İSTANBUL BİLGİ UNIVERSITY
INSTITUTE OF GRADUATE PROGRAMS
BANKING AND FINANCE MASTER'S DEGREE PROGRAM

# IMPACT OF BASIC MACROECONOMIC INDICATORS ON BIST BANKING INDEX

EMRE ERSÖZ
114700070

SUPERVISOR
Assist. Prof. BARIŞ SOYBİLGEN

İSTANBUL
2019

# IMPACT OF BASIC MACROECONOMIC INDICATORS ON BIST BANKING INDEX

# TEMEL MAKROEKONOMİK DEĞİŞKENLERİN BİST BANKACILIK ENDEKSİ ÜZERİNDEKİ ETKİSİ

EMRE ERSÖZ
114700070

| | | |
|---|---|---|
| Tez Danışmanı: | Dr. Öğr. Üyesi BARIŞ SOYBİLGEN<br>İstanbul Bilgi Üniversitesi | ..... |
| Jüri Üyeleri: | Prof. Dr. Cenktan ÖZYILDIRIM<br>İstanbul Bilgi Üniversitesi | ..... |
| | Dr. Öğr. Üyesi Dinçer DEDEOĞLU<br>Bahçeşehir Üniversitesi | ..... |

Tezin Onaylandığı Tarih : 16.05.2017
Toplam Sayfa Sayısı : 60. Sayfa

Anahtar Kelimeler
1) Bankacılık
2) Bankacılık Endeksi
3) Borsa
4) Makro Ekonomi
5) Hisse Senedi

Key Words
1) Banking
2) Banking Index
3) Stock Market
4) Macroeconomics
5) Equity Share

## ACKNOWLEDGEMENT

I would like to thank my supervisor Assist. Prof. Barış SOYBİLGEN who did not spare their support from the beginning of my work. Lastly, I would devote my study to my family for inspiration and patience.

# TABLE OF CONTENTS


ACKNOWLEDGEMENT ..... iii

LIST OF ABBREVIATIONS ..... v

LIST OF FIGURES ..... vi

LIST OF TABLES ..... vii

ABSTRACT ..... viii

ÖZET ..... ix

INTRODUCTION ..... 1

BORSA ISTANBUL, BANKING INDEX AND MAJOR MACROECONOMICS VARIABLES ..... 4

1.1. BORSA ISTANBUL AND BANKING INDEX ..... 4

1.2. MAJOR MACROECONOMICS VARIABLES AND BANKING SECTOR ..... 5

1.2.1. Consumer Price Index ..... 6

1.2.2. Interest Rate ..... 7

1.2.3. Industrial Production Index ..... 8

1.2.4. Turkey Credit Default Swap Premium ..... 9

1.2.5. The US Dollar/TL Exchange Rate ..... 10

EFFECTS OF MACROECONOMICS VARIABLES ON STOCK MARKET ..... 12

DATA AND MODEL ..... 32

3.1. DATA SET ..... 32

3.2. ECONOMETRIC MODEL ..... 36

CONCLUSION ..... 44

REFERENCES ..... 46

## LIST OF ABBREVIATIONS

| | |
|---|---|
| **AMEX** | : American Stock Exchange |
| **BIST** | : Borsa Istanbul |
| **BRSA** | : Banking Regulation and Supervision Agency of Turkey |
| **CBT** | : The Central Bank of The Republic of Turkey |
| **CDS** | : Credit Default Swap |
| **CPI** | : Consumer Price Index |
| **EU** | : European Union |
| **GDP** | : Gross Domestic Product |
| **IPI** | : Industrial Production Index |
| **ISE** | : Istanbul Stock Exchange |
| **NAFTA** | : North American Free Trade Agreement |
| **NASDAQ** | : National Association of Securities Dealers Automated Quotations |
| **NPL** | : Non performing loans |
| **NYSE** | : New York Stock Exchange |
| **TRY** | : Turkish Lira |
| **USD** | : United States Dollars |
| **XBANK** | : BIST Banking Index |

## LIST OF FIGURES

Figure 1.2.3-1: Growth Rates of GDP, Industrial Production Index and Total Assets Size of Banking Sector ..... 9
Figure 3.1-1: BIST XBANK Index (Real) ..... 32
Figure 3.1-2: Consumer Price Index ..... 33
Figure 3.1-3: Real Interest Rates of Turkey Treasury Debt Securities by Years ..... 34
Figure 3.1-4: Industrial Production Index ..... 35
Figure 3.1-5: Turkey's CDS Premium by Years ..... 35
Figure 3.1-6: US Dollar/TL Exchange Rate by Years ..... 36
Figure 3.2-1: VAR(3) Impulse Response Results ..... 40
Figure 3.2-2: VAR(6) Impulse Response Results ..... 41
Figure 3.2-3: VAR(9) Impulse Response Results ..... 42
Figure 3.2-4: VAR(12) Impulse Response Results ..... 43

## LIST OF TABLES

**Table 1.1-1: Weights of Banks in BIST Banking Index**.....5

## ABSTRACT

In this study, effects of the variables of consumer price index, industrial production index, Turkey credit default swap premium, the US Dollar/TL exchange rate and Treasury 2-year real benchmark interest rates which could be considered as the basic macroeconomic variables, on the Borsa Istanbul Banking Index is examined.

Although there are many studies focusing on the effects of macroeconomic variables on the stock market, the number of studies concentrated on the index is relatively limited. In this thesis, it is aimed to reveal the sensitivity of the BİST Banking Index to macroeconomic changes, which includes banks with a high share in Borsa Istanbul.

In this econometric study, Vector Autoregression model is primarily used and the inferences have similarities in parallel with the many studies in the literature. It is determined that the shocks in the US Dollar/TL exchange rate, Treasury 2-year real benchmark interest rates, credit default swap premium and consumer price index variables have a negative and significant effect on the inflation-adjusted Banking Index. However, it also revealed that the changes in the industrial production index have no effect on the index.


Key Words: Banking, Macroeconomics, Stock, Banking Index, Equity Share

# ÖZET

Gerçekleştirilen çalışmada, temel makroekonomik veri olarak kabul edilebilecek olan, tüketici fiyat endeksi, sanayi üretim endeksi, Türkiye credit default swap primi, Amerikan Doları kuru ve Hazine gösterge faiz oranı değişkenlerinin Borsa İstanbul Bankacılık Endeksindeki değişmlere olan etkisi incelenmiştir.

Literatürde makroekonomik verilerin, hisse senedi piyasasına olan etkisini araştıran çok sayıda çalışma olmakla beraber, endeks özelinde gerçekleştirilen çalışma sayısı ise nispeten azdır. Söz konusu tez ile Borsa İstanbul içerisinde ağırlığı oldukça yüksek olan Bankaların yer aldığı Bankacılık Endeksinin makroekonomik değişimlere olan duyarlılığı ortaya konulmuştur.

Vector Autoregression modeli kullanılarak gerçekleştirilen ekonometrik çalışmada, literatürde yer alan kimi çalışmalarla da paralelik gösterecek şekilde, Amerikan Doları kuru, Hazine gösterge faiz oranı, credit default swap primi ve tüketici fiyat endeksi değişkenlerinde yaşanacak şokların enflasyondan arındırılmış reel Bankacılık Endeksi üzerinde negatif ve anlamlı bir etkisinin bulunduğu, bununla beraber sanayi üretim endeksindeki değişimlerin ise endeks üzerinde anlamı bir etksinin bulunmadığı tespit edilmiştir.

Anahtar kelimeler: Bankacılık, Makroekonomi, Borsa, Bankacılık Endeksi, Hisse Senedi

# INTRODUCTION

The banking business emerged around the 3500 BC. It is assumed that there were activities like banking business in ancient civilizations, especially in ancient Greek, Sumerian and Babylonian civilizations. Though, the main facts that enable the improvement of banking activities are the invention of money, the development of maritime and advance in the trade as a parallel development.

First of all, money changers emerged with the development of colonialism and the achievement of international qualification. For this reason, it is possible to characterize the money changers as pioneers of bankers and banks. The name of the bank comes from the Italian word of 'banco' which refers to the 'table, desk' where money changers carry out their business. In addition to the expansion of money changers' field of interests, accepting deposits, performing the transfer operation and providing loans to customers transformed their business into a status of deposit and transfer banks. While the industrial revolution gave a rise to a rapid development of banking business, the emergent capital accumulation transformed banks into an important constituent of the economy starting from the 17$^{th}$ century (Aydın, 2006).

The history of the stock exchange is attributed to the Roman Empire. While the Roman Empire became a big trade center with the war booties, the traders started to set up companies in order to collect the capital required to attend large tenders. In this period, these companies were very popular and as a result of these developments the first stock exchange was established in Rome in 180 BC. The use commercial bills such as credit letters became widespread in large trades along with the development of trade through fairgrounds and markets established in various parts of Europe in the Middle Ages. Following these developments, policy started to be used in the 13$^{th}$ century. In the 15$^{th}$ century, a type of mediator, known as "broker", which deals with the regulations and trade of policy, was emerged and

the guilds with their rules were constituted by the professionals. Call provision and government bonds were released and financing was created through these in the first years of the establishment of the United States. In the same period, private banks also began to collect money through the equity shares and to buy company shares. Afterwards, it was decided to establish the New York Stock Exchange (NYSE) with the participation of 24 major traders in 1792, and the position of the stock exchanges in the financial markets has maintained its importance since then (Light, 2012).

The emergence of both the Banks and the Stock Exchange concept in the Ottoman Empire can be related to the financing needs generated with the Crimean War (1854). The first stock market in the Ottoman Empire was established in 1866 with the name of "*Dersaadet Tahvilat Borsası*". Even if the "*Bank-ı Dersaadet*" (*Istanbul Bank*) was founded in 1847 by bankers J.Alleon and Th. Baltazzi as the first bank, "*Bank-ı Osmani Şahane*" (*Ottoman Bank*) which was established in 1863, was in service for creating emission through issuing banknotes until the establishments of Central Bank of Turkey (CBT) (Sumer, 2016).

In the present time, banks are transformed into instrument that governments take the advantage for regulating the economy in addition to basic functions such as collecting deposits and providing loans. In this way, it is possible to manage the economic growth through the loan volumes of the banking sector with different treatments such as changing the number of credit card instalments, arranging the loan periods, regulating the reserve option mechanism and changing overnight lending rates. This situation also provides an opportunity to use banking data such as loan volume, deposit volume and the ratio of non-performing loan as leading indicators for economic developments. Considering the basic function of banks as collecting deposits and providing loans, it is expected that the banking sector can be affected by changes in household and public expenditures, investments and

savings rates. Therefore, the changes in the economy are supposed to be effective in the balance sheets, profitability and equity share performance of banks.

Today, banks operating in Turkey with their size and supervised transparent corporate structures are situated among the highest public companies in the Borsa İstanbul in terms of transaction volumes and market values. In this thesis, it is tried to explain to what extend the performances of banks -which are assumed to be influenced by macroeconomic changes- and their equity share performance are affected by consumer price index, Treasury 2-year real benchmark interest rates, the US Dollar/TL exchange rate, credit default swap premium of Turkey and industry production index. In order to measure the bank's share performances, inflation-adjusted changes in the Borsa İstanbul Banking Index (XBANK) will be taken into consideration and the macroeconomic data mentioned above will be used as independent variables.

Although there are many studies focusing on the effects of macroeconomic indicators on the stock market, the number of studies concentrated on the index is relatively limited. It is hoped that this thesis will contribute to make up the deficiency in the current literature.

In the first part of the study, basic information about Borsa İstanbul Banking Index, macroeconomic variables that will be used in the study and financial sector is reviewed. In the second part, the studies on the effects of macroeconomic variables on stock exchange markets and stock market performance of banks are examined. In the third part of the study, the effect of the related macroeconomic factors on BIST Banking Index is explained by Vector Autoregression analysis. In the last part of the study, evaluations on the obtained results are discussed.

