strategy and its potential to grow and being able to take credits. Overall, insurance, banks, wholesale and retail trade, financial leasing, and restaurants have lower leverage ratios. For the equity multiplier ratio, the highest ratio is in the sports sector while the lowest ratios are in banking and venture capital firms.

The leverage ratios for the sectors in the period 2010-2019 is given in Table 3.7. The leverage ratio average of the sectors is 4805.39 in the years investigated. Firms operating in the sport

sector have the highest average leverage ratio. The high debt to total assets ratio means higher financial leverage ratio. As the financial leverage ratio increases, it increases the company's risk. Apart from the companies in the sports sector, financial leasing and investment companies are also risky. The low rate indicates that most of the asset funds are covered by equity.

The equity multiplier ratio table for the sectors in the period 2010-2019 is given in Table 3.8. The average of the sectors is 3.87 in the years investigated. Insurance companies sector has highest equity multiplier ratio with 14.14. It shows that insurance companies have been using more debt than equity. Firms operating in the sports sector generally have negative equity and also some of them have high equity. This also causes the standard deviation to be high. Due to low equity the company has, equity multiplier is low in these companies. This indicates that companies pay excessive debt.

Table 3.8: The descriptive statistics on equity multiplier ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	2.16	2.10	8.86	-172.83	20.57	561
Automotive	3.02	2.32	2.26	1.06	22.22	670
Banks	9.39	9.21	2.29	2.53	16.65	494
Chemicals	2.60	2.02	1.86	1.01	14.08	649
Construction	4.65	1.69	51.70	-24.25	1635.84	1172
Defense & Com.	2.27	2.10	1.09	1.11	6.46	225
Durable Cons.	2.92	2.68	1.43	1.19	7.68	283
Electricity	1.10	2.34	31.73	-571.95	58.76	525
Fabricated Metal	1.76	2.03	13.52	-245.50	144.75	531
Financial Leasing	7.69	7.18	4.73	1.42	31.30	301
Food & Beverage	2.42	2.04	14.24	-106.61	350.67	791
Holding & Invest	4.01	2.21	21.10	-124.88	584.40	992
Information	2.62	2.12	1.66	1.02	9.21	330
Insurance	14.14	5.16	18.00	2.58	84.41	228
Law & Man.	2.03	1.71	1.08	1.16	6.79	113
Media & Com.	2.92	2.29	2.01	1.17	8.63	114
Health	3.28	2.03	12.10	1.08	166.97	197
Public Works	4.61	2.07	30.27	1.07	510.87	288
R. Estate & REIC	2.74	1.47	17.60	-96.08	474.68	1090
Restaurant - Hotel	6.01	1.60	30.11	-126.21	344.04	225
Sport	0.65	-1.29	43.09	-170.95	473.73	148
Telecom.	3.06	2.58	1.76	1.37	7.94	76
Textile	2.87	2.25	1.87	1.07	24.19	581
Transportation	4.82	3.58	7.49	-57.05	74.51	289

Venture Capital	1.53	1.23	0.75	1.00	5.19	158
Wholesale & Retail	9.09	2.76	19.86	-78.42	194.51	394
Total	3.87	2.10	22.62	-571.95	1635.84	11425

3.3 Turnover Ratios

Third group is turnover ratios. Turnover rates indicate the degree of effectiveness and density of the assets held by the firm. Among this group I calculate the following ratios:

- i) **Net working capital turnover** is calculated by dividing net sales to current assets minus liabilities. This rate is a financial calculation that can help you determine how efficiently the company uses its existing assets to generate income. If this rate is high, it means that the company is performing well in using a company's short-term assets and liabilities for supporting sales. In other words, company creates higher sales for very unit of working capital used.
- ii) **Receivable turnover ratio** is the ratio of net sales to firms' receivables. It shows how many times the company collects its receivables in a given period. Increase in this ratio mean that the liquidity value of the receivables increases. Shrinkage of this ratio may indicate that the maturity date of the receivables is extended.
- iii) **Tangible fixed assets turnover ratio** is calculated by dividing net sales to tangible fixed assets. Tangible fixed assets are assets that are bought for use in operating activities and with an estimated usage time of more than one year. To be categorized as tangible asset; an asset i) must have a material structure, ii) must be purchased for use in business activities, iii) a sale should not be thought throughout use, iv) service life should be more than one year (Sevilengül, 2005).

In general, higher values are preferred for working capital turnover and receivable turnover ratios. On the other hand, while higher levels of tangible fixed asset turnover ratio is a signal for efficiency showing that the investment on tangible fixed assets produce high levels of net sales, the higher values of tangible fixed asset turnover ratio may also stem from low levels of tangible fixed assets.

The working capital turnover table for the sectors in the period 2010-2019 is given in Table 3.9. As mentioned, high working capital turnover rates are preferred and this indicates that company is performing well in using a company's short-term assets and liabilities for supporting sales. This turnover ratio is the highest in banking sector (20.75). After banks, financial leasing companies have second highest value with 2.57 ratio rate. The lowest rate is in insurance companies.

The receivable turnover ratio table for the sectors in the period 2010-2019 is given in Table 3.10. For the receivable turnover ratio, the highest ratio average among 26 sectors, in wholesale and retail sector with 32.62 which shows that receivables are easily collected. Food and beverage sectors have the lowest ratio with 2.05 that shows receivables are collected in a longer time period than other sectors.

The tangible fixed assets turnover ratio table for the sectors in the period 2010-2019 is given in Table 3.11. In tangible fixed assets turnover ratio, companies operating in holding and investment, hotel and restaurants, and real estate sectors have the highest values for ratios. On the other hand, companies operating in telecommunication, media and communication and transportation sectors have the lowest ratio.

Table 3.9: The descriptive statistics on working capital turnover ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	1.13	0.98	0.77	0.07	6.34	561
Automotive	1.25	1.06	0.84	0.09	5.33	670
Banks	20.75	0.25	84.08	0.04	679.87	494
Chemicals	1.17	0.90	1.12	0.00	9.90	649
Construction	1.07	0.93	0.73	0.03	4.24	1172
Defense & Com.	0.74	0.63	0.52	0.09	2.71	225
Durable Cons.	0.91	0.78	0.63	0.00	3.45	283
Electricity	0.99	0.71	1.00	0.00	10.74	525
Fabricated Metal	1.13	0.97	0.75	0.12	4.26	531
Financial Leasing	2.57	0.09	7.10	0.01	76.78	301
Food & Beverage	1.13	0.93	0.83	0.00	6.03	791
Holding & Invest	1.56	0.34	9.90	0.00	182.12	992
Information	1.39	1.21	1.37	0.00	19.73	330
Insurance	0.01	0.01	0.04	-0.14	0.11	228
Law & Man.	1.46	1.24	1.16	0.00	5.31	113
Media & Com.	1.00	0.84	0.60	0.17	2.81	114
Health	1.07	0.84	0.75	0.12	4.00	197
Public Works	0.70	0.50	0.71	0.00	5.44	288
R. Estate & REIC	1.12	0.25	6.84	0.00	142.65	1090
Restaurant - Hotel	2.19	0.33	11.88	0.00	129.14	225
Sport	1.61	1.13	1.52	0.07	9.35	148
Telecom.	1.06	0.90	0.68	0.22	2.98	76
Textile	0.99	0.91	0.56	0.00	4.64	581
Transportation	1.47	1.13	1.31	0.00	9.32	289
Venture Capital	0.34	0.10	0.70	0.00	5.01	158
Wholesale & Retail	2.41	1.91	2.25	0.00	14.56	394
Total	2.07	0.72	18.41	-0.14	679.87	11425

Table 3.10: The descriptive statistics on receivable turnover ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	4.46	3.68	0.89	3.68	5.72	570
Automotive	6.08	4.42	1.86	4.42	8.16	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	4.44	2.00	5.21	0.00	12.82	760
Construction	4.47	3.58	2.02	2.87	8.25	1216
Defense & Com.	2.94	2.94	0.00	2.94	2.94	228
Durable Cons.	3.90	3.90	0.00	3.90	3.90	342
Electricity	14.07	7.74	13.44	3.64	37.15	608
Fabricated Metal	5.25	5.78	1.13	1.89	5.78	570
Financial Leasing	22.44	12.60	18.29	5.68	45.76	304
Food & Beverage	2.05	0.00	3.09	0.00	6.72	874
Holding & Invest	9.50	7.22	3.94	7.22	16.33	1064
Information	4.27	4.27	0.00	4.27	4.27	418
Insurance	0.00	0.00	0.00	0.00	0.00	228
Law & Man.	4.08	2.57	3.04	2.57	10.15	190
Media & Com.	3.06	3.06	0.00	3.06	3.06	114
Health	3.79	3.79	0.00	3.79	3.79	266
Public Works	5.56	5.56	0.00	5.56	5.56	342
R. Estate & REIC	2.63	2.66	0.18	1.66	2.66	1178
Restaurant - Hotel	4.43	4.43	0.00	4.43	4.43	228
Sport	4.19	4.19	0.00	4.19	4.19	152
Telecom.	5.33	5.33	0.00	5.33	5.33	76
Textile	4.90	3.81	2.89	2.53	11.04	646
Transportation	14.69	14.69	0.00	14.69	14.69	342
Venture Capital	4.25	4.25	0.00	4.25	4.25	190
Wholesale & Retail	32.62	48.76	22.86	0.33	48.76	456
Total	6.59	4.19	9.19	0.00	48.76	12540

