

**THE REPUBLIC OF TURKEY  
BAHCESEHIR UNIVERSITY**

**EVALUATION OF THE FINANCIAL  
PERFORMANCE OF TECHNOLOGY  
COMPANIES IN BIST AND LSE**

**Master's Thesis**

**CANER GÜNGÖR**

**ISTANBUL, 2018**



**THE REPUBLIC OF TURKEY  
BAHCESEHIR UNIVERSITY**

**GRADUATE SCHOOL OF SOCIAL SCIENCES  
MASTER OF BUSINESS ADMINISTRATION PROGRAM**

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**Thesis Supervisor: Asst. Prof. AYŞE ALTIOK YILMAZ**

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## ABSTRACT

### EVALUATION OF THE FINANCIAL PERFORMANCE OF TECHNOLOGY COMPANIES IN BIST AND LSE

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Master of Business Administration Program

Thesis Supervisor: Asst. Prof. Aye Altok Ylmaz

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The purpose of this research is to test the effect of financial variables to technology firm performances comparison between Turkey and London. The observation data used from Istanbul Stock Exchange and London Stock Exchange in this study is technology companies from technology sectors. Financial data was used, collected from Bloomberg during 2001 – 2016. By combining 16 years research, there are 15 Turkish companies and 24 English companies that meet predetermined criteria. The measurement of financial performance, regression analysis method is often used in many sectors, so Multiple Regression was used to analyze. This study uses Return on Asset, Return on Equity, EBITDA Margin, Debit to Equity ratio, Net Profit Margin, Interest Expense, Current Ratio, Total Assets, Capital and Capital Expenditures as financial variables. Test results show that financial variables can effect to firm financial performance.

**Keywords:** Multiple Regression Analysis, Financial Performance, Technology Sector, BIST, LSE

## ÖZET

### BIST VE LSE DE İŞLEM GÖREN TEKNOLOJİ ŞİRKETLERİNİN FİNANSAL PERFORMANS DEĞERLENDİRMESİ

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Bu araştırmanın amacı, Türkiye ve Londra da bulunan teknoloji firmalarının performans karşılaştırmasında finansal değişkenlerin etkisini test etmektir. Araştırmada incelenen veriler, İstanbul Borsası ve Londra Borsasında işlem gören teknoloji şirketlerine aittir. Kullanılan finansal veriler, 2001 ve 2016 yılları arasında kapsamakta olup Bloomberg den alınmıştır. Araştırılan 16 yıl içerisinde, kıstasları sağlayan 15 Türk şirketi ve 24 İngiliz şirketi bulunmaktadır. Finansal performans ölçümünde, birçok sektör tarafından kullanılan çoklu regresyon analizi kullanılmıştır. Bu çalışmada aktif getiri oranı, öz sermaye karlılık oranı, FAVÖK payı, borç öz kaynak oranı, net kar payı, faiz harcaması, cari oran, aktif toplam, sermaye ve sermaye harcamaları değişken olarak kullanılmıştır. Araştırma sonuçları, şirketlerin finansal performansını finansal verilerin etkileyebileceğini göstermektedir.

**Anahtar Kelimeler:** Çoklu Regresyon Analizi, Finansal Performans, Teknoloji Sektörü, BIST, LSE

## CONTENTS

<b>TABLES.....</b>	<b>vi</b>
<b>FIGURES.....</b>	<b>vii</b>
<b>ABBREVIATIONS.....</b>	<b>viii</b>
<b>SYMBOLS.....</b>	<b>ix</b>
<b>1. INTRODUCTION.....</b>	<b>1</b>
<b>1.1 GENERAL KNOWLEDGE ABOUT STOCK EXCHANGE.....</b>	<b>1</b>
<b>1.2 GENERAL KNOWLEDGE ABOUT TECHNOLOGY SECTOR.....</b>	<b>3</b>
<b>1.2.1 The World's 26 Largest Technology Company.....</b>	<b>5</b>
<b>2. LITERATURE REVIEW.....</b>	<b>7</b>
<b>3. METHODOLOGY.....</b>	<b>13</b>
<b>3.1 DATA DESCRIPTION AND ANALYSIS OF     TECHNIQUES.....</b>	<b>13</b>
<b>3.2 VARIABLES.....</b>	<b>15</b>
<b>3.3 PANEL DATA ANALYSIS.....</b>	<b>19</b>
<b>3.3.1 One-Way Error Component Regression Model .....</b>	<b>20</b>
<b>3.3.2 Fixed Effects Model.....</b>	<b>20</b>
<b>3.3.3 Random Effects Model.....</b>	<b>21</b>
<b>3.4 ADVANTAGES AND DISADVANTAGES OF PANEL DATA     ANALYSIS.....</b>	<b>22</b>
<b>3.5 HAUSMAN TEST FOR COMPARING FIXED AND RANDOM     EFFECTS.....</b>	<b>23</b>
<b>3.6 FINDINGS.....</b>	<b>26</b>
<b>4. CONCLUSION.....</b>	<b>31</b>
<b>REFERENCES.....</b>	<b>32</b>

## TABLES

Table 3.2: Variables Used in Model.....	14
Table 3.3: Hausman Test (ROA dependent variable).....	24
Table 3.4: Hausman Test (ROE dependent variable).....	24
Table 3.5: Panel Data Regression Results for ROE dependent variable.....	25
Table 3.6: Panel Data Regression Results for ROA dependent variable.....	25



## FIGURES

Figure 1.1: The World's Largest Technology Company.....	6
Figure 3.1: Firms Subject to Analysis.....	12



## ABBREVIATIONS

BIST	: Borsa Istanbul
LSE	: London Stock Exchange
EM	: EBITDA Margin
DE	: Debt to Equity Ratio
NPM	: Net Profit Margin
CRS	: Crisis
IE	: Interest Expense
CR	: Current Ratio
TA	: Total Assets
CPL	: Capital
CPLE	: Capital Expenditure



## SYMBOLS

Performance of technology firm $i$ at time $t$	: $P_{it}$
Measure of EBITDA Margin for firm $i$ at time $t$	: $EM_{it}$
Measure of debt to equity for firm $i$ at time $t$	: $DE_{it}$
Measure of net profit margin for firm $i$ at time $t$	: $NPM_{it}$
Measure of crisis criteria for firm $i$ at time $t$	: $CRS_{it}$
Measure of interest expense for firm $i$ at time $t$	: $IE_{it}$
Measure of current ratio for firm $i$ at time $t$	: $CR_{it}$
Measure of total assets for firm $i$ at time $t$	: $TA_{it}$
Measure of capital for firm $i$ at time $t$	: $CPL_{it}$
Measure of capital expenditures for firm $i$ at time $t$	: $CPL_{Eit}$
Vector of parameters to be estimated	: $\beta$
Error term	: $\varepsilon$

