T.C. BAHÇEŞEHİR UNIVERSITY

HOW THE FOREIGN INTEREST RATES AFFECT THE BORSA ISTANBUL STOCK EXCHANGE MARKET

Master's Thesis

AHMAD SAYEED AMIRI

İSTANBUL, 2019

T.C. BAHÇEŞEHİR UNIVERSITY

THE GRADUATE SCHOOL OF SOCIAL SCIENCES
MASTER OF CAPITAL MARKET AND FINANCE

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INSTITUTE OF SOCIAL SCIENCES

CAPITAL MARKET AND FINANCE MASTER'S PROGRAM

Title Of The Thesis: HOW THE FOREING INTEREST RATES AFFECT THE BORSA ISTANBUL STOCK EXCHANGE MARKET

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Thesis Defence Day : 24.05.2019

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ACKNOWLEDGEMENTS

ABSTRACT

HOW THE FOREING INTEREST RATES AFFECT THE BORSA
ISTANBUL STOCK EXCHANGE MARKET

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Master of Capital Market & Finance

Thesis Supervisor: Ph. D. Kaan İrfan Öğüt

May 2019, 63 pages

The impact of the foreign interest rates on the stock markets falls in the category of the widely discussed topics in the financial literature. The research focuses specifically on the impact of the foreign (US) interest rates on the Borsa Istanbul Stock Exchange Market. The period selected for the research ranges between 1998 and 2019. The methods utilized in the research are VAR analysis and causality test. Although results of the analysis haven't provided sufficient evidence to support the hypothesis regarding impact of the foreign interest rates on the Borsa Istanbul Stock Exchange Market, they have displayed an interaction between equity inflow to stock market and the change in stock exchange market index. Research can be improved by adding new factors like global money supply.

Key Words: Interest Rates, Borsa, Istanbul Stock Market, VAR, Causality.

ÖZET

YABANCI FAİZ ORANLARININ BORSA İSTANBUL PİYASASINI NASIL ETKİLİYOR

Ahmad Sayeed Amiri

Sermaye Piyasaları ve Finans Programı

Tez Danışmanı: Ph. D. Kaan İrfan Öğüt

Mayıs 2019, 63 sayfa

Yabancı faiz oranlarının borsalar üzerindeki etkisi finansal literatürde geniş biçimde tartışılan konular kategorisinde yer almaktadır. Araştırma, özellikle ABD faiz oranlarının Borsa İstanbul Menkul Kıymetler Borsası'na etkisi üzerine odaklanmaktadır. Araştırma için seçilen dönem, 1998 ile 2019 arasıdır. Araştırmada VAR analizi ve nedensellik testi kullanılmıştır. Analizin sonuçları, ABD faiz oranlarının, Borsa İstanbul Menkul Kıymetler Borsası hisse senedi fiyatları endeksi üzerinde etkili olduğu hipotezini destekleyecek yeterli kanıt sağlamamış olsa da hisse senedi piyasasına gelen yabancı sermaye akımları ile hisse senedi getirisi arasındaki karşılıklı etkileşimi göstermekte başarılı olmuştur. Araştırma faiz oranlarının yanı sıra hisse senedi piyasasını etkileme potansiyeline sahip küresel para arzı gibi faktörlerin de dahil edilmesiyle geliştirilebilir.

Anahtar Kelimeler: Faiz Oranları, İstanbul Menkul Kıymetler Borsası, VAR, Nedensellik

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ABBREVIATIONS

LIBOR	:	London Interbank Offer Rate
BIST 100	:	Borsa Istanbul
VAR	:	Vector Autoregressive Model
GDP	:	Gross Domestic Product
ADF	:	Augment Dicky Fuller
ECB	:	European Central Bank

1. INTRODUCTION

The introductory chapter of the dissertation includes the aims and objectives of the study along with background and rationale of the study. The effects of foreign interest rates on the stock markets of Turkey are essential for the research. However, at first there is a need to analyze why interest rates affect the economy and stock market of a country or a city. All other factors are equal and the country's highest interest rate increases the value of the national currency compared to countries with lower interest rates. However, these simple and linear calculations are rare in foreign currencies. Although interest rate differences constitute an important factor affecting exchange rates, the final currency rate depends on a wide range of the additional factors reflecting economic conditions in other countries (Suriani et al 2015, pp. 385-388).

In general, higher interest rates increase the value of the national currency. The higher interest rates tend to attract foreign investment, which increases the demand and value of the country of origin. However, lower interest rates tend to be insufficient for foreign investment and reduce the relative value of money. Many other factors that affect the value of money and exchange rates make this simple event more difficult. One of the most important problems is the relationship between the high interest rates and inflation. Expansionary monetary policy implies the lower interest rate and the higher levels of the inflation rates to support spending (Abdallah 2016, pp. 153-163)

The interest rate is a crucial component of the monetary policy. The two other factors are political and economic stability, as well as the levels of demand for goods and services in the country. These factors are commonly essential from the standpoint of their impact on the interest rates. The factors such as the country's trade balance between imports and exports can be decisive in determining monetary value. Such a tendency stems from the fact that the increased demand for products in the country also means an increase in demand for the national currency. The vital data, such as GDP and current accounts, are also important values that experts and investors are considering when assessing a particular currency. Another important factor is the government debt

ratio. Despite the management of short-term bonds, high indebtedness led to an increase in inflation and ultimately led to an official exchange rate (Aduda, Chogii and Murayi pp.141-159). This is the reason that in this research the researcher will analyze the effects of foreign interest Rates affects the Borsa Istanbul Stock Exchange Market. In this regard, the research uses quantitative methodology where the existing literature and trends will be a part of the assessment. A consistent mixture of current and past study constitute the research (Abraham 2016, pp.111-123).

1.1 BACKGROUND

The previous research literature seeks definition of the market share of the concept of ownership and statistical considerations. In terms of pricing, stock market adjustments require definition as the investors in one country can buy and sell shares in another country without restriction and similar stocks have the same price, when share prices are valued at the exchange rate. The currency of Turkey depends on the wide range of factors. These measures have the same risks and profitability in terms of profit and investment risk. For statistical reasons, if two equity markets have a long-term equilibrium ratio and the price trends are the same, they are combined (Suriani et al 2015, pp.385-388). Ma and Kao (1990) show the relationship between the two countries' stocks with the use of a model of asset structure in which the portfolio consists of only two types of stocks, namely the Domestic Shares and the Foreign Shares. The model design shows the relationship between the purchase price and the exchange rate. However, according to the wording, it is possible to utilize the model for explaining the positive relationship between domestic and foreign stocks. At the same time, the exchange rate depends on the prices of domestic shares from current exports or imports. With the dominance of exports, the appreciation of the domestic currency reduces the competitiveness of the export market, thereby reducing domestic stocks. However, in case the value of imports prevails over the value of exports, the exchange rate reflects the trade balance deficit, thereby increasing domestic stock prices (Boachie et al 2016, pp.46-51). The depreciation of the domestic currency implies adjustment of the stock prices for the inflation that commonly follows the depreciation.

In an integrated global economy, the consistency of the real interest rate is an indicator of financial integration. Thus, the impact of interest rates is commonly visible through the fluctuation of the stock prices, potentially resulting from the integration of domestic and foreign money markets. According to the interest rate option theory, the country's nominal interest rate is the sum of the foreign interest rate, the domestic currency exchange rate and the risk premium. The growth of the stock prices may be the direct outcome of the changes in the interest rates, commonly their increase (Aduda, Chogii and Murayi 2014, pp.141-159). When the external interest rate is higher than the domestic interest rate, capital outflow may occur, resulting in the depreciation of the domestic currency. The exchange rate depreciation may increase the export and delivery of goods on the domestic market, which may lead to an increase in domestic products. The constant rise in commodity prices is an indicator of future inflation, which encourages central banks to raise domestic interest rates so that price stability continues. In addition, internal interest rates may increase investment or borrowing costs, which means a drop in investment. Larger investment costs reduce the company's profits and can affect the company's earnings, which causes the company's share price to fall (Boachie et al 2016, pp.46-51). The rising interest rates in the bond markets may cause increase in the stock prices as a response to the rising debt costs for the companies.

Based on the historical evidence, several studies investigate stock market integration. Scientists applying this problem are Arouri and Jawadi (2009) and Rahim and Masih (2016). In addition, the impact of foreign interests on the adaptation of ex-stock exchanges such as Guesm and Teulon (2014) was also a part of the research. Despite growing literature, there has been lack of consensus. Several scientists, such as Chang et al. (2017) reported that there is a link between the two countries' stocks or stocks (Bhuvaneshwari & Ramya 2017, pp.39-45). Others such as Roca and Selvanathan (2001), Gilmore and Mc Manus (2002) and Egert and Kocenda (2005) did not disclose the relationship between the two countries (Abraham 2016, pp.111-123).This difference an outcome of changes in the financial situation of the researcher country, which means that different scientists analyze data from different periods. In addition, most of the studies discussed here focus on their research in industrialized countries, and few have studied developing countries. In addition, in most studies, the aggregate index implies utilization in the form of a stock price index. Only a few studies use certain stock

indices as variables. In addition, the impact of external interests on the integration of Islamic stock markets has been further explored (Aduda, Chogii and Murayi 2014, pp. 141-159).

1.2 AIMS AND OBJECTIVES

The aim of the research is to investigate the effects of the foreign interest rates on the Borsa Istanbul Stock Exchange Market. In this regard following are the objectives of the study:

i. To determine whether the foreign interest rates possess significant effects on the stock market developments in Bosra Istanbul.

ii. To analyze the Relationship between the foreign interest rates and the stock returns within the Borsa Istanbul Stock Exchange Market.

iii. To assess the degree to which the capıtal ınflows can affect the stock market and ıts returns.

1.3 RATIONALE

Borsa Istanbul began operations in 1986. Despite the increase in the number of companies and the total market value, the total value of business in 1999-2000 was relatively low. In 1986, the number of companies was 80, as it increased to 315 in 2000, which is a significant increase in the number of companies. Between 2002 and 2007, the total value subsequently increased, mainly due to the high inflow of foreign capital. In 2007, there were a total of ISK 7 billion, representing 45 percent of Turkey's gross domestic product, with a total value of ITL 335 948 000, representing 59 percent of GDP (WCD, 2007). The majority of the reforms occurred with the purpose of meeting the market demand. EU standards were applicable since 2000. The survey also shows that the Turkish stock market correlated with the world market (Boachie et al 2016, pp. 46-51). Jong and Roon (2001) show that the integration of new capital markets into international markets has had a significant impact on expected equity reporting in emerging markets (Jong and Roon 2001). In subsequent studies, Korkmaz and Çelik (2009) realized that the Turkish stock market had merged with 16 and 20 developed markets. Based on these results, it is possible to assume that local and international

factors play an important role in determining revenue. The expected market signal is positive. At the same time, the unit's global index factor may also be a sign of state adaptation. Therefore, the purpose of this study is to examine the relationship between interest rates and the global index of the Borsa Istanbul Index (Boachie et al 2016, pp.46-51).