Table 3.11: The descriptive statistics on tangible fixed assets turnover ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	3.50	3.00	3.70	0.00	52.94	570
Automotive	6.29	5.58	4.70	0.00	33.12	684
Banks	6.49	3.79	9.38	0.95	65.88	494
Chemicals	3.43	2.06	4.08	0.00	31.13	760
Construction	3.55	1.47	10.67	0.00	81.94	1216
Defense & Com.	22.57	12.57	23.27	0.00	110.03	228
Durable Cons.	8.76	6.50	9.69	0.00	51.66	342
Electricity	110.14	1.23	2555.05	0.00	63003.29	608
Fabricated Metal	4.09	2.94	4.40	0.00	28.74	570
Financial Leasing	623.38	125.57	1215.70	0.00	7057.06	304
Food & Beverage	3.24	2.45	4.03	0.00	29.89	874
Holding & Invest	89928.30	1.84	1466674.00	0.00	29700000.00	1064
Information	690.88	43.97	2200.89	0.00	19866.70	418
Insurance	2.06	1.24	2.61	0.00	14.54	228
Law & Man.	17.36	9.32	24.03	0.00	143.16	190
Media & Com.	2.73	2.45	1.38	0.00	9.18	114
Health	9.27	2.33	18.24	0.00	120.35	266
Public Works	24.93	6.08	58.35	0.00	671.40	342
R. Estate & REIC	1445.30	46.71	34326.80	0.00	1174987.00	1178
Restaurant - Hotel	1634.99	0.25	12239.52	0.00	96396.37	228
Sport	47.00	32.98	107.78	0.00	1325.12	152
Telecom.	1.89	1.91	0.21	1.57	2.44	76
Textile	4.89	2.24	14.88	0.00	328.10	646
Transportation	3.12	1.25	7.79	0.00	84.19	342
Venture Capital	128.59	16.26	239.85	0.00	1285.93	190
Wholesale & Retail	163.31	7.92	1047.84	0.00	12721.77	456
Total	7851.64	2.90	427904.20	0.00	29700000.00	12540

3.4 Profitability Ratios

Another ratio group that are included in the analysis and used by investors when making company analysis is profitability ratio. It shows whether the profitability of the business is sufficient and some other factors like interest expense and operating expenses as a percentage of sales. Amongst this group I take the following ratios:

- i) **EBITDA / Equity:** EBITDA stands for earnings before interest, taxes, depreciation, and amortization.
- ii) **Interest Expenses / Net Sales Ratio** is a ratio used to measure the weight of interest expenses on the profit for the specified period.
- iii) **Operating Expenses to Net Sales** is a ratio used to measure the weight of operating expenses on the profit for the specified period.

The profitability ratios for the sectors in the period 2010-2019 is given in Table 3.12, 3.13 and 3.14. Across the EBITDA to equity ratios the highest ratios belong to the financial leasing, telecommunication, and transportation sectors, while the lowest ratios are recorded in the restaurant, hotel and sport sector (Table 3.12). Table 3.13 presents the descriptive statistics for interest expenses to net sales ratios. Table 3.13 depicts that venture capital, holding and investment and food and beverage firms have much bigger ratios than other firms. Accounts such as exchange difference expenses, leasing expenses, bank loan interests are accounted in the finance expenses account. For this reason, this rate is high in the venture capital trust, holding and investment companies' sector. In the sport sector, broadcasting revenues, revenue and license rights revenues, sales and rental income of football players increase the net sales. This ratio is low in this sector as net sales are high. Table 3.14 presents the descriptive statistics for operating expenses to net sales ratio. As the operating expenses increase, this rate increases. law and management companies have the lowest average as they have less operating expenses than the other sectors. For example; a law firm have less interest paid, accounting fees, repair and maintained compared to restaurant and hotels.

Table 3.12: The descriptive statistics on EBITDA to equity ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	11.79	8.75	28.74	-483.42	148.59	561
Automotive	20.57	15.97	20.63	-29.27	173.21	670
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	12.36	9.30	14.38	-50.43	105.38	649
Construction	3.05	7.98	162.20	-5386.12	188.11	1172
Defense & Com.	6.29	5.15	12.73	-59.84	77.76	225
Durable Cons.	14.59	10.72	16.52	-16.41	98.64	283
Electricity	11.85	7.12	34.07	-316.95	399.08	525
Fabricated Metal	12.88	8.39	37.05	-268.41	546.24	531
Financial Leasing	32.91	22.28	31.43	-23.03	189.27	301
Food & Beverage	9.57	6.43	75.20	-524.76	1839.20	791
Holding & Invest	7.43	4.05	48.86	-500.38	918.92	992
Information	13.46	11.76	13.84	-42.08	68.49	330
Insurance	0.00	0.00	0.00	0.00	0.00	228
Law & Man.	6.43	7.00	30.74	-167.05	160.23	113
Media & Com.	11.41	1.24	22.46	-73.90	77.32	114
Health	19.72	8.67	98.74	-6.46	1365.53	197
Public Works	7.60	4.42	26.52	-124.41	294.29	288
R. Estate & REIC	6.81	3.08	65.53	-664.66	1945.56	1090
Restaurant - Hotel	0.18	0.31	104.62	-1169.02	499.65	225
Sport	0.66	7.59	205.32	-1754.54	584.57	148
Telecom.	27.30	21.03	18.43	3.95	72.03	76
Textile	15.84	8.95	26.02	-40.30	252.38	581
Transportation	28.03	17.12	80.13	-687.99	767.09	289
Venture Capital	0.61	1.02	22.52	-126.01	72.66	158
Wholesale & Retail	12.20	4.97	46.47	-241.36	461.66	394
Total	10.49	6.32	72.31	-5386.12	1945.56	11425

Table 3.13: The descriptive statistics on interest expenses to net sales ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	12.86	10.42	8.27	0.00	55.42	570
Automotive	10.49	8.94	5.51	0.00	34.20	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	23.67	12.90	147.25	0.00	2765.54	760
Construction	11.80	10.40	12.55	0.00	167.54	1216
Defense & Com.	21.28	10.10	42.85	2.03	556.47	228
Durable Cons.	11.14	11.28	7.79	0.00	27.61	342
Electricity	76.92	8.74	757.69	0.00	17052.01	608
Fabricated Metal	11.97	10.11	8.41	0.00	78.06	570
Financial Leasing	15.21	13.97	13.02	0.00	60.73	304
Food & Beverage	80.49	12.57	1760.98	0.00	51982.64	874
Holding & Invest	147.36	14.35	3656.56	0.00	119005.50	1064
Information	30.48	3.72	55.42	0.00	433.44	418
Insurance	0.00	0.00	0.00	0.00	0.00	228
Law & Man.	13.59	6.25	18.12	0.00	113.20	190
Media & Com.	24.68	21.01	9.79	13.01	42.77	114
Health	12.83	5.38	12.32	0.00	53.75	266
Public Works	42.46	4.57	330.22	0.00	4609.30	342
R. Estate & REIC	45.13	15.74	200.61	0.00	4532.14	1178
Restaurant - Hotel	51.48	30.38	66.64	0.00	341.01	228
Sport	10.00	8.78	6.61	0.00	56.67	152
Telecom.	22.71	22.66	4.92	10.57	30.49	76
Textile	16.50	12.21	14.36	0.00	60.13	646
Transportation	11.89	10.26	10.59	0.00	67.45	342
Venture Capital	688.40	12.60	2930.96	0.00	25851.84	190
Wholesale & Retail	26.57	17.77	75.48	0.00	1442.11	456
Total	48.06	10.45	1234.14	0.00	119005.50	12540