# 1. INTRODUCTION

## 1.1 GENERAL KNOWLEDGE ABOUT STOCK EXCHANGE

Stock exchanges can be ordered according to their size, function and market value. The 'most important' stock exchanges are not only the biggest ones in the world but also the ones with the highest market values, as well as the shares of the world's most famous companies. When we say important stock exchanges, we have to talk about the world's largest economy, the American stock market, and the European stock market, which represents the Euro area. The world's largest stock exchange is the New York Stock Exchange (NYSE) which was established on 8 March 1817. The stock market, which is known to have a market value of 16,613 trillion dollars, has historically suffered many declines and is still standing. NYSE U.S. 100 Index, Dow Jones and S&P 500 indices are the most important indices of NYSE. Another important stock exchange which is the American Stock Exchange (AMEX) is founded in 1908, the stock market is now part of the NYSE. The name of AMEX, the stock exchange, was changed to NYSE Alternext U.S. In terms of market value, the Nasdaq Stock Market is in second place when stock markets are evaluated. The Nasdaq Stock Market is also known for its technology companies. The stock market in Times Square is also known as the 'technology stock exchange' because it contains the shares of world-renowned technology companies. It is known that Europe has more than 50 stock exchanges. The London Stock Exchange and the Euronext Stock Exchange come to mind when one of the most important of European stock exchanges is called. The London Stock Exchange is founded in 1801. It's market value of approximately 4 trillion dollars and it is understood that it has a historical significance when the date of its establishment is taken into consideration. The world's fourth largest stock exchange is The London Stock Exchange. The Euronext Stock Exchange was formed by the merger of four major stock exchanges and it is merged with the New York Stock Exchange in 2006. It became NYSE Euronext which is the world's largest stock exchange. The Euronext Group, founded by the merger of Paris, Brussels, Amsterdam and Lisbon, has many important stocks and indices. Euronext Paris is a stock exchange and has a market value of around

\$ 3 trillion. The most important index is the CAC - 40 index. Euronext Brussels is a stock exchange and has a market value of € 117 billion. The most important index is BEL20 index. Euronext Amsterdam is a stock market, with a market value of EUR 458 billion. The most important index is the AEX index. Euronext Lisbon is a stock market and has a market value of \$ 47 billion. The most important index is PSI - 20 index. Among the major stock exchanges in Europe are the Frankfurt Stock Exchange, which is located in Germany. The Frankfurt Stock Exchange, which reached a market value of \$ 1.3 trillion in 2012, was established in 1585. The most important index of the Frankfurt Stock Exchange which is Europe's second largest stock exchange is the DAX index. The Italian Stock Exchange, founded in 1808, is also a major stock exchange in Europe. The stock exchange, which has a market value of \$ 694 billion, belongs to the London Stock Exchange Group. Borsa Istanbul is also among the European stock exchanges. It was established in 1985 as the Istanbul Stock Exchange, was named as Borsa Istanbul on 5 April 2013. The Istanbul Gold Exchange and the Futures and Options Exchange have been added to the Istanbul Stock Exchange.

Borsa Istanbul (BIST) was united from the merger of the Istanbul Stock Exchange, Istanbul Gold Exchange and the Turkish Derivatives Exchange. Tulip which is the traditional Ottoman mark for Istanbul is logo of the BIST. Its slogan is “worth investing”. It was established on 3rd April 2013 as an incorporated company with a founding capital of TRY 423,234,000 (approx. US\$240 million). It began to operate on 5th April 2013. The Turkish government has a 49 percent share in Borsa Istanbul and it plans to sell through an IPO in 2016. Bourse officially announced public offering in March 2015.. Following the merger of İstanbul Stock in 2013, international memberships of former institutions were transferred to Borsa İstanbul and then it became a member of Association of Futures Markets (AFM), Futures Industry Association (FIA), World Federation of Diamond Bourses (WFDB) and London Bullion Market Association (LBMA). BIST ranked 26th among global derivatives exchanges by volume in 2016. Borsa Istanbul currently has 42 members.

London, one of the most important cities in Europe, has been one of the world's most important financial centers since the Middle Ages, when geographical discoveries began. The London Stock Exchange, which operates today in London, is the fourth largest in the world and the largest trading volume in Europe. London Stock Exchange

is one of the world's oldest stock exchanges and its history base on more than 300 years. LSE was starting life in the coffee houses of 17th century. It quickly grew to become the city's most important financial institution. Over the centuries following, London Stock Exchange has consistently led the way in developing a strong, well-regulated stock market. Today it lies at the heart of the global financial community. When London Stock Exchange merged with Milan Stock. The LSE has 350 companies so it is the most international of all stock exchanges. The LSE's dominant index is the Financial Times Stock Exchange (FTSE, or "Footsie"). The top-performing 100 companies listed on the exchange. As of 2014, the LSE has a market cap of £4.09 trillion. The most important of these is the Big Bang, which took place in 1986. With this arrangement, the opportunity to broker banks and other financial institutions in the London Stock Exchange has been freed up and commissions have been freed up and brokerage and dealerships have been made available to transactional institutions, enabling transactions to be made via computers and telephones instead of face-to-face transactions. Stocks traded on the London Stock Exchange are also divided into four classes: alpha, beta, gamma and delta.

## **1.2 GENERAL KNOWLEDGE ABOUT TECHNOLOGY SECTOR**

The technology sector is made up of companies that technologically research, develop and distribute goods, services and products. This sector includes businesses that build, market, and sell computers and products related to electronics, software, and information technology. Technology companies have little or no inventory, so they are not profitable, and even do not generate revenue. In addition, many technology companies are investing heavily in large-scale venture capital investments or funding research and development. The technology companies have strategy which is different from the strategy of earning of most companies. When analyzing a technology company there are significant financial ratios are used. Rapid developments in science, communication, computer and transportation technologies are the main reasons for the change in the world. From the past to today, changes have been made to the extent that knowledge creation, storage, organization, preparation for use, transmission, provision of services to the public, and use are possible. The technologies that provide the

changes that come to fruition are called information technologies. (DPT, 2001: 1). The importance of the information sector in the development of societies and countries is increasing day by day. (Aydın, 2012: 180). Information technology benefits businesses in providing and using information and has also played a leading role in making more sound strategic decisions for businesses. It also provides advantages in terms of lowering the costs of information technology enterprises and increasing their performance. The use of information in this way can only be achieved through the production and use of information technologies. In this context, countries need to give more importance to the information and technology sector in economies and to support this sector in various forms. The state of the informatics sector, which has a large precaution in the country's economies, is closely related to the performances of the enterprises operating in the information sector. Businesses are concerned with finding and evaluating business performances accurately in order to capture success under severe and challenging competition conditions, to find a place for them in new markets and to be able to sustain them, and to profitably maintain today and future activities (Tekin ve Zerenler, 2005: 187). Evaluating and analyzing the performances of the enterprises; the lack of business is seen more easily, the performance negatively affecting factors provide great benefits to business managers in achieving timely and more efficient future goals. With performance appraisal, businesses ensure the development of these assets and resources by measuring and evaluating assets and resources (Bayyurt, 2007: 578). In this context, it can be said that the performance of the information and technology sector plays an important role in the country's economy, and also it provides significant added value to the country's economy. For this reason, it is very important that the performance of the information technology and technology sector is revealed and this is the subject of the study. Technology is advancing every day, with the market becoming more competitive than ever before. Companies are constantly innovating in order to satisfy the needs and demands of today's tech-savvy and social customers. In order to succeed and thrive, technology companies also need to develop innovative and effective marketing and support services that are delivered seamlessly across all channels of customer contact and communication. The Information Technology Sector covers the general areas such as Technology Software and Services. They include companies that primarily develop software in various fields

such as the Internet, applications, systems, databases management and/or home entertainment, and companies that provide information technology consulting and services, as well as data processing and outsourced services. Technology Hardware and Equipment include manufacturers and distributors of communications equipment, computers & peripherals, electronic equipment and related instruments. And also The Information Technology Sector covers Semiconductors and Semiconductor Equipment Manufacturer. There are 16 Industries within the Sector;