2. LITERATURE REVIEW

The previous research has included components focusing on the development of a currency model related to the specific corporations. The construction of empirical external shocks to monetary policy was also a part of the preceding research in detail. The majority of the research studies included assessment of the other states. The central banks of the developing countries are facing further challenges. The two of these challenges relate to the issue of currency allocation and the motivation of the central bank to monitor its foreign exchange reserves. Therefore, the model of developed countries can be a model for emerging economies. By sharing capital, the public can avoid using its currency and choose whether to protect foreign currency from inflation. In case the interest rate is low or if the value of the national currency falls higher, the agent wants to use more money in foreign currency than in the national currency Samate (2017).

2.1 MONETARY POLICY OF TURKEY

Since 2001, monetary policy has been one of the main pillars of the Balance Program. In 2006, the central bank successfully achieved the indirect inflation target and set a medium-term inflation target of 4 percent by the end of 2007. However, it has demonstrated the two major challenges. On the one hand, even in case the international commodity and energy prices continued to decline, inflation remained stable while the inflation rate has exceeded 10 percent. On the other hand, real interest rates remained high, continuing strong capital inflows and foreign exchange reserves and undermining the competitiveness of the labor market (Awili and Ahmed 2019). The productivity contributed to economic growth effectively allowing contractionary monetary policy with the rising interest rates.

Therefore, Turkey faces a typical problem in ensuring further economic growth. The reluctance of inflation requires strict policies, but the loss of competitiveness seems to outweigh the ability of the economy to swallow and adapt. There are reasons for solving this problem that require monetary policy through broad-based policies, including

aggressive cost-cutting and pricing policies, and the use of reliable multi-annual spending to boost confidence in the budget and the stability of employers (Kara 2012, p.17). The households may benefit from the lower interest rates because of the cheaper funding amiable. The success of this policy will help to use the central bank's interest-bearing amount as the sole means to increase the credibility of inflation targets.

2.2 FINANCIAL MARKET & PURPOSE OF STOCK

Until the crisis of 2001, one of the main features of the Turkish economy was a very high and persistent inflation. High inflation is mainly due to public sector imbalances. The key factor in generating demand is the high availability of financing provided by the central bank, the increased productivity, wage growth, and public service pricing policies that ensure income growth. The unstable macroeconomic and political environment makes it difficult to break down inflationary pressures. During this crisis, the Central Bank of Turkey has achieved monetary policy and sacrificed financial stability to stabilize its price stability goals (Kara 2012, p.17). The government of Turkey began implementation of the exchange rate stabilization program towards the end of 1999. Initially, the plan has contributed to an increase in capital inflows and managed to reduce inflation while achieving high growth and real exchange rate growth. However, low interest rates and exchange rate appreciation have led to consumption increase, investment growth, and potential competitiveness, resulting in a high current account deficit of 5 percent of GDP. In addition, global high oil prices and the euro exchange rate against the US dollar have also led to a deterioration of the trade balance. In addition, due to the insecure banking system and financial failure, external confidence is limited. The outbreak of political controversy was one of the core factors contributing to crises in Turkey. The February 2001 economic crisis is amongst the most common examples (Kontonikas, Donald and Saggu 2013, p.4025).

2.3 CENTRAL BANK & INTEREST RATE POLICIES

The change in the Central Bank Act in 2001 was to define the main objective of monetary policy as the cornerstone of price stability. The law provides independence of the bank and prohibits the allocation of public funds to the bank's resources. Arnone et al. (2007) reported that Turkey has made significant progress in the law and has developed central bank independence in line with international standards 6 The Bank's independence has increased the credibility of the new monetary policy 7 and other inflation The Turkish economic agents are still very vulnerable. Any event that may take into account the independence of the central bank. In fact, one of the factors that caused Turkey's global instability from May to June 2006 was more than other new countries, but the market's focus was too long to appoint a new executive. Later, these worries were neutral without the surprise of market participants (Abou-Zaid 2013, p.179). Since 2002, the low levels of the short-term interest rates for the demand and inflation have been the main strategy for central banks. The Bank started to set its policy rate at the proposed Monetary Policy Committee meeting. The logical decision will follow immediately after each meeting. At the end of 2004, the Bank lowered its borrowing rate (base market) from 13 percent in April 2006 to 13.25 percent, followed by a 425 increase in the financial market in September 2007 and an increase of 17.50 percent in September 2007 and then started to pick up at the beginning of the year. However, May 2008 was a slight increase (Awili and Ahmed 2019). After 50 basis points, interest rates rose by 15.75 percent at the end of May 2008 (19.75 percent interest rate). Given high inflation and unfavorable expectations, monetary policy shows that decisions are possible for implementation throughout the year. The impact of interest rate decisions stems from their impact on short-term and long-term interest rates. The relationship between policy and market growth affects the credibility of both the transmission system and the central bank. An intuitive overview of the relationship between the central bank overnight interest rate and the Istanbul bond prices shows that both rates were moving in the same direction over time, while remaining subject to market risks (Cömert, Olçum and Yeldan 2011, p. 459).

The market risk outlook for the Iraq war in 2003 was high when the Federation of Turkey decided in early 2006 to raise interest rates due to international instability and domestic political tensions. On the other hand, despite the uncertainty of double depth and international financial capacity, market risk was unexpectedly low before 2007. This may reflect a return to confidence in the Turkish domestic base market and the stability of nuclear management in 2007 (Kara 2012, p.17).

2.4 INTEREST RATES AND STOCK MARKET

It is vital to analyze the behavior of real exchange rates and restrictive monetary policy. Through Kim and Roubin (2000) it is possible to utilize the actual exchange rate instead of the VAR analysis to save freedom. The excessive model of liquidity flexibility model and price volatility show that tightening monetary policy is linked to a temporary loss of revenue and a continued decline in nominal and real exchange rates, which is in line with the initial estimate. Thus, the increase in the real exchange rate is temporary and after the adjustment of all prices, the real rate returns to the starting position. The baseline TL requires assumption and the first four months of industrial production are the main source of income, the scale is statistically significant. When utilizing housing in income management, the increase in real exchange rate was statistically significant over two months (Cömert, Olçum and Yeldan 2011, p.459).

2.5 DOMESTIC INTEREST RATE & FEDERAL FUNDS RATE

The monetary policy agreement increases interest rates and money supply growth. However, after the first price increase, they may fall due to the tightening of the monetary policy's deflationary pressure. Then the price drops and the price falls in the form of money. On the other hand, output may decrease after currency formation or price increases. As long as monetary policy is unusual, monetary policy does not systematically measure inflationary pressures, excessive demand and shocks from other parts of the world. Production and prices should not increase (Cömert, Olçum and Yeldan 2011, p.459).

The system used here also includes the world market price of goods exported in national currency and exchange rate. It is possible to assume that exchange rates do not reduce the world market price of exports, as Turkey is too low to influence the prices of products. On the other hand, it is possible to assume that the assessed currency will demonstrate a limited monetary policy that corresponds to the flexible exchange rates in the short term. In addition, even in small countries, the values of national currencies may reduce the world market price of exported goods in national currency (Awili and Ahmed 2019).

Turkey is a small open economy. As a result, economic conditions can affect policies elsewhere in the world. Simms believes that the impact of foreign policy focuses on the unstable impact of external interest rates rather than on the flexible impact of monetary policy. Therefore, the local VAR ratio is the first variable. Empirical evidence shows that Turkish funds do not affect the contact fund. This is also in line with Turkey's small economic assumptions (Awili and Ahmed 2019).

In addition, the impact of Turkish monetary policy on macroeconomic variables is almost the same. The authors do not know that there is an empirical study to assess the impact of restrictive monetary policy on domestic interest rates, output and domestic prices. However, predicting our information is not always against the literature. At this point, active innovation in the Land continues to diminish production and prices will only rise if capacity utilization and housing are vital for covering the potential deficits in the income and assess national currency. Finally, it increases spread and helps to increase cash payments. Most of our conclusions are similar to previous empirical evidence, but similar to exchange rates (Abou-Zaid 2013, p.179).

2.6 RELATIONSHIP BETWEEN THE INTEREST RATE AND STOCK MARKET

Equity markets are an integral part of the financial infrastructure of the world economy, as the part that regulates the latter. Such markets, along with the system of financial institutions, represent the sphere where the formation of sources of economic growth and the redistribution of investment resources takes place. The stock market is an

important component of market relations. The development levels of the stock markets may define the state the country's economy. Failures in its operations can lead to disruption of the entire economic system both at the macro and at the micro level due to the influence of various factors. Against the backdrop of globalization, which has developed in our day, economic integration is expanding, resulting in interactions of the economic systems, as well as the creation of the common markets and market infrastructure. The integration of various countries into the world economic system follows the processes that affect the economy mainly due to exogenous factors external to a particular country, i.e., high prices for oil, gold, exchange rates, various interest rates, etc. Many economists believe that such a dependence of a larger number of stock markets, mainly emerging, from external circumstances, especially of a commodity nature, is gradually increasing (Gay 2016, pp.119-126).

The London Inter-bank Offered Rate (LIBOR) is the most common indicator of short-term interest rates and currently includes the following currencies: Australian dollar, Danish krona, US dollar, euro, Canadian dollar, New Zealand dollar, pound sterling, Swedish krona, Swiss franc, and Japanese yen. The rate appeared in 1985, and the interest rates of the sixteen largest banks serve as reference points for further calculations, operate as a basis. The choice stems from reputation, credit rating level, and activity in the market for the currency that requires determining LIBOR. The activities of banks included in the list for calculating the rate are subject to continuous monitoring in order to meet the specified criteria. The significance of the LIBOR relates to its historical role, as well las the reputation of a serious international indicator. Among the main positive properties of its properties, it is impossible not to note the scale: the rate offers exchange trading in foreign currencies (fixing) on the largest set of currencies and terms. The calculation is open and transparent. As for the banks included in the calculation base, they form the market and have a very high credit rating. The named rate is one of the most frequently used basic reference rates in world finance. Interest and coupon payments of most bonds issued by states and companies linked to it. LIBOR's role in this quality stems from two sources: it was one of the first index rates in global finance, and besides, both in terms of money market turnover and the number

of participants, London is the world's largest financial center (Ferrer, Bolós and Benítez 2016, pp.1-12).

The foreign exchange rates have a direct impact on the price and value of stocks in various countries. Changes in the exchange rate affect the costs of business in a country that will influence the stock price of companies doing business abroad. Often, companies and investors depend on individual currencies such as the euro, yen, the British pound and the Brazilian real. Bilateral movement of foreign currency in relation to its own baseline can have a significant impact on the financial sector. However, from a more general economic point of view, and in particular with a view to understanding the impact of currency dynamics on a country as a whole, it is often better to evaluate a currency at a trade-weighted rate. Several currencies on the market can influence stock markets and oil prices. It is possible to determine such an impact by utilizing the trade-weighted US dollar index. The index is the weighted average of the US dollar rate against the currencies of six major world currencies. Each of them has its own weight in the composition of the index. Although there is a number of empirical studies on the effect of macroeconomic indicators on stock indices, most of these surveys are usually focused on a developed economy, and the effects of these factors on stock indices in less developed countries (for example, Brazil, China, India, etc.) are less obvious. In particular, the less-developed markets react to changes in fundamental macroeconomic variables, such as crude oil prices, money supply, industrial production index, and inflation, in a wide range of tendencies (Gay 2016, pp.119-126).