# CHAPTER 1

# BORSA ISTANBUL, BANKING INDEX AND MAJOR MACROECONOMICS VARIABLES

## 1.1. BORSA ISTANBUL AND BANKING INDEX

Borsa Istanbul was established with the name of Istanbul Stock Exchange (IMKB/ISE) on 26.12.1985 and started to work on 03.01.1986. At the beginning, ISE had been working only for local investors. The ISE allowed the foreign investors to make transactions with the Law No. 32 on the Protection of the Value of Turkish Currency, which was published in the Official Gazette No. 20249 dated on 11.8.1989. After that, with the sprawl of the equity share market to international transactions, the transaction volume has begun to increase rapidly.

Istanbul Stock Exchange (ISE) - which was the only market where equity shares of public companies in Turkey were traded – transformed into Borsa İstanbul with the article 138 of the Capital Market Law No. 6362 and entered into force by being published in the Official Gazette on 30 December 2012. A large number of groups and sector-based indexes were created since the establishment of the stock exchange.

The BIST Banking Index consists of the equity shares of 13 different banks according to the data published by Borsa İstanbul dated on 28.09.2018. The data of banks and their weight within the Banking index, which have been kept since 27.12.1996, are given in Table 1.1-1.

**Table 1.1-1: Weights of Banks in BIST Banking Index**

| Equity Code | Equity Name | Total Number Of Shares | Weight (%) |
|---|---|---|---|
| GARAN.E | T. Garanti Bankası | 42.000.000.000.000 | 32,76% |
| AKBNK.E | Akbank | 40.000.000.000.000 | 30,34% |
| ISCTR.E | İş Bankası (C) | 44.999.700.000.000 | 13,00% |
| HALKB.E | T. Halk Bankası | 12.500.000.000.000 | 8,64% |
| YKBNK.E | Yapı ve Kredi Bankası | 84.470.512.840.000 | 6,03% |
| VAKBN.E | Vakıflar Bankası | 25.000.000.000.000 | 4,99% |
| TSKB.E | T.S.K.B. | 28.000.000.000.000 | 1,98% |
| SKBNK.E | Şekerbank | 11.580.000.000.000 | 0,94% |
| ALBRK.E | Albaraka Turk | 9.000.000.000.000 | 0,60% |
| ICBCT.E | ICBC Turkey Bank | 8.600.000.000.000 | 0,49% |
| KLNMA.E | T. Kalkınma Bankası | 5.000.000.000.000 | 0,11% |
| QNBFB.E | QNB Finansbank | 33.500.000.000.000 | 0,07% |
| DENIZ.E | Denizbank | 33.161.000.000.000 | 0,05% |

Source: Borsa İstanbul

## 1.2. MAJOR MACROECONOMICS VARIABLES AND BANKING SECTOR

This study tries to understand the effects of changes in the consumer price index (CPI), Treasury 2-year real benchmark interest rates, the US Dollar/TL exchange rate, credit default swap premium of Turkey and industry production index (IPI) on the BİST Banking index.

### 1.2.1. Consumer Price Index

Inflation, with its common definition, is expressed as the continuous increase in the general level of prices (Laidler and Parkin, 1975).

Prior to 2000s, high inflation caused to a decrease in the amount of long-term TL resources and to a limitation in the TL loan value. High inflation also led dollarization to be dominant in the market. However, thanks to the disinflationary process, economic growth that emerged in the 2000s, the progress to international standards in banking regulations and the increase in the supervision; Banks' policy and service areas extended, and their equity became stronger.

Keskin, et al. (2008) reports that while the weight of TL-denominated loans increased, the ratio of loan volume to GDP increased by 23 points compared to 2002 and rose to 43 percent at the end of 2007. The total equity increased from 9,7 billion TL to 73,5 billion TL and free equity increased from 4,1 billion TL to 50,7 billion TL and also improvement in the profitability of equity was observed. While the loan volume of the banking sector reached 2 trillion TL by the end of 2017, the ratio of loan volume to GDP exceeded 60% percentage.

Considering the results mentioned above, it can be stated that price stability and the emergence of an investable environment provide an increase in the loan volume and dissemination of the use of TL. However, while this situation increases the balance sheets of banks, the decrease in the interest margin may cause pressure on banks' profits. In fact, Demirgüç-Kunt and Huizinga (1999) state that the high interest rate environment caused by high inflation led to increase in the interest margin and the profit of the bank.

In this way, the operational expenses that increased with the inflation could be compensated. Yet in another study by Athanasoglou, Brissimis and Delis (2005), it

is claimed that inflation has a positive effect on bank profits on accounts of the asymmetric knowledge level between banks and consumers.

Değer and Anbar (2011) express that there is no significant relationship between inflation and bank profitability, while the studies conducted by Kosmidou (2008) and Abreu and Mendes (2001) claims that the inflation causes cost increase and it results with the negative impact on the bank performance.

### 1.2.2. Interest Rate

In general, Treasury 2-year interest rate, which was determined by T.C. Ministry of Treasure and Finance, is used as the benchmark interest rate. It would be appropriate to define this interest rate as the price which the government has to pay to find loan money. The rise in the interest rates results in higher cost of financing obtained by banks from abroad. At the same time, it also induces the cost of overnight lending to increase in the market between banks.

It can be predicted that this will lead to increment in the interest rate of deposits and also increase in the interest rate of loan due to the increase in loan costs. The increase in the interest rate of loan may lead to a shrinkage in the loan volume of banks. As a result of that, firms and consumers who have difficulty in finding financing sources may not pay their debts and it may cause ratio of non-performing loan to rise. However, it can be argued that the effect of the increase in interest rates on the Bank's profitability may be positive in some cases where the interest margin is well managed by the Banks.

In a study prepared by Taşkın Dilvin (2011), it is expressed that the changes in interest rates do not have a direct effect on the Bank's performance. However, in another study by Değer and Anbar (2011), it is argued that the increase in real interest rate may affect the profitability of banks positively. In the literature, there

are also other studies demonstrating that the change in interest rates affects the stock prices of financial institutions in a negative way (Bae, 1990).

### 1.2.3. Industrial Production Index

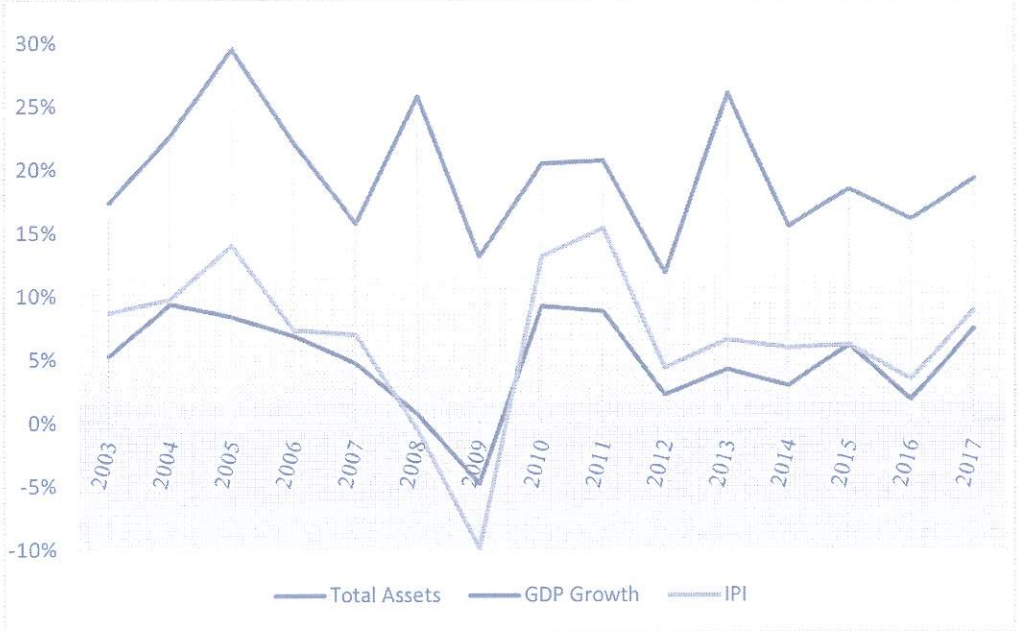
Considering that the increase in rates of gross domestic product (GDP) growth of countries is mainly based on the consumption or investment which are financed by bank's loans considerably. It can be thought that the increase in the growth rate causes the growth of banks' loan volumes and hence their balance sheets.

In the research of Değer and Anbar (2011) prepared through the data of 10 Turkish Banks between 2002 and 2010 by using Panel Data Analysis methodology, it was stated that economic growth results in the growth in banks' balance sheets but did not affect their profitability. In another study on the Greek Banking sector, it is emphasized that economic growth had a positive effect on the performance of the banking business (Kosmidou, 2008).

Moreover, in the study of Neely and Wheelock (1997) which is a comparative study of American states, it is revealed that economic growth and increase in the income per capita had a positive impact on the Bank's revenues.

As it can be seen in the graph below, the increase in the asset size of the banking sector is mainly parallel to the economic growth and change in the industrial production. It is also seen that the growth in the total asset size of the sector is well above the economic growth rates. The Turkish banking sector, which had an asset size of 213 billion TL in 2002, reached a size of 3.10 trillion TL by 2017. In this study, the effects of the changes in the industrial production index (IPI), which is considered as one of the leading indicators of economic growth, on the banking index will be evaluated.

**Figure 1.2.3-1: Growth Rates of GDP, Industrial Production Index and Total Assets Size of Banking Sector**




Source: The Banks Association of Turkey, Central Bank of the Republic of Turkey, Turkish Statistical Institute

### 1.2.4. Turkey Credit Default Swap Premium

Credit Default Swap (CDS) is a financial contract to collect loans in return for a premium paid by the creditor to the protection vendor, in case of non-payment of credit debt (Han ve Zhou, 2015). According to this, there will be an increase in CDS premiums of countries where it is thought that countries may have difficulty in paying their loans.

Therefore, CDS premiums are considered as important indicators to measure and ensue the risk levels of countries. In the study of Bozkurt (2015), it is indicated that there is a positive relation in between ratio of NPL, non-performing loans / equities,

fixed-asset / total asset, government debt interest rates and CDS premiums of Turkey. Moreover, in the study of Danacı, Şit and Şit (2017), bi-directional causality between economic growth and CDS premiums is determined.

Negative impacts of the increase in the country's risk premium, economic growth, increase in foreign investments are among the expected consequences due to the uncertain market environment caused by increases in inflation, interest rate and non-performing loans and their negative affect on the economy.

### 1.2.5. The US Dollar/TL Exchange Rate

It can be assumed that the US Dollar/TL exchange rate may cause deterioration in banks' balance sheets due to the loan risks of the companies taking foreign exchange risk. Furthermore, it is possible to expect that the increase in the exchange rate will lead to increase in inflation and interest rates which may be resulted with the decrease in demand. The increase in interest rates and hence the increase in the interest margin may have a positive effect on the profitability of banks, while the decline in demand and economic activity may have a negative effect on the loan volume.

There are studies claiming that the increment of exchange rate, depreciation of the companies' assets and their balance sheets, as well as the upward trend in the exchange rate divert the investors from the equity share market to invest in the foreign exchange which may cause the decrease in the equity share prices (Dizdarlar and Derindere, 2008), (Akçoraoğlu and Yurdakul, 2002).

Nonetheless, in their study on Portuguese, Spanish, German and French banks, Abreu and Mendes (2001) state that changes in the exchange rates have no effect on banks' profit. It is revealed that the Real Exchange Rate Index and Euro-Dollar Parity were effective at the percentage of 77.5 to explain the changes in ISE

National 100 Index as stated in the study of Savaş and Can (2011) prepared through using data between the years of 2000:01-2009:06 and Granger Causality Test.

# CHAPTER 2

## EFFECTS OF MACROECONOMICS VARIABLES ON STOCK MARKET

Geopolitical and socio-economic conditions of countries, macroeconomic indicators such as economic growth, inflation, exchange and interest rates and country's risk perceptions have the power to influence investors' decisions.