Table 3.14: The descriptive statistics on operating expenses to net sales ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	6.16	3.57	9.02	-0.89	103.24	570
Automotive	6.76	3.83	9.30	-1.47	96.46	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	80.25	4.44	978.26	0.00	19234.17	760
Construction	6.87	3.47	9.07	-1.20	94.81	1216
Defense & Com.	6.51	3.38	9.05	0.06	86.91	228
Durable Cons.	6.22	4.94	5.92	0.00	29.00	342
Electricity	58.86	5.91	889.01	-34.37	21878.73	608
Fabricated Metal	7.92	4.98	12.58	-1.24	134.24	570
Financial Leasing	43.08	55.01	35.34	0.00	120.41	304
Food & Beverage	20.86	4.79	380.14	0.00	11220.18	874
Holding & Invest	17.80	5.25	92.22	-22.68	2658.97	1064
Information	5.73	1.47	13.18	0.00	122.85	418
Insurance	0.00	0.00	0.00	0.00	0.00	228
Law & Man.	2.15	0.50	4.31	-2.49	34.86	190
Media & Com.	9.10	7.82	7.57	0.25	43.94	114
Health	3.75	1.50	4.72	0.00	24.26	266
Public Works	72.25	3.60	477.24	0.00	6373.39	342
R. Estate & REIC	88.33	15.32	579.56	-4.28	18377.77	1178
Restaurant - Hotel	114.58	26.91	273.75	-5.31	2152.63	228
Sport	32.93	24.64	28.91	0.00	218.38	152
Telecom.	13.52	10.53	11.36	1.26	62.64	76
Textile	10.05	8.06	8.91	0.00	65.13	646
Transportation	13.66	6.46	20.49	-0.44	110.44	342
Venture Capital	3691.44	0.00	25473.91	0.00	272108.40	190
Wholesale & Retail	32.53	1.68	127.42	0.00	1288.21	456
Total	84.91	4.00	3182.61	-34.37	272108.40	12540

In addition to this we also consider the following ratios available in the dataset.

- i) **Foreign assets to total debt ratio:** It shows the rate of how much of the assets of the company are denominated in foreign currency.
- ii) **Export ratio** is the ratio of total export to total sales of a given firm.

Table 3.15: The descriptive statistics on foreign assets to total debt ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	31.83	12.27	42.29	0.00	265.44	570
Automotive	75.81	36.32	158.25	0.00	1371.50	684
Banks	0.00	0.00	0.00	0.00	0.00	494
Chemicals	37.65	19.38	54.91	0.00	643.16	760
Construction	17.52	10.99	22.95	0.00	264.09	1216
Defense & Com.	75.23	48.24	80.67	0.00	453.47	228
Durable Cons.	30.02	31.90	27.33	0.00	97.55	342
Electricity	44.91	15.32	93.08	0.00	617.92	608
Fabricated Metal	31.85	18.71	38.74	0.00	282.73	570
Financial Leasing	39.10	40.68	31.43	0.00	94.88	304
Food & Beverage	15.03	5.40	25.46	0.00	264.03	874
Holding & Invest	33.59	10.14	237.32	0.00	7566.05	1064
Information	83.56	17.03	180.12	0.00	1317.98	418
Insurance	8.22	6.44	8.51	0.00	59.45	228
Law & Man.	12.71	0.59	33.12	0.00	215.94	190
Media & Com.	16.24	13.89	15.94	0.00	86.00	114
Health	25.96	1.84	42.38	0.00	170.39	266
Public Works	17.42	4.82	27.80	0.00	239.94	342
R. Estate & REIC	222.46	2.83	1116.70	0.00	14709.02	1178
Restaurant - Hotel	30.72	7.41	73.14	0.00	503.53	228
Sport	20.14	3.80	63.06	0.00	518.83	152
Telecom.	23.63	19.83	17.61	3.16	62.64	76
Textile	25.74	20.80	24.99	0.00	170.55	646
Transportation	70.14	14.19	363.45	0.00	4221.79	342
Venture Capital	33.60	0.04	94.86	0.00	708.59	190
Wholesale & Retail	11.26	0.49	27.84	0.00	230.14	456
Total	50.52	9.86	364.37	0.00	14709.02	12540

Table 3.15 presents the descriptive statistics for foreign assets to total debt ratio. The average ratio has been recorded as 50.52. According to the table companies operating in real estate and real estate real estate investment trust company sector have the highest ratio. Companies operating in the insurance sector have the lowest rate with 8.22.

Table 3.16: The descriptive statistics on export ratio across different sectors

Sector	Mean	P50	SD	Min	Max	N
Agriculture	16.61	8.58	17.18	0.00	80.39	399
Automotive	44.48	45.41	24.70	0.00	94.83	501
Banks	.	.	.	.	.	0
Chemicals	21.96	19.26	19.62	0.00	85.00	488
Construction	16.82	12.53	15.59	0.00	80.00	1078
Defense & Com.	13.82	10.66	12.48	0.00	68.37	202
Durable Cons.	42.35	51.49	26.98	0.00	95.72	257
Electricity	20.84	8.26	26.53	0.00	99.94	377
Fabricated Metal	33.69	33.41	22.87	0.00	85.81	494
Financial Leasing	.	.	.	.	.	0
Food & Beverage	24.99	15.39	24.54	0.00	96.68	733
Holding & Invest	16.83	9.45	20.87	0.00	100.00	492
Information	3.03	0.69	7.47	0.00	40.65	257
Insurance	.	.	.	.	.	0
Law & Man.	2.37	0.73	4.07	0.00	21.17	83
Media & Com.	23.62	25.52	19.87	0.03	56.90	109
Health	4.63	0.53	8.29	0.00	43.06	117
Public Works	28.57	23.86	31.83	0.00	100.00	135
R. Estate & REIC	3.91	0.00	12.59	0.00	60.86	102
Restaurant - Hotel	0.26	0.00	1.44	0.00	11.17	107
Sport	12.74	9.60	13.85	0.00	46.60	47
Telecom.	6.52	6.39	3.17	1.58	13.29	61
Textile	35.78	34.54	25.40	0.00	98.22	515
Transportation	42.90	43.34	29.82	2.26	90.35	185
Venture Capital	17.37	0.00	29.35	0.00	99.17	54
Wholesale & Retail	2.24	0.00	11.58	0.00	99.15	205
Total	22.82	14.29	24.17	0.00	100.00	6998

Due to the export made by the companies operating in the automobile sector, the export ratios are the highest. (Sector average is 44.48). This rate is also high in the durable consumption sector. The lowest ratio among the sectors belongs to the service sectors such as restaurants and hotel sectors as well as companies operating in the law and management sector.

4. MODEL AND EMPIRICAL FINDINGS

Exchange rate exposure is estimated from the following baseline regression following Adler and Dumas (1984) and Jorion (1990);

$$R_{it} = \beta_{0i} + \beta_{er,i}ER_{st} + \varepsilon_{i,t} \quad t = 1, \dots, T \quad (1)$$

where, R_{it} rate of return on the i th firms stock price and ER_{st} is the rate of change in a foreign exchange rate calculated as the value of the Turkish lira per foreign currency. Jorion (1990) states that the above-mentioned definition would be appropriate if it is assumed that changes in stock prices and exchange rates are unpredictable.

This model can also be extended by taking into account market moves. The extended version of the regression equation is following:

$$R_{it} = \beta_{0i} + \beta_{er,i}ER_{st} + \beta_{m,i}(U)R_{mt} + \lambda_{i,t} \quad t = 1, \dots, T \quad (2)$$

Throughout our analysis, I assume that exchange rate fluctuations are unpredictable. Increase in the exchange rate represents a depreciation of Turkish Lira. Our main coefficient of interest is β . Positive (negative) and significant values of beta implies that as the currency depreciates stock return increase (decrease).

The impact of depreciation can be both positive and negative effect the firms. There are different channels that potentially effect the amount of revenues, therefore the stock return of a given firm. These channels are:

- i. **Competitiveness channel:** When exchange rate depreciates, exported good are more competitive therefore firms sell more in international markets. This is expected to be more prevalent in exporting firms.
- ii. **Substitution effect:** When exchange rate depreciates, the price of the imported goods will increase, the price difference between domestic goods and imported goods will increase. This will create a substitution effect and domestic sales increase.

- iii. **Financial status:** When the exchange rate depreciates, the financial status of the exporting companies will be affected positively as their revenues are denominated in mostly dollars and euro, while the companies that borrow foreign assets will adversely affected.
- iv. **Cost of production:** The production cost will increase when the exchange rate increases.

Depending on the relative importance of these channels net effect of currency depreciation may be positive, negative or insignificant.

Using the models described in equation 1 and 2, I conduct a simple linear regression analysis using the firm level data for each sector.