2.6.1 Federal Fund Rate & Domestic Interest Rates

The interest rates demonstrate inverse relation to the price of the bonds. This means that when interest rates rise, bond prices fall, and vice versa. Such a situation occurs when bonds have a fixed interest rate – the coupon interest rate. When interest rates rise, the yield of bonds – the interest that an investor receives from buying a bond – must also increase in order not to lose demand compared to higher interest rates. Since the coupon interest rate is fixed, the yield of a bond can increase only by reducing the price of the bond. In general, the volume of reduction in the price of bonds depends on their duration. In practice, the duration (expressed in number of years) is necessary to

determine the sensitivity of a bond to interest rate changes. For example, a 4-year bond can lose about 8 percent, and a 6-year bond can lose about 12 percent of its market value if the interest rate rises by 2 percent. The longer the term of the bond, the more it shows influence by changes in interest rates. It is vital to note that the examples given do not take into account many factors, for example, the brokerage commission, potential tax consequences, inflationary expectations, the risk of default on credit obligations, and so on. It indicates the ratio of interest rates in the markets to the price of bonds, despite the fact that the other conditions remain unchanged (Bradley and Roberts 2015).

The link between interest rates and the stock exchange, however, remains less obvious based on the historical data. Due to higher interest rates, loans become more expensive, which affects both individuals and businesses. First, the increased base interest rate indirectly forces banks to raise the rates at which they give loans to their customers. At the same time, private individuals face an increase in interest rates on loans (for example, mortgages), especially with varying interest rates. Therefore, the amount of cash that consumers can spend may decline. This means that households will spend less money on consumption, which will affect the income and profits of enterprises. Enterprises are also subject to the direct influence. They also carry out loans from banks to maintain and expand their activities. When banks increase the interest rates, companies may not borrow much, and they will pay their loans at higher interest rates. Smaller spending on products of production value can slow the growth of the company, which will lead to a decrease in revenues. It is vita vital to note that the increase in the base interest rate affects the behavior of consumers and businesses. The smaller purchases of consumer goods and the income of enterprises, as a rule, have a negative impact on stock prices. However, to assess the impact of raising interest rates on stocks, it is extremely important to understand that the market operates in the long-term. Therefore, the efficient market hypothesis implies that the current stock prices in the market reflect the majority of the information and data. Consequently, in case the interest rates are more likely to rise, and incase financial media mentions such a tendency, it is possible to forecast that experienced corporate investors who lead the auction and therefore dictate prices also know this information. It is necessary to consider the current market situation, to find out whether interest rates will rise in the

market and its reactions. It is essential to track the interest rates and price changes of bonds. The investors that use bonds or bond funds for profit in a long-term investment plan put lower emphasis on such a monitoring. Bond funds generate income from both interest payments and changes in the price of bonds, but in the long run, mainly from interest payments. Such a tendency is accurate because the rise and fall in bond prices over time balance each other, so that long-term investors remain with income from interest payments on bonds (Naseer and Tariq 2015, pp.1-17).

Interest rates are rising as inflation grows. The main task of most central banks is to ensure price stability. For example, the target of the ECB is inflation at 2 percent. Inflation grows when the economy grows. With the growth of the economy, entrepreneurs also do better, and as a result, the prices of shares grow. It is also extremely important to notice when the increase in interest rates stemming from the strengthening of the economy. In this case, a moderate and stable rate of interest rate increase should not adversely affect the stock exchange. On the contrary, it must maintain steady growth and prevent "bubbles" on the stock exchange. It is possible to assess the historical evidence of how the US market acted in a period of rising rates (a study published by the Central Bureau of Statistics). The evidence suggests that it is difficult to conclude that rising interest rates have a negative effect on stocks. Interest rates are only a part of a wide range of market conditions. Many other factors affect the stock price, which is why it is necessary not to rely solely on the interest rate when deciding whether to buy or sell shares (European Central Bank 2019).

2.6.2 Bonds

The return expectations of the investors depend on a wide range of factors including economic development of a region or a country. In this regard, bond markets reflect the policies and the approaches of the governments based on the inverse relationship between the bond rates and their prices. Turkey remains amongst the leading emerging markets based on the levels of the country's economic growth and development (Coşkun et al 2017). The roots of the stock market financing in Turkey date back to the middle of the 19th century. At the same time, the contribution of the stock markets and the capital markets remained negligible in the country. The stock and government bond

markets in Turkey have several crucial functions. The first function relates to provision of the investment channels and alternative financing to the companies, as well as local and foreign investors. The second function implies injection of the vital short-term capital funding in the capital markets of the economy. Such functions remained detrimental for the short-term growth, as the regulatory framework includes the further essential elements.

2.6.3 BIST Sensitiveness to Global Interest Rates

Borsa Istanbul stock market or BIST demonstrates high levels of sensitivity to the global interest rates, particularly in relation to the countries that remain the core trading partners of the country. In the fight against the global crisis of 2008, central banks took measures to stimulate the economy by lowering interest rates. It is essential to analyze the degree to which their growth has affected investment in securities. One of the first measures was to reduce the base interest rate to an unprecedentedly low (close to zero) level. Following the expansionary monetary policy, the U.S. Federal Reserve has stated conducting the contractionary monetary policy. In essence, base interest rates are an important tool used by the state and central banks to regulate economic growth. When the economy grows faster than required, the state intervenes and raises interest rates to discourage enterprises to take out loans for expansion and private individuals to take out loans for purchases, which makes it possible to slow down economic growth. On the other hand, when economic growth stops or does not happen fast enough, the state usually lowers interest rates to stimulate economic growth. Changes in interest rates also affect financial markets. The following is an analysis of how an increase in the base interest rate affects the bond market and the stock exchange. The interest rate shows inverse relation to the price of the bonds. This means that when interest rates rise, bond prices fall, and vice versa. This happens when bonds have a fixed interest rate, namely the coupon interest rate. When interest rates rise, the yield of bonds – the interest that an investor receives from buying a bond – must also increase in order not to lose demand compared to higher interest rates. Since the coupon interest rate remains fixed, the yield of a bond can increase only by reducing the price of the bond (Bradley and Roberts 2015).

2.7 PORTFOLIO RETURNS AND STOCK RETURNS

Borsa Istanbul has been demonstrating varying returns over time with the higher levels during the periods of economic growth, as well as the larger declines during the recessions, which is common for the emerging economies. In general, the volume of reduction in the price of bonds depends on their duration. In practice, the duration (expressed in number of years) is vital for determining the sensitivity of a bond to interest rate changes. For example, a 4-year bond can lose about 8 percent, and a 6-year bond can lose about 12 percent of its market value if the interest rate rises by 2 percent. The longer the term of the bond, the more shows influence by changes in interest rates. It is vital to mention that the examples given do not take into account many factors, for example, the brokerage commission, potential tax consequences, inflationary expectations, the risk of default on credit obligations, and so on. It indicates the ratio of interest rates in the markets to the price of bonds, despite the fact that the other conditions are unchanged (Erdogan 2016).

3. INTEREST RATE VS STOCK MARKET PERFORMANCE
IN THE OTHER COUNTRIES

Interest rates commonly reflect the monetary policy of the government. The two main policies practiced by the government are the expansionary and contractionary approaches. The expansionary approach implies decline of the interest rate with the purpose of stimulating economic growth. At the same time, the contractionary monetary policy implies the increase of the interest rates to limit inflationary tendency during the periods of economic development. However, it is essential to keep track of interest rates and price changes of bonds. For investors who use bonds or bond funds for profit in a long-term investment plan, such a task might have the lower priority. Bond funds generate income from both interest payments and changes in the price of bonds, but in the long run, mainly from interest payments. Such a trend stems from the fact that rise and fall in bond prices often over time balance each other, so that long-term investors remain with income from interest payments on bonds (Gay 2016, pp.119-126).

3.1 COMPARISON BETWEEN TURKEY AND OTHER COUNTRIES

Turkey fits the profile of the country remaining in the emerging state. The link between interest rates and the stock exchange, however, requires further assessment. Due to higher interest rates, loans become more expensive, which affects both individuals and businesses. First, the increased base interest rate indirectly forces banks to raise the rates at which they give loans to their customers. At the same time, private individuals face an increase in interest rates on loans (for example, mortgages), especially with varying interest rates. Following such a tendency, the amount of cash that consumers can spend reduces. Therefore, the individuals will spend less money on direct consumption, which will affect the income and profits of enterprises. Enterprises are also subject to a more direct influence. They also carry out loans from banks to maintain and expand their activities. When banks make loans more expensive, the companies may not borrow as much, and they will pay their loans at the higher interest rates. The smaller spending on products of production value can slow the growth of the company, which will lead to a decrease in revenues. It is possible to note that an increase of the foreign interest rates

affects the behavior of the stock markets. Such an impact may vary depending on the capitalization of the specific stocks, namely small-cap, mid-cap, or large-cap. However, to assess the impact of raising interest rates on stocks, it is extremely important to understand that the market is far-sighted. Therefore, the information available about the market currently affects the stock prices. Consequently, in case it is possible to forecast that interest rates are more likely to rise, and incase the financial media increasingly mentions such a potential, it is possible to predict that experienced corporate investors who lead the auction and therefore dictate prices also know this information. Thus, it is vital to consider the current market situation, to find out whether interest rates are more likely to rise in the market and the investors will react in the future (Erdogan 2016).

The interest rates are rising as inflation grows. The main task of the majority of the central banks is to ensure price stability. For example, the target of the European Central Bank (ECB) is inflation at 2.0 percent. Inflation grows when the economy shows consistent growth. With the growth of the economy, the companies are able to demonstrate the stronger performance, and, as a result, the prices of shares have resumed their growth. It is also essential to note that the increase in interest rates stems from the strengthening of the economy. In this case, a moderate and stable rate of interest rate increase should not adversely affect the stock exchange. On the contrary, it must maintain steady growth and prevent "bubbles" on the stock exchange (European Central Bank 2019).

It is possible to assume that the European Central Bank (ECB) will not raise interest rates in the coming year (or one and a half years). The ECB has taken additional measures to stimulate the economy by launching a quantitative easing program. Consequently, the ECB should not raise interest rates until the end of this program. However, in the US, the situation is different. The strengthening of the US economy was the reason why the US Federal Reserve Bank stopped the quantitative easing program, and now sends signals about the possible steps to increase the interest rates prior to the end of the year. Such steps will affect a wide range of the financial markets, including the Borsa stock exchange (Abraham 2016). As mentioned earlier, such a tendency affects current market prices to the relative degree. On the other hand, before

such a change occurs, the Fed will closely monitor economic development and raise interest rates only if there are convincing signs that the economy is ready for this. This will mean that rates will rise, as the economy is steadily strengthening. This favorable factor, along with other, for example, European revitalizing, stimulating monetary policies (ECB, central banks of Japan and China), will provide the basis for sustained and probably higher global growth, which favors more risky investments, such as stocks. The bond opinion is more conservative. In the bond market, the situation is such that, in terms of the risk / return ratio, government bonds and investment grade corporate bonds are less attractive than the higher-yield bonds.

4. DATA AND RESEARCH METHOD

4.1 RESEARCH MODEL/METHODOLOGY

The core research methods utilized will be the Vector Autoregressive (VAR) and Granger Causality test. It is essential to focus on modeling time series that do not satisfy the condition of stability of the VAR model (Habibullah, Baharumshah and Azali 2017). The essence of this test is as follows. It is essential to note that the existence of a relationship between variables does not mean causation. Establishing cause-effect relationships does not relate to statistical research. Such links focuses on the professional logical considerations. However, based on the statistical methods, it is possible to establish whether the past values of one variable improve the values of the other. If this is so, then they say that one variable is the cause of another variable. Such causality takes into consideration the information aspect, i.e. with the definition of what precedes what, as well as with the information content of the variable in terms of predicting another variable. The causality usually applies to stationary co-integrated time series. The Causality test suggests that information relating to the prediction of variables is contained exclusively in the time series of these variables. The test includes an assessment of the next pair of regressions.