- i. Application Software
- ii. Communications Equipment
- iii. Computer Hardware
- iv. Computer Storage and Peripherals
- v. Electronic Component
- vi. Electronic Equipment
- vii. Electronic MNFRG SVC
- viii. Home Entertainment Software
- ix. IT Consulting and Services
- x. Internet Software and Services
- xi. Office Electronics
- xii. Semiconductor Equipment
- xiii. Semiconductors
- xiv. Services-Data PROC
- xv. Systems Software
- xvi. Technology Distribution

### **1.2.1 The World's 26 Largest Technology Company**

Gartner, a technology research firm, has prepared a list of the world's largest technology suppliers based on the revenue they have earned for IT and its components. Technology giants also took this list. According to Business Insider, there are a total of 100 companies listed in this list, including Amazon, Apple, and Microsoft, which are world-renowned, as well as companies selling name-less hardware and software directly to businesses. Gartner says business leaders can understand where and how companies can

use their IT budgets with this list. John-David Lovelock, one of Gartner's vice president, said in a statement on this topic that IT customers have changed their needs and that the impact of digital commerce has brought new categories to the ranks. 26 technology companies and their incomes are listed below.

**Figure 1.1: The World's Largest Technology Company**

<i>The World's 26 Largest Technology Company</i>
1. Apple - \$ 218.1 Billion
2. Samsung - \$ 139.1 Billion
3. Google - \$ 90.1 Billion
4. Microsoft - \$ 85.7 Billion
5. IBM - \$ 77.8 Billion
6. AT & T - \$ 70.5 Billion
7. Dell – \$ 59.5 Billion
8. Intel - \$ 57.6 Billion
9. HP - \$ 48 Billion
10. Hewlett Packard Entrepreneurship - \$ 46.1 Billion
11. Lenovo - \$ 42.6 Billion
12. Amazon - \$ 41.9 Billion
13. Sony - \$ 41.7 Billion
14. NTT - \$ 41.3 Billion
15. Comcast - \$ 39.7 Billion
16. Oracle - \$ 37 Billion
17. Cisco - \$ 37 Billion
18. Huawei - \$ 36.6 Billion
19. Panasonic - \$ 35.4 Billion
20. LG – \$ 34.2 Billion
21. Accenture – \$ 34.1 Billion
22. SoftBank - \$ 31.5 Billion
23. Verizon, \$ 31 Billion
24. Fujitsu - \$ 28.7 Billion
25. Facebook - \$ 27.6 Billion
26. Canon - \$ 26.8 Billion

In the second part of the study, literature is examined. In the third part data set, constraints, methods and empirical findings are explained. In the last section, the findings obtained from the analysis are evaluated.

## 2. LITERATURE REVIEW

The purpose of this research is to examine the relationship between firm value and financial ratios belonging to firms operating in Stock Exchange Istanbul Information Sector during 2005-2015 period. In the study in which the annual data are used, the ratio of net profit growth rate, Net Sales Growth Rate, Equity Growth Rate, Long Term Debt Growth Rate, Stock Turnover Rate, Equity / Tangible Assets Rate, Equity Profitability, Price Gain Rate, The dummy variable expressing the Book Stamps Ratio and the 2008 Crisis and 2013 Political Events were used as explanatory variables in the models developed within the scope of the analysis. In addition, the announced variable is based on the stock closing price data submitted by Borsa Istanbul on the last day of April. The findings show that the Net Sales Growth Rate, Earnings per Share and Market Value / Book Value Ratio affect firm value positively. The Long Term Debt Growth Rate and the 2008 global crisis puppet change affect the firm value in the negative direction. (Biçen, Sezgin 2017)

In Yaman, Korkmaz and Açıkgöz (2017) study, the relationship between the share of financial sector ratios of the food sector enterprises registered in Borsa Istanbul (BIST) was examined by panel data regression analysis for the period before and after 2008 global financial crisis. The study covers 6 months of data for the period of 2003-2015 of the BIST food sector enterprises. Three models were established in the study. The period of models are the entire period between June 2003 and December 2015, the pre-crisis period between June 2003 and December 2007 and the post-crisis period June 2008 and December 2015. According to the analysis results, the financial ratios with significant effect on the shareholding are for the whole period; current ratio, price / earnings ratio and earnings per share, for the pre-crisis period; the current ratio and the price / earnings ratio for the post-crisis period; current ratio, price / earnings ratio and earnings per share.

The financial performance of twelve commercial banks are evaluated to provide support about the performance of banks by using multi criteria decision in terms of seventeen financial performance indicators. The study is examined with Fuzzy Analytic Hierarchy Process (henceforth Fuzzy AHP) and Fuzzy Technique for Order Preference by

Similarity to Ideal Solution (henceforth Fuzzy TOPSIS) methods. According to conclusion of the study show that banks are ranked in a similar manner by these two methods. (Akkoç, Vatansever 2013)

In Wang and Lee (2007) study, the financial performance of Taiwan major container shipping companies are evaluated. Most of previous performance assessments were focused on operational aspect, whereas financial performance influencing the survival of a company is often ignored. They used grey relation analysis to group financial ratios and find representative indicators. On the other hand, they propose a fuzzy multi-criteria decision-making method constructed on strength and weakness indices to evaluate financial performance of container shipping companies.

In Yusrianti, Habsari and Prukumpai (2016) research, effects of financial and non-financial variables to firm performances are examined for Thailand and Indonesia manufacturing companies. Datas which are analysed are collected from Indonesia and Thailand Stock Exchange. By combining 3 years research, Multiple Regression was used to analyze. This research has significant impact to business community. All variables (Return on Equity, Earnings per Share, Market Value Added) does not have significant effect to firm performance.

To identify the effect on the corporate financial performance of company which is traded in Borsa İstanbul-30 (BIST-30) to the several financial indicators, periods between 2002-2013 were analyzed. Independent variables of this research are current ratio, earnings per share, leverage ratio, firm size and market value to book value ratio. On the other hand, dependent variable is a net profit margin. All variables which are used in this research are analysed by panel data. Using panel data analysis, there is positive effect on company performance between current ratio and company size and the level of debt has a negative effect on company performance. (Oruç Erdoğan, Erdoğan, Ömürbek 2015)

It is aimed to determine the activities of the 17 operators who are active in the cement industry listed on the Stock Exchange Istanbul. For this reason, technical and total activities were firstly determined with the ratios used in the ratios analysis of the financial data of the enterprises between 2011-2014. The technical and total activities were evaluated separately at the level of years with the VZA method. In this frame, efficiency problem were explained with Equity Multiplier, Receivables Turnover, Net

Profit Margin and Debt Ratio variables. In the context of this data, it can be said that the companies operating in the cement industry are not affected much by the negative developments in the general economic situation and therefore are less risky and less risky in this sense. (Akbulut, Rençber 2015).

Suganthi and Rajaram (2016) are examined Indian life insurance sector in terms of financial performance and their determinants. Panel data is used in study which has 10 companies for 10 years from 2005 to 2014. Determinant of financial performance is Return on Assets (ROA) and the independent variables are claims ratio, growth in gross premiums, leverage, liquidity, capital, size, solvency, risk retention ratio and tangibility. The study showed that liquidity, size, solvency and risk retention ratio do not have any significant relationship with financial performance. Claims ratio, growth in gross premiums, capital and tangibility are negatively related to financial performance.