According to the baseline model, the coefficient of exchange rate, beta, is significant in 8 of 26 sectors. Significant sectors are; automotive companies, banks, construction companies, durable consumption, fabricated metal and other manufacturing, financial leasing and factoring companies, holding and investment companies and sports. Among the 8 sectors; automotive and construction companies have significant negative coefficient which implies that as the currency depreciates stock return in the sector declines. On the other hand, for the sample of financial leasing companies, I find significant and positive coefficient for exchange rate variable. For this sector exchange rate depreciation has a positive impact on stock returns.

According to extended model, the coefficients are significant in 6 of 26 sectors. Overall, for the significant coefficients across sectors, the sign of the coefficients are in line with the baseline model except construction and sport sectors in which the coefficients turn insignificant. The sectors with significant and positive exposure coefficients are durable consumption, banks, financial leasing and factoring, holding and investment, media and communication companies while automotive sector has a negative and significant coefficient. Automotive sector and automotive companies is the only sector with negative and significant coefficient implying that as Turkish Lira depreciates stock return in the sector decrease.

Table 4.1: Regression for the baseline and extended model

Sector	Baseline Regression		Extended Model	
	Number of firms	FX Exposure	FX Exposure	Market Exposure
Agriculture	15	-0.795	0.0587	0.751***
Automotive	18	-2.857***	-1.883***	0.853***
Banks	12	1.459*	2.231***	0.808***
Chemicals	20	-1.165	-0.461	0.815***
Construction	32	-2.186***	-0.919	0.749***
Defense & Com.	6	-0.672	-0.151	0.806***
Durable Cons.	9	2.804*	3.785**	0.880***
Electricity	17	-0.911	-0.364	0.807***
Fabricated Metal	15	-1.666*	-0.813	0.588***
Financial Leasing	8	2.242***	2.706***	0.451***
Food & Beverage	23	-0.598	0.105	0.549***
Holding & Invest	28	1.525*	2.257***	0.796***
Information	11	-1.874	-0.531	1.049***
Insurance	6	0.295	0.929	0.724***
Law & Man.	5	5.982	6.433	0.552
Media & Com.	3	2.738	3.690*	0.999***
Health	7	-0.251	0.450	0.877***
Public Works	9	-1.714	-0.924	1.065***
R. Estate & REIC	31	-0.740	0.0405	0.722***
Restaurant - Hotel	6	-0.196	1.736	0.857***
Sport	4	-3.780*	-3.041	1.182***
Telecom.	2	-0.818	-0.399	0.756***
Textile	17	-0.0537	0.695	0.781***
Transportation	9	1.745	2.690	1.279***
Venture Capital	5	-4.192	0.199	0.669***
Wholesale & Retail	12	-1.487	-0.926	0.601***

Notes: *** p<0.01, ** p<0.05, * p<0.1

Next, I test the degree of exposure across firms with different levels of liquidity. In order to do that I divide the sample in two groups based on the distribution of the current and inventory to total assets ratio. High ratio (High, 50%) represent the sample consisting the firms with ratios belonging to the upper 50 percentile of the distribution, while the low ratio (Low, 50%) represents the firms with ratios belonging to the lower 50 percentiles. In addition, I test the results using the groups that corresponds to upper (High, 25%) and lower quartiles (Low, 25%) of the distributions. For the cash ratio and liquidity ratio, there is no linear relationship between the value of the ratios and its preference level, therefore, I have applied a different method to divide the sample. Cash ratio is preferred to be close to 0.20. (Gündoğdu, 2017) Therefore I have divided the sample between firms whose cash ratio is

close to 0.20 or not. Accordingly, firms that has cash ratio between 0.10 and 0.20 are considered preferable while the others not. Similarly, liquidity ratio is preferred to be close to 1, therefore I have divided the sample between firms whose cash ratio is close to 1 or not. As a result, firms that has cash ratio between 0.80 and 1.20 are considered preferable while the others not.

Below, I present the results based on the extended specification described in equation 2.

The results associated with firms with different levels of current and inventory to total assets ratios are present in Table 4.2. For the current ratio, in the two-specification, there is no significant exchange rate coefficient reported indicating no evidence for exchange rate exposure of firms with different liquidity levels. On the other hand, when I look at the sample of firm with low inventory to total assets ratio, my results show that firms with preferable inventory to total assets ratio (low levels) have positive and significant coefficients for exchange rate indicating that these firms are positively affected by exchange rate depreciation. For the other group firm which have higher values of inventory to total assets ratio the coefficients of exchange rate exposure are insignificant, indicating no evidence for exchange rate exposure.

Table 4.3 presents results based on cash ratio and liquidity ratios. The results show that firms with favourable cash ratio are not affected by exchange rate variations as shown by insignificant coefficients of exchange rates depicted in Table 4.3, while firms with unfavourable cash ratio are affected positively by exchange rate depreciations. In parallel to the findings of cash ratio, firms with favourable liquidity ratio are not affected by exchange rate fluctuations as shown insignificant coefficients, while firms with unfavourable cash ratio are affected positively by exchange rate depreciations.

For the financial ratios, I further investigate the sample with high and low leverage and equity multiplier ratios. If the leverage ratio increases that means companies use more loans therefore, the leverage ratio is preferred to be low. Companies that are potentially adversely affected by the exchange rate due to an increase in lows may be more vulnerable to negative impacts of exchange rate fluctuations. On the other hand, low equity multiplier can be both risky and safe at the same time. Low values imply that the company has low debt, therefore

it is less risky. High values represent more aggressive company strategy which can create further growth. Because of this, it's difficult to make any assertion.

The results of financial ratios are depicted in Table 4.4. In parallel to my expectations, I see no significant relation between firms having low and high equity ratios. On the other hand, firms with preferable (low) levels of leverage ratio have positive and significant exchange rate coefficients implying that stock returns are positively affected by exchange rate depreciation.

Next, I investigate the samples with different profitability ratios. The results are present in Table 4.5. Companies with low EBITDA to equity ratio have positive and significant exchange rate coefficients while there is no significant exchange rate coefficient reported for the companies with high EBITDA to equity ratios. As a profitability indicator, I use two additional ratios, namely interest expenses to net sales, and operating expenses to net sales (OPEX) . Interest expenses to net sales ratio measured weight of interest expenses on the profit. My results depicted in Table 4.5 show that firms with low levels of expense (net sales ratio, have significant and positive exchange rate coefficient implying that depreciation positively affects these firms. On the other hand, for the firms with high and low OPEX values, there is no significant exposure coefficient reported.

I investigate the sample for turnover ratios with high and low working capital turnover, receivable turnover and tangible fixed assets turnover ratios. The results are depicted in Table 4.6. There is no evidence for exchange rate exposure for firms with different levels of working capital turnover ratios. On the other hand, according to the table companies with low receivable turnover ratio are positively and significantly affected by the exchange rate implying that stock returns are positively affected by exchange rate depreciation.

The high rate of receivables turnover shows that receivables are collected faster. Companies with low collection rates are positively affected by the exchange rate.

If the companies have a higher tangible fixed assets turnover ratio means that the company is using its fixed assets more effectively. There is statistical positive significance between

tangible fixed assets and basket and this is more common in companies within the lower and upper quartile of the distribution of this ratio.

Moreover, I test exposure degree for firms with different levels of exports and FX assets. The increase in the ratio of foreign assets to total debt will affect the company's financials negatively in case of cash depreciation or the company's assets can be more valuable by the appreciation in the foreign exchange. For the export ratio there are different channels. If export ratio increases, depreciation results in increasing stock returns because firms exports are in dollar or euro, and therefore the dollar value of the exported goods become more competitive. However, if firms use imported inputs, the reverse effect can be seen. As a result, the results may be mixed depending on the relative importance of imported inputs and exports as these two effects may counterbalance.

The results are depicted in table 4.7. Based on the categorization of firms with different export ratios, there is no significant coefficients for exchange rates reported indicating no evidence of exchange rate exposure for firms with lower and higher foreign involvement. Moreover, for firms in the lower quartile of foreign assets to debt ratio, the coefficient of exchange rate appear as positive and significant implying that these firms are positively affected by exchange rate depreciation.