Formula: Causality Test

$$y_t = \sum_{i=1}^{n} \alpha_i x_{t-i} + \sum_{j=1}^{n} \beta_j y_{t-j} + u_{1t}, \tag{4.1}$$

$$x_t = \sum_{i=1}^{n} \lambda_i x_{t-i} + \sum_{j=1}^{n} \delta_j y_{t-j} + u_{2t}. \tag{4.2}$$

Such an assumption does not imply that the residuals of the regressions do not show significant correlation. In the context of VAR, it will be essential to test whether the lag coefficients in the first equation are statistically significant, and lag coefficients in the second equation are statistically insignificant, and vice versa. It is vital to note that a

two-way causal relationship is possible: i.e. at the same time is the cause (then both groups of discussed coefficients are statistically significant). The mutual independence is possible, when both groups of coefficients are statistically insignificant.

Formula: F-Statistic

$$F = \frac{(RSS_R - RSS_{UR})/m}{RSS_{UR}/(n-k)}$$

(4.3)

The test of variables for causality implies the need to perform the following steps (for the first equation). First, it is necessary to estimate the regression of the variable. Its lag values, moreover, the lag values of another variable are not included in this regression, and the estimated sum of squared deviations is estimated (RSS). Regression requires calculation with the inclusion of the lagged values of both variables, and then the sum of squared deviations requires context (RSS). Null hypothesis may suggest lag variable members do not belong to this regression. This hypothesis requires testing based on F-statistics with the number of degrees of freedom of the numerator m, and the denominator (n – k), where m is the number of lagged variables in the regression equation, k is the number of parameters estimated prior. In case the calculated value of the F-statistic is more critical, then the null hypothesis implies rejection it requires further assessment. The steps are available for the further assessment and estimates. It is vital to note that in this test the number of lag terms in each equation can has a significant impact on the final solution. One of the recommendations in solving this problem suggests the use of the Akaike and Schwartz information criteria. In addition, significant conclusions are available based on F-statistics, but not based on the testing model coefficients separately.

VAR model remains amongst the most successful, transparent, flexible, and comprehensive approaches related to the multivariate time series (Başci and Karaca 2015). It is possible to represent VAR analysis in the form of the extension of the univariate autoregressive model to the dynamic multivariate time series. The effectiveness of the model stems from its ability to ensure dynamic behavior of the

forecasting, financial time series, as well as the economic time series. The forecasts provided by VAR model demonstrate the higher degree of accuracy in comparison to the univariate time-series models, as well as the simultaneous equations models utilizing based on theoretical notions. The flexibility of VAR model relates to its forecasts, since they use the potential future paths of the specified variables.

4.2 RESEARCH HYPOTHESES

The research hypothesis implies that the foreign interest rates have a strong impact on the Borsa Stock Exchange, based on the ISE INDEX.

4.3 RESEARCH DESIGN

The research design will focus on the Causality methodology and VAR approach for deriving the necessary evidence regarding the support or rejection of the hypothesis presented. The VAR model is effective for describing the evolution of endogenous or k variables over the specific period based on their historical evolution. The collection of the variables occurs via k * 1 vector y_t. The t observation is time of the variable y_i.

Formula: VAR model

$$y_{1t} = \gamma_{10} - b_{12}y_{2t} + \gamma_{11}y_{1t-1} + \gamma_{12}y_{2t-1} + \varepsilon_{1t}$$
$$y_{2t} = \gamma_{20} - b_{21}y_{1t} + \gamma_{21}y_{1t-1} + \gamma_{22}y_{2t-1} + \varepsilon_{2t}$$

(4.4)

Where

$$\begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{pmatrix} \sim i.i.d. \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_1^2 & 0 \\ 0 & \sigma_2^2 \end{pmatrix} \right)$$

4.3 DATA

The data will include the core stock market price data fluctuations, as well as the changes of the interest rates amongst the largest countries on a global scale. It is crucial to assess the historical evidence of how the stock market of Turkey acted in a period of rising rates (a study published by the Central Bureau of Statistics). The assessment includes a wide range of data from Borsa stock exchange (ISE Index) during the periods of economic growth when interest rates were increasing at the highest rates. The shortest of these growth phases lasted ten months. Periods of ten months were part of the research period within each period during which interest rates rose at the higher rates. In 80 percent of these periods, earnings from stock exchanges were positive. In comparison, approximately 70 percent of all possible periods of 10 months brought positive returns. The time interval covers the period between January 1998 to March 2019, while the frequency of data is Monthly. The data will include the stock market index BIST 100 (XU100.IS), the LIBOR USD rate and EQUITY INFLOW.

Table 4.1: Variables and Definitions

Variable	Definition
Rate	LIBOR USD Rate
BIST	BIST 100 Index
Equity Inflow	Capital inflow to STOCK EXCHANGE MARKET

5. RESULTS AND FINDINGS

The first step includes examination of the variables relative to presence of the unit root (see Table 5.1).

Table 5.1: Outcomes of the ADF Root Test

Null Hypothesis: D(LIBOR 3MONTH) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.761884	0.0000
Test critical values:	1% level	-3.456197	
	5% level	-2.872811	

Null Hypothesis: D(ISE INDEX) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-16.48031	0.0000
Test critical values:	1% level	-3.456093	
	5% level	-2.872765	
	10% level	-2.572826	

Null Hypothesis: EQUITY INFLOWS has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.95241	0.0000
Test critical values:	1% level	-3.455990	
	5% level	-2.872720	
	10% level	-2.572802	

According to ADF root test the data respectively LIBOR and ISE index is significant at its first deference (I_1) and has unit root, in other hand the EQUITY inflow is significant at its level (I_0).

The second step in VAR model implies inclusion of the lag. The order of the VAR model is available in Table 5.2.

Table 5.2: VAR Lag Order Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-4117.043	NA	1.23e+11	34.04994	34.09320	34.06737
1	-4087.910	57.30357	1.04e+11	33.88355	34.05656*	33.95325*
2	-4081.766	11.93326	1.07e+11	33.90715	34.20991	34.02912
3	-4073.822	15.23104	1.08e+11	33.91588	34.34840	34.09011
4	-4064.557	17.53505	1.07e+11	33.91369	34.47596	34.14019
5	-4056.856	14.38189	1.09e+11	33.92443	34.61645	34.20320
6	-4046.411	19.25136	1.07e+11	33.91248	34.73426	34.24353
7	-4044.422	3.615623	1.14e+11	33.97043	34.92196	34.35374
8	-4038.117	11.30714	1.17e+11	33.99270	35.07399	34.42828
9	-4030.317	13.79550	1.18e+11	34.00262	35.21366	34.49047
10	-4003.272	47.16062	1.02e+11	33.85349	35.19428	34.39361
11	-3991.387	20.43087*	9.93e+10*	33.82964*	35.30019	34.42203
12	-3984.361	11.90372	1.01e+11	33.84596	35.44626	34.49061

The eleventh lag order was within the definition by AIC, FPE . The results suggest that to come up with a significant result it should be used eleven periods as in the table 5.2 it indicates it by three stars. The foreign interest rates have a moderate impact on the Borsa Stock market. It is vital to underline that the supporting evidence primarily detects such a relationship with the largest developed nations and the core trading partners of the country.

Table 5.3: Variance Decomposition of D (ISE INDEX)

Period	S.E.	D(ISE INDEX)	EQ INFLOWS	D(LIBOR 3MONTH)
1	3712.119	100.0000	0.000000	0.000000
2	3746.318	98.18284	1.624704	0.192453
3	3770.697	97.19642	1.605261	1.198315
4	3798.520	96.72552	1.610854	1.663625
5	3821.372	95.92269	2.432768	1.644539
6	3850.482	95.25247	3.126964	1.620562
7	3874.533	94.64278	3.157332	2.199889
8	3876.423	94.64114	3.155635	2.203224
9	3956.513	93.36949	4.304737	2.325773
10	4039.089	90.76470	6.960510	2.274786

The first decomposition focuses specifically on the D(ISE INDEX) utilized for determining the impact on Equity inflow and D(LIBOR) and as a result in table 5.3, it show that INDEX has impact into INDEX in terms of short run to long run but in long run its less then short run 100%- 90%. And in long run it affects EQUITY inflows about 7%.

Table 5.4: Variance Decomposition of D (LIBOR)

Period	S.E.	D(ISE INDEX)	EQUITY INFLOWS	D(LIBOR MONTH)
1	0.179306	0.217262	0.575554	99.20718
2	0.187587	0.990483	0.594368	98.41515
3	0.196264	4.349208	1.335395	94.31540
4	0.200551	6.055217	3.180938	90.76384
5	0.205374	6.785592	4.345886	88.86852
6	0.206922	6.964453	5.151431	87.88412
7	0.212230	7.590676	8.382966	84.02636
8	0.213159	7.541361	8.804539	83.65410
9	0.216019	7.770181	10.58509	81.64473
10	0.216252	7.891710	10.63923	81.46906

Table 5.4 shows variance decomposition of D (LIBOR) that shows that it explains its own from the past values and can explain around 10% in Equity inflow to the stock exchange market.

Table 5.5: Variance Decomposition of Equity Inflows

Period	S.E.	D(ISE INDEX)	EQUITY INFLOWS	D(LIBOR 3 MONTH)
1	459.1625	28.20873	71.79127	0.000000
2	476.2291	27.42725	72.30795	0.264795
3	484.9307	27.69850	70.47195	1.829548
4	486.4137	27.75597	70.39350	1.850532
5	496.0817	27.68570	68.87002	3.444277
6	499.4901	27.65902	68.11071	4.230269
7	501.9254	27.74435	68.06472	4.190933
8	502.2824	27.79716	68.01732	4.185525
9	503.4833	27.90960	67.91123	4.179163
10	510.3788	28.03406	67.81270	4.153236

According to Table 5.5, Equity inflows to D (ISE Index) and it can explain about 30% of variance can be explained by index, it shows a relationship in between in from short run to long run its actually same affect. It is vital to evaluate assess the historical evidence of how the stock market of Turkey acted in a period of rising rates (a study published by the Central Bureau of Statistics). The assessment includes a wide range of data from BIST 100 Index during the periods of economic growth when interest rates were increasing at the highest rates. The shortest of these growth phases lasted ten months. The periods of ten months were part of the research period within each period during which interest rates rose at the higher rates. In 80 percent of these periods, earnings from stock exchanges were positive. In comparison, approximately 70 percent of all possible periods of 10 months brought positive returns. Based on the above data, it

is possible to conclude that rising interest rates have a positive effect on stocks. Interest rates are only a part of a wide range of market conditions. The wide range of the additional factors affect the stock price, thus it is vital to rely only on additional factors when deciding whether to buy or sell shares. The assessment also includes the impact of the LIBOR rate on the behavior of the BORSA stock market, as defined with the BIST 100 Index

Table 5.6: Granger Causality Test

Depended value D (ISE INDEX)			
Excluded	Chi-sq	df	Prob.
EQUITY INFLOWS	22.29234	11	0.0222
D(LIBOR 3MONTH)	10.01696	11	0.5289
All	30.04335	22	0.1174
Dependent variable: EQUITY INFLOWS			
Excluded	Chi-sq	df	Prob.
D (ISE INDEX)	16.29471	11	0.1305
D(LIBOR 3MONTH)	17.78911	11	0.0866
All	30.90171	22	0.0981
Dependent variable: D(LIBOR 3 MONTH)			
Excluded	Chi-sq	df	Prob.
D (ISE INDEX)	43.96968	11	0.0000
EQUITY INFLOWS	31.14510	11	0.0010
All	69.75579	22	0.0000

Causality test suggests the effect between foreign interest (LIBOR) rate and ISE Index between the stock prices and the interest rates within the sample accordingly it's not satisfactory. The coefficient of determination suggests that the changes in the foreign interest rates have a no causal relation on the ISE Index price. The research will reflect the direct influence of this index on the behavior of the stock markets of the countries in question hasn't allowed acceptance of the null-hypothesis. But in the result it shown the causal relationship between ISE index and Equity inflow to the market. Equity markets remained as an integral part of the financial infrastructure of the world economy; the part that regulates the latter. Such markets, along with the system of financial institutions, represent the sphere where the formation of sources of economic growth and the redistribution of investment resources takes place. The stock market is an important component of market relations. The data reflects the connection between the

two core variables. Failures in his work can lead to disruption of the entire economic system both at the macro and at the micro level due to the influence of various factors. Against the backdrop of globalization, which has developed in the modern day, economic integration is expanding, as economic systems closely interact, common markets and market infrastructure imply initiation.