In Türkmen and Çağıl (2012) research, financial performances of twelve Information Technology companies traded on Istanbul Stock Exchange (ISE) have been analyzed using company financial statements, with TOPSIS method. Eight financial ratios are calculated between 2007 and 2010. In the first analysis, the financial ratios calculated for the financial performance of each company and then financial ratios which are calculated were converted into a single score. This score is indicating general company performance by TOPSIS method. Calculated scores were used in the performance rankings of the companies.

In this study, the purpose is to evaluate the financial performances of the companies is operating in the information and technology sector registered in Stock Exchange Istanbul. In this research, the ratios of the companies operating in the sector have been analyzed using the financial statement data between 2005 and 2011. By using Analytical Hierarchy Process method, the most weighted criterion was tried to be obtained and then Gray Relational Analysis method was applied to calculate the gray relational ratios for each enterprise for the performance of the enterprises in the sector. As a result of the study, the most weighted criterion is the profitability ratios, and according to the competitors in the sector Link Computer Systems Software and Hardware Industry and Trade Co. Inc. has the highest financial performance. (Tayyar, Akcanlı, Genç, Erem 2014)

In this study, the financial performances of the enterprises were analyzed by using the TOPSIS method using the financial tables for the 2006-2010 period of the 13 main metal industry operations traded on the Istanbul Stock Exchange (BIST). Financial ratios were first calculated to show the financial strength of the businesses, then the calculated ratios; Using a TOPSIS method, a single point is displayed that shows the overall performance of the company. Calculated performance scores are used to rank businesses. As a result of the study, it was found that the performance scores of the companies operating in the basic metal industry sector varied in general during the analysis period. (Uygurtürk, Korkmaz 2012)

One of the important elements of economic and social development of countries is civil aviation activities. When financial indicators are examined, it can be said that the air transportation sector has a very fragile structure. In Ömürbek and Kınay (2013) study; An attempt was made to evaluate the financial performance of an airline transport company (ABC) operating in the Stock Exchange Istanbul (BIST) and an air transport company operating in the Frankfurt Stock Exchange (XYZ). For this purpose, financial data from the financial statements for 2012 are used by both companies. Both airline companies have superiority in terms of different performance indicators. However, in order to make a holistic evaluation, TOPSIS method, which is one of the most criticized decision making techniques, has been preferred. The TOPSIS method involves solving all the criteria (performance indicators) and produces a single result. Performance indicators and weights were used in the TOPSIS method to assess the financial performance of two airlines. ABC's performance was found to be higher than XYZ according to the application result.

One of the main economic objectives of enterprises, except social enterprises, is to profit from their activities, to grow, to ensure their continuity and to increase their market value. In order to be able to adapt to increasing competition and changing environmental conditions, businesses need performance measurement systems to determine the right strategies, to get the right results correctly and to reach the goals that they set for their purposes, and to determine the stage of implementation. In today's information systems, with changes in technology, production management and management systems, it has become necessary for enterprises to oversee performance measurement systems. Financial performance measurement systems, which are heavily

used from the past to the present, are inadequate in determining the performance of their operations on their own. In this study, the efficiency values of companies belonging to the cement sector traded on the Istanbul Stock Exchange (ISE) were calculated by using Data Envelopment Analysis (VZA) method and performance results related to the sector were obtained. The research findings show that there is a difference in efficiency and corrective actions among firms. According to the fixed income model, 75% of the cement companies were found to be productive. (Gencer 2011)

In Dumanoğlu and Ergül (2010) study, the financial performances of the companies were analyzed by the TOPSIS method using financial tables of eleven technology companies traded on the Istanbul Stock Exchange. Financial ratios were first determined in the measurement of financial performance and, using the ratio analysis, the financial ratios were calculated separately for each company. Then, by using the TOPSIS method, rates are calculated, they have turned a single pointing to overall company performance. After that, the ranking of the companies is completed and the grading of the companies is completed. Performance scores have been used to rank companies. Financial performance evaluation was made for the four periods in the 2006-2009 period and the results were compared.

As an election of the best of the alternatives classified according to certain conditions the decision making process that can be defined is a measurement tool that is also consulted in order to evaluate the financial performances of today's businesses by using very precise methods that are included in its scope. In this study aimed at measuring the financial performance of the food sector, one of the sectors where the effects of the 2008 global financial crisis are observed, the 10 financial ratios obtained from the financial statements for the 2009-2012 financial year of 20 food enterprises operating in the Borsa Istanbul (BIST) food, beverage and tobacco sector were used. The obtained data were evaluated with the help of TOPSIS which is a "Multi Criteria Decision Making" method. As a result, when we look at the financial performance of the companies after the global financial crisis of 2008, it is found out that there is not an enterprise that performs best in all the years in the analyzed period (Aytekin, Sakarya 2013).

This study covers the 18 companies operating in the Borsa İstanbul Metal Goods, Machinery Index and the data for 2000-2012 period belonging to these companies. The

analyzed period was examined within the context of the financial crises in 2001 and 2008. Crises; crisis period, pre- and post-crisis periods, and the findings were evaluated on a yearly basis. In the study, the financial performance of firms was determined and it was tried to determine the extent to which financial crises affected this performance. To determine the financial performance, TOPSIS which is a very criteria decision method has been used. As a result of the analysis, the most stable financial performance among the companies in the sector is Federal Mogul Izmit Piston and Pim Production Facilities Inc. The fluctuations in the financial performance scores of the other companies for 2000-2012 and the resulting rankings were determined. Moreover, it can be said that the fragility due to the 2008 crisis is lower than the 2001 crisis. (Topaloğlu 2014)

The tourism sector has an important place in the economic development of countries because of the contribution it provides to both the economy and the employment, as well as the positive impact on employment. For this reason, measuring the financial performance of tourism companies is very important for managers, investors and other companies in the sector. The main aim of the study is to examine the financial performances of tourism companies by using financial ratios. For this purpose, the financial performance of the seven tourism companies that benefited from the TOPSIS method and was traded in the Stock Exchange Istanbul (BIST) for the period 2010-2014 was evaluated according to eight financial ratios within the scope of liquidity, leverage, profitability and activity indicators. In the study, TOPSIS method was used. The Financial Tables used in the analysis were obtained from the BIST. As a result of the study, the performance of tourism enterprises operating in BIST was evaluated during 2010-2014 period. (Özçelik, Kandemir 2015)

Financial performance of different sector are analysed with many study. In that studies, several techniques and methods are used.

### **3. METHODOLOGY**

#### **3.1 DATA DESCRIPTION AND ANALYSIS OF TECHNIQUES**

We collect our data for a sixteen year period (2001-2016) from the financial statements of the technology companies which is operated in BIST & LSE. By combining 16 years research, there are 15 Turkish companies and 24 English companies that meet predetermined criteria. The research data was obtained by using the preliminary information of the technology companies located on the Bloomberg web site. The companies included in the study are listed below.