Table 4.2: Regression analysis for liquidity ratios

	(1)	(2)	(7)	(8)	(9)	(10)	(11)	(12)
	Current Ratio Low (%25)	Current Ratio High (%25)	Inventories to Total Assets Low (%25)	Inventories to Total Assets High (%25)	Current Ratio Low (%50)	Current Ratio High (%50)	Inventories to Total Assets Low (%50)	Inventories to Total Assets High (%50)
Variables								
Basket	0.430 (0.468)	0.568 (0.438)	1.023*** (0.389)	-0.145 (0.372)	0.294 (0.272)	0.445 (0.293)	0.542* (0.284)	0.0742 (0.278)
Bist Return	0.849*** (0.0680)	0.838*** (0.0567)	0.728*** (0.0530)	0.761*** (0.0515)	0.780*** (0.0388)	0.774*** (0.0380)	0.785*** (0.0380)	0.772*** (0.0382)
Constant	0.709 (1.695)	1.744 (1.448)	-0.361 (1.341)	2.659** (1.296)	1.680* (0.977)	1.814* (0.967)	1.081 (0.967)	2.655*** (0.961)
Observations	2,037	2,887	2,616	2,641	4,949	5,799	5,262	5,340
R-squared	0.071	0.070	0.068	0.078	0.076	0.067	0.075	0.071
N	2037	2887	2616	2641	4949	5799	5262	5340
r2	0.0711	0.0703	0.0680	0.0777	0.0756	0.0670	0.0750	0.0713

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3: Regression analysis for cash and liquidity ratios

	(1)	(2)	(3)	(4)
VARIABLES	CR Good 1 (10-30)	CR Bad CR (10-30)	LR Good 0	LR Bad 0
BASKET	0.101	0.411*	0.127	0.412*
	-0.386	-0.231	-0.381	-0.233
BIST Return	0.844***	0.758***	0.755***	0.782***
	-0.0525	-0.0315	-0.0542	-0.0313
Constant	1.764	1.858**	2.547*	1.628**
	-1.33	-0.794	-1.343	-0.794
Observations	2,317	8,431	2,396	8,352
R-squared	0.101	0.064	0.075	0.07
N	2317	8431	2396	8352
r2	0.101	0.0641	0.0752	0.0695

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.4: Regression analysis for financial position ratios

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Leverage Ratio	Leverage Ratio High	Equity Multiplier	Equity Multiplier	Leverage Ratio Low	Leverage Ratio High	Equity Multiplier	Equity Multiplier
Variables	Low (%25)	(%25)	Low (%25)	High (%25)	(%50)	(%50)	Low (%50)	High (%50)
Basket	1.176*** (0.436)	-0.100 (0.345)	0.577 (0.470)	0.535 (0.345)	0.717** (0.302)	-0.0292 (0.264)	0.222 (0.307)	0.379 (0.259)
BIST Return	0.766*** (0.0553)	0.833*** (0.0506)	0.743*** (0.0601)	0.788*** (0.0497)	0.728*** (0.0388)	0.832*** (0.0374)	0.732*** (0.0396)	0.826*** (0.0366)
Constant	-0.501 (1.414)	2.489** (1.262)	1.716 (1.538)	0.765 (1.244)	0.935 (0.998)	2.665*** (0.936)	2.287** (1.012)	1.476 (0.922)
Observations	2,656	2,646	2,641	2,669	5,273	5,329	5,267	5,335
R-squared	0.068	0.094	0.055	0.086	0.063	0.086	0.061	0.087
N	2656	2646	2641	2669	5273	5329	5267	5335
r2	0.0682	0.0940	0.0548	0.0860	0.0625	0.0856	0.0613	0.0871

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.5: Regression analysis for profitability ratios

	(1)	(2)	(3)	(4)	(5)	(6)
	EBITDA/Equity	EBITDA/Equity	Expense to Sales	Expense to Sales	OPEX	OPEX
Variables	Low (%25)	High (%25)	Low (%25)	High (%25)	Low (%25)	High (%25)
Basket	1.186*** (0.436)	-0.375 (0.387)	1.291*** (0.486)	-0.227 (0.341)	0.610 (0.476)	0.470 (0.395)
BistRetun	0.751*** (0.0577)	0.847*** (0.0583)	0.663*** (0.0642)	0.851*** (0.0510)	0.788*** (0.0667)	0.745*** (0.0528)
Constant	-3.083** (1.467)	6.515*** (1.441)	-0.606 (1.631)	1.712 (1.260)	1.258 (1.668)	0.682 (1.335)
Observations	2,630	2,647	2,156	2,900	2,133	2,872
R-squared	0.061	0.076	0.049	0.089	0.062	0.065
N	2630	2647	2156	2900	2133	2872
r2	0.0615	0.0760	0.0489	0.0887	0.0616	0.0650

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.5 continued: Regression analysis for profitability ratios

	(7)	(8)	(9)	(10)	(11)	(12)
	EBITDA/Equity	EBITDA/Equity	Expense to Sales	Expense to Sales	OPEX	OPEX
Variables	Low (%50)	High (%50)	Low (%50)	High (%50)	Low (%50)	High (%50)
Basket	0.723** (0.300)	-0.237 (0.264)	0.867*** (0.316)	0.0616 (0.258)	0.272 (0.298)	0.364 (0.268)
BistRetun	0.755*** (0.0386)	0.835*** (0.0377)	0.713*** (0.0402)	0.828*** (0.0369)	0.792*** (0.0418)	0.764*** (0.0356)
Constant	-1.051 (0.998)	5.262*** (0.932)	0.951 (1.041)	2.192** (0.920)	2.789*** (1.047)	1.163 (0.905)
Observations	5,242	5,360	5,038	5,710	4,979	5,769
R-squared	0.068	0.085	0.059	0.081	0.067	0.074
N	5242	5360	5038	5710	4979	5769
r2	0.0680	0.0849	0.0592	0.0813	0.0675	0.0740

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.6: Regression analysis for turnover ratios

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Working Capital Low (%25)	Working Capital High (%25)	receivable turnover ratio Low (%25)	receivable turnover ratio High (%25)	FAT Low (%25)	FAT High (%25)
Basket	0.565 (0.387)	-0.0684 (0.400)	0.860** (0.399)	-0.0110 (0.460)	1.117** (0.539)	0.779* (0.442)
Bist Return	0.795*** (0.0516)	0.761*** (0.0525)	0.688*** (0.0547)	0.841*** (0.0630)	0.769*** (0.0727)	0.793*** (0.0625)
Constant	0.292 (1.338)	3.400** (1.321)	0.0261 (1.386)	3.227** (1.587)	-1.148 (1.855)	1.220 (1.570)
Observations	2,637	2,648	2,782	2,073	1,981	2,871
R-squared	0.083	0.075	0.054	0.080	0.054	0.053
N	2637	2648	2782	2073	1981	2871
r2	0.0828	0.0748	0.0543	0.0798	0.0543	0.0533

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4.6 continued: Regression analysis for turnover ratios

VARIABLES	(7)	(8)	(9)	(10)	(11)	(12)
	Working Capital Low (%50)	Working Capital High (%50)	receivable turnover ratio Low (%50)	receivable turnover ratio High (%50)	FAT Low (%50)	FAT High (%50)
Basket	0.685** (0.290)	-0.0507 (0.273)	0.608** (0.286)	0.0774 (0.277)	0.0615 (0.290)	0.569** (0.274)
Bist Return	0.765*** (0.0395)	0.795*** (0.0371)	0.733*** (0.0390)	0.821*** (0.0378)	0.782*** (0.0394)	0.773*** (0.0375)
Constant	0.445 (1.017)	3.195*** (0.917)	0.803 (0.985)	2.891*** (0.953)	1.937* (0.991)	1.791* (0.948)
Observations	5,229	5,373	5,450	5,298	4,928	5,820
R-squared	0.067	0.079	0.061	0.082	0.074	0.068
N	5229	5373	5450	5298	4928	5820
r2	0.0672	0.0795	0.0608	0.0822	0.0743	0.0681

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4.7: Regression analysis for export and foreign assets to total debt ratios

VARIABLES	(1) Export Ratio Low (%25)	(2) Export Ratio High (%25)	(3) Foreign Assets to Total Debt Ratio Low (%25)	(4) Foreign Assets to Total Debt Ratio High (%25)	(5) Export Ratio Low (%50)	(6) Export Ratio High (%50)	(7) Foreign Assets to Total Debt Ratio Low (%50)	(8) Foreign Assets to Total Debt Ratio High (%50)
Basket	-0.00506 (0.644)	-0.0496 (0.418)	1.587** (0.637)	0.317 (0.303)	-0.00554 (0.384)	0.0527 (0.306)	0.376 (0.342)	0.328 (0.231)
BIST Return	0.735*** (0.0876)	0.785*** (0.0600)	0.684*** (0.0871)	0.809*** (0.0414)	0.746*** (0.0517)	0.765*** (0.0419)	0.762*** (0.0469)	0.788*** (0.0313)
Constant	3.256 (2.262)	3.573** (1.473)	-0.923 (2.196)	2.466** (1.027)	3.084** (1.327)	2.882*** (1.049)	1.412 (1.183)	2.160*** (0.791)
Observations	1,569	1,605	1,922	2,963	3,203	3,235	4,843	5,905
R-squared	0.043	0.098	0.033	0.115	0.062	0.094	0.052	0.097
N	1569	1605	1922	2963	3203	3235	4843	5905
r2	0.0434	0.0979	0.0327	0.115	0.0616	0.0939	0.0517	0.0968

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION

Changes in money value affect both the value of companies and their cash flows in terms of sustaining their activities and profitability. In this thesis, based on the financial statements of 330 firms operating in 26 sectors between 2010-2019, exchange rate exposure has been examined across different sectors and across firms with different liquidity, financial, turnover and profitability ratios.

