

Determinants of Stock Return in BIST

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ABSTRACT

In this study, we investigated the effect of macroeconomic variables on the volatility of Turkish stock market returns. We examined the effect of growth in gross domestic product, inflation, treasury bills rate, return on oil, exchange rate of major currencies against Turkish Lira, and contagion effect proxied for average of four major stock market returns most especially in United States, United Kingdom, Germany, and Japan. Using quarterly data from the periods 2002-2016, we carried out descriptive, correlation, and classical linear regression analysis. Empirical results show that there are three main determinants of Turkish stock market returns such as; return on oil, exchange rates, and contagion effect. Based on the results, we are of the opinion that, investors should speculate the fluctuations in oil price and monitor Turkish Lira against major currencies. Investors who are seeking international diversification benefits, especially through Turkey Lira should put into consideration impacts of contagion effect and other major stock market variables.

Keywords: Turkish stock market, exchange rate, contagion effect.

ÖZ

Bu çalışmada makroekonomik göstergelerin Borsa İstanbul hisse getirileri üzerindeki etkisi araştırılmıştır. Bunun için gayri safi yurtiçi hasıladaki büyüme, enflasyon, faiz, petrol getirileri ve döviz kurlarındaki değişikliğin İstanbul Borsası hisse gelirlerini nasıl etkilediği incelenmiştir. Bunun yanında Amerika Birleşik Devletleri, Birleşik Krallık, Almanya ve Japonya Borsalarındaki gelişmelerin İstanbul Borsasını nasıl etkilediği, nasıl bulaştığı da değerlendirilmiştir. Çalışma için 2002-2016 çeyrek verileri kullanılmış ve açıklayıcı istatistikler, korelasyon ve klasik doğrusal regresyon analizi gerçekleştirilmiştir. Ampirik sonuçlar, İstanbul Borsası getirilerinin üç ana belirleyicisi olduğu ve anlamlı etkilediği tespit edilmiştir. Buna göre Dünya borsasındaki gelişmeler ve petrol getirileri ile İstanbul Borsası getirileri arasında pozitif bir ilişki olduğu, bu iki değişkendeki artışın İstanbul borsasındaki getiriyi olumlu etkileyeceği gözlemlenmiştir. Diğer taraftan dövizdeki kur artışının İstanbul borsasını olumsuz etkilediği tespit edilmiştir. Sonuçlara göre görüşümüz İstanbul Borsası yatırımcılarının petrol fiyatlarındaki dalgalanmaları ve Türk Lirasının önemli para birimlerine karşı değişimini dikkate alarak değerlendirmeleri yönündedir. Uluslararası alanlarda getiri arayışı içerisinde olan yatırımcıların, özellikle Türk Lirası aracılığıyla bulaşıcılık etkisinin ve diğer büyük borsalardaki gelişmelerin etkilerini de göz önünde bulundurmaları gerekecektir.

Anahtar Kelimeler: Borsa İstanbul, Döviz kuru.

TABLE OF CONTENTS

ABSTRACT.....	iii
ÖZ.....	iv
LIST OF TABLES.....	vii
1 INTRODUCTION.....	1
1.1 Background to the Study	1
1.2 Objective of the Study.....	4
1.3 Statement of Significance.....	4
1.4 Research Methodology.....	5
1.5 Thesis Structure.....	5
2 LITERATURE REVIEW.....	6
2.1 Macroeconomic Variables and Stock Returns	7
2.1.1 Interest Rate and Stock Market Price	9
2.1.2 Inflation and Stock Market Price	11
2.1.3 Exchange Rate and Stock Market Price	15
2.1.4 Oil Prices and Stock Market Price	19
2.2 Contagion Effect of Major Stock Markets	21
2.3 Summary of Literature Review	23
3 DATA AND METHODOLOGY.....	24
3.1 Data	24
3.1.1 Variables Description	24
3.1.2 Descriptive Analysis	26
3.2 Methodology	27
3.2.1 Unit root test	27

3.2.2 Model and Regression Analysis	28
3.3 Hypothesis	30
4 EMPIRICAL RESULTS.....	32
4.1 Correlation Analysis	32
4.2 Unit Root Test Results	33
4.3 Regression Analysis Results	34
4.3.1 First Model Results	34
4.3.2 Second Model Results	36
4.3.3 Comparison between the Models	38
5 SUMMARY AND CONCLUSION.....	40
REFERENCES.....	43

LIST OF TABLES

Table 1: Summary of the Variables	24
Table 2: Descriptive Statistics	27
Table 3: Correlation Analysis	33
Table 4: ADF Results	34
Table 5: First Model Regression Results	36
Table 6: Second Model Regression Results	38
Table 7: Summary of results	38

Chapter 1

INTRODUCTION

1.1 Background to the Study

Finding optimum returns and minimizing the risk within the market, the prospect for diversification to international business, financial organizations and stakeholders is influenced by financial changes, which can be gathered under the title of financial liberalization. Shifting this tendency towards global integration is caused by four factors.