Figure 5.1: D (ISE Index), LIBOR, Equity Inflow
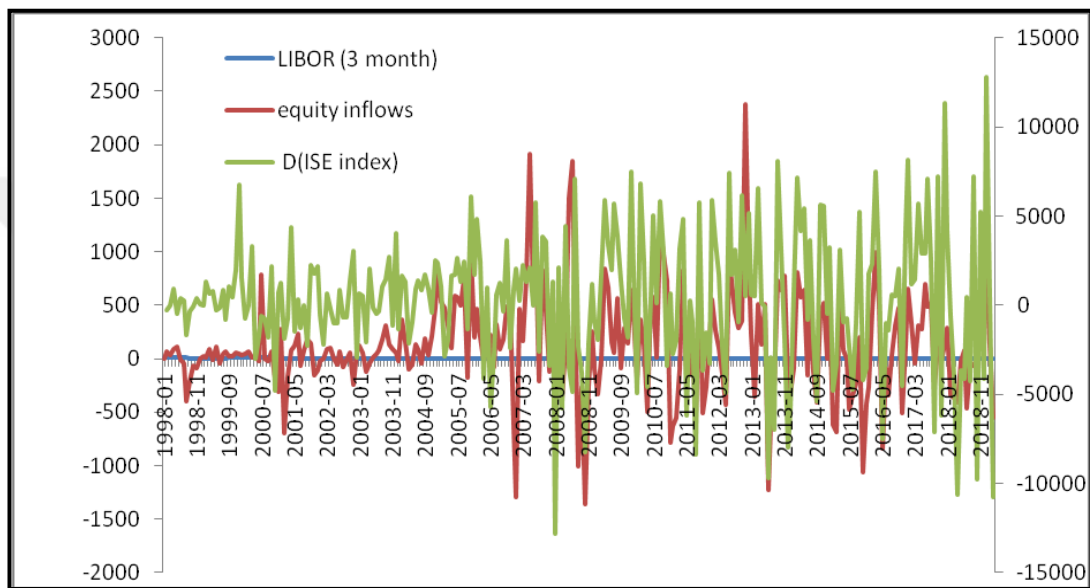
Figure 5.1 reflects the fluctuations of the foreign interest rates (LIBOR) , D(ISE INDEX) and EQUITY INFLOW for the selected period between 1998 to 2019. As a macroeconomic factor, the London interbank rate was a part of the analysis (London Interbank Offer Rate, LIBOR), which is a globally recognized indicator of the value of financial resources. At this rate, the largest banks in the world are ready to issue loans to other large banks on the London Interbank Exchange.

Figure 5.2: Difference of LIBOR Rate
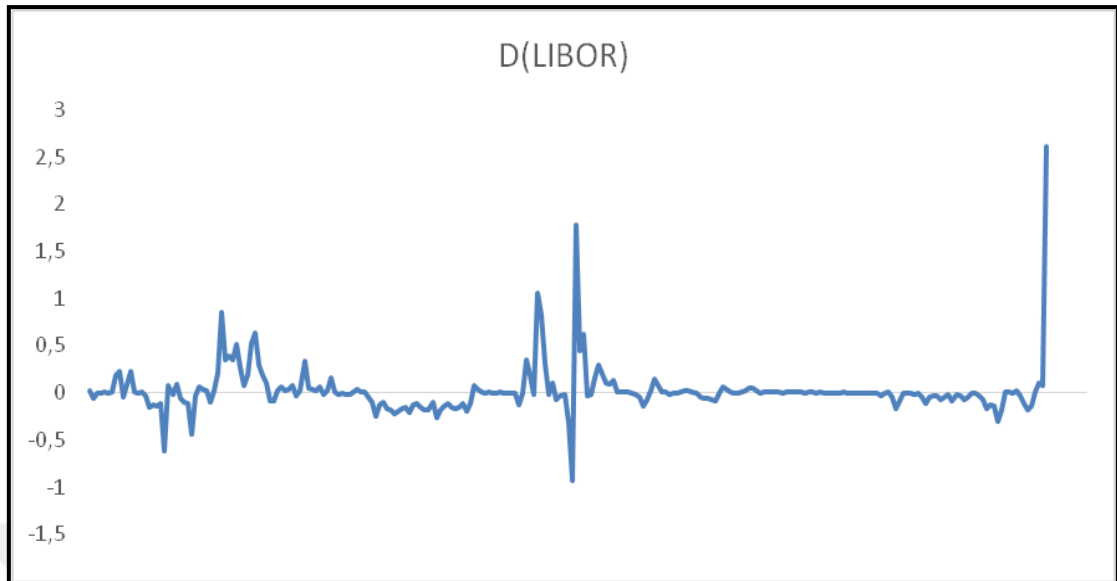
The LIBOR rate is effective for determining loan rates in foreign currency. LIBOR is the most common indicator of short-term interest rates and implies utilization of the following currencies: Australian dollar, Danish krona, US dollar, euro, Canadian dollar, New Zealand dollar, pound sterling, Swedish krona, Swiss franc, and Japanese yen. The integration of various countries into the world economic system precedes the processes that affect the economy mainly due to exogenous factors external to a particular country, i.e., high prices for oil, gold, exchange rates, various interest rates, etc. Many economists are inclined to believe that such a dependence of a larger number of stock markets, mainly emerging, from external circumstances, especially of a commodity nature, is gradually increasing.

Figure 5.3: LIBOR
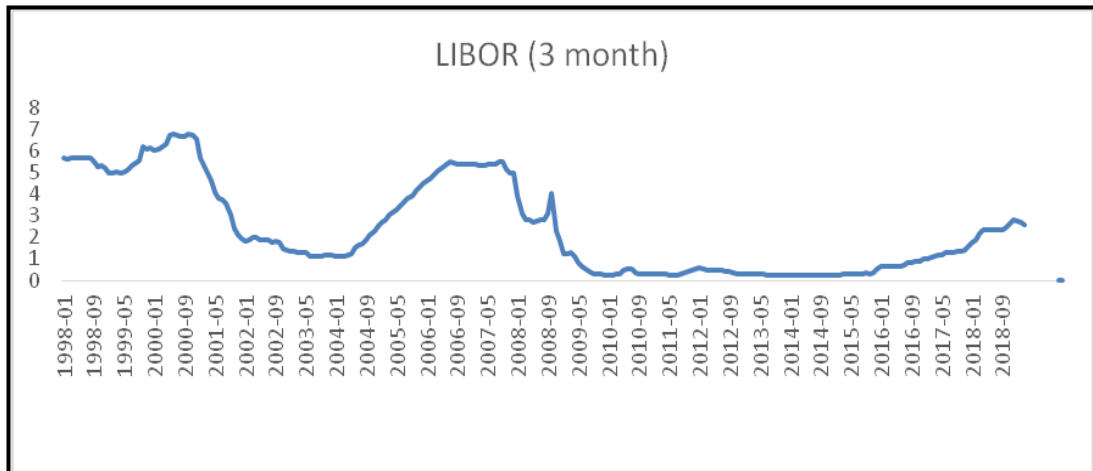
Figure 5.3 includes the LIBOR plot of the data points focusing on the time period . The rate has been effective since 1985. Interest rates of the sixteen largest banks, which serve as reference points for further calculations, used as a basis. The choice relates to the reputation, credit rating level, activity in the market for the currency for which LIBOR is calculated. The activities of banks included in the list for calculating the rate are subject to continuous monitoring in order to meet the specified criteria. The significance of the LIBOR is that it remained for a long time and received recognition as a serious international indicator. Among the main positive properties, it is vital to the scale: the rate offers exchange trading in foreign currencies (fixing) on the largest set of currencies and terms. The calculation is open and transparent. In relation to the banks included in the calculation base, they form the market and have a very high credit rating. The named rate is one of the most frequently used basic reference rates in the world finance. Interest and coupon payments of most bonds issued by states and companies require connection to the rate.

LIBOR's role in this quality stems from two sources: it was one of the first index rates in global finance, and besides, both in terms of money market turnover and the number of participants, London is the world's largest financial center. The interest rates have a direct impact on the price and value of stocks in various countries. Changes in the exchange rate affect the costs of business in a country that will influence the stock price of companies doing business abroad. Often, companies and investors depend on individual currencies such as the euro, yen, the British pound and the Brazilian real.

Bilateral movement of foreign currency in relation to its own baseline can have a significant impact on the financial sector. However, from a more general economic point of view, and in particular with a view to understanding the impact of currency dynamics on a country as a whole, it is often better to evaluate a currency at a trade-weighted rate. There are several currencies on the market that can strongly influence currency markets and oil prices, therefore, the research utilizes the trade-weighted US dollar index, which is the weighted average of the US dollar rate against the currencies of six major world currencies. Each of them has its own weight as part of the index.

Although there is a number of empirical studies on the effect of macroeconomic indicators on stock indices, most of these surveys are usually focused on a developed economy, and the effects of these factors on stock indices in less developed countries (for example, Brazil, China, India, etc.) are less obvious. In particular, the less-developed markets react to changes in fundamental macroeconomic variables, such as crude oil prices, money supply, industrial production index, and inflation in a different manner, including reaction of the stock exchange in Turkey. The Turkish market is developing. The main trends in the development of the domestic stock market were part of the research according to the following criteria: the number of companies admitted to listing, stock market capitalization, capitalization to GDP ratio, stock liquidity, degree of concentration, industry structure, etc. The assessment has shown a relatively low level of development of the domestic stock market. In addition, the potential impact of the macroeconomic variables on stock indices in developing countries lack representation in the literature. However, the understanding this process can help investors choose a country for investment and thereby increase return on investment.