Equity share markets are also affected significantly by the issues mentioned above and serious volatilities may occur in the markets as well. However, it is difficult to estimate which variables can directly affect the equity share market. Furthermore, the negative or positive aspect of this interaction may vary according to countries and market conditions. On the other hand, bank's equity shares can react substantially to the changes mentioned above due to the size of banks, balance sheet configurations and high transaction volumes.

Banks in the Banking Index are quite dominant in Borsa Istanbul compared to companies listed in BIST Istanbul due to their capital structures, transaction volumes and high market values. Moreover, it is possible to claim that banks have more corporate structure than other companies when criteria such as compliance with corporate governance principles, transparency and auditability are considered. It is thought that Banking Index can be affected by macro-economic variables since banks' balance sheets are sensible to these variables. However, there are also some studies claiming the opposite or possibility of negative and positive effect. In this chapter, national and international studies on equity share market and Banking index are examined.

The relationship between main macroeconomic values and equity share prices of 5 Far East countries comprised of Indonesia, Malaysia, Philippines, Singapore and Thailand is discussed in the study of Wongbangpo and Sharma (2002). In the study,

it is stated that equity share prices have a positive relation with economic growth and negative relation with inflation in the long-term period. However, negative correlation in Philippines, Singapore and Thailand and positive correlation in Indonesia and Malaysia are determined when long-term equity share prices and interest rates are examined. In the same study, it is observed that there is a negative correlation in Indonesia and Philippines, while there is a positive correlation in Malaysia, Singapore and Thailand in terms of inflation and equity share relation. When the exchange rate is taken into consideration, it is stated that exchange rate changes have a positive effect in Indonesia, Malaysia and Philippines, while it has a negative effect in other countries. This study, which is concentrated on five Far East countries, could be an example for showing that the effect of macroeconomic indicators on equity share prices may change according to the specific conditions of the countries.

Al-Sharkas (2004) tries to explain the relationship between macroeconomic variables and the equity share prices of Amman Stock Exchange between the dates of 1980:03 - 2003:12. In this study, money supply, industrial production index, inflation and interest rate are used as independent variables. Accordingly, it is determined that there was a negative relation between inflation, interest rates and equity share prices, while there was a positive relation between real economic growth and money supply.

Dritsaki (2005) analysis the long-term relationship in macroeconomic variables which was consisted of the Greek equity share market and inflation, interest rates, industrial production with using the Granger Causality test and data from 1988:09 to 2003:06. As a result of this study, it is revealed that the macroeconomic data had a positive effect on the Athens Stock Exchange Index.

Liu and Shrestha (2008) examine the long-term relationship between macroeconomic variables and equity share prices in their study concentrated on

Chinese equity share market. In the study, while a long-term relationship between macroeconomic changes and stock returns is not observed, a negative short-term relationship is revealed between inflation, exchange rate, interest rate and stock returns. As a result, it is emphasized that the equity share market is more sensitive to speculation and short-term volatility than long term macroeconomic changes.

Gay (2008) analysis the effects of changes in oil prices and exchange rates on equity share prices of BRIC countries (Brazil, Russia, India and China). It is understood from the examination that there is no relationship between these independent variables and equity share prices. This is explained with the fact that variables such as inflation, interest rate and GDP growth rates which are not subject of the study influence the stock return.

Hsing (2011), in the study prepared with GARCH method, tries to explain to what extent the Hungarian equity share market is affected from GDP growth rates, ratio of public debt to GDP, exchange rate, German equity share index, real interest rate, expected inflation, Eurozone public debt prices and money supply.

In the study that used the data of the period 2000: Q1 – 2010: Q2, it is determined that the ratio of growth rate, the ratio of public debt to GDP and the German equity share index had a positive effect on the Hungarian equity share prices. However, it is also claimed that the expected inflation, interest rates of Eurozone debt securities and Hungary treasury bond interest rates have a negative effect. It is also indicated that money supply has a positive effect up to a certain level, but it has a negative effect when the certain level is exceeded. This situation is explained by the fact that the high increase in money supply causes inflationary effects. Similarly, it is emphasized that the effect of the public debt rate, which is determined as positive at first, may change due to other risks caused by the increase in the debt to high levels. The study is found significant due to concentrating on the EU country and the diversity of data.

Sayılgan and Süslü (2011) try to determine the relationship between stock returns and exchange rates, inflation, Standard & Poors 500 Index, interest rate, GDP growth rates, money supply and oil prices of the period from 1999 to 2006 in developing countries (Hungary, Jordan, Poland, Russia, Argentina, Brazil, Indonesia, Mexico, Malaysia, Chile and Turkey). According to the study, no significant relationship is found between stock returns and interest rate and between money supply and oil prices.

In addition to this, the reaction of equity share price to changes of exchange rate, inflation and Standard & Poors 500 index is measured. It is explained that the relationship between the equity share prices and inflation, which is determined as positive, causes an increase in the dividend distributed by the companies due to the increase of their turnover by inflation. It is observed that there was a negative relationship between the equity share prices and the exchange rate in accordance with the expectations.

Sayılgan and Süslü (2011) state that due to the negative effect of the exchange rate, the crisis in the equity share market can be kept under control by intervening in the exchange rate. They emphasize that the change in the exchange rate is an important stimulus for international investors. They also claim that the equity share market become prominent factor for balancing the exchange rate.

Ayaydın and Dağlı (2012) carry out a similar study by using Panel Data Analysis method. In this study, the relationship between macroeconomic variables and equity share prices is tried to be determined by using the data of the middle-income countries (Egypt, India, Indonesia, Morocco, the Philippines, Argentina, Brazil, China, Chile, Colombia, Malaysia, Mexico, Peru, Russia, South Africa, Turkey, Thailand, the Czech Republic, Hungary, South Korea, Israel and Poland). In the study, it is similarly revealed that while stock return is affected by Standard & Poors

500 Index positively, it is affected by exchange rate negatively. In addition to that, it is indicated that there is no relationship between deposit rates and equity share prices in the mentioned countries.

In the same study, it is also expressed that inflation rate is only a significant and positive variable in lower-middle income countries. However, no significant relationship is found between inflation and equity share prices in countries with relatively high income. The study is also important in terms of showing that the effect of inflation can change from one country to another. The same situation is also valid for the industrial production index and it is seen that there is a positive relationship with the equity share performances only in lower-middle income countries. However, what is interesting here is that the interest rate has a negative effect on the equity share prices independent from country's income level. This situation is explained in this study as considering two markets as alternatives to one another.

Durukan (1999) tries to reveal the relationship between macroeconomic variables such as inflation, interest rate, exchange rate and money supply, and the equity share prices of companies in the ISE. In this study, the data of the period between 1986-1998 are tested with the Least Squares Method. According to the results of the study, a negative relationship is found between interest rates and equity share prices. However, in the study completed in the 1990s, when inflationary processes and financial crises are experienced, no significant relationship between inflation, exchange rate and stock returns is found in contrast to the study of Zügül and Şahin (2009) done 10 years after this study.

Zügül and Şahin (2009) try to examine the relationship between the ISE 100 Index and macroeconomic variables using the monthly data of stock market from 2004 to 2008. Least Squares Method was used in the study. The relationship between the ISE 100 Index and the US Dollar exchange rate, money supply (M1), interest rate

and consumer price index are tried to be analyzed. According to the results, it is presented that there is a negative correlation between money supply, exchange rate, interest rate and ISE 100 Index, whereas inflation has a positive effect on ISE 100 index. While it is expected that the increase in money supply would create an inflationary environment and increase equity share prices, it is surprising that a negative correlation is observed in the result of the study. It is emphasized that the negative relationship is an expected result since the increase in the exchange rate will decrease the interest of the investors towards the foreign exchange market. A similar relationship is also observed between the bond interest rates and the equity share market, and as interest rates rise, the interest in the equity share declines. Another result is the positive relationship between inflation and equity share prices. Nevertheless, the rise in inflation causes a decline in purchasing power. It is expected that the prices of goods and services will cause a decrease in equity share prices and, the result is emphasized as surprising.

Dizdarlar and Derindere (2008) examine effects of 14 basic macroeconomic variables of 2005 to 2007 on ISE-100 Index. In the study, the factors affecting the index are explained with the exchange rate of 0.55. It is claimed that, changes in exchange rates, corruption of the overall economy, damage in the balance sheet structures of the companies and problems in foreign debt may cause the value loss of companies. On the other hand, apart from the effect of exchange rate; national and international socio-political developments, information of publicly traded companies, manipulative movements, risk appetite of foreign investors and alternative investment insturments are stated as other factors affecting equity share prices.

Gençtürk (2009) analyze the relationship between the equity share prices of Borsa Istanbul and macroeconomic data in a comparative manner including periods with and without crisis. In this study, relationship between ISE-100 Index and treasury bond interest rate, consumer price index, money supply (M2), industrial production

index, exchange rate of dollar and gold prices is examined by using the data between 1992 and 2006 and with Multiple Linear Regression Method. As a result, it is observed that while there was a negative relationship between the equity share prices and the consumer price index at crisis period, there is a positive relationship with the money supply at the same time. Accordingly, it is determined that each unit increase in the consumer price index decreases the ISE 100 Index by 2,270 unit in the periods of crisis. This situation is explained by the fact that the consumer price index, which increases in times of crisis, has more negative effect on the equity share prices comparing to the normal periods. Even if the money supply has a positive effect in general, it is observed that the effect decreases in the period of crisis. It is predicted that the increase in money supply will drive the interest rates down and increase interest in the equity share market and this situation will have a positive effect on equity share prices. Yet, the increase in inflation, in line with the rise in interest rates, will decrease the attention to the stock exchange.

According to the same study, there is no macroeconomic variables except inflation and money supply which would have significant result during the crisis. It is observed that while there is a positive correlation between gold, consumer price index and money supply during the periods without crisis, there is a negative correlation between the index, and the industrial production index, dollar and treasury bond interest rates.

In the study prepared by using the exchange rate and CPI data from 1994 to 2010, Yurttançıkkmaz (2012) questions the effect of these variables on stock returns. As a result of the study, it is revealed that while the inflation had a high and positive effect on the equity share returns, the exchange rate have a lower and negative effect. According to the regression analysis, while one unit increase in inflation leads to an increase of 1,582 units in equity share prices, one unit increase in the exchange rate results in 0.652 unit decrease in share prices.

Kaya, Çömlekçi and Kara (2013) test the relationship between the ISE-100 Index and some macroeconomic variables using the data from 2002:01-2012: 06. In this study, the relationship between the return of ISE-100 Index, interest rate, money supply, industrial production index and exchange rate is analyzed by using multiple regression model and Least Squares Method. As a result, it is determined that while the relation between stock returns and money supply (M2) is positive, the relation between stock returns and exchange rate is negative. On the other hand, it is concluded that there is no statistically significant relationship between equity share returns, interest rates and industrial production index.

Aktaş and Akdağ (2013) examine the relation between ISE-100 Index and macroeconomic variables of 2008-2012 by using Granger Causality Test and Multiple Linear Regression method. CPI, deposit rate, USD and Euro rates, capacity utilization rate, industrial production index, gold prices, export data, consumer confidence index, unemployment rate and oil prices are used as independent variables. According to the results of Multiple Regression Analysis, it is determined that deposit interest rates, CPI, USD rate, capacity utilization rate and consumer confidence index influence the ISE-100 Index. Correspondingly, it is revealed that, one-unit increase in deposit interest rates and USD exchange rate resulted in 0.517- and 0.411- unit negative effects on ISE-100 Index. Moreover, it is observed that, one-unit change in the CPI has a 0,797-unit, capacity utilization rate has 0,499-unit and consumer confidence index has 0,198-unit positive effect. However, a significant relationship is observed only between the capacity utilization rate, interest rate and the ISE-100 Index as a result of the Granger Causality Test.

Maysami, Howe and Hamzah (2004) survey the effects of macroeconomic variables on finance, hotel and real estate indexes in Singapore Stock Exchange. According to the study, while inflation, 3-month interbank market interest rates and money supply have a positive impact on the index of the financial sector; industrial

production, exchange rate, and 1-year interbank market interest rates have a negative effect.