The European Union seems to have a better knowledge of the capital markets, even to the removal of fixed trading commissions and readjusting governmental regulation; as the major capital markets became more liberalized. This is the first factor, the realization of how international portfolio diversification is in favor of the investors comes as the second. The third factor also comes to be the realization of sourcing new capital internationally favoring the Multi-National Corporations (MNC). The fourth factor is computer technology and new communications having proficient securities swapping throughout order routing and implementation, information distribution and clearance and expenditure (Eun & Resnick, 2004). Furthermore, financial implications becoming more substantial and setting up risk in finance and currency internationally happened as a result of international business companies referring to international activity of import and export Moosa (2003). Moreover, energizing the international economy mostly happens as a result of the

continuous liberalization of assets and international trade and incursion progresses in transportation technologies and telecommunications, which bring great incorporation for the international economy (Eun and Resnick, 2004). Additionally, assisting international transactions of progresses in computer and telecommunication technologies have backed the globalization of investment (Abugri, 2002). So as a matter of fact inter-relationship among financial markets can be brought by global liberalization.

To bargain for a progressive outcome in global financial markets, the significant growth of capital finances should be seen as financial state gripping business stakeholders, financial organizations and individual stakeholders. For instance, for international investments, investing in the emerging stock markets create significant progress and opportunities. It has been noted in More and Monage (2007) that Australia's pool of superannuation resources proceeds to significantly develop up to approximately AUD1 trillion.

Enormous annual inputs about AUD77 billion in 2005 to 2006 and the persistent excessive profit attained by Australia's superannuation funds galloped this significant development. Additionally, it has been shown in Skully (2007) how the first and second largest Australian Prudential Regulatory Authority (APRA) classifications are invested with Australian shares at 32% and international shares at 24.5% in 2006 according to the statistics from APRA.

The emerging stock market can be seen as including a high risk potential, however, its outcomes have high potential. While the international equity profit was 7.3% and Australia's equity profit was 11.9%, the sum of international equity profits accrued

from Jan 1988 to Dec 2006 showing significant profit on major class of international equities from emerging markets at 14.4% (Warren & Radcliffe, 2008). The international equities market had negative turnouts as a result of the global economic decline, however the profits are predicted to progress, especially in Asia's emerging markets that are more eye-catching and have more development latent than the international markets (Oliver, 2008). Thus, latent profits improved the eye-catching of the evolving markets and shaped the foremost overlook for international stakeholders for captivating confirmatory and progressive profits back from the economic decline.

With the significant acceleration of growth in the South-East Asian market along with the capital markets, the investment portfolios have also shown growth trailing the financial crisis in 1997 with the underpinning of the Asia financial market with new encounters to specialists, policy makers and investigators in finance discipline (International Finance Corporation, 2000).

There have been swings in economics and in the financial market with evolving market assets due to bringing into line the currency values and free trade within the time frame of the repercussion of the 1997 Asian economic crisis (Murphy, 2009). Furthermore, it was reported in Micklethwait (2009), that most of the international economic production has been engendered from the international emerging economies but these countries have to face many structures like market volatility and contagion conduction.

As a result of loss of investor confidence the result of instability and contagion will affect market returns and elevated level of uncertainty makes abridged assurance of

stakeholders according to Ballie and De Gennaro (1990). Volatility is fundamental for competent financial choices with the precise calculating of market (Maddala and Rao, 1996).

1.2 Objective of the Study

Turkey is one of the main emerging markets in the world which make it an interesting country to study. Investors are analyzing and considering Turkish stocks to be included in their portfolio. The objective of this study is to find the determinants of Turkish stock returns and what causes the returns to fluctuate in order to have better analysis and stronger financial market. In addition, the contagion effect is added to this study in order to examine its effect on the volatility of Turkish stock returns which will help in the analysis for potential investors.

The main contribution of this study is that there has been no other study taking into account the dataset available in this thesis alongside with the index representing the contagion effect included in this study in the case of Turkey.

1.3 Statement of Significance

This study investigate factors that influence securities exchange volatility in the Turkish Stock market. The result of this study will be valuable in advising speculators and approach creators on their choices identifying with the Istanbul securities exchange, BIST, specifically. This study will help in making sense and precise estimation of securities exchange volatility with the importance of the powerful aspects giving a valuable apparatus to expand advantage, since it is key for financial specialists to keep up certainty and figure value development. Financial specialists will have the capacity to figure out systems, to limit the jeopardy with utilizing portfolio diversification, risk management and hedging. In addition,

recognizing, determining and making sense of the variables of volatility will educate the nations in the enunciation of the strategies to limit the impact of contagion.