The exchange rate exposure was examined using a basket consisting of the average of the euro and the dollar, based on baseline and extended model. The exchange rate exposure in the baseline model is the coefficient of the exchange rate following Adler and Dumas' (1984) methodology and calculated by regressing firm returns on the change in the basket exchange rate index. On the other hand, in the extended model, I add an additional independent variable, market return in order to take into account market movements.

According to the baseline model, the coefficient of exchange rate, beta, is significant in 8 of 26 sectors. Significant sectors are; automotive companies, banks, construction companies, durable consumption, fabricated metal & other manufacturing, financial leasing and factoring companies, holding and investment companies and sports. According to extended model, the coefficients are significant in 6 of 26 sectors. Overall, for the significant coefficients across sectors, the sign of the coefficients are in line with the baseline model except construction and sport sectors in which the coefficients turn insignificant.

According to the ratio distribution, it was divided into two groups and examined. High Ratio (High, 50%, High 25%) represent the sample consisting the firms with ratios belonging to the upper 50 and 25 percentile of the distribution, while the Low Ratio (Low, 50%, Low 25%) represents the firms with ratios belonging to the lower 50 percentiles.

For the liquidity ratios, firms with favourable liquidity position based on cash ratio, and liquidity ratio exhibit insignificant exchange rate coefficients, indicating no evidence of

exchange rate exposure. On the other hand, firms with unfavourable levels of cash and liquidity ratios have positive and significant exchange rate coefficients. For the current ratio, the results are insignificant for firms having both favourable and unfavourable liquidity levels. In terms of inventory to total assets ratio, while firms with favourable ratios have positive coefficient, unfavourable firms are not exposed to exchange rate variations.

When I categorize firms with respect to financial ratios (leverage and equity multiplier ratio). Except firms with favourable (low levels) of leverage ratio, all groups have no significant exchange rate coefficient. On the other hand, firms with low leverage, in other words with lower debt, have positive coefficients of exchange rate exposure.

When I categorize firms with respect to profitability ratios, only firms low EBITDA to equity ratio (unfavourable) and interest expense to sales ratio (favourable) have significant and positive exchange rate coefficient. For the turnover ratios, firms with low levels of receivable turnover ratios, (unfavourable) have positive exchange rate coefficients. On the other hand, the coefficient of tangible fixed asset turnover ratio is positive across the two group of firms having low and high levels of this ratio.

Moreover, for firms in the lower quartile of foreign assets to debt ratio (favourable), the coefficient of exchange rate appears as positive and significant implying that these firms are positively affected by exchange rate depreciation. On the other hand, for firms with different levels of export ratio, there is no evidence for exchange rate exposure.

Table 5.1: Results for investigated ratios

Ratio	Results	Ratio	Results
Current Ratio	There is no significant exchange rate coefficient reported	Receivable Turnover Ratio	Companies with low receivable turnover ratio are positively and significantly affected by the exchange rate implying that stock returns are positively affected by exchange rate depreciation.
Cash Ratio	Firms with favourable cash ratio are not affected by exchange rate variations, while firms with unfavourable cash ratio are affected positively by exchange rate depreciations.	Tangible Fixed Assets Turnover Ratio	There is statistical positive significance and this is more common in companies within the lower and upper quartile of the distribution of this ratio.
Liquidity Ratio	Firms with favourable liquidity ratio are not affected by exchange rate fluctuations as shown insignificant coefficients, while firms with unfavourable cash ratio are affected positively by exchange rate depreciations	EBITDA / Equity	Companies with low EBITDA to equity ratio have positive and significant exchange rate coefficients while there is no significant exchange rate coefficient reported for the companies with high EBITDA to equity ratios

Table 5.1 continued: Results for investigated ratios

<p>Inventories To Total Assets Ratio</p>	<p>Preferable inventory to total assets ratio (low levels) have positive and significant coefficients for exchange rate higher values of inventory to total assets ratio the coefficients of exchange rate exposure are insignificant</p>	<p>Interest Expenses / Net Sales Ratio</p>	<p>Firms with low levels of expense to sales ratio, have significant and positive exchange rate coefficient implying that depreciation positively affects these firms.</p>
<p>Leverage Ratio</p>	<p>Firms with low levels of leverage ratio have positive and significant exchange rate coefficients implying that stock returns are positively affected by exchange rate depreciation</p>	<p>Foreign Assets To Total Debt Ratio</p>	<p>Firms in the lower quartile of foreign assets to debt ratio, the coefficient of exchange rate appear as positive and significant implying that these firms are positively affected by exchange rate depreciation.</p>
<p>Equity Multiplier Ratio</p>	<p>No significant relation between firms having low and high equity ratios.</p>	<p>Operating Expenses To Net Sales</p>	<p>There is no significant exposure coefficient reported.</p>
<p>Net Working Capital Turnover</p>	<p>Except low fifty percent, There is no evidence for exchange rate exposure for working capital turnover ratios</p>	<p>Export Ratio</p>	<p>There is no significant coefficients for exchange rates reported indicating no evidence of exchange rate exposure for firms with lower and higher foreign involvement</p>

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7. APPENDIX A: FIRMS

No	Code	Name	Sector
1	AVOD	A.V.O.D Gıda Ve Tarım	Food
2	ACSEL	Acıpayam Selüloz	Chemical Other
3	ADANA	Adana Çimento (A)	Cement Concrete
4	ADBGR	Adana Çimento (B)	Cement Concrete
5	ADNAC	Adana Çimento (C)	Cement Concrete
6	ADEL	Adel Kalemcilik	Stationery
7	ADESE	Adese Alışveriş Ticaret	Retail
8	AFYON	Afyon Çimento	Cement Concrete
9	AKENR	Ak Enerji	Energy
10	AKBNK	Akbank	Banks
11	AKCNS	Akçansa	Cement Concrete
12	AKGUV	Akdeniz Güvenlik Hız.	Administrative Support
13	AKFGY	Akfen GMYO	Real Estate Investment Trust
14	ATEKS	Akın Tekstil	Textile Products
15	AKSGY	Akiş GMYO	Real Estate Investment Trust
16	AKMGY	Akmerkez GMYO	Real Estate Investment Trust
17	AKSA	Aksa	Textile Chemistry
18	AKSEN	Aksa Enerji	Energy
19	AKGRT	Aksigorta	Insurance
20	AKSUE	Aksu Enerji	Energy
21	ALCAR	Alarko Carrier	Durable Consumption
22	ALGYO	Alarko GMYO	Real Estate Investment Trust
23	ALARK	Alarko Holding	Holding
24	ALBRK	Albaraka Türk	Banks
25	ALCTL	Alcatel Lucent Teletaş	Communication Defense
26	ALKA	Alkim Kağıt	Paper Product Industry
27	ALKIM	Alkim Kimya	Chemical Other
28	ANACM	Anadolu Cam	Glass
29	AEFES	Anadolu Efes	Beverage
30	AGHOL	Anadolu Grubu Holding	Holding
31	ANHYT	Anadolu Hayat Emek.	Insurance
32	ASUZU	Anadolu Isuzu	Automotive
33	ANSGR	Anadolu Sigorta	Insurance
34	ANELE	Anel Elektrik	Public Work
35	ARCLK	Arçelik	Durable Consumption
36	ARENA	Arena Bilgisayar	Informatics
37	ARMDA	Armada Bilgisayar	Informatics
38	ARSAN	Arsan Tekstil	Textile Products
39	ASELS	Aselsan	Communication Defense
40	ASLAN	Aslan Çimento	Cement Concrete