In a similar study of Aydemir and Demirhan (2009), service, financial, industrial and technology indexes together with the ISE 100 index, are examined for equity share market of Turkey. Daily exchange rate and equity share data between February 23, 2001 and June 11, 2008 are taken into consideration. According to the study, it is detected that exchange rate has a negative effect on all indexes mentioned above. Together with that, index differences become evident. It is observed that, while the national 100, financial, industrial and technology indexes are largely affected by the exchange rate at similar levels, this effect decreases to lower levels for the service sector.

Another study is carried out for changes in 17 different sector indexes within the NYSE, AMEX and NASDAQ equity share indexes. In this study, the effects of inflation, expected inflation and unexpected inflation on equity share indexes of the related sectors are tried to be explained by using the data between 1928 and 2008. It is revealed that the above-mentioned inflation data can cause different results for all sectors. It is stated that while inflation and expected inflation have a negative effect on the financial company equity share index, unexpected inflation has a positive effect on stock returns. In the study, it is observed that only 5 sectors, including the financial sector, are negatively affected by the change in inflation. Although the oil industry is considered to be the sector with the highest positive effect, it is determined that the residual 12 sectors are affected positively by inflation with medium ratio (Antwerpen, 2010).

Omağ (2009), in his study for the Turkish equity share market, focuses on the effects of long-term interest rates, inflation and money supply (M1) on the ISE National 100 Index and financial indexes in which banks are also included. It is stated that both the National 100 Index and the financial index act in parallel with

the money supply and inflation, while they change in the opposite direction with interest rates. Accordingly, it is revealed that while one-unit increase in inflation and money supply leads to increases of 2,422 and 22,187 units on the financial index, one-unit increase in long-term interest rates causes a decrease of 2,297 units. Considering the high weight of banks in the index, it is not surprising that these values are quite close to the changes in the National 100 index. Although it is emphasized that the increase in inflation may have a negative effect on the equity share indexes, the situation mentioned above, is explained with the inflation and positive effects of increase in the company's profits, cash flows and profit shares on the equity share indexes.

Choi, Elyasian and Kopecky (1992) analyze the exchange rates for international currencies and returns of bank shares in the study concentrated on the largest 48 American bank. This study especially examines to what extent the American banks, which have a net foreign exchange position after the 1970s, are affected by the changes in the exchange rates. According to that it is revealed that there is a negative relationship between exchange rates and returns of bank shares until October 1979, but this relationship turns into positive after that time. The decline in net position of the major foreign currencies held by banks in the 1980s is indicated as the reason for this situation. According to the same study, there is a strong positive relationship between the changes in interest rates and stock returns after 1979. This situation is tried to be explained with the negative trend in the short-term loan positions of banks. What we can understand from the study is that changes in equity share prices of banks are explained by changes in balance sheet structures of banks rather than changes in interest rates and exchange rates in USA.

Atindéhou and Gueyie (2001) survey the impact of exchange rate changes on the stock returns of banks in Canada. It is determined that, the value increase in Canadian Dollar has a significant and positive effect on the stock returns of Canadian banks. This study has an importance due to showing the negative

correlation between exchange rate of USD and stock returns in Canada which is one of the developed countries and also a member of North American Free Trade Agreement (NAFTA). This relationship is explained by the negative impact of foreign exchange position deficits of Canadian Banks and the investors' approach to the US Dollar exchange rate as an alternative investment instrument.

Ewing (2002) explores the NASDAQ Financial 100 Index's response to macroeconomic developments. It has been observed that while inflation shocks have a significant negative impact which started to show its effect in the first period, the monetary policy shocks have a negative impact on the financial sector index especially since the second month. It is demonstrated that unexpected developments in economic growth have a positive effect on the index. The study is highly valuable since it is based on a direct financial index in a highly developed and complex market like in the USA. It is also significant in terms of having similar results with studies in developing countries including Turkey.

Staub and Tabak (2003) analyze the performances of Brazilian banks such as Banco do Brasil, Unibanco, Itau and Bradesco and the banking index during the 1998 Russian Crisis and the 2002 Argentina Crisis by using the arbitrage pricing model. The Brazilian financial sector, which is greatly affected by the Russian crisis, is hardly ever affected by the 2002 Argentine crisis. According to study, the reason for this is an emergence of predictable economic environment as a result of the implementation of the floating exchange rate regime and inflation-targeted monetary policies. This situation is important due to emphasizing that macroeconomic changes and regulations directly affect the Bank's share performances.

Paul and Mallik (2003) focus on the relationship between the Australian banking and stock returns of financial sector through macroeconomic variables between 1980:Q1 - 1999:Q1. In the study, in which the inflation, interest rate and real

economic growth are considered as independent variables, it is found that inflation does not have a significant effect on performances of bank share, while economic growth has positive and the interest rate has a negative effect.

Tu (2012) examines the effect of inflation, exchange rate, interest rate and money supply (M2) on returns of bank shares in his study concentrated on Chinese banks. According to the study, a positive and also tenuous relationship is found between inflation and money supply (M2) and equity share prices. This situation is explained with the reflection of the increase in the general price level to the equity share prices. It is stated that while exchange rate is the most important variable affecting equity share prices, the value increase in the US Dollar exchange rate causes a decrease in equity share prices. It is also revealed that interest rates, like exchange rate, have a significant negative impact. This situation is explained by the fact that these instruments are considered as alternative investment instruments.

In another study by Meng and Deng (2013), the relationship between interest rate and exchange rate changes with 14 Chinese origin bank shares are discussed. It is stated in the results of the study that exchange rate fluctuations in both public and private banks leads to fluctuations in stock returns due to market risks of Chinese banks. However, no significant relation between the stock returns and interest rate is indicated. It is observed that the interest rate changes, reported by the Central Bank, causes very small changes in bank shares. Another result highlighted in the same study is that changes in interest rates and exchange rates cause different degrees of change in banks. The reason for this is revealed as the different balance sheet structures of the banks and especially the differences between public and private banks.

Narayan, Narayan and Singh (2014) question the relationship between the equity share prices of 13 large Indian banks and the interest rate, exchange rate and economic activity by using Granger Causality Test. The results of the study show

that while short-term interest rates have a negative effect on equity share prices, exchange rate and industrial production have a positive effect. In the study, it is observed that while industrial production has the most significant effect on equity share prices, the exchange rate also has positive effect even if the opposite relation was asserted in many other studies. This situation is explained with the decrease in the exchange rate which make equity share prices more expensive for foreign investors and it is resulted with the decrease in the demand.

Ali, Bashir, Ahmed, Ishaq and Shahzad (2018) propound the relationship between bank share prices, economic growth, exchange rate and interest rates in their study on 8 Pakistani banks by using the monthly stock exchange data between the years 2005-2013 with the Granger Causality Test. According to the results of the study, a negative relationship is interrelated between the exchange rate and short-term interest rates with the bank share prices. Moreover, it is determined that bank share data is more sensitive to interest and exchange rates comparing to the general equity share market.

Yuksel and Yuksel (2013) try to explain the relationship between Banking index and inflation through 7 countries including Turkey by using the Granger Causality Test. This study which is based on the Banking Index of Germany, Argentina, United States, Austria, Israel, Hungary and Turkey, is quite valuable in terms of considering developed markets such as Austria, as well as developing countries such as Turkey and Argentina. According to the analysis, inflation in Germany, Israel, America, Austria and Hungary has no impact on their banking index data. Likewise, no relation between inflation and banking index is found for the case of Turkey. The study is significant in terms of showing that there is no relationship between inflation and banking index in both developing and developed countries.

Albeni and Demir (2005) state that the equity shares react very rapidly to economic developments, since they are the riskiest investment instruments in the capital

market. In this study, it is aimed to determine the macroeconomic factors affecting the prices of financial sector shares traded in Borsa Istanbul. In the study, the data between 1991-2000 period is considered according to the Least Squares Method and variables such as inflation, private and public investments, GDP growth rates, public expenditures, exchange rates, treasury bond interest rates, savings deposit interest rates, gold prices, international portfolio investments, M2 money supply are evaluated. As a result of the study, it is seen that deposit interest rates, Republican gold, international portfolio investments and the German Mark affected the financial sector share prices. It is indicated that 1% increase in deposit interest rates results in a 2% decrease in financial sector share prices. According to that, incremental interest rates encourage alternative investments instead of investing in financial sector shares. It is thought that investors will sell off their equity shares in order not to make a loss due to the fear of the decline in the financial sector equity share prices due to the rise in interest rates. In addition to that, the 1% increase in the German Mark results in a decrease of 3,427% on the financial sector index. The negative relationship between the two of them is determined as normal because exchange and equity share are seen as alternative to each other.

Özün and Çifter (2006) emphasize that while banks have a leading role in the Turkish equity share market due to high transaction volumes and consistence with corporate governance principles, they are sensitive to macroeconomic changes due to their balance sheet structure. In this study, the relationship between the Banking Index and the daily changes of government domestic debt securities at benchmark interest rates are analyzed by using Wavelet Analysis and Granger Causality Test. According to the study, it is determined that the change in interest rates have an impact on the Banking Index up to 16 days, it is ineffective between 16-63 days and then it is effective again after the 64th day. The interaction reaches its highest point between the days of 64-128.

However, in the study, it is emphasized that the chaotic structure observed in developing countries causes investors to have risk-loving, irrational and non-linear behaviors. It is also underlined that, unlike developed markets, the analysis of the factors determining the stock returns of banks through linear econometrics models often does not provide an effective result. In the same study, it is indicated that using wavelet analysis is more appropriate than arbitrage pricing model in countries such as Turkey due to the reasons mentioned above.

Demir and Göçmen Yağcılar (2009) examine the monthly returns of the 13 banks (Akbank, Alternatif Bank, Fortis, Finansbank, T. Garanti Bankası, T. İş Bankası, Şekerbank, Tekstilbank, Türk Ekonomi Bankası, Türkiye Kalkınma Bankası, Türkiye Sınai Kalkınma Bankası, Yapı Kredi Bankası ve Denizbank) traded on the ISE by using the Arbitrage Pricing Theory between the years 2000 and 2006. In the study, the relationship between ISE-100 Index, foreign exchange basket, capacity utilization rate, treasury bond interest rate, money supply, industrial production index, GDP growth rates, current account balance, change in loan interest rates, gold prices and bank share prices are tried to be revealed. According to this, the effect of ISE-100 Index on bank shares is the most influential one and also this effect is stated as positive.

In addition, it is claimed that the expected negative relationship between the treasury bond interest rate and stock returns is partially existed. However, negative relationship, which is theoretically expected, between exchange rate and stock returns could not be seen, on the contrary some positive relations are observed. This situation is interpreted as the fact that both the treasury bonds and the exchange rate are not seen as an alternative to the equity share market by investors. In the study, no relationship between GDP growth rates and bank stock returns are discovered.

There is a negative and strong relationship between exchange rate changes, interest rate changes and stock returns according to the study of Kasman, Vardar and Tunç

(2011), which explains the relationship between the stock returns of Turkish banks, interest rates and exchange rates by using the OLS and GARCH estimation model. It is emphasized that it will be appropriate for investors to follow their monetary policy closely and to lead their investments according to the changes in interest and exchange rates and accordingly for bank managers to shape the risk management.

The Multiple Linear Regression model is used in the study of Özkul and Akgüneş (2015) which analysis the effects of macroeconomic variables on BIST 10 Bank Return Index. In the study, data from the period 2010:01 - 2014:07 of 10 different variables including BIST-100 Index, inflation, interest rate, exchange rate and industrial production index are used. According to the results of the study, BIST-100 index is determined as the most effective variable. It is seen that one unit increase in the BIST-100 index causes 1,928671-unit increase in the BIST 10 Bank index. The situation is not surprising since there are 9 banks in the BIST-10 index from the BIST-100 index. It is tried to be explained with the shift in demand to other firms due to the increase in money supply in the study which indicates that money supply (M1) has a negative effect.