1.4 Research Methodology

The study covers 2002 to 2016 (quarterly) with the time series data. Economic variables were gathered from the Central bank of Republic of Turkey. All stock market indices were obtained from the Thomson Reuters data stream. Chapter 3 is going to discuss in details methodology adopted for this study.

The dependent variables of this study is change in BIST100 index, while the independent variables are change in GDP, CPI, investors' confidence, T-bill of Turkey, USD/TRY and EUR/TRY exchange rate, oil price, NIKKEI, DAX, S&P500 and LSE.

1.5 Thesis Structure

The thesis structure is scheduled as follow; in chapter 2, we discuss literature review on the components influencing the volatility of the stock market and contagion effects, while in chapter 3, we discuss data and methodology adopted for the study. In chapter 4, we discuss the results and empirical findings, while chapter 5, we conclude the study with policy recommendations.

Chapter 2

LITERATURE REVIEW

In this section, we discuss past literatures examining the relation concerning macroeconomics variables and stock prices. Stock market prices promptly adjust depending on the current information available on the stock market floor; thus, the stock market prices show all information about the stocks in an efficient capital market. This implies that an investor current information is required when predicting stock market prices movements, in order to make reasonable profits via buying and selling of shares. Generally, an efficient capital market rapidly integrates current information. It is believed that, stock market prices show expectations of the future corporate profit and performances. Therefore, if stock market prices indicate these propositions, it should be utilized as a measure of economic activities. According to Maysami *et al* (2004) the relationship between macroeconomic key factors and stock market prices can be utilized as a guide towards any economy macroeconomic policies.

It is paramount to note that, the prices of stocks are realized via the net earnings of a stock market or organization. This is determined by the profit such organization is expected to make in the nearest future. The price of stock of an organization is expected to rise, if such organization performance is expected to improve, this indicates positive expectation that affects stock prices, and vice versa. This implies that, stock prices are positively related to organization performance. In such a

situation, when the price level increases, the organization net worth will also diminish. This situation in one way or the other negatively erode efficiency of the stock prices, hence the market returns.

2.1 Macroeconomic Variables and Stock Returns

Talking about evaluation process of the capital market, industry and economic environment should be put into consideration, couple with analysis of stocks and/or individual organizations. It was argued that failure or success of an individual can be as a result of his or her family environment, genetic skills, social and economic environment. Relating this assumption to the capital market securities evaluation Reilly and Brown (2006) indicates that an industry and economic environment should be taken into consideration during the stock market evaluation process. The top-down and bottom-up techniques show the significance of the industry and economic environment in the stock market evaluation process.

The top-down method assume that both the industry and economic significantly influence the aggregate stock returns for individual stocks, despite the qualities of the organization or firm. While using the bottom-up method, stocks generate higher returns, no matter the industry and economic outlook of such country or firm. The outcomes of various empirical studies examining the impacts of macroeconomic variables on stock market returns have been in favor of the top-down investment processes. This method is addition to profit potential and individual quality, also put into consideration how industry performance and economic environment influences the value of securities and its rate of return. Hence, specific macroeconomic variables are regarded as presumptive risk that are all familiar to organizations or firms.

In order to get a better insight into the relationship that exist between macroeconomic variables and stock prices, we employed theoretical stock evaluation models, which includes, Free Cash Flow (FCF), Residual Income (RI) and the Dividend Discount Model (DDM). Using these model, it is assumed that, the prevailing prices of an equity share are roughly equivalent to the present value of all the future cash flows. Therefore, macroeconomic variable influencing required rate of return and cash flows would successively have effect on the value of share.

In addition, it has been argued in literature that the stock returns volatility usually rises most especially during economic recessions and decline in recoveries period. According to Schwert (1989) volatility in stock market is often higher in recessions, while Nardari and Scruggs (2005) were of the opinion that, several, but not all periods of high uncertainty of future returns are related with economic recessions. In addition, Moore (1983) in his analysis for the United States revealed that, in most cases, the overall level of stock prices has been observed to be much higher at the peak of a boom than at the bottom of an economic recession. The author argued that, the turn in stock prices occur before the turn in business activities. Schwert (1989) in his empirical findings also revealed that, the evidence of a nexus between macroeconomic variables variability and stock prices volatility is somewhat weak. However, they found causality relationship between macroeconomic variables volatility and financial asset volatility. Therefore, stock prices was argued to be the cause oscillation in business cycle with stock price indices being the leading indicators. By implication, it appears that, the stock market prices were already declining right from the peak of the business cycle; whereas the stock prices were readily rising at the bottom of the business cycle respectively.