**Figure 3.1: Firms Subject to Analysis**

<i>No</i>	<i>Code</i>	<i>Name of Company</i>
1	ALCTL	Alcatel-Lucent Teletas Telekomunikasyon AS
2	ANELT	Anel Telekomunikasyon Elektronik Sistemleri Sanayi ve Ticaret AS
3	ARENA	Arena Bilgisayar Sanayi ve Ticaret AS
4	ARMDA	Armada Bilgisayar Sistemleri Sanayi ve Ticaret AS
5	ASELS	Aselsan Elektronik Sanayi Ve Ticaret AS
6	DGATE	Datagate Bilgisayar Malzemeleri TAS
7	DESPC	Despec Bilgisayar Pazarlama ve Ticaret AS
8	ESCOM	Escort Teknoloji Yatirim AS
9	INDES	Indeks Bilgisayar Sistemleri Muhendislik Sanayi ve Ticaret AS
10	KAREL	Karel Elektronik Sanayi ve Ticaret AS
11	KRONT	Kron Telekomunikasyon Hizmetleri AS
12	LINK	Link Bilgisayar Sistemleri Yazilimi Ve Donanimi Sanayi Ve Ticaret AS
13	LOGO	Logo Yazilim Sanayi Ve Ticaret AS
14	NETAS	Netas Telekomunikasyon AS
15	PKART	Plastik Kart Akilli Kart Iletisim Sistemleri Sanayi Ve Ticaret AS
16	AVV	AVEVA Group PLC
17	CML	CML Microsystems PLC
18	CCC	Computacenter PLC
19	EDP	Electronic Data Processing PLC
20	FDM	FDM Group Holdings PLC
21	FDSA	Fidessa Group PLC
22	GHT	Gresham Technologies PLC
23	IMG	Imagination Technologies Group PLC
24	KNOS	Kainos Group PLC
25	LRD	Laird PLC
26	MCRO	Micro Focus International PLC
27	MCGN	Microgen PLC
28	NANO	Nanoco Group PLC
29	NCC	NCC Group PLC
30	RM	RM PLC
31	SGE	Sage Group PLC
32	SDL	SDL PLC
33	SEPU	Sepura PLC
34	SERV	Servelec Group Plc
35	SCT	Softcat PLC
36	SOPH	Sophos Group PLC
37	SPT	Spirent Communications PLC
38	TOOP	Toople PLC
39	TRD	Triad Group PLC

### 3.2 VARIABLES

The variables used in the model are shown in Table 2. A total of 429 observation models of 39 firms in 16 years were included. As the variables are expressed in millions of dollars, the process includes firms between 2001 and 2016.

**Table 3.2: Variables Used in Model**

<i>Variables</i>
Return on assets
Return on equity
EBITDA margin
Debt-to-equity ratio
Net profit margin
Interest expense
Current ratio
Total Assets
Capital
Capital Expenditures

The measurement of financial performance, regression analysis method is used. Since the focus of this study mainly centered on the impact of financial variables toward financial performance, this study employed a set of financial factors such as;

Return on assets (ROA) is calculated by dividing net profit by total assets. ROA shows how effective company assets are in generating profits. The greater the coefficient at the end of this calculation, the more likely it is that the company's assets have been so successfully used to generate profits. The active structure of a company may vary depending on the industry in which it operates. In some sectors it has mostly liquid assets, while in some sectors may be weighted more immovable property or machinery equipment in the balance sheet. For example, it can be normalized that the return on assets in the industrial sector, which has a high initial investment cost, is lower than the other companies. This is why ROA is particularly beneficial in comparing companies operating in the same sector.

$$\text{ROA} = \text{Net income} / \text{Total asset} \quad (3.1)$$

Return on equity (ROE) is the ratio of net profit to equity capital. Equity is the balance sheet that finances operating assets through partners and with undistributed profits. ROE shows how much profit the business partners make in the provision of capital, that is, how many unit profits are created for each unit capital. ROE, an important indicator of profitability, is also an indicator of management performance. High ROE indicates that business resources are being used efficiently. From another point of view, rather than operating an ROE, it is an interest in business partners. It shows how much profit your business partners have made as a result of their investments. ROE should not be mixed with earnings per share.

$$\text{ROE} = \text{Net income} / \text{Total equity} \quad (3.2)$$

An EBITDA margin (EM) is primarily one of the ratios when measuring financial performance. It is calculated by dividing EBITDA by net sales. In this way, the profitability of the business is expressed in terms of the main activity. EBITDA is an important figure in terms of profitability of the company's main activities. An EBITDA of negative value is indicative of a fundamental problem with that business. A positive EBITDA may not always be indicative of the company's cash earnings.

$$\text{EBITDA Margin} = \text{EBITDA} / \text{Revenue} \quad (3.3)$$

The debt-to-equity ratio (DE) is the ratio of business debt to equity capital. This rate, known as the lending rate, indicates the relationship between the foreign resources the employer uses in financing his assets and the own resources he has set up by the partners in the company and his own resources. The low rate indicates that the operator provides more financing from its own resources than borrowing, and if it is large, the operator chooses aggressive borrowing path for financing. In general, it is preferable for an analysis that the debt is low. The balance between debt and equity used when interpreting the debt equity ratio is the reason for preference. Debt equity ratio should be evaluated according to the sectors and competitors in which the relevant operator is located, as in the analysis of each ratio. While this ratio is generally considered not to

exceed 1, it can be considered normal that semantic intensive sectors have 2 and above, while labor intensive ones have 0.5.

$$\text{Debt/Equity Ratio} = \text{Total Liabilities} / \text{Shareholders' Equity} \quad (3.4)$$

Net profit margin (NPM) is a more accurate measure of the profitability of the company; because it represents the percentage of income that a company represents for its dollar-equivalent profit. Net profitability is an important distinction because the current increases do not really have to turn into increased profitability. Net profit is the sum of gross profit (cost of origin goods) minus operating expenses and other costs such as taxes and interest which the debtor should pay. It is also possible that a company's net profit margin is negative. Negative net profit margin arises when a company loses a quarter or year and may be a temporary problem for the company. The reasons for the loss may be labor and raw material costs, periods of stagnation and increasing destructive technological tools that can affect the company's main line. Reviewing the net profit margin can help a company to see overall costs more clearly than its income. Especially if the company is operating in a very competitive market, it is easier for a company to increase its profitability by lowering costs rather than increasing its sales.

$$\text{Net profit margin} = \text{Net profit} / \text{Sales Revenue} \quad (3.5)$$

Interest expense (IE) is the cost of funds loaned to a business by a lender, and recognized within an accounting period. Interest expense is recorded on the income statement. Since interest on debt is not paid daily, a company must record an adjusting entry to accrue interest expense and to report interest payable. Interest can be fixed or variable, meaning that the rate either stays the same through or changes according to a predetermined formula. That means interest expense often changes over time. The amount of interest expense has a direct bearing on profitability, especially for companies with a huge debt load.

$$\text{Interest Expense} = \text{Principal} * \text{Rate} * (\text{Days during which funds were borrowed} \div 365 \text{ Days}) \quad (3.6)$$

The current ratio (CR) The ratio of the sum of current assets that represent liquid assets of a business to debts which are shorter than one year is defined as the current ratio. It is used as an important indicator of liquidity to analyze the performance of meeting short-term debt. The trade accounts receivable and inventories, which make up the portion of the current assets of the company, are called gross operating capital. The current rate shows whether the operating capital is sufficient and gives a more accurate analysis when evaluated together with net operating capital. While an operating company's net operating capital represents the short-term cash requirement in a quantitative manner, the current rate measures its ability to meet this demand. The current ratio is 1.5 to 2, which is sufficient for financial analysis. The calculation of the coefficient as 2 means that the company has 2 lira for every 1 lira debt. If the current ratio is less than 1, it indicates that the operator has a liquidity problem.

$$\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities} \quad (3.7)$$

Total assets (TA) It is the balance sheet section showing the assets of the entity. They are examined in two groups as returning and standing assets. Current assets generally include liquid assets such as the bank accounts of the entity, inventories and short-term receivables. Fixed assets include the owner's long-term receivables for one year with shares in other companies, immovable properties such as machine park, factory building or land. The sum of a company's assets is not only a financial indicator but it is not enough to comment on the financial performance of the company alone. In the analysis, the asset structure of the company, the increase and decrease in assets over the years and how the assets are financed should be questioned.