In the same study, it is stated that the industrial production index and exports have a negative effect on BIST 10 Bank index, while this situation is explained with the increase in the demand for the shares of manufacturing firms and exporting firms. Contrary to many studies in the literature, it is determined that the exchange rate, interest rate and inflation do not have any effect on BIST 10 Bank index. This situation, which contradicts with the literature, is tried to be explained by the lack of big changes, which may cause the investors to change their preferences, in the data subject to the research period.

In the study of Kendirli and Cankaya (2016), the relationship between exchange rate, CPI and Borsa Istanbul Banking Index data of 2009:Q1 - 2015:Q3 is questioned by Johansen Co-integration Test and Granger Causality Test.

Consequently, it is revealed that the exchange rate and inflation rate do not have any effect on equity share prices.

In another recent study by Awwad and Türsoy (2016), the effects of the short-term interest rate between 2002-2013 years and exchange rate on the BIST Banking index of money supply (M2) is examined by using the Impulse Response Function Analysis, Variational Decomposition Analysis, Cointegration and Granger Causality Tests. As a result, it is seen that macro-economic variables have both short- and long-term effects on the index. The long-term effect of macroeconomic variables is proved because the structural changes made after the 2001 crisis led to the successful performance of the Banking Index, even during the 2008 crisis.

When the other results of the study are considered, it is stated that according to Cointegration Test, in long term, there is a negative relationship between short-term interest rate, money supply and exchange rate and Banking Index. Therefore, the one-percent change in money supply and interest rates resulted in decreases of 1.42 and 3.9 percent, respectively. It has similarities with many previous studies since it is stated that changes in interest rates and exchange rates may result in a decrease in investors' interest in the Banking Index. On the other hand, it is mentioned that the increase in money supply has a negative effect because the inflationary results cause ambiguity in the market.

The Granger Causality Test applied in the same study shows that the macroeconomic indicators do not have a significant impact on the Banking Index in 10 periods, on the contrary, the banking index have an explanatory value of 40.07344% in the exchange rate changes.

Saldanlı, Aydın and Bektaş (2017) try to determine the effects of industrial production index, exchange rate and money supply in their study about the equity share prices of 10 banks traded in Borsa İstanbul between the period of 2007: 06 -

2016: 10. According to the study carried out with the Kónya Panel Causality Test, no relation is found between the industrial production index and equity share prices. On the other hand, it is seen that while the exchange rate has an effect only on share prices of ICBC and Akbank, the money supply influences the share price of Garanti Bankası and Akbank.

Contrary to expectations, a positive relationship is ascertained between exchange rate and stock returns. However, it is expected that the increase in the exchange rate may cause a decline in prices by decreasing the demand for equity share which is another alternative investment instrument. This situation is clarified by the fact that it is difficult to explain the relationship between the exchange rate and equity share prices since banks are exposed to exchange rate risk due to their active and passive structures. According to the study mentioned above, a positive correlation is revealed between the stock returns of 11 banks and GDP growth rates. However, it is said that only 3 out of 11 banks have statistically significant results.

The results of the study are found coherent with the expectations because the increase in industrial production and economic growth is expected to increase the investments and volume of the companies and to reflect to the equity share prices. A negative relationship between the interest rate on treasury bond and stock returns of six banks is determined. This situation is explained by the decrease in the attention on the equity share as a result of the increase in the attention on the interest rates of the treasury bond which is seen as an alternative investment instrument.

As a result of the study, it is interpreted that relevant investment instruments are not considered as an alternative instrument for equity share. The reason behind this is that both the exchange rate and the equity share prices, in contrast to the expectations, have a positive correlation, and the interest rates and equity share prices have partially negative correlation. In the study, it is claimed that there is a negative relation between gold prices and equity share prices, therefore only gold

is seen as an alternative investment instrument. Similarly, it is interpreted that relevant data has no significant effect on the bank shares since there is no significant result between the GDP growth rates and the stock returns of only 3 banks.

In the literature, there are not many studies examining the relationship between CDS premiums and stock returns. However, Norden and Weber (2009), in their study concentrated on European companies including banks by using the data from 2000-2002, determine a negative correlation between weekly and monthly stock returns of firms and CDS changes.

A similar study is made by Başarır ve Keten (2016) for 12 developing countries including Turkey too. In this study, the relationship between CDS premiums and equity share index is analyzed. Even no causality relationship is found between CDS and equity shares in the long-term, a bi-directional causality relationship is detected in the short term. Moreover, Hancı, (2014) identifies the inverse relationship between the two variables in the study which examines the relationship between BIST-100 returns and CDS premium.

The raise of CDS premium decreases the attention of foreign investors to investment instruments including direct equity share market and also increases interest rates. As a result, a decline is expected in stock returns, which is seen as an alternative investment instrument and results with the tendency to interest-bearing products.

When many studies on different countries, on different periods and on different market conditions are reviewed, it is observed that changes in equity share prices may differ according to the level of development of countries, complexity of markets and that the relationship between equity share prices and macroeconomic data may shift to positive or negative direction. It is seen that most of the studies claim that there is a negative correlation between exchange rate, interest rate and

equity share market since they are seen as alternative investment instruments to each other. However, there are also studies indicating that there is no significant relationship between exchange rates and stock returns, as in the study of Durukan (1999), or between interest rates and stock returns, as in studies of Kaya Çömlekçi ve Kara (2013), Meng ve Deng (2013) and Ayaydın ve Dağlı (2012). It is stated that both variables have no effect on stock returns in a recent study by Özkul and Akgüneş (2015).

It is seen that the relationship between equity share prices and CSD premiums is negative in the studies for CDS. On the other hand, differences may be observed according to countries and to the level of inflationist or disinflationary environment in the studies on the effect of inflation. In many studies, it is stated that industrial production and GDP growth rates have a positive effect on stock returns. It is noteworthy that, Maysami, Howe and Hamzah (2004) and Özkul and Akgüneş (2015) claim that the increase in industrial production have a negative effect on bank stock returns since manufacturing industry and finance sector are seen as an alternative to each other.

In the following parts of the thesis, while the effects of macroeconomic changes on BIST Banking Index between the years 2002-2017 are tried to be explain, it would not be correct to consider the results of the study separately from the above-mentioned points.

# CHAPTER 3

# DATA AND MODEL

Information about the data set and econometric method used in the following sections will be given.

## 3.1. DATA SET

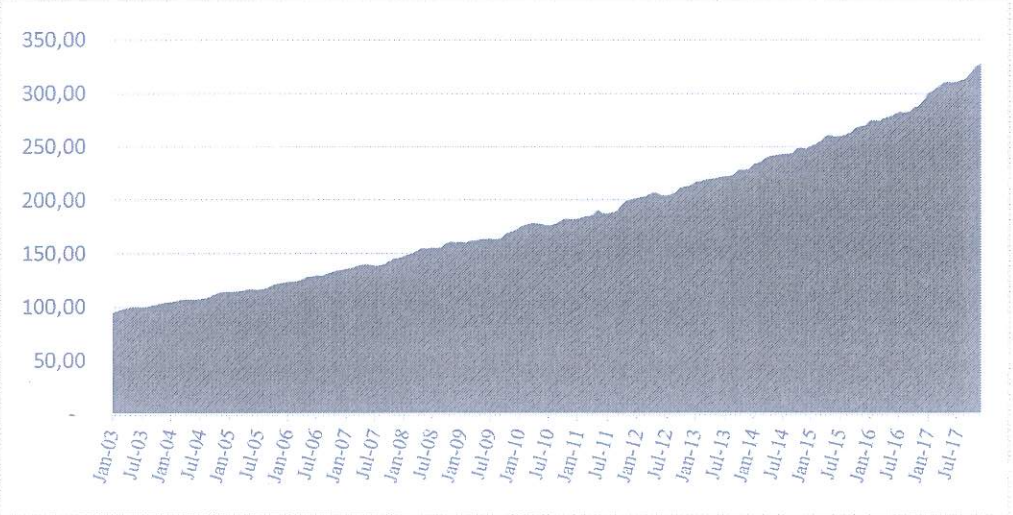
Monthly data between 2003:01 and 2017:12 of BIST Banking Index, consumer price index, industrial production index, Turkey CDS premiums, Treasury 2-year benchmark reel interest rates, the US Dollar/TL exchange rate are taken from Turkey Data Monitor for the analysis. In order to have a better understanding of the changes in the Banking Index, the real banking index data, which are inflation-adjusted are used. In the following parts of the chapter, macroeconomic variables are given respectively.

**Figure 3.1-1: BIST XBANK Index (Real)**


Source: Turkey Data Monitor

It is observed that there is a rapid increase in the BIST Banking Index real values, especially when there is a rapid decline in inflation in the 2003-2005 period. It can be said that this situation continued until 2008 except when the fluctuation happened in 2006, but it had a big decrease with the impact of the 2008 crisis. Even though there was a serious recovery in 2010, it is observed that there was a decline in the demand for bank shares and downward movement in the real values of index even if there were some fluctuations. The reason behind these were the decline in foreign exchange interest, especially the decline in the USD exchange rate, which is seen as an alternative investment instrument, and the impact of political and economic crises.

**Figure 3.1-2: Consumer Price Index**




Source: Turkey Data Monitor

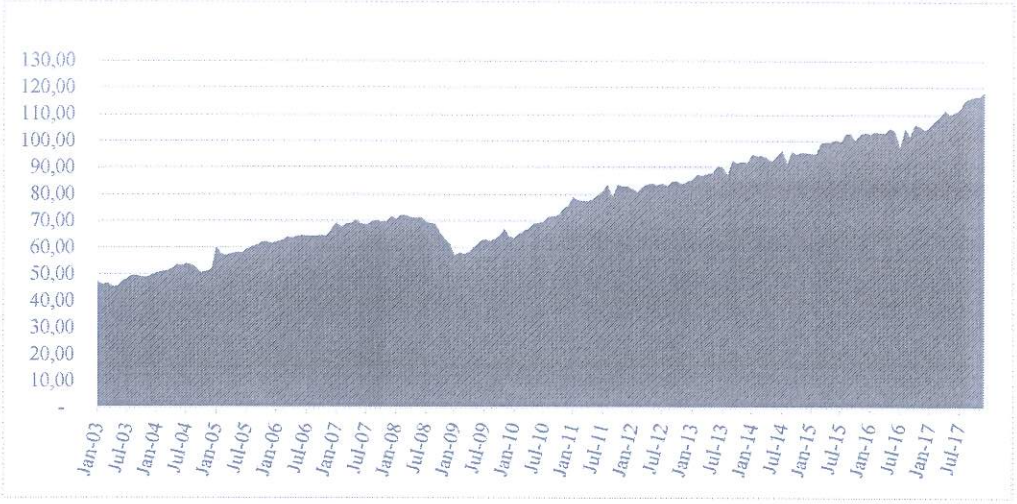
It has been observed that consumer price index, which was averaged as 100 in 2003, have displayed a steady upward trend since the relevant date. It is possible to say that, the increase in the Index was more limited compared to the previous decades due to the decline in consumer inflation in 2003 and beyond but it started to increase in recent years.

**Figure 3.1-3: Real Interest Rates of Turkey Treasury Debt Securities by Years**


Source: Turkey Data Monitor

It is also possible to say that a rapid decline in real interest rates occurred between 2003 and 2005 similarly to the decline in consumer inflation. It is observed that the real interest rates, which were 10% between 2004 and 2008, fell below 5% with the effect of the increase in international money supply following the global crisis in 2008. Especially, some periods between 2010 and 2014 reel interest rate is observed negative.