The empirical studies of the interaction between stock indexes and interest rates remained prominent for more than a decade, as economists were unable to reach a consensus on the relationship between these variables. Some show that there is a positive relationship, while the others express themselves in opposition to the arguments of the first. Therefore, there is a need for additional research in this area. Considering monthly data several variables (interest rate, national production, budget deficit, interest rates, inflation rates, money supply, foreign investment in India), the research attempted to identify the effect of these variables on the change in the Bombay Stock Exchange index. The study used a parametric model of vector auto-regression. The values found

showed that such values as interest rates, money supply, inflation rate and exchange rate have a significant impact on the change in the stock market, while the rest is insignificant. The assessment results show that the total price of S&P shares adversely affects the interest rates and vice versa. The long-term and short-term dynamics of stock prices and the exchange rate, as well as channels through which there is an impact on groups of countries in the Pacific. The study analyzes the monthly prices using the causation effect. The role of macroeconomic variables affecting the change in share prices in Turkey included assessment. The variables considered included the inflow of foreign direct investment, the rate of treasury bills, the consumer price index and the interest rate as the core focus. It was possible to note that the interest rate (or rate of treasury bills) and the inflow of foreign direct investment are the key factors determining the price of shares in Turkey. The assessment of the causal relationship between stock prices and the interest rate and using data between 1998 and 2019, implies that there is a bi-directional causal relationship between the stock index market and interest rates. Empirical results showed that the interest rates and stock prices were not stationary. The further causation test was a part of the research.

The study considers the relationship between the price of oil, the interest rate and the stock markets of developing countries. The results of these studies suggest that it is possible to present the most probable directions of influence of macroeconomic factors on the stock markets of the emerging countries. In other words, it is advisable to form a number of hypotheses, which require testing in the future with the help of an economic analysis of the selected indicators. An inverse relationship should flow from interaction with the LIBOR rate and the trade-weighted index of the United States. Then, an analysis of the influence of these factors on the emerging stock markets implies assessment, including the outcome of the research. The development of the economy, the complication of economic processes and the increasing requirements for the applied management decisions in the field of macro- and microeconomics required a more thorough and objective analysis of the actual processes based on statistical methods and mathematical modeling. The constructed model provided the answer to the question about the quantitative assessment of the magnitude of the phenomenon or process under study under the influence of external factors. An econometric toolkit of selected

characteristics were incorporated in the research, namely correlation analysis, checking time series for stationarity, causality analysis, calculation of a multifactor model of vector auto regression (VAR), as well as integration analysis.

The results have shown a moderate effect of the foreign interest rates on the Turkish stock market, based on the conducted assessment. It is essential to note that the timing and period of the data selected covered the period between 1998 and 2019. The foreign interest rates were increasing primarily following 2015, when the U.S. Federal Reserve began the current contractionary policy. The rising interest rates contribute to the rising value of the stocks to the moderate levels based on the outcomes.

The dependencies considered in this research largely determine the behavior of the stock markets themselves. According to how actively certain factors in different periods in different countries affect stock markets, an investor will be able to decide where to invest his savings. Furthermore, it is important for him to know when and how to react in order to avoid the loss of invested funds. This study has shown the relationship between variables and the possible causes of such relationships from an economic point of view. The result is the ability to predict the behavior of stock markets with a certain degree of exposure to specific variables. The lags in VAR model were sufficient to describe variations in the stock price fluctuations.

6. CONCLUSION

It is necessary to state that the deviation between the interest rates and stock exchanges provides the investors with the stronger tools allowing minimization of the associated risks, as well as optimization of the long-term strategies. The collected evidence rejected the hypothesis regarding the direct impact of the interest rates on the Borsa Stock Exchange (ISE INDEX). Further assessment has also shown that the impact was comparatively weak for stock market over the observed period. It is essential to conduct further analysis with the utilization of the addition methods, as well as inclusion of the supplementary data. The Variance Decomposition to confirm the relation between the interest rates and the stock market price in a weak form and it showed comparatively influence of equity inflow to ISE index and the relation is affected from ISE index to equity and vice versa, fluctuations over the observed period. Impulse response also indicates a respond to the equity inflow to ISE index. Causality analysis has reflected the need for the further research regarding the effect of the foreign interest rate (LIBOR) on the BORSA stock markets (ISE Index), According to Granger causality there is only one way direction from equity inflows to index . It's not possible to say there is two side relation between because other way is not significant.

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APPENDICES

Appendix A. ADF Unit Root Test

Null Hypothesis: LIBOR__3_MONTH_ has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.833307	0.3638
Test critical values:	1% level	-3.456197	
	5% level	-2.872811	
	10% level	-2.572851	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LIBOR 3MONTH) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.761884	0.0000
Test critical values:	1% level	-3.456197	
	5% level	-2.872811	
	10% level	-2.572851	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: ISE_INDEX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.870171	0.7965
Test critical values:	1% level	-3.455990	
	5% level	-2.872720	
	10% level	-2.572802	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(ISE INDEX) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-16.48031	0.0000
Test critical values:	1% level	-3.456093	
	5% level	-2.872765	
	10% level	-2.572826	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: EQUITY INFLOWS has a unit root
Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, max lag=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.95241	0.0000
Test critical values:	1% level	-3.455990	
	5% level	-2.872720	
	10% level	-2.572802	

Appendix B. Graphs of the Data
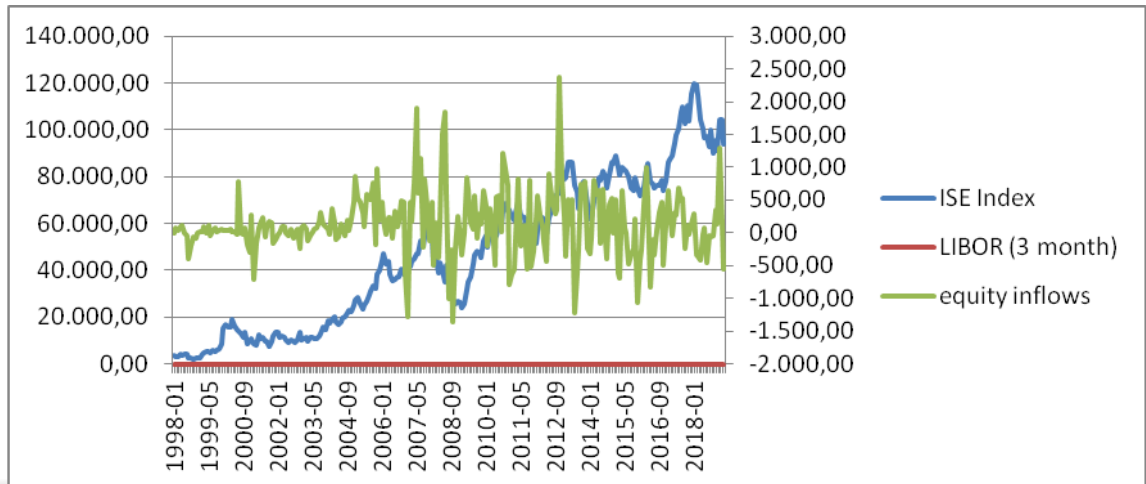
Above graph shows the movement of ISE Index and Equity inflows (1998-2019).
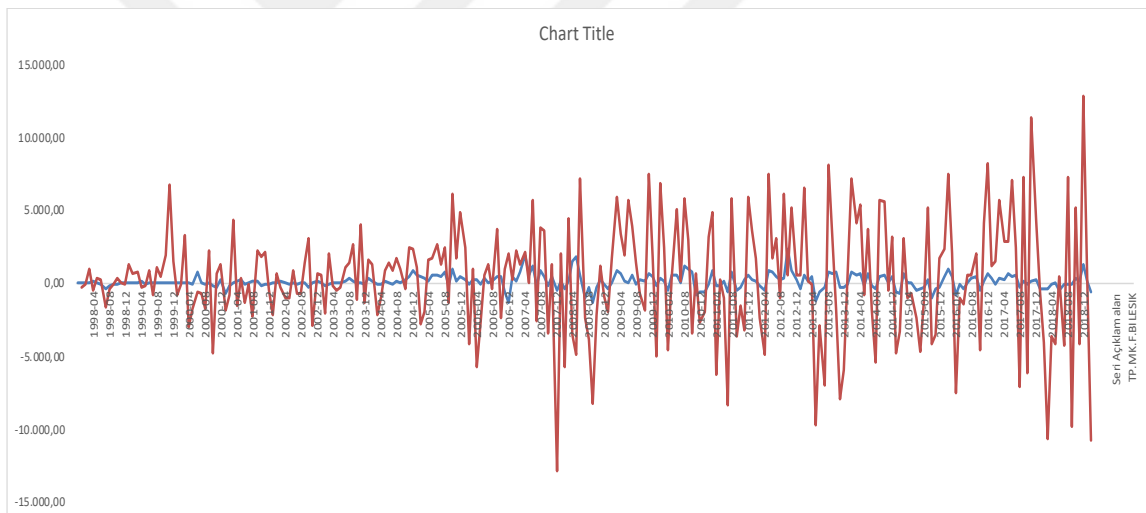
The graph above shows the fluctuation of Equity flow (Blue line) and ISE Index (Red line).
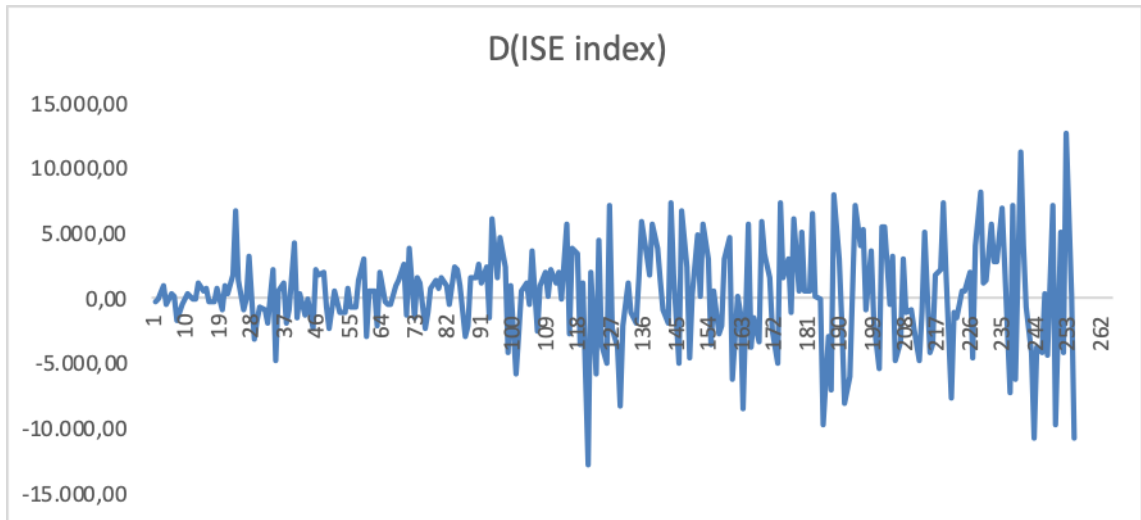
Above graph shows the Change in ISE Index (1998 – 2019), 265 observation .