Capital (CPL) refers all of the tools and equipment used in production such as buildings, plants, machinery and equipment. It is one of the three main production factors used in production together with labor and natural resources. In business, it includes not only the total assets of the business, namely the sum of capital goods, but also the intangible rights such as trademarks and patents. The expression of capital in the economy refers to goods that are more real capital goods, that is, physical assets.

Capital Expenditures or CAPEX (CPL) is called the calculation of the estimated investment amounts required to make feasibility studies on the financial model of

investments. The investment items must be listed in detail in the calculation of the capex amount of an investment. The necessary amount of technology, machinery, consulting and many other necessary items for investment are listed and the required amount is written. VAT expenditures must also be shown in calculating the investment amount of investments. Calculation of capex amount in financial modeling and calculation of feasibility reports of investments which is one of the important financial tables.

$$CF/CapEx = \text{Cash Flow From Operations} / \text{Capital Expenditures} \quad (3.8)$$

### 3.3 PANEL DATA ANALYSIS

Panel data are defined as where individuals, firms or countries are assembled in a certain period of horizontal cross-sectional data (Gujarati, 2006: 24; Baltagi, 2005: 1). Panel data analysis, on the other hand, uses panel data with time dimension to determine the economic relations between variables with the help of models (Yerdelen Tatoğlu, 2013: 4). The general model used for panel data analysis is given below.

$$y_{it} = \beta_{1it} + \beta_{2it} X_{2it} + \dots + \beta_{kit} X_{kit} + e_{it} \quad i=1,2,\dots,N ; t=1,2,\dots,T \quad (3.9)$$

$$E(e_{it}) = 0 \text{ ve } Var(e_{it}) = \sigma_{\varepsilon}^2 \quad (3.10)$$

In the model,  $i = 1, 2, \dots, N$  denote the fractional unit and the time period at  $t = 1, 2, \dots, T$ . It is also assumed that the average of the error term  $e$  is zero and constant variance. The slope coefficients up  $\beta_{2it}$  to  $x_{kit}$  are the unknown response coefficients. These may vary for different units and for different time periods. When the model is estimated, various assumptions are made regarding the model's steady-state, slope coefficients and error.

Panel data analysis can be defined as a method for predicting economic relations using the horizontal section series with time dimension in the most general sense. In this analysis, time series and horizontal section series are combined to form a data set with both time and section size. This data type is also called "Longitudinal data".

In cases where it is not enough to only work with the time series or only with the horizontal cross section data, the panel data allows both data types to work together. The term "unit" used in models predicted by panel data can represent a person, a firm, a household, a sector, a region or a country. In this respect, the concept of panel data means that horizontal cross-sectional observations are combined during a given time period. For the panel data, it can also try to use a data type that varies with both the horizontal section and the time, and therefore contains many units and multiple observation periods at the same time.

There are two approaches to estimate the panel data model: fixed effects and random effects. The fixed effects approach is based on various assumptions about fixed intercept, slope coefficients and error.

### **3.3.1 One-Way Error Component Regression Model**

Panel data regressions include time series and horizontal cross-sectional data. Models to be used; the choice of sample to be made and the component in which these unobservable effects are found. The following briefly describes the use of stationary effects and random effects models and their models. The other two models used for panel data analysis are fixed and random effects models. When the models are called fixed and random, the effects that can not be observed in each unit are taken into consideration. Unobservable effects in this context include a random variable such as error, a random effects model is emerging. Each horizontal section is estimated as a variable for observation the model of fixed effects emerges (Yerdelen Tatoğlu, 2013: 79).

### **3.3.2 Fixed Effects Model**

One way of incorporating the change in the model, resulting from differences between units in work done using panel data, or between differences between units and over time; assumes that the present change leads to a change in some or all of the coefficients of the regression model. In choosing a model, the random incident model is taken into account, in general, when the subject of analysis is a horizontal section, which is

randomly drawn from a large body mass. If a narrower and more specific data set is concerned, the fixed effect model is taken into account (Yerdelen Tatoğlu, 2013: 79). The fixed effect model is a convenient method when the analysis of a particular group for example, N insurance companies or N developing countries, where the data collection process is not unreasonable, and the deductions made will also apply to these particular groups (Baltagi, 2005: 12). Fixed Effect Model; constant term is a linear regression model that varies across units. The fixed effects regression model has n different constant terms, one for each existing unit. These fixed terms can be represented by indicator variables. These indicator variables include the effects of all excluded variables that change from one unit to another but are constant over time. Constant effective regression model; are used to control neglected variables that vary between events but are constant over time.

### **3.3.3 Random Effects Model**

If there are too many parameters in the fixed effect model, the degree of freedom falls. If units are to be towed by coincidence, a random impact model is appropriate. The random effects model assumes that each individual is the same as the fixed effects model in the sense that a separate number of cross sections is defined but that this approach can be considered random and can be treated as a part of the error term by perceiving it as withdrawing from a bag containing fixed terms (section coefficients). When N units are accidentally taken from a large population, it is appropriate to determine the random effects model (Baltagi, 2005: 14). As a consequence, we obtain a specification consisting of a set of integral coefficients, a set of independent variables and a combined error term that we are interested in. This compound error consists of two parts. It shows how different the number of cross-sections of this beau from the cross-section coefficient of the whole for a given individual and for a given time interval. The other part is the known coincidental mistake that shows the individual's chance deviation in the relevant time interval. Panel data can be analyzed using "Fixed Effect Models" as well as "Random Effect Models", which can be used to study changes in units or units and time differences. In random effective models, changes that occur by units or units and time are included as a component of the model error term. The main

reason for this is that the loss of freedom level encountered in fixed effect models is wanted to be avoided. If the data to be used in the model is randomly selected or selected as the representative of the population, Random Effects Model is preferred instead of Fixed Impact Model (Baldemir and Keskiner, 2004: 48). The greatest advantage of the Random Effects model is that it avoids the risk of loss of freedom in the Fixed Effective Models.

### **3.4 ADVANTAGES AND DISADVANTAGES OF PANEL DATA ANALYSIS**

The main advantages of the panel data analysis, which reduces the disadvantages of time series analysis by combining with the horizontal-section analysis method, can be listed as follows:

- a. As the results obtained from panel data analysis are more informative and more effective,
- b. Panel data analyzes have more number of observations by combining horizontal-slice and time series observations, thus allowing more reliable predictions to be made,
- c. Increasing the degree of freedom depending on the increase in the number of observations,
- d. Although the problem of Multicollinearity is encountered in the applications made with the time series data, because of the panel data usage and the values of the variables are changed depending on the two dimensions, it causes less Multiple Linear Connection problem among the explanatory variables,
- e. Only horizontal-section or time series analysis can provide effects that can not be demonstrated,
- f. To enable heterogeneity to be controlled and to be able to participate in the model,
- g. It allows econometric analyzes to be carried out in the presence of short time series and / or inadequate horizontal-cross-section observations, and allows for the establishment of a dynamic model since the panel data has time dimension,
- h. Possibility to reduce the problems arising from neglected variables and estimation deviations,

- i. It is only possible to create and test more complex behavioral models than horizontal-section data or time-series data,
- j. To allow better estimation of behaviors related to units.