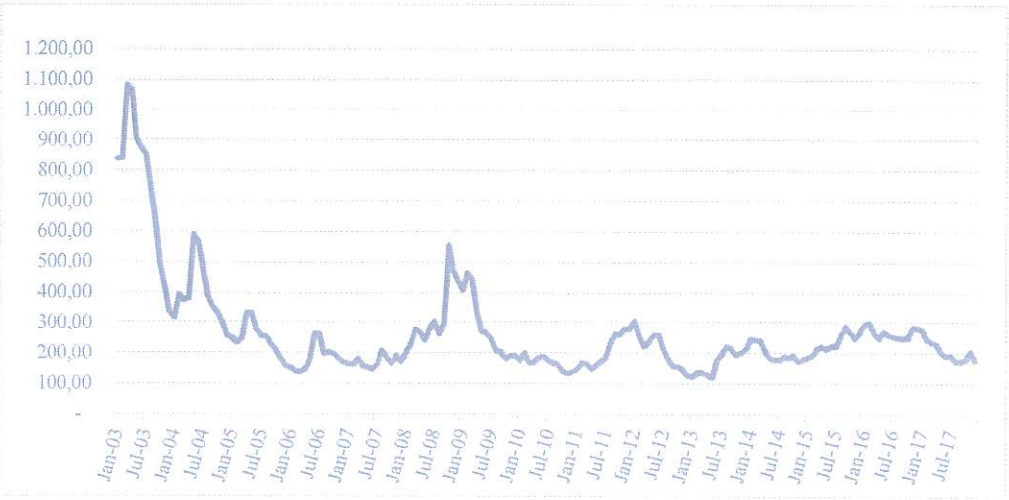
**Figure 3.1-4: Industrial Production Index**




Source: Turkey Data Monitor

In the chart above, industrial production index data which can be considered as one of the indicators for growth are given. The aforementioned Index decreased in parallel with the 4,7% shrink in the economy of Turkey in 2009, afterwards it is observed that there is a tendency to increase with minor fluctuations.

**Figure 3.1-5: Turkey's CDS Premium by Years**




Source: Turkey Data Monitor

It is seen that Turkey CDS premium had a great decline in between 2003-2004 when a rapid improvement in macroeconomic value was seen. However, it increased over the last15-year average in 2008-2009 when economic crisis was effective.

**Figure 3.1-6: US Dollar/TL Exchange Rate by Years**


Source: Turkey Data Monitor

It is observed that there was a slight downward trend in the US Dollar/TL exchange rate except for small fluctuations until the global economic crisis in 2008. It is seen that, the exchange rate shows an upward trend except for small decreases, due to the deceleration of upward trend of exchange rate, especially the deceleration of the monetary expansion by the Federal Reserve Bank (FED), economic and political crisis in Turkey. This upward trend reached a higher level especially in recent years.

## 3.2. ECONOMETRIC MODEL

In this study, the logarithmic values of the real Banking Index, which are adjusted for inflation, are used as dependent variables. The logarithmic values of Consumer Price Index, Turkey CDS premiums, US Dollar/TL exchange rate and Industrial

Production Index with benchmark interest rate of Turkey 2-year Treasury bond debt security are used as independent variables. The monthly values between 2003:01 - 2017:12 for the dependent and independent variables are evaluated by using the Vector Autoregression method.

Let assume $y_t = (y_{1,t}, y_{2,t}, y_{3,t}, y_{4,t}, y_{5,t}, y_{6,t})'$ including the economic condition and the leverage data, then our bi-variate VAR model has the following representation:

$$y_t = \mathrm{c} + \sum_{i=1}^{p} \beta_i y_{t-1} + \varepsilon_t, t = 1,2, \dots, T, \quad (1)$$

where $\beta_i$ is $6x6$ dimensional coefficient matrix and $\varepsilon_t$ is $6x1$ vector of innovations. Lag parameter $p$ is determined according to Akaike Information Criterion (AIC).

There are a few ways to estimate impulse response functions. We use generalized impulse responses (GIRFs) proposed by Pesaran and Shin (1998) as GIRFs are invariant to the ordering of the variables. To estimate the GIRFs, we first express the model as an infinite moving average as follows:

$$y_t = \mathrm{c} + \sum_{i=1}^{\infty} G_i + \varepsilon_{t-1}, t = 1,2, \dots, T, \quad (2)$$

where $6x6$ coefficient matrix $G_i$ satisfying $\beta_1 G_{i-1} + \cdots + \beta_p G_{i-p}$ for $i > 0$; $G_0 = I_2$ and $G_i = 0$ for $i < 0$.

The generalized impulse of $y_t$ to the $j-th$ element of the VAR for a $\delta_j$ size shock at the horizon $h$ is given by:

$$E(y_{t+h}|\varepsilon_{j,t} = \delta_j, \Omega_{t-1}) - E(y_{t+h}|\Omega_{t-1}), \quad (3)$$

where $\Omega_{t-1}$ contains all the information of the economy up to time $t-1$. Assuming $\varepsilon_t$ has a multivariate normal distribution and $\delta_j = \sqrt{\sigma_{j,j}}$, we obtain the impulse response for a one standard deviation shock by,

$$G_h \sum \varepsilon_j \sigma_{j,j}^{-1/2}, h = 0, 1, 2, \ldots, \quad (4)$$

In order to test the results of the Vector Autoregression estimates, the impulse response results of the standard deviation shocks that will appear in the parameters are produced by using the VARs with lags 3, 6, 9 and 12 lags.

Accordingly, it is noted in all studies that a standard deviation shock in the real Banking Index has a decreasing positive effect on the real Banking Index. However, the period in which the impact is significant differs between 8 and 12, this effect is significant for 12 periods in the impulse response study carried out with VAR with 3 lags and VAR with 6 lags.

It is observed that there is a descending negative effect of one-unit standard deviation shock in Turkey CDS premium and US/TL Dollar exchange rate on the real Banking Index. The responses in the real Banking Index are determined as significant for CDS premium until 6th up to 9th periods and significant for exchange rate until 5th up to 7th periods in different studies.

It is revealed that one-unit standard deviation shock in the Treasury real benchmark interest rates have a negative effect on the real Banking Index. Though, negative effect on the real Banking Index is indicated as significant until 2nd period in the study carried out with VAR with 3 lags, VAR with 6 lags and VAR with 12 lags, this effect is significant until 3th period in the study carried out with VAR with 9 lags. Additionally, negative effect recur after 3th period, in the study produced by VAR with 3 lags.

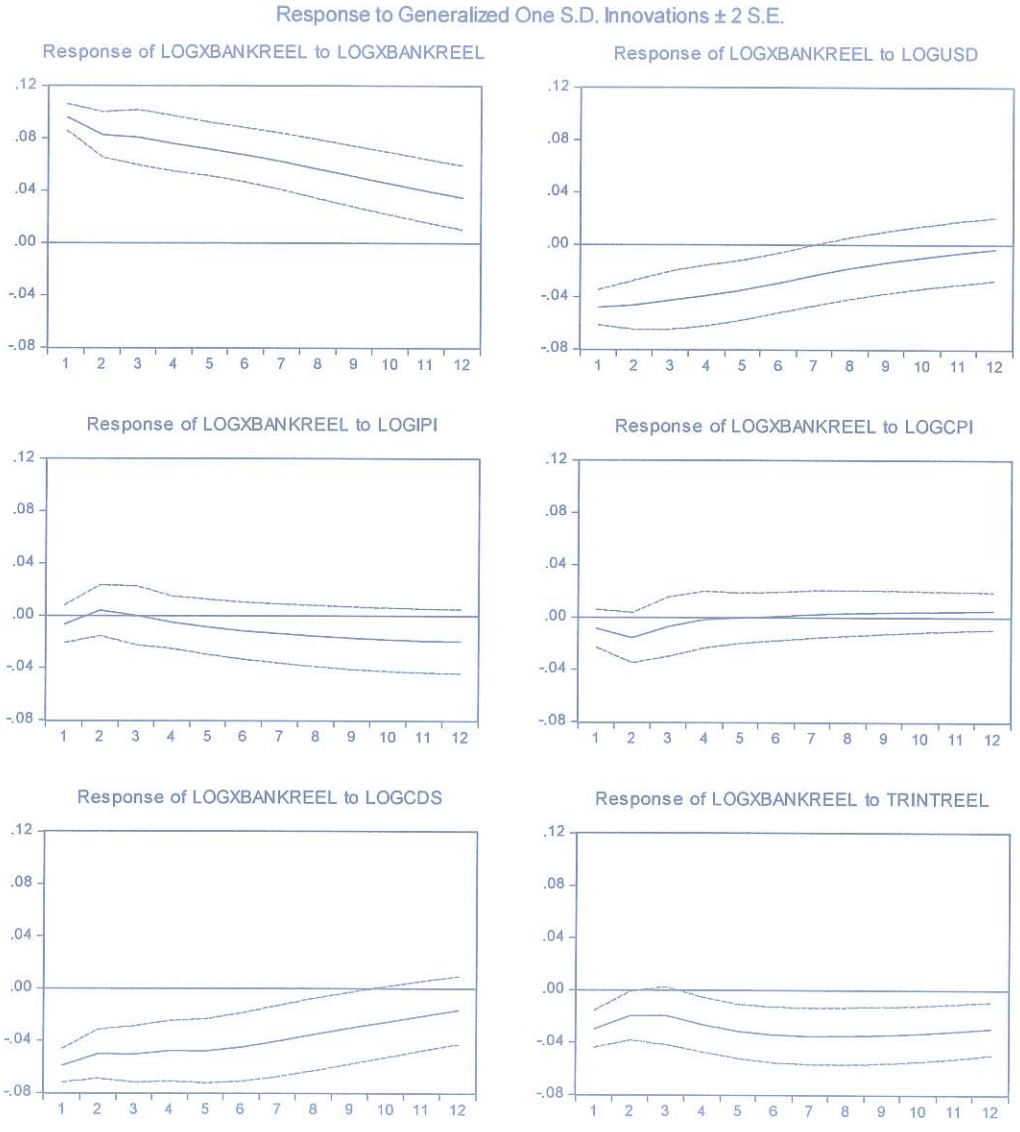
It is seen that one-unit standard deviation shock in the consumer price index does not cause a significant result in the impulse response carried out with VAR with 3 lags. However, it is observed that there is a significant and negative effect in the first 1 or 2 periods in studies carried out with other lags.

Finally, it is seen that the industrial production index does not have any significant impact on the real Banking Index under any circumstances.

Especially, impulse response results of the shock from exchange rate, CDS premium and interest rate have similarity with a large number of studies in literature. However, consumer price index has a limited effect on real Banking Index, industrial production index does not have any significant impact on the Banking Index, according to all impulse response studies with different lags.

While, it is noticed that impulse responses produced by using different lags show similar results considerably, below figures illustrate impulse response of reel Banking Index carried out with different lags. In these figures, LOGXBANKREAL, LOGUSD, LOGIPI, LOGCPI, LOGCDS and TRINTREAL stand for logarithmic values of the Real Banking Index, logarithmic values of Consumer Price Index, logarithmic values of Turkey CDS premiums, logarithmic values of US Dollar/TL Exchange Rate, logarithmic values of Industrial Production Index and Treasury 2-year real benchmark interest rates respectively.