41	ATAGY	Ata GMYO	Real Estate Investment Trust
42	AGYO	Atakule GMYO	Real Estate Investment Trust
43	AVISA	AvivaSA Emeklilik Hayat	Insurance
44	AVGYO	Avrasya GMYO	Real Estate Investment Trust
45	AVTUR	Avrasya Petrol ve Tur.	Restaurant - Hotel
46	AVHOL	Avrupa Yatırım Holding	Holding
47	AYEN	Ayen Enerji	Energy
48	AYGAZ	Aygaz	Petroleum
49	BAGFS	Bagfaş	Fertilizer Agricultural
50	BAKAB	Bak Ambalaj	Paper Product Industry
51	BNTAS	Bantaş Ambalaj	Other Manufacturing
52	BANVT	Banvit	Food
53	BTCIM	Batı Çimento	Cement Concrete
54	BSOKE	Batsöke Çimento	Cement Concrete
55	BERA	Bera Holding	Holding
56	BRKSN	Berkosan Yalıtım	Building Materials
57	BJKAS	Beşiktaş Futbol Yat.	Sport
58	BEYAZ	Beyaz Filo	Transportation
59	BOYP	Beymen Perakende Yat.	Investment Companies
60	BLCYT	Bilici Yatırım	Textile Products
61	BIMAS	Bim Mağazalar	Retail
62	BIZIM	Bizim Mağazaları	Retail
63	BOLUC	Bolu Çimento	Cement Concrete
64	BRSAN	Borusan Mannesmann	Fabricated Metal
65	BRYAT	Borusan Yat. Paz.	Investment Companies
66	BFREN	Bosch Fren Sistemleri	Automotive Supply Industry
67	BOSSA	Bossa	Textile Products
68	BRISA	Brisa	Automotive Supply Industry
69	BURCE	Burçelik	Fabricated Metal
70	BUCIM	Bursa Çimento	Cement Concrete
71	CRFSA	Carrefoursa	Retail
72	CEOEM	Ceo Event Medya	Administrative Support
73	CCOLA	Coca Cola İçecek	Beverage
74	CRDFA	Creditwest Faktoring	Factoring
75	CLEBI	Çelebi	Transportation
76	CELHA	Çelik Halat	Fabricated Metal
77	CEMAS	Çemaş Döküm	Fabricated Metal
78	CEMTS	Çemtaş	Fabricated Metal
79	CMBTN	Çimbeton	Cement Concrete
80	CMENT	Çimentaş	Cement Concrete
81	CIMSA	Çimsa	Cement Concrete
82	CUSAN	Çuhadaroğlu Metal	Fabricated Metal
83	DAGI	Dagi Giyim	Wearing Apparel
84	DGATE	Datagate Bilgisayar	Informatics
85	DMSAS	Demisaş Döküm	Fabricated Metal
86	DENGE	Denge Holding	Holding
87	DZGYO	Deniz GMYO	Real Estate Investment Trust
88	DENIZ	Denizbank	Banks

89	DENCM	Denizli Cam	Glass
90	DERIM	Derimod	Leather Products
91	DERAS	Derlüks Deri	Leather Products
92	DESA	Desa Deri	Leather Products
93	DESPC	Despec Bilgisayar	Informatics
94	DEVA	Deva Holding	Medicine and Health
95	DITAS	Ditaş Doğan	Automotive Supply Industry
96	DOCO	DO-CO	Transportation
97	DOHOL	Doğan Holding	Holding
98	DGKLB	Doğtaş Kelebek Mobilya	Forest Products
99	DOGUB	Doğusan	Building Materials
100	DGGYO	Doğuş GMYO	Real Estate Investment Trust
101	DOAS	Doğuş Otomotiv	Automotive
102	DOKTA	Döktaş Dökümcülük	Fabricated Metal
103	DURDO	Duran Doğan Basım	Media
104	DYOBY	Dyo Boya	Dyeing
105	ECILC	Eczacıbaşı İlaç	Medicine and Health
106	ECZYT	Eczacıbaşı Yatırım	Investment Companies
107	EDIP	Edip Gayrimenkul	Public Work
108	EGEEN	Ege Endüstri	Automotive Supply Industry
109	EGGUB	Ege Gübre	Fertilizer Agricultural
110	EGPRO	Ege Profil	Building Materials
111	EGSER	Ege Seramik	Building Materials
112	EMKEL	Emek Elektrik	Electrical Supplies
113	EKGYO	Emlak Konut GMYO	Real Estate Investment Trust
114	ENJSA	Enerjisa Enerji	Energy
115	ENKAI	Enka İnşaat	Public Work
116	ERBOS	Erbosan	Fabricated Metal
117	EREGL	Ereğli Demir Çelik	Iron-Steel
118	ERSU	Ersu Gıda	Beverage
119	ESCOM	Escort Teknoloji	Informatics
120	EUHOL	Euro Yatırım Holding	Investment Companies
121	FENER	Fenerbahçe Futbol	Sport
122	FLAP	Flap Kongre Toplantı Hiz.	Administrative Support
123	FMIZP	F-M İzmit Piston	Automotive Supply Industry
124	FONET	Fonet Bilgi Teknolojileri	Informatics
125	FROTO	Ford Otosan	Automotive
126	FORMT	Formet Çelik Kapı	Durable Consumption
127	GSRAY	Galatasaray Sportif	Sport
128	GARAN	Garanti Bankası	Banks
129	GARFA	Garanti Faktoring	Factoring
130	GEDIK	Gedik Y. Men. Değ.	Intermediary Firm
131	GEDZA	Gediz Ambalaj	Chemical Other
132	GENTS	Gentaş	Forest Products
133	GEREL	Gersan Elektrik	Electrical Supplies
134	GLYHO	Global Yat. Holding	Holding
135	GOODY	Good-Year	Automotive Supply Industry
136	GOLTS	Göltaş Çimento	Cement Concrete

137	GOZDE	Gözde Girişim	Venture Capital
138	GSDDE	GSD Denizcilik	Transportation
139	GSDHO	GSD Holding	Holding
140	GUBRF	Gübre Fabrik.	Fertilizer Agricultural
141	GLRYH	Güler Yat. Holding	Holding
142	GUSGR	Güneş Sigorta	Insurance
143	HLGYO	Halk GMYO	Real Estate Investment Trust
144	HATEK	Hatay Tekstil	Textile Products
145	HDFGS	Hedef Girişim	Venture Capital
146	HEKTS	Hektaş	Fertilizer Agricultural
147	HURGZ	Hürriyet Gzt.	Media
148	ICBCT	ICBC Turkey Bank	Banks
149	INFO	Info Yatırım	Intermediary Firm
150	IEYHO	Işıklar Enerji Yapı Hol.	Holding
151	IDEAS	İdealist Danışmanlık	Law-Management
152	IHEVA	İhlas Ev Aletleri	Durable Consumption
153	IHLGM	İhlas Gayrimenkul	Mining
154	IHGZT	İhlas Gazetecilik	Media
155	IHLAS	İhlas Holding	Holding
156	IHYAY	İhlas Yayın Holding	Holding
157	INDES	İndeks Bilgisayar	Informatics
158	INTEM	İntema	Building Materials
159	IPEKE	İpek Doğal Enerji	Petroleum
160	ISDMR	İskenderun Demir Çelik	Iron-Steel
161	ISCTR	İş Bankası (C)	Banks
162	ISFIN	İş Fin.Kir.	Financial Leasing
163	ISGSY	İş Girişim	Venture Capital
164	ISGYO	İş GMYO	Real Estate Investment Trust
165	ISMEN	İş Y. Men. Değ.	Intermediary Firm
166	ITTFH	İttifak Holding	Holding
167	IZTAR	İz Hayvancılık Tarım	Food
168	IZMDC	İzmir Demir Çelik	Iron-Steel
169	IZFAS	İzmir Fırça	Chemical Other
170	JANTS	Jantsa Jant Sanayi	Automotive Supply Industry
171	KFEIN	Kafein Yazılım	Informatics
172	KAPLM	Kaplamin	Paper Product Industry
173	KRDMA	Kardemir (A)	Iron-Steel
174	KRDMB	Kardemir (B)	Iron-Steel
175	KRDMD	Kardemir (D)	Iron-Steel
176	KAREL	Karel Elektronik	Communication Defense
177	KARSN	Karsan Otomotiv	Automotive
178	KRTEK	Karsu Tekstil	Textile Products
179	KARTN	Kartonsan	Paper Product Industry
180	KATMR	Katmerciler Ekipman	Automotive Supply Industry
181	KENT	Kent Gıda	Food
182	KERVT	Kerevitaş Gıda	Food
183	KLGYO	Kiler GMYO	Real Estate Investment Trust
184	KLMSN	Klimasan Klima	Durable Consumption