Panel data analysis has several advantages as well as some disadvantages.

- a. Failure to reach and / or receive responses to the units participating in the survey in certain periods; missing answers, inability to remember answers, etc. reason for obtaining data in panel data analysis and encountering some problems in the course of regulation
- b. The time series size for each unit can be short,
- c. Since the dataset is wide, there is a lot of measurement mistakes in the panel dataset; The occurrence of a number of deviations in situations where heterogeneity between horizontal-slice and time series observations is not considered, and this leads to inconsistent and non-significant estimates of the parameters
- d. Occurrence of selectivity bias problems

### **3.5 HAUSMAN TEST FOR COMPARING FIXED AND RANDOM EFFECTS**

The validity of the hypothesis that the error-prone components of coefficients representing unit or unit and time differences are unrelated to the independent variables in the model can be examined by the test statistic recommended by Hausman. In this case it is necessary to examine whether the difference between the parameter estimators of the random effect model and the fixed effect model parameter estimators is statistically significant.

In panel data analysis, the fixed effect model is a model that is frequently used and has the desired characteristics in terms of its statistical properties. However, if the random effects model gives more effective results than the fixed effects model, the random effects model should be used. It may therefore be necessary to identify the more efficient of the two models, both of which are consistent but different in effectiveness. In the literature, this efficacy test, in other words the Hausman test fitting the k-degree of freedom chi-square distribution, is used to choose between the fixed effect model and

the random effects model (Baltagi, 2001: 20). In the Hausman test, the null hypothesis that the coefficients obtained from the random effects model and the coefficients from the fixed effects model are the same rejection, and the fixed effect model can not be rejected, it shows that the random effects model gives more effective results.

In this study the empirical test is concerned performance of technology firm. In the models,  $i$  and  $t$  represent firm and time period respectively and  $\epsilon_{it}$  error term respectively. The model is formulated;

ROA dependent variable

$$P_{it} = \alpha_0 + \beta_1 EM_{it} + \beta_2 DE_{it} + \beta_3 NPM_{it} + \beta_4 CRS_{it} + \beta_5 IE_{it} + \beta_6 CR_{it} + \beta_7 TA_{it} + \beta_8 CPL_{it} + \beta_9 CPLE_{it} + \epsilon_{it} \quad (3.11)$$

ROE dependent variable

$$P_{it} = \alpha_0 + \beta_1 EM_{it} + \beta_2 DE_{it} + \beta_3 NPM_{it} + \beta_4 CRS_{it} + \beta_5 IE_{it} + \beta_6 CR_{it} + \beta_7 TA_{it} + \beta_8 CPL_{it} + \beta_9 CPLE_{it} + \epsilon_{it} \quad (3.12)$$

where,

$P_{it}$  is the performance of technology firm  $i$  at time  $t$  measured by ROA and ROE separately.

$EM_{it}$  is the measure of EBITDA Margin for firm  $i$  at time  $t$ .

$DE_{it}$  is the measure of debt to equity for firm  $i$  at time  $t$ .

$NPM_{it}$  is the measure of net profit margin for firm  $i$  at time  $t$ .

$CRS_{it}$  is the measure of crisis criteria for firm  $i$  at time  $t$ .

$IE_{it}$  is the measure of interest expense for firm  $i$  at time  $t$ .

$CR_{it}$  is the measure of current ratio for firm  $i$  at time  $t$ .

$TA_{it}$  is the measure of total assets for firm  $i$  at time  $t$ .

$CPL_{it}$  is the measure of capital for firm  $i$  at time  $t$ .

$CPLE_{it}$  is the measure of capital expenditures for firm  $i$  at time  $t$ .

$\beta$  is a vector of parameters to be estimated

$\epsilon_{it}$  is a error term

Hausman (1978) to select among the predictors in the panel data models, an explicit test is used. One of the main differences between the fixed effect model and the random effects model is whether the unit effects are correlated with the explanatory variables. If there is no correlation between the explanatory variables and the unit effect, the random effects estimator is valid. The Hausman test tests the H0 hypothesis "there is no correlation between explanatory variables and unit effect", in other words "suitably predictive of random effects" (Yerdelen Tatoğlu, 2013: 179-181).

We used the Hausman test to investigate whether there is a difference between random effects and fixed effects models and whether to use consistent results for these models. When Hausman test results were examined, probability values smaller than 0.05 were obtained for the entire period model. According to Hausman test statistic result random effects model is preferred in all models. Hausman's specification test is carried out and the results are shown in Table 4 and Table 5.

**Table 3.3: Hausman Test (ROA dependent variable)**

<i>Correlated Random Effects-Hausman Test</i>			
Equation : Untitled			
Test cross-section random effects			
<b>Test Summary</b>	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	<b>95.09</b>	<b>3.31</b>	<b>0</b>

Source: The table was constructed using the data obtained with the STATA 12.0 program

**Table 3.4: Hausman Test (ROE dependent variable)**

<i>Correlated Random Effects-Hausman Test</i>			
Equation : Untitled			
Test cross-section random effects			
<b>Test Summary</b>	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	<b>21.31</b>	<b>12.00</b>	<b>0</b>

Source: The table was constructed using the data obtained with the STATA 12.0 program

### 3.6 FINDINGS

This study attempts to examine the relationship between financial performance and their determinants in the case of technology sector. This examination is carried out using panel data of 39 companies for 16 years from 2001 to 2016.

The Hausman test reveals that the null hypothesis of fixed effects is rejected and therefore, random effects is taken as appropriate model for this study. The random effects model results show that EBITDA Margin, Debt to Equity, Net Profit Margin, Interest Expense and Capital are significantly related to profitability. The null hypotheses that there is no significant relationship between these variables and profitability are accepted for variables Crisis, Current Ratio, Total Assets and Capital Expenditures.

Demir (2001) found that the equity return (ROE) in the study of ISE financial sector operations is the factor at the enterprise level affecting the share prices.

According to the results of the study conducted by Khorasan (2008) on the data of 118 firms traded in the ISE in the period of 1991-2006, ROE affects the share gains positively

Ege and Bayrakdaroğlu (2009) found that the cash flow rate and the turnover rate of total assets were significantly variable in explaining the share gains in the work done by the firms in the ISE-30 index on 2004 data.

Using panel data analysis, there is positive effect on company performance between current ratio and company size and the level of debt has a negative effect on company performance. (Oruç Erdoğan, Erdoğan, Ömürbek, 2015)

When ROA is dependent variable in the model, there is no statistically significant relationship between Crisis, Current Ratio, Total Assets and Capital Expenditures variables as a financial performance indicator but model is statistically significant between EBITDA Margin, Debt to Equity, Net Profit Margin, Interest Expense and Capital.

**Table 3.5: Panel Data Regression Results for ROA dependent variable**

Dependent variable : ROA				
Method : Panel Least Squares				
Sample : 2001 2016				
Periods included : 16				
Cross-sections included : 429				
Total panel (unbalanced) observations : 5437				
Variable	Coefficient	Std. Error	t - Statistic	Prob.
EBITDA Margin	0.0511801	0.009627	5.32	0.000
Debt to Equity	-0.0316653	0.0117159	-2.70	0.007
Net Profit Margin	0.0368634	0.0060536	6.09	0.000
Crisis	1.10545	1.757425	0.63	0.529
Interest Expense	-0.2281636	0.0683515	-3.34	0.001
Current Ratio	0.1903538	0.2275795	0.84	0.403
Total Assets	-0.0315605	0.025106	-1.26	0.209
Location	1.3699153	2.639998	0.52	0.604
Capital	0.0564462	0.0182235	3.10	0.002
Capital Expenditures	0.0006416	0.0009506	0.67	0.500

Source: The table was constructed using the data obtained with the STATA 12.0 program.