## Figure 3.2-1: VAR(3) Impulse Response Results



## Figure 3.2-2: VAR(6) Impulse Response Results

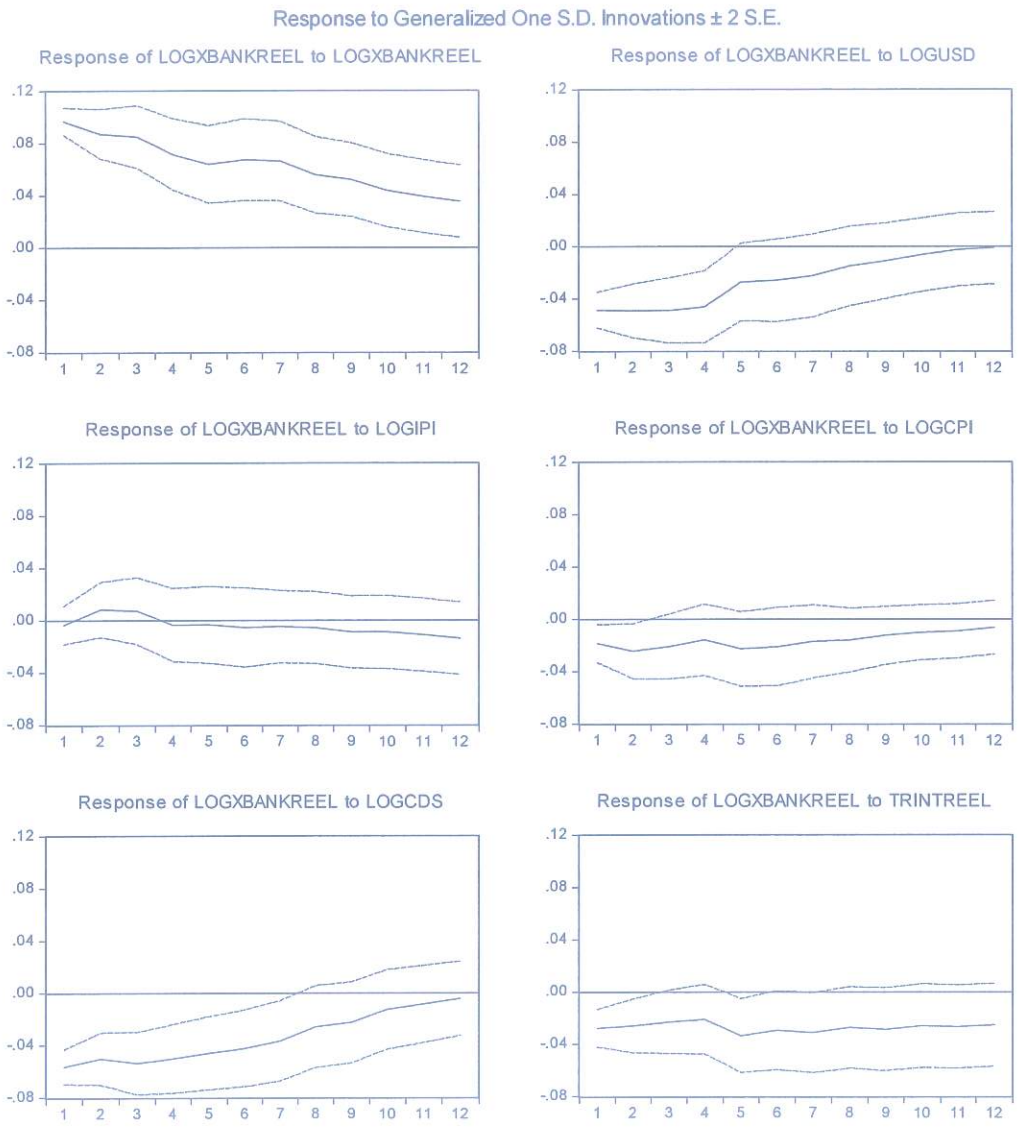
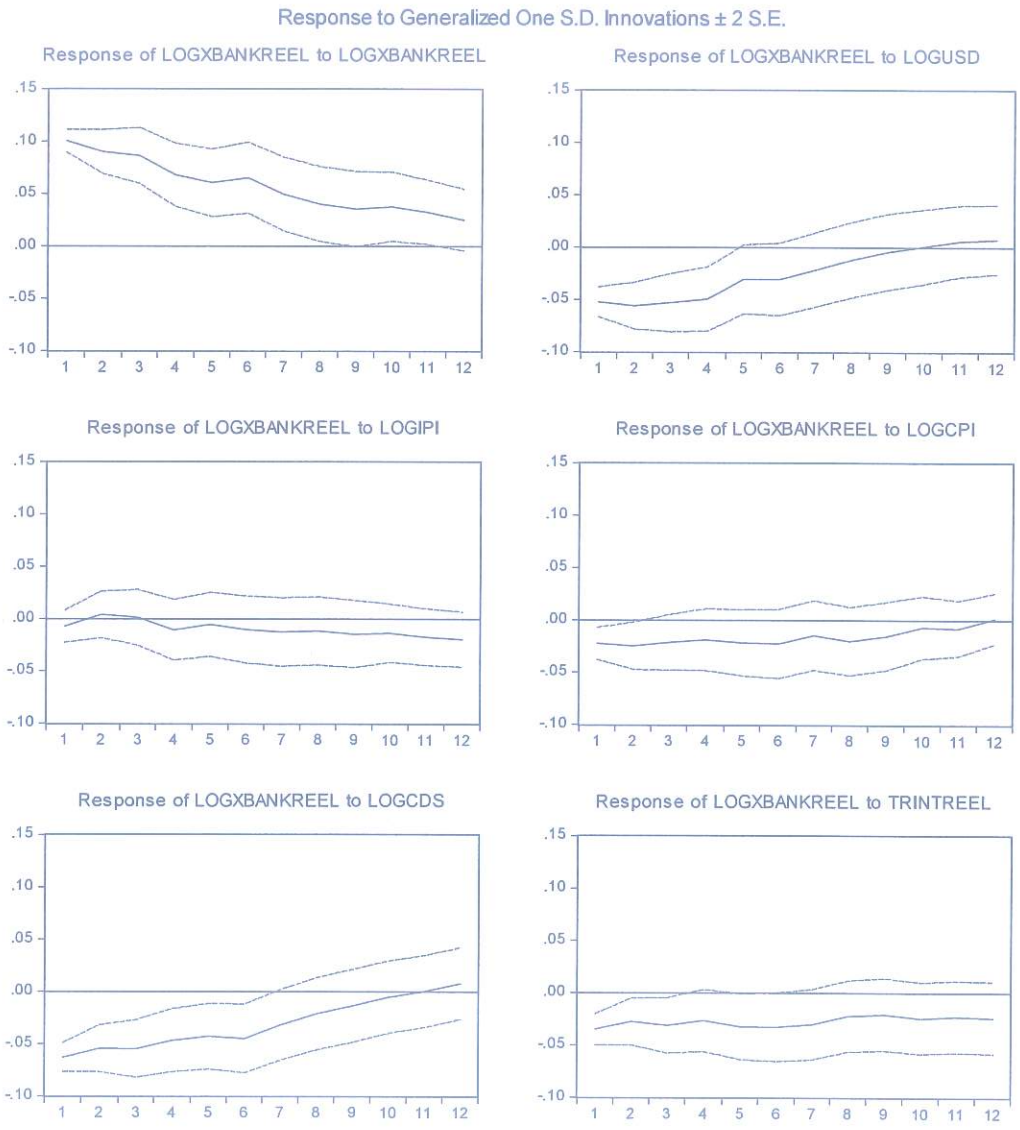
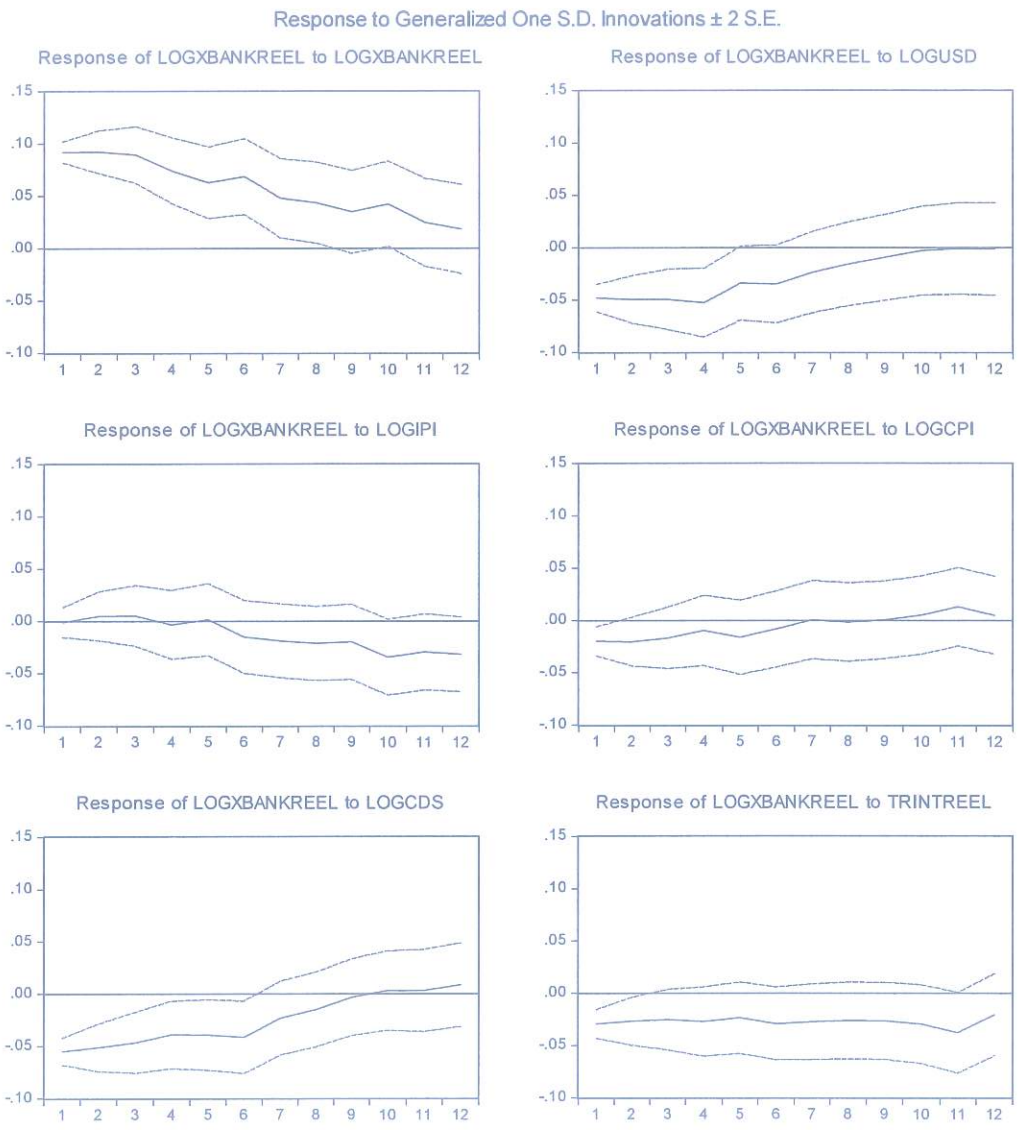


**Figure 3.2-3: VAR(9) Impulse Response Results**



## Figure 3.2-4: VAR(12) Impulse Response Results



# CONCLUSION

Through this study, it is tried to understand to what extent the equity shares performance of the banks, which are both an important part of the economic system and dominant in BIST, are affected by macroeconomic shocks. In this context, literature is reviewed and the effect of changes in US Dollar/TL exchange rate, Turkey CDS premium, consumer price index, Treasury 2-year real interest rate and industrial production index on real Banking Index is examined through the Vector Autoregression model.

As a result of the study, it is revealed that, changes of the US Dollar/TL exchange rate, Turkey CDS premium, Treasury real benchmark interest rates and the consumer price index have a negative and significant effect on the real Banking Index with different length periods. However, exchange rate and CDS premium have a significant impact on the reel Banking Index for a longer period than Treasury real benchmark interest rates.

When the literature is considered, negative impact of interest rate and US Dollar/TL exchange rate variables on real Banking index is among the expected results. Particularly, it is normal for the increases in these variables to decrease the tendency in the stock market and thus to decrease the equity share prices of the companies since the aforementioned tools are considered as alternative investment instruments for the equity share market.

The increase in country's risk leads to an increase in the country's CDS premium. It causes a decrease in the foreign investments to Turkey. Therefore, the impact on the equity share market, where there are many foreign investors, is among the expected results.

There are many studies in the literature that provide different results for effects of changes in consumer price index and industrial production index on the equity share market. However, in this study it is observed that changes in the consumer price index may have a negative impact on the real Banking Index. Yet, it is seen that this impact is significant for short-term periods. It is also revealed that changes in the industrial production index have no significant effect on the real Banking Index.

Consequently, it is thought that, especially the negative effect of the US Dollar/TL exchange rate, real benchmark interest rate and CDS premium variables on the real Banking Index is clearly expressed in this study. It should be also noted that, more detailed studies on the consumer price index and industrial production index and testing their results will be useful.