185	KCHOL	Koç Holding	Holding
186	KNFRT	Konfrut Gıda	Food
187	KONYA	Konya Çimento	Cement Concrete
188	KORDS	Kordsa Teknik Tekstil	Automotive Supply Industry
189	KOZAL	Koza Altın	Mining
190	KOZAA	Koza Madencilik	Mining
191	KRSTL	Kristal Kola	Beverage
192	KRONT	Kron Telekomünikasyon	Communication Defense
193	KUYAS	Kuyumcukent Gayrimenkul	Public Work
194	KUTPO	Kütahya Porselen	Other Manufacturing
195	LINK	Link Bilgisayar	Informatics
196	LOGO	Logo Yazılım	Informatics
197	LKMNH	Lokman Hekim Sağlık	Medicine and Health
198	MAKTK	Makina Takım	Fabricated Metal
199	MRDIN	Mardin Çimento	Cement Concrete
200	MARKA	Marka Yatırım Holding	Holding
201	MAALT	Marmaris Altinyunus	Restaurant - Hotel
202	MRSHL	Marshall	Dyeing
203	MRGYO	Martı GMYO	Real Estate Investment Trust
204	MARTI	Martı Otel	Restaurant - Hotel
205	MAVI	Mavi Giyim	Wearing Apparel
206	MEGAP	Mega Polietilen	Chemical Other
207	MNDRS	Menderes Tekstil	Textile Products
208	MERKO	Merko Gıda	Food
209	METUR	Metemtur Otelcilik	Restaurant - Hotel
210	METRO	Metro Holding	Investment Companies
211	MEPET	Metro Petrol ve Tesisleri	Retail
212	MGROS	Migros Ticaret	Retail
213	MIPAZ	Milpa	Wholesale Trade
214	MSGYO	Mistral GMYO	Real Estate Investment Trust
215	MPARK	MLP Sağlık	Medicine and Health
216	TIRE	Mondi Tire Kutsan	Paper Product Industry
217	NATEN	Naturel Yen.Enerji Ticaret	Energy
218	NTHOL	Net Holding	Holding
219	NETAS	Netaş Telekom.	Communication Defense
220	NIBAS	Niğbaş Niğde Beton	Cement Concrete
221	NUHCM	Nuh Çimento	Cement Concrete
222	NUGYO	Nurol GMYO	Real Estate Investment Trust
223	ODAS	Odaş Elektrik	Energy
224	OLMIP	Olmüksan-IP	Paper Product Industry
225	ORGE	Orge Enerji Elektrik	Public Work
226	OSTIM	Ostim Endüstriyel Yat	Investment Companies
227	OTKAR	Otokar	Automotive
228	OYLUM	Oylum Sınai Yatırımlar	Food
229	OZKGY	Özak GMYO	Real Estate Investment Trust
230	OZBAL	Özbal Çelik Boru	Fabricated Metal
231	OZGYO	Özderici GMYO	Real Estate Investment Trust
232	PAGYO	Panora GMYO	Real Estate Investment Trust

233	PRKME	Park Elek.Madencilik	Mining
234	PARSN	Parsan	Automotive Supply Industry
235	PGSUS	Pegasus	Transportation
236	PEKGY	Peker GMYO	Real Estate Investment Trust
237	PENGD	Penguen Gıda	Food
238	PEGYO	Pera GMYO	Real Estate Investment Trust
239	PSDTC	Pergamon Dış Ticaret	Wholesale Trade
240	PETKM	Petkim	Petroleum
241	PETUN	Pınar Et Ve Un	Food
242	PINSU	Pınar Su	Beverage
243	PNSUT	Pınar Süt	Beverage
244	PKART	Plastikkart	Communication Defense
245	POLHO	Polisan Holding	Holding
246	POLTK	Politeknik Metal	Chemical Other
247	PRZMA	Prizma Press Matbaacılık	Paper Product Industry
248	QNBFB	QNB Finansbank	Banks
249	RALYH	Ral Yatırım Holding	Investment Companies
250	RAYSG	Ray Sigorta	Insurance
251	RYGYO	Reysaş GMYO	Real Estate Investment Trust
252	RYSAS	Reysaş Lojistik	Transportation
253	RHEAG	Rhea Girişim	Venture Capital
254	RTALB	RTA Laboratuvarları	Medicine and Health
255	SAHOL	Sabancı Holding	Holding
256	SAFKR	Safkar Ege Soğutmacılık	Durable Consumption
257	SANEL	Sanel Mühendislik	Public Work
258	SANKO	Sanko Pazarlama	Wholesale Trade
259	SAMAT	Saray Matbaacılık	Paper Product Industry
260	SARKY	Sarkuysan	Fabricated Metal
261	SASA	Sasa Polyester	Textile Chemistry
262	SEKUR	Sekuro Plastik	Chemical Other
263	SELEC	Selçuk Ecza Deposu	Medicine and Health
264	SNKRN	Senkron Güvenlik	Administrative Support
265	SRVGY	Servet GMYO	Real Estate Investment Trust
266	SEYKM	Seyitler Kimya	Medicine and Health
267	SILVR	Silverline Endüstri	Durable Consumption
268	SNGYO	Sinpaş GMYO	Real Estate Investment Trust
269	SMART	Smartiks Yazılım	Informatics
270	SODA	Soda Sanayii	Chemical Other
271	SKTAS	Söktaş	Textile Products
272	SONME	Sönmez Filament	Real Estate Activities
273	SEKFK	Şeker Fin. Kir.	Financial Leasing
274	SKBNK	Şekerbank	Banks
275	SISE	Şişe Cam	Glass
276	SOKM	Şok Marketler	Retail
277	HALKB	T. Halk Bankası	Banks
278	KLNMA	T. Kalkınma ve Yatırım Bankası	Banks
279	TSKB	T.S.K.B.	Banks
280	TBORG	T.Tuborg	Beverage

281	TACTR	Taç Tarım Ürünleri	Food
282	TATGD	Tat Gıda	Food
283	TAVHL	TAV Havalimanları	Transportation
284	TEKTU	Tek-Art Turizm	Restaurant - Hotel
285	TKFEN	Tekfen Holding	Holding
286	TKNSA	Teknosa İç ve Dış Ticaret	Retail
287	TMPOL	Temapol Polimer Plastik	Chemical Other
288	TGSAS	TGS Dış Ticaret	Wholesale Trade
289	TOASO	Tofaş Oto. Fab.	Automotive
290	TRGYO	Torunlar GMYO	Real Estate Investment Trust
291	TLMAN	Trabzon Liman	Transportation
292	TSPOR	Trabzonspor Sportif	Sport
293	TRKCM	Trakya Cam	Glass
294	TSGYO	TSKB GMYO	Real Estate Investment Trust
295	TUCLK	Tuççelik	Iron-Steel
296	TUKAS	Tukaş	Food
297	TRCAS	Turcas Petrol	Petroleum
298	TCELL	Turkcell	Telecommunication
299	TMSN	Tümosan Motor ve Traktör	Automotive
300	TUPRS	Tüpraş	Petroleum
301	THYAO	Türk Hava Yolları	Transportation
302	PRKAB	Türk Prysmian Kablo	Electrical Supplies
303	TTKOM	Türk Telekom	Telecommunication
304	TTRAK	Türk Traktör	Automotive
305	TURGG	Türker Proje Gayrimenkul	Public Work
306	ULUSE	Ulusoy Elektrik	Electrical Supplies
307	ULUUN	Ulusoy Un Sanayi	Food
308	USAK	Uşak Seramik	Building Materials
309	UTPYA	Utopya Turizm	Restaurant - Hotel
310	ULKER	Ülker Bisküvi	Food
311	UNYEC	Ünye Çimento	Cement Concrete
312	VAKFN	Vakıf Fin. Kir.	Financial Leasing
313	VKGYO	Vakıf GMYO	Real Estate Investment Trust
314	VAKBN	Vakıflar Bankası	Banks
315	VAKKO	Vakko Tekstil	Wearing Apparel
316	VANGD	Vanet Gıda	Food
317	VERUS	Verusa Holding	Holding
318	VERTU	Verusaturk Girişim	Venture Capital
319	VESTL	Vestel	Durable Consumption
320	VESBE	Vestel Beyaz Eşya	Durable Consumption
321	YKGYO	Yapı Kredi Koray GMYO	Real Estate Investment Trust
322	YKBNK	Yapı ve Kredi Bank.	Banks
323	YATAS	Yataş	Forest Products
324	YAYLA	Yayla En. Ür. Tur. Ve İnş	Public Work
325	YGGYO	Yeni Gimat GMYO	Real Estate Investment Trust
326	YGYO	Yeşil GMYO	Real Estate Investment Trust
327	YYAPI	Yeşil Yapı	Public Work
328	YESIL	Yeşil Yatırım Holding	Holding

329 YUNSA Yülsa
330 ZOREN Zorlu Enerji

Textile Products
Energy