Appendix C. Impulse Response

Response to Cholesky One S.D. Innovations
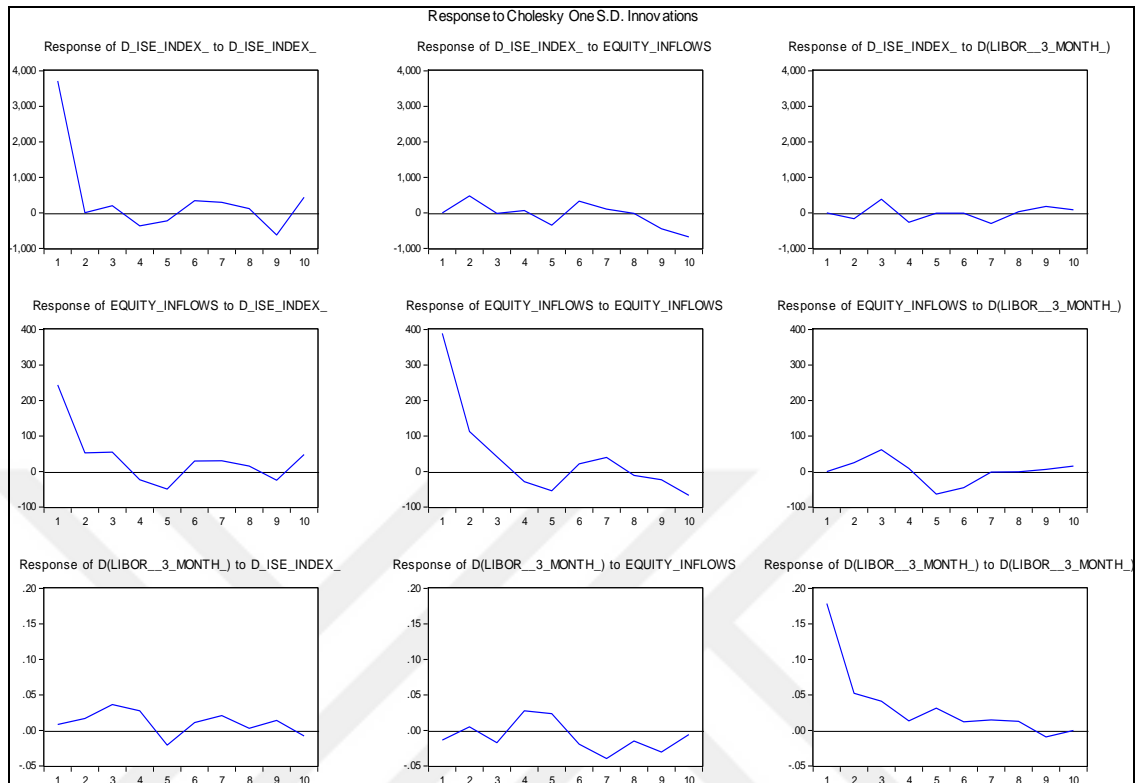
Appendix D. Data (ISE INDEX, LIBOR, EQUITY INFLOW)

	ISE Index	LIBOR (3 month)	equity inflows	D(ISE index)	D(LN(ISE index))
1998-01	3.547,18	5,64955381	0,00		
1998-02	3.272,21	5,6335945	65,00	-274,97	-0,08
1998-03	3.259,06	5,688032727	30,00	-13,15	0,00
1998-04	4.194,50	5,689258	85,00	935,44	0,25
1998-05	3.727,75	5,692229474	114,00	-466,75	-0,12
1998-06	4.100,00	5,689453182	-12,00	372,25	0,10
1998-07	4.322,32	5,688858696	-43,00	222,32	0,05
1998-08	2.635,14	5,684375	-396,00	-1.687,18	-0,49
1998-09	2.265,94	5,499645	-206,00	-369,20	-0,15
1998-10	2.196,38	5,27314	-66,00	-69,56	-0,03
1998-11	2.577,54	5,323245238	-91,00	381,16	0,16
1998-12	2.597,91	5,227567619	2,00	20,37	0,01
1999-01	2.568,16	5,0041485	22,00	-29,75	-0,01
1999-02	3.890,83	4,9959925	10,00	1.322,67	0,42
1999-03	4.554,07	5,005197391	85,00	663,24	0,16
1999-04	5.354,03	4,99825	-7,00	799,96	0,16
1999-05	5.069,22	5,024109474	107,00	-284,81	-0,05
1999-06	4.950,21	5,178806818	-44,00	-119,01	-0,02
1999-07	5.805,45	5,309545455	42,00	855,24	0,16
1999-08	5.018,28	5,449911429	68,00	-787,17	-0,15
1999-09	6.071,12	5,565568182	17,00	1.052,84	0,19
1999-10	6.509,92	6,182291905	26,00	438,80	0,07
1999-11	8.459,48	6,102528636	59,00	1.949,56	0,26
1999-12	15.208,78	6,1265625	43,00	6.749,30	0,59
2000-01	16.715,00	6,0391565	37,00	1.506,22	0,09
2000-02	15.946,00	6,099761905	41,00	-769,00	-0,05
2000-03	15.920,00	6,197038261	61,00	-26,00	0,00
2000-04	19.206,00	6,31191	13,00	3.286,00	0,19
2000-05	16.206,00	6,755654762	19,00	-3.000,00	-0,17
2000-06	14.466,00	6,790142727	-23,00	-1.740,00	-0,11
2000-07	13.870,00	6,731875238	783,00	-596,00	-0,04
2000-08	13.132,06	6,691449091	-4,00	-737,94	-0,05
2000-09	11.350,30	6,674226667	-19,00	-1.781,76	-0,15
2000-10	13.538,44	6,778353182	71,00	2.188,14	0,18
2000-11	8.747,68	6,751735	-183,00	-4.790,76	-0,44
2000-12	9.437,21	6,545132105	-307,00	689,53	0,08
2001-01	10.685,07	5,698181818	272,00	1.247,86	0,12
2001-02	8.791,60	5,3481565	-702,00	-1.893,47	-0,20

2001-03	8.022,72	4,963977273	-161,00	-768,88	-0,09
2001-04	12.367,36	4,613881579	80,00	4.344,64	0,43
2001-05	10.879,83	4,103660952	127,00	-1.487,53	-0,13
2001-06	11.204,24	3,834078095	227,00	324,41	0,03
2001-07	9.914,61	3,751136364	-71,00	-1.289,63	-0,12
2001-08	9.878,88	3,566022727	82,00	-35,73	0,00
2001-09	7.625,87	3,034563	181,00	-2.253,01	-0,26
2001-10	9.848,76	2,400054348	148,00	2.222,89	0,26
2001-11	11.633,93	2,102983636	-156,00	1.785,17	0,17
2001-12	13.782,76	1,924309474	-106,00	2.148,83	0,17
2002-01	13.252,32	1,820597273	-18,00	-530,44	-0,04
2002-02	11.055,67	1,9031875	-3,00	-2.196,65	-0,18
2002-03	11.679,43	1,987875	87,00	623,76	0,05
2002-04	11.441,50	1,966964286	98,00	-237,93	-0,02
2002-05	10.413,70	1,904545455	3,00	-1.027,80	-0,09
2002-06	9.379,92	1,877605556	-51,00	-1.033,78	-0,10
2002-07	10.236,46	1,848451304	64,00	856,54	0,09
2002-08	9.547,30	1,774851429	-76,00	-689,16	-0,07
2002-09	8.842,24	1,804614286	-10,00	-705,06	-0,08
2002-10	10.251,92	1,784538696	56,00	1.409,68	0,15
2002-11	13.300,40	1,455878095	-247,00	3.048,48	0,26
2002-12	10.369,92	1,40725	81,00	-2.930,48	-0,25
2003-01	11.032,03	1,366051818	119,00	662,11	0,06
2003-02	11.574,44	1,343344	52,00	542,41	0,05
2003-03	9.475,09	1,286235714	-119,00	-2.099,35	-0,20
2003-04	11.509,95	1,300469	-42,00	2.034,86	0,19
2003-05	11.381,41	1,2845	9,00	-128,54	-0,01
2003-06	10.884,43	1,12253	48,00	-496,98	-0,04
2003-07	10.572,04	1,109538696	77,00	-312,39	-0,03
2003-08	11.611,84	1,134844	174,00	1.039,80	0,09
2003-09	13.055,90	1,142457727	311,00	1.444,06	0,12
2003-10	15.754,34	1,158370435	131,00	2.698,44	0,19
2003-11	14.617,53	1,1723445	88,00	-1.136,81	-0,07
2003-12	18.625,02	1,170328095	57,00	4.007,49	0,24
2004-01	17.259,25	1,128154762	-18,00	-1.365,77	-0,08
2004-02	18.889,20	1,124094	364,00	1.629,95	0,09
2004-03	20.190,83	1,112173913	157,00	1.301,63	0,07
2004-04	18.022,69	1,151938	-96,00	-2.168,14	-0,11
2004-05	17.081,08	1,253322632	-60,00	-941,61	-0,05
2004-06	17.967,60	1,500597273	131,00	886,52	0,05
2004-07	19.380,86	1,62804	90,00	1.413,26	0,08
2004-08	20.218,37	1,729166667	-47,00	837,51	0,04
2004-09	21.953,52	1,903892727	183,00	1.735,15	0,08

2004-10	22.889,89	2,082500476	37,00	936,37	0,04
2004-11	22.486,20	2,306108182	212,00	-403,69	-0,02
2004-12	24.971,68	2,499137143	474,00	2.485,48	0,10
2005-01	27.330,35	2,66675	853,00	2.358,67	0,09
2005-02	28.396,17	2,819501	526,00	1.065,82	0,04
2005-03	25.557,76	3,023511905	472,00	-2.838,41	-0,11
2005-04	23.591,64	3,153262857	311,00	-1.966,12	-0,08
2005-05	25.236,48	3,2740195	96,00	1.644,84	0,07
2005-06	26.957,32	3,426251364	584,00	1.720,84	0,07
2005-07	29.615,29	3,613024762	571,00	2.657,97	0,09
2005-08	30.908,02	3,799024091	501,00	1.292,73	0,04
2005-09	33.333,23	3,905717727	756,00	2.425,21	0,08
2005-10	31.963,99	4,167400476	-174,00	-1.369,24	-0,04
2005-11	38.088,65	4,352234091	977,00	6.124,66	0,18
2005-12	39.777,70	4,4910015	196,00	1.689,05	0,04
2006-01	44.590,22	4,605268571	465,00	4.812,52	0,11
2006-02	47.015,88	4,755547	199,00	2.425,66	0,05
2006-03	42.911,32	4,920291304	-23,00	-4.104,56	-0,09
2006-04	43.880,43	5,071153889	223,00	969,11	0,02
2006-05	38.132,21	5,185510952	226,00	-5.748,22	-0,14
2006-06	35.453,31	5,384803182	-82,00	-2.678,90	-0,07
2006-07	36.037,92	5,495328571	324,00	584,61	0,02
2006-08	37.285,94	5,420697273	85,00	1.248,02	0,03
2006-09	36.924,86	5,383664762	182,00	-361,08	-0,01
2006-10	40.582,25	5,37334	492,00	3.657,39	0,09
2006-11	38.168,53	5,372078636	469,00	-2.413,72	-0,06
2006-12	39.117,46	5,359968421	-621,00	948,93	0,02
2007-01	41.182,55	5,360011364	-1.290,00	2.065,09	0,05
2007-02	41.430,99	5,3594065	470,00	248,44	0,01
2007-03	43.661,12	5,347145455	169,00	2.230,13	0,05
2007-04	44.984,45	5,354764211	760,00	1.323,33	0,03
2007-05	47.081,49	5,358914286	1.909,00	2.097,04	0,05
2007-06	47.093,67	5,36	597,00	12,18	0,00
2007-07	52.824,89	5,359655	1.139,00	5.731,22	0,11
2007-08	50.198,60	5,482706364	-215,00	-2.626,29	-0,05
2007-09	54.044,22	5,493939	830,00	3.845,62	0,07
2007-10	57.615,72	5,146522609	429,00	3.571,50	0,06
2007-11	54.213,82	4,962075	-119,00	-3.401,90	-0,06
2007-12	55.538,13	4,979408947	459,00	1.324,31	0,02
2008-01	42.697,56	3,917643182	-497,00	-12.840,57	-0,26
2008-02	44.776,88	3,087590476	160,00	2.079,32	0,05
2008-03	39.015,44	2,782501053	-370,00	-5.761,44	-0,14
2008-04	43.468,12	2,79466	127,00	4.452,68	0,11