When ROE is dependent variable in the model, there is no statistically significant relationship between Crisis, Interest Expense, Current Ratio, Total Assets and Capital Expenditures variables as a financial performance indicator but model is statistically significant between EBITDA Margin, Debt to Equity, Net Profit Margin, and Capital.

**Table 3.6: Panel Data Regression Results for ROE dependent variable**

Dependent variable : ROE				
Method : Panel Least Squares				
Sample : 2001 2016				
Periods included : 16				
Cross-sections included : 429				
Total panel (unbalanced) observations : 5437				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t - Statistic</b>	<b>Prob.</b>
EBITDA Margin	0.0857376	0.0203163	4.22	0.000
Debt to Equity	-0.1087103	0.0248621	-4.37	0.000
Net Profit Margin	0.0584518	0.0127768	4.57	0.000
Crisis	-2.367351	3.720877	-0.64	0.525
Interest Expense	-0.2498559	0.1474897	-1.69	0.090
Current Ratio	-0.1372227	0.4767385	-0.29	0.773
Total Assets	-0.0899753	0.0530861	-1.69	0.090
Location	2.498758	5.241137	0.48	0.634
Capital	0.2426433	0.0431792	5.62	0.000
Capital Expenditures	0.0004823	0.0020239	0.24	0.812

Source: The table was constructed using the data obtained with the STATA 12.0 program

The purpose of the research is to make a comparative analysis of Return on Equity (ROE) and Return on Asset (ROA) of technology companies operating in BIST and LSE. In this direction, the calculations from the financial tables were subjected to regression analysis by using the panel data obtained by the resultant data. The Hausman test was used to choose between fixed effects and random effect models.

The research consists of two phases. In the first stage, the ROEs of technology companies operating in BIST and LSE between 2001-2016 were compared with other variables as dependent variables. The number of companies operating in the technology sector in BIST is 15. The technology companies that are traded in BIST and all included in the scope of analysis are: Alcatel Lucent Teletaş, Anel Telekom, Arena Computer, Armada Computer, Escort Computer, Aselsan, Datagate, Despec, Index Computer, Karel Elektronik, Kron Telecommunication, Logo Software and Netaş Telekom. The other technology companies that have been analyzed at the LSE exchange are: Aveva group plc, Cml microprocessor plc, Computacenter plc, Electronic data processing PLC, Fdm group plc, Fidessa group plc, Gresham technologies plc, Imagination technologies

group plc, Kainos group plc, Laord plc, MICro focus inter- nal plc, MICrogen plc, Nanoco group plc, Ncc group plc, Rm plc, Sage group plc, Sdl plc, Sepura plc, Servelec group plc, Softcat plc, Sophos group plc, and Triad group plc. In the second stage, the ROAs of technology companies operating in BIST and LSE between 2001-2016 were compared with other variables as dependent variables. The dataset used in the study carries the panel dataset feature. Econometric estimates are better because the panel data reduces the interaction between variables according to the traditional time series and the horizontal cross section and the work done (Kahveci, Sayilgan, 2006: 9). In this study, a total of 39 companies were used to obtain the data required for the research by making use of the 16-year financial statements. The financial information used is based solely on the firm's financial information of Bloomberg. The data have been made available for financial performance analysis from the financial tables in question.

We understand that EBITDA Margin, Debt to Equity, Net Profit Margin, Interest Expense and Capital are significantly related to profitability.

EBITDA Margin with dependent variable ROA has a positive impact on profitability with a coefficient of 5.11%. A positive EBITDA value indicates that the company has pre-paid income from interest, taxes and depreciation, and a negative EBITDA value indicates that the company is in a loss before interest, tax and depreciation. Higher EBITDA indicates a more positive outcome for the firm. Among the biggest reasons for the preference of EBITDA is that it makes the company an international benchmark for valuation by removing the differences arising from taxation and accounting policies between countries and / or sectors.

Debt to Equity with dependent variable ROA is our other profitability indicator which is - 3.16%. One of the most important things about a company is the amount of debt they have in their balance. This is a source of concern if business owners see trends in borrowing rising. Debt may increase because a business owner might want to make more cash contributions to the company, so they are willing to borrow more to get a hunger or buy back shares. In general, the company should pay more attention to the financial statements than the 40-50% debt and compare it with other companies in the industry as it may be in financial hardship. This ratio shows how much financing of company capital and investments is covered by foreign sources, and by how much equity (Kondak, 1999).

Net Profit Margin with dependent variable ROA affects the profitability which is around 3.68%. In this case, a profit margin of 4.75% means a net income of 3.68 cents per 1 USD after sale. The net profit margin measures the level at which the company can control expenses. The profit margin comes with some accompanying constraints, although it is a useful and popular rate such as any financial metric or rate to measure a company's profitability. The company's net profit shows its share in net sales and the high ratio means that the company is efficient (Akdoğan & Tenker, 2003).

Interest expense is an important indicator for profitability. The interest rate for debtor companies depends on the broad interest rates in the economy. Especially for companies with large debt burden, the amount of interest earned has a direct effect on profitability. Heavily indebted companies may have difficulty in servicing their debt burden during the economic depression.

Capital means that any material quantity which has value, and using which brings revenue to the business. Malik (2011) investigated the interaction between ROA and corporate capital in his study in Pakistan and found that the increase in the capital of insurance companies influenced profitability positively. In our study, capital has positive impact to increase financial performance of company.

#### 4. CONCLUSION

The performances of the sectors considered as sub-units of the country's economies the macroeconomic aspects of the country's economy, micro-economic aspects of business owners and managers have a large precaution. Macroeconomically, the added value and situation of the related sector can be evaluated in terms of the economy of the country. In terms of microeconomics, business owners and managers can see the performance of the enterprises within the sector and they can reach more strategic decisions in terms of businesses. Studies in domestic and foreign literature where performance appraisals are made it is seen that TOPSIS method are used in the overall studies. It is also possible to say that the study carried out differs from the studies carried out by the sector and the period in which it is applied. It was aimed to measure the financial performance of the said companies during the period mentioned, since the data of 39 companies operating in the information and technology sector listed in the LSE and BIST can be reached completely in the years 2001-2016. Panel data regression method was used to measure the financial performance of the companies since the companies included in the analysis can be reached within the specified period.

In another study, efficiency can be measured by setting different input values. In addition, companies can make longer cycle evaluations. Panel data regression method can be decided by integrating with other complementary methods (such as TOPSIS). The use of such methods of analysis is usually quantitative methods, method science, production and finance, and etc. is preferred in work areas. In this context, this work will add value to the accounting literature.

There are some limitations to this research that investigates the financial factors that determine the profitability of the firm. Firstly, the findings of the study, BIST and LSE should be interpreted in terms of companies operating in the technology sector. Moreover, the use of the data of the firms for the years 2001-2016 is another limitation of the study. In future studies, financial factors determining firm profitability can be examined in terms of different sectors or sub-sectors in the technology sector.

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