## REFERENCES


- Abreu, M. and Mendes, V. (2001). Commercial bank interest margins and profitability: Evidence for some EU countries, *Pan-European conference jointly organised by the IEFS-UK & University of Macedonia Economic & Social Sciences Thessaloniki, Greece,* (pp. 17-20).
- Akçoraoğlu, A. and Yurdakul, F. (2002), Global faktörler ve hisse senedi getirileri: istanbul menkul kıymetler borsası'na ilişkin amprik kanıtlar. *İMKB Dergisi, 6*(21), 1-20.
- Aktaş, M. and Akdağ, S. (2013). Türkiye'de Ekonomik faktörlerin hisse senedi fiyatları ile ilişkilerinin araştırılması. *International Journal Social Science Research, 2*(2), 0-67.
- Albeni, M. and Demir, Y. (2005). Makro ekonomik göstergelerin mali sektör hisse senedi fiyatlarına etkisi (İMKB uygulamalı). *Muğla Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 14*, 1-18.
- Ali, S., Bashir, T., Ahmed, T., Ishaq, A. and Shahzad, S. J. H. (2018). The determinants of bank stock prices: a panel approach. *South Asian Journal of Management Sciences, 12(2)*, 116–129.
- Al-Sharkas, A. (2004). The dynamic relationship between macroeconomic faktors and the Jordanian stock market. *International Journal of Applied Econometrics and Quantitative Studies, 1(1)*, 94-114.
- Antwerpen, D. V. (2010). Hedging inflation by selecting stock industries. *thesis Erasmus School of Economics*, 1-30.
- Athanasoglou, P., Brissimis, S. and Delis, M. (2005). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Working Paper No:25, Bank of Greece, 1-35.
- Atindéhou, R. and Gueyie, J. (2001). Canadian Chartered Banks' stock returns and exchange rate risk. *Management Decision, 39(4)*, 285-295.

- Awwad, T. A. and Türsoy, T. (2016). The effects of macroeconomic variables on the banking sector ındex: evidence from Turkish stock market. *Sosyal Bilimler Dergisi, 9(1)*, 168-190.
- Ayaydın, H. and Dağlı, H. (2012). Gelişen piyasalarda hisse senedi getirisini etkileyen makro ekonomik değişkenler üzerine bir inceleme: panel veri analizi, *Atatürk Üniversitesi iktisadi ve İdari Bilimler Dergisi, 26(3-4)*, 45-65.
- Aydemir, O. and Demirhan, E. (2009). The relationship between stock prices and exchange rates: evidence from Turkey, *International Research Journal of Finance and Economics, 23*, 207-215.
- Aydın, N. (2006). Bankacılık uygulamaları. *Anadolu Üniversitesi Yayınları,* 13-30.
- Bae, S. C. (1990). Interest rate changes and common stock returns of financial ınstitutions: revisited. *The Journal of Financial Research, 13*(1), 71-79.
- Başarır, Ç. and Keten, M. (2016). Gelişmekte olan ülkelerin CDS primleri ile hisse senetleri ve döviz kurları arasındaki kointegrasyon ilişkisi. *Mehmet Akif Ersoy Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 6*(15), 369-380.
- Bozkurt, İ. (2015). Finansal istikrar ile cds primleri arasındaki ilişkinin bulanık regresyon analizi ile tespiti: Türkiye örneği. *Gümüşhane Üniversitesi Sosyal Bilimler Elektronik Dergisi, 6*(13), 64-80.
- Choi, J.J., E. Elyasian and Kopecky, K.J. (1992). The sensitivity of bank stock returns to market, interest, and exchange rate risks. *Journal of Banking and Finance, 16*, 983-1004.
- Danacı, M. C., Şit, M. and Şit, A. (2017). Kredi temerrüt swaplarının (cds'lerin) büyüme oranıyla ilişkilendirilmesi: Türkiye örneği. *Aksaray Üniversitesi İktisadi ve İdari Bilimler Fakültesi, 9*(2), 67-78.
- Değer, A. and Anbar, A. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Turkey. *Business and Economics Research Journal, 2*(2), 139-152.

- Demir, Y. and Göçmen Yağcılar, G. (2009). İMKB'de işlem gören banka hisse senetlerinin getirilerini etkileyen faktörlerin arbitraj fiyatlama modeli ile belirlenmesi. *Alanya İşletme Fakültesi Dergisi 1*(2), 36-51.
- Demirgüç-Kunt, A. and Huizinga, H. (1999) Determinants of commercial bank ınterest margins and profitability: some ınternational evidence. *The World Bank Economic Review, 13*(2), 379,408.
- Dizdarlar, H. I. and Derindere, S. (2008). Hisse senedi endeksini etkileyen faktörler: İMKB 100 endeksini etkileyen makroekonomik göstergeler üzerine bir araştırma, *Yönetim Dergisi, 61*, 113-124.
- Dritsaki, M. (2005). Linkage between stock market and macroeconomic fundamentals: case study of Athens Stock Exchange. *Journal of Financial Management & Analysis, 18*(1), 38-47.
- Durukan, M. B. (1999). İstanbul Menkul Kıymetler Borsası'nda makroekonomik değişkenlerin hisse senedi fiyatlarına etkisi. *İMKB Dergisi, 3*(11), 19-47.
- Ewing, B. T. (2002) Macroeconomic news and the returns of financial companies. *Managerial and Decision Economics, 23*, 439-446.
- Gay, Jr. R. D. (2008). Effect of macroeconomic variables on stock market returns for four emerging economies: Brazil, Russia, India, and China. *International Business & Economics Research Journal, 7*(3), 119-126
- Gençtürk M. (2009). Finansal kriz dönemlerinde makroekonomik faktörlerin hisse senedi fiyatlarına etkisi. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 14*(1), 127-136.
- Han, B. and Zhou, Y. (2015). Understanding the term structure of credit default swap spreads. *Journal of Empirical Finance, 31*, 18–35.
- Hancı, G. (2014). Kredi temerrüt takasları ve BİST-100 arasındaki ilişkinin incelenmesi. *Maliye Finans Yazıları, 28*(102), 1-22.
- Hsing, Y. (2011). Macroeconomic determinants of the stock market index and policy implications: the case of a Central European Country. *Eurasian Journal of Business and Economics, 4*(7), 1-11.

- Işık, O. (2012). Hukuki açıdan borsa ve borsa türleri. *Yalova Üniversitesi Hukuk Fakültesi Dergisi, 2012*(1), 215-258.
- Kasman, S., Vardar, G. and Tunç, G. (2011). The impact of interest rate and exchange rate volatility on banks' stock returns and volatility: evidence from Turkey. *Economic Modelling, 28*(3), 1328-1334.
- Kaya, V., Çömlekçi, İ. and Kara, O. (2013). Hisse senedi getirilerini etkileyen makroekonomik değişkenler 2002-2012 Türkiye örneği. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, 35*, 167-176.
- Kendirli, S. and Çankaya, M. (2016). Döviz kuru ve enflasyonun BİST Banka Endeksi üzerindeki etkisi. *MANAS Sosyal Araştırma Dergisi, 5*(3), 215-227.
- Keskin, E. et al. (2008). 50. yılında Türkiye Bankalar Birliği ve Türkiye'de bankacılık sistemi "1958-2007", Working Paper No: 262, Türkiye Bankalar Birliği, 1-293.
- Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance, 34*(3), 146-159.
- Laidler, D. and Parkin, M. (1975). Inflation: A survey. *The Economic Journal, 85*, 741–809.
- Liu, M. and Shrestha, K., B. (2008). analysis of the long-term relationship between macroeconomic variables and the Chinese Stock Market using heteroscedastic cointegration. *Managerial Finance, 34*(11), 744-755.
- Maysami, R. C., Howe L. C. and Hamzah M. A. (2004). Relationship between macroeconomic variables and stock market indices: cointegration evidence from stock exchange of Singapore's all sector indices. *Jurnal Pengurusan, 24*, 47-77.
- Meng, X. and Deng, X. (2013). Interest rate and foreign exchange sensitivity of bank stock returns: evidence from China. *Multinational Finance Journal, 17*, 77-106.
- Narayan, P., Narayan, S. and Singh, H. (2014). The determinants of stock prices: new evidence from the Indian banking sector. *Emerging Markets Finance and Trade, 50*(2), 5-15.

- Neely, M. C. and Wheelock, D. C. (1997). Why does bank performance vary across states?. *Federal Reserve Bank of St. Louis Review, March/April 1997*, 27-40.
- Norden, L. and Weber, M. (2009). The co-movement of credit default swap, bond and stock markets: an empirical analysis. *European Financial Management, 15*(3), 529-562.
- Omağ, A. (2009). Türkiye'de 1991-2006 döneminde makroekonomik değişkenlerin hisse senedi fiyatlarına etkisi. *Öneri Dergisi, 8*(32), 283-288.
- Özkul, G. and Akgüneş, A. O. (2015). Makro ekonomik faktörlerin bankacılık sektörü getirileri üzerine etkisi: Borsa İstanbul örneği. *İşletme Araştırmaları Dergisi, 7*(4), 272-298.
- Özün, A. and ÇİFTER, A. (2006). Bankaların hisse senedi getirilerinde faiz oranı riski: dalgacıklar analizi ile Türk bankacılık sektörü üzerine bir uygulama. *Bankacılar Dergisi, 59*, 4-15.
- Paul, S. and Mallik, G. (2003). Macroeconomic factors and bank and finance stock prices: The Australian experience. *Economic Analysis and Policy, 33*(1), 23-30.
- Pesaran, M. H. and Shin, Y. (1998). Generalized Impulse Response Analysis in Linear Multivariate Models. *Economics Letters, 58*(1), 17-29.
- Saldanlı, A., Aydın, M. and Bektaş, H. (2017). The determinants of stock prices: Evidence from the Turkish banking sector. *Theoretical and Applied Economics, 22*(1), 181– 188.
- Savaş, İ. and Can, İ. (2011). Euro-Dolar paritesi ve reel döviz kuru'nun İMKB 100 Endeksi'ne etkisi. *Eskişehir Osmangazi Üniversitesi İİBF Dergisi, 6*(11), 323-339.
- Sayılgan, G. and Süslü, C. (2011). Makro Ekonomik Faktörlerin Hisse senedi Getirilerine Etkisi: Türkiye ve gelişmekte olan piyasalar üzerine bir inceleme, *BDDK Bankacılık ve Finansal Piyasalar, 5*(1), 73-96.
- Staub, R. B. and Tabak, B. M. (2003). Assessing financial instability: The case of Brazil. *Research in International Business and Finance, 21*, 188-202.

- Sümer, G. (2016). Türk bankacilik sektörünün tarihsel gelişimi ve AB bankacılık sektörü ile karşılaştırılması. *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 18*(2), 485-508.
- Taşkın Dilvin, F. (2011). Türkiye'de ticari bankaların performansını etkileyen faktörler. *Ege Akademik Bakış, 2*, 289-299.
- Tu, L. (2012). The impact of macro-economic factors on banking industry stock return in China. *University of the Thai Chamber of Commerce, Master Thesis*, 1-74.
- Wongbangpo, P. and Sharma, S.C. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 Countries. *Journal of Asian Economics, 13*, 27-51.
- Yurttançıkmaz, Z. Ç. (2012). Döviz kuru ve enflasyonun hisse senedi getirileri üzerindeki etkisi. *Ekev Academic Review, 16*(51), 393-410.
- Yüksel, A. and Yüksel, A. (2013). Bankacılık sektörü hisse senedi endeksi ile enflasyon arasındaki ilişki: yedi ülke örneği. yönetim ve ekonomi. *Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 20*(2), 37-50.
- Zügül, M. and Şahin, C. (2009). İMKB 100 Endeksi ile bazı makroekonomik değişkenler arasındaki ilişkiyi incelemeye yönelik bir uygulama. *Akademik Bakış, 16*, 1-16.