2008-05	39.969,63	2,692378	1.507,00	-3.498,49	-0,08
2008-06	35.089,53	2,765389524	1.845,00	-4.880,10	-0,13
2008-07	42.200,75	2,79233913	579,00	7.111,22	0,18
2008-08	39.844,48	2,8062525	-1.010,00	-2.356,27	-0,06
2008-09	36.051,30	3,121677273	-260,00	-3.793,18	-0,10
2008-10	27.832,93	4,058586957	-1.365,00	-8.218,37	-0,26
2008-11	25.714,98	2,279063	-256,00	-2.117,95	-0,08
2008-12	26.864,07	1,829345714	256,00	1.149,09	0,04
2009-01	25.934,37	1,210805238	-104,00	-929,70	-0,04
2009-02	24.026,59	1,242627	-331,00	-1.907,78	-0,08
2009-03	25.764,83	1,266737273	-3,00	1.738,24	0,07
2009-04	31.651,81	1,1062215	841,00	5.886,98	0,21
2009-05	35.002,99	0,815034211	662,00	3.351,18	0,10
2009-06	36.949,20	0,620712273	159,00	1.946,21	0,05
2009-07	42.641,26	0,515327826	52,00	5.692,06	0,14
2009-08	46.551,19	0,4245185	563,00	3.909,93	0,09
2009-09	47.910,30	0,297949091	-83,00	1.359,11	0,03
2009-10	47.184,71	0,283082273	291,00	-725,59	-0,02
2009-11	45.350,17	0,268140952	141,00	-1.834,54	-0,04
2009-12	52.825,02	0,25304619	639,00	7.474,85	0,15
2010-01	54.650,58	0,2501195	410,00	1.825,56	0,03
2010-02	49.705,49	0,2505195	-202,00	-4.945,09	-0,09
2010-03	56.538,37	0,268424783	370,00	6.832,88	0,13
2010-04	58.959,10	0,3116065	137,00	2.420,73	0,04
2010-05	54.384,94	0,458514211	-501,00	-4.574,16	-0,08
2010-06	54.839,46	0,536898636	537,00	454,52	0,01
2010-07	59.866,75	0,510327727	571,00	5.027,29	0,09
2010-08	59.972,59	0,362546667	14,00	105,84	0,00
2010-09	65.774,37	0,291365909	1.218,00	5.801,78	0,09
2010-10	68.760,46	0,28884	969,00	2.986,09	0,04
2010-11	65.350,85	0,287120455	730,00	-3.409,61	-0,05
2010-12	66.004,48	0,302723333	-785,00	653,63	0,01
2011-01	63.278,07	0,3034105	-629,00	-2.726,41	-0,04
2011-02	61.283,87	0,3119	-554,00	-1.994,20	-0,03
2011-03	64.434,51	0,308434783	-97,00	3.150,64	0,05
2011-04	69.250,14	0,281382222	825,00	4.815,63	0,07
2011-05	63.046,02	0,260713	-193,00	-6.204,12	-0,09
2011-06	63.269,40	0,247824091	-136,00	223,38	0,00
2011-07	62.295,68	0,249911905	113,00	-973,72	-0,02
2011-08	53.946,09	0,293237727	-545,00	-8.349,59	-0,14
2011-09	59.693,43	0,350226818	811,00	5.747,34	0,10
2011-10	56.061,47	0,406478571	-513,00	-3.631,96	-0,06
2011-11	54.517,76	0,475291818	-270,00	-1.543,71	-0,03

2011-12	51.266,62	0,5557375	203,00	-3.251,14	-0,06
2012-01	57.171,34	0,5659	556,00	5.904,72	0,11
2012-02	60.721,23	0,503240476	266,00	3.549,89	0,06
2012-03	62.423,04	0,473288636	99,00	1.701,81	0,03
2012-04	60.010,42	0,466807895	-145,00	-2.412,62	-0,04
2012-05	55.099,33	0,466531818	-435,00	-4.911,09	-0,09
2012-06	62.543,49	0,465586842	898,00	7.444,16	0,13
2012-07	64.259,54	0,453554545	727,00	1.716,05	0,03
2012-08	67.367,95	0,4326	429,00	3.108,41	0,05
2012-09	66.396,71	0,3856325	287,00	-971,24	-0,01
2012-10	72.528,97	0,33048913	359,00	6.132,26	0,09
2012-11	73.058,51	0,311022727	2.383,00	529,54	0,01
2012-12	78.208,44	0,309473684	852,00	5.149,93	0,07
2013-01	78.783,47	0,302613636	235,00	575,03	0,01
2013-02	79.333,67	0,290495	-354,00	550,20	0,01
2013-03	85.898,99	0,2819	511,00	6.565,32	0,08
2013-04	86.046,04	0,277142857	134,00	147,05	0,00
2013-05	85.990,01	0,274169048	508,00	-56,03	0,00
2013-06	76.294,51	0,27374	-1.230,00	-9.695,50	-0,12
2013-07	73.377,45	0,267582609	-605,00	-2.917,06	-0,04
2013-08	66.394,41	0,263395238	-258,00	-6.983,04	-0,10
2013-09	74.486,56	0,253178571	733,00	8.092,15	0,12
2013-10	77.620,37	0,241765217	641,00	3.133,81	0,04
2013-11	75.748,27	0,238245238	772,00	-1.872,10	-0,02
2013-12	67.801,73	0,2438975	-245,00	-7.946,54	-0,11
2014-01	61.858,21	0,238229545	-318,00	-5.943,52	-0,09
2014-02	62.553,32	0,2352025	-85,00	695,11	0,01
2014-03	69.736,34	0,234097619	811,00	7.183,02	0,11
2014-04	73.871,54	0,227495	579,00	4.135,20	0,06
2014-05	79.289,80	0,22609	643,00	5.418,26	0,07
2014-06	78.489,01	0,230945238	-152,00	-800,79	-0,01
2014-07	82.156,87	0,234173913	660,00	3.667,86	0,05
2014-08	80.312,94	0,23465	-124,00	-1.843,93	-0,02
2014-09	74.937,81	0,234031818	-406,00	-5.375,13	-0,07
2014-10	80.579,66	0,231376087	431,00	5.641,85	0,07
2014-11	86.168,66	0,2328625	524,00	5.589,00	0,07
2014-12	85.721,13	0,244607143	-4,00	-447,53	-0,01
2015-01	88.945,82	0,254319048	506,00	3.224,69	0,04
2015-02	84.147,51	0,25842	-617,00	-4.798,31	-0,06
2015-03	80.846,03	0,268297727	-683,00	-3.301,48	-0,04
2015-04	83.947,04	0,27596	652,00	3.101,01	0,04
2015-05	82.981,15	0,279536842	74,00	-965,89	-0,01
2015-06	82.249,53	0,282711364	1,00	-731,62	-0,01

2015-07	79.909,68	0,290669565	-474,00	-2.339,85	-0,03
2015-08	75.210,37	0,3207975	-347,00	-4.699,31	-0,06
2015-09	74.205,47	0,331111364	-237,00	-1.004,90	-0,01
2015-10	79.409,00	0,321359091	204,00	5.203,53	0,07
2015-11	75.232,79	0,370971429	-1.057,00	-4.176,21	-0,05
2015-12	71.726,99	0,533235714	-417,00	-3.505,80	-0,05
2016-01	73.481,09	0,6195525	-261,00	1.754,10	0,02
2016-02	75.814,41	0,622719048	444,00	2.333,32	0,03
2016-03	83.268,04	0,632	999,00	7.453,63	0,09
2016-04	85.327,80	0,63275	497,00	2.059,76	0,02
2016-05	77.803,41	0,645571053	-838,00	-7.524,39	-0,09
2016-06	76.817,19	0,651620455	-94,00	-986,22	-0,01
2016-07	75.405,53	0,696309524	-348,00	-1.411,66	-0,02
2016-08	75.967,63	0,810223182	31,00	562,10	0,01
2016-09	76.488,38	0,849680455	308,00	520,75	0,01
2016-10	78.536,17	0,878682857	471,00	2.047,79	0,03
2016-11	73.995,20	0,908464091	-504,00	-4.540,97	-0,06
2016-12	78.138,66	0,9753285	118,00	4.143,46	0,05
2017-01	86.295,72	1,025692857	649,00	8.157,06	0,10
2017-02	87.478,33	1,0445965	331,00	1.182,61	0,01
2017-03	88.947,40	1,134713043	-49,00	1.469,07	0,02
2017-04	94.655,31	1,159228235	307,00	5.707,91	0,06
2017-05	97.541,58	1,185849524	272,00	2.886,27	0,03
2017-06	100.440,39	1,262409545	693,00	2.898,81	0,03
2017-07	107.531,44	1,307512857	488,00	7.091,05	0,07
2017-08	110.010,49	1,314176818	520,00	2.479,05	0,02
2017-09	102.907,73	1,323295714	-248,00	-7.102,76	-0,07
2017-10	110.142,60	1,360793182	111,00	7.234,87	0,07
2017-11	103.984,39	1,434204091	-24,00	-6.158,21	-0,06
2017-12	115.333,01	1,601752105	142,00	11.348,62	0,10
2018-01	119.528,79	1,733970909	289,00	4.195,78	0,04
2018-02	118.950,76	1,874672	-348,00	-578,03	0,00
2018-03	114.930,22	2,173357619	-361,00	-4.020,54	-0,03
2018-04	104.282,78	2,349426	-414,00	-10.647,44	-0,10
2018-05	100.652,27	2,335608571	-24,00	-3.630,51	-0,04
2018-06	96.520,07	2,330264286	76,00	-4.132,20	-0,04
2018-07	96.952,23	2,339118182	-463,00	432,16	0,00
2018-08	92.723,40	2,323575	-36,00	-4.228,83	-0,04
2018-09	99.956,90	2,349427	-71,00	7.233,50	0,08
2018-10	90.200,71	2,460626522	-45,00	-9.756,19	-0,10
2018-11	95.416,03	2,649184091	346,00	5.215,32	0,06
2018-12	91.270,48	2,787742105	143,00	-4.145,55	-0,04
2019-01	104.074,22	2,774177727	1.300,00	12.803,74	0,13

2019-02	104.529,93	2,676678	136,00	455,71	0,00
2019-03	93.784,18	2,605674762	-554,00	-10.745,75	-0,11