2.1.1 Interest Rate and Stock Market Price

The relationship that exist between interest rate and stock market prices has been documented in literature. That is, an inverse relationship has been reported to exist between interest rates and stock prices, which is due to several factors. The first factor to be determined in an equity evaluation process is the discount rate. Discount rate show the relationship between the riskiness of the stock and the time value of money. One has to put in mind that, the risk free interest rate depict the time value of money. On the other hand, a risk premium is the remuneration for risk. It is measured relative to the risk free interest rate. According to Stowe et al (2007) a selected discount rate by an investor is perceived and regarded as a required rate of return on investment.

In pricing of risky securities, calculated required rate of return is applied with a specified model that would explain the relationship between the risk and expected return. In other words, it is quite significant to choose the required rate of return, while evaluating the value of stocks. The reason being that, variation in interest rates influence the conceptual price of stocks, indirectly by the investor's rate of return. In such a situation, DDM is suitable to decide the value of shares.

As the key interest rates is adjusted by the government, the risk-free interest rate will also change. As the interest rate rises, the risk-free interest rate will also increase. The increase in both interest rate and risk-free rate would cause the market rate to also increase. However, if nothing else changes, then, the stock target price would decline which is as a result of the increase in required rate of return, the opposite is true. On the other hand, if interest rates decline and every other things is held constant, then, the stock target price would increase, which is due to the decline in

the required rate of return. In addition, there will be increase in the required rate of return, when there is an increase in the level of risk premium.

Furthermore, interest rates are expected to be inversely associated with stock market returns, either via the discount factor or inflationary effect. As reported in the work of Choi and Jen (1991) that the anticipated returns on shares have a strong relationship with the interest-rate risk and market risk. Their empirical findings indicate that, for small firms, the interest-rate risk is a crucial source of investors' portfolio risk, while for large firms, the interest-rate risk it is inverse. Interest-rate risk premium was argued to be a crucial part of the difference in expected returns between the bottom and top quintile of the MEX and the NYSE. In Humpe and Macmillan (2007) work, they argued that both the Japan and the United States stock prices are inversely related with a long term interest rate.

In addition, the impact of interest rate on stock returns has been examined for several emerging economies, such as Adam and Tweneboah (2008) for emerging economy of Ghana and Al-Sharkas (2004) for Jordan. Their studies show statistical significant and estimated negative coefficients relationship between interest rates and stock prices. In the same vein, Maysami *et al* (2004) in their analysis show that, interest rates have significant positive and negative relationships with the stock market prices, both in the short- and long-run in the case of Singapore.

Muradoglu and Metin (1996) empirical analysis in the case of Turkey, show that the growth of interest rates influences, stock returns inversely, with a statistical significant lag of interest rates in the short run (dynamic) model. In addition, Yildirtan (2007) show that, the interest rate differential variables and the real interest

rate on deposits have a strong-weak, inverse relationship with stock returns in the case of Turkey. Analysis of Kandir (2008) in their analysis for Turkey, examined stock portfolios and concluded that, interest rate inversely influence aggregate stock portfolio returns. Tursoy et al (2008) on the other hand, provide no evidence to support a statistical significant relationship between pricing, stock return and interest rate in the case of Turkey. Lastly, Ozturk (2008) argued that, the lagged interest rate (overnight) does have predictive power over stock returns in the case of Turkey. In addition, he found that, stock returns is a useful predictor of overnight interest rate and treasury interest rate. Ozturk (2008) empirical analysis for both emerging and developed markets is consistent with the existing literature and theory that, an inverse relationship between interest rate and stock return.

2.1.2 Inflation and Stock Market Price

During the stock evaluation process, it is crucial to put into consideration the impacts of inflation on stock market prices. This is because, inflation rates differs overtime and it is peculiar with a certain economy. Going by existing literature and in theory, the value of stocks should be inflation neutral, while increase in the level of inflation should not in any ways influence stock valuations. Fisher (1930) defines the nominal interest rate as the collective addition of the expected inflation rate with the real interest rate.

As pointed out in the existing studies, the nominal interest rate is determined in the marketplace, which is referred to as the rate of interest or interest rate. The real interest rate on the other hand, is estimated from the interest rate and the forecasted inflation observed. The real interest rates has been argued to be stable over time, thus, volatility in interest rates are outcomes of alteration in inflationary expectations and not as a result of changes in real returns. Fisher (1930) decomposed the nominal

rate of return into two components, the first is the expected inflation and the second is the expected real interest rate. According to the author, the expected real return is as a result of real factors and has nothing to do with anticipated inflationary level. Which implies that, the real rates of return on common stocks and anticipated inflationary level are independent of one another, while the nominal stock returns differ in a one-to-one correlation with the anticipated inflationary level. Furthermore, Gultekin (1983) in his empirical analysis, where he was examining the generalized Fisher proposition, between the periods 1947-1979 for 26 countries, failed to provide an evidence in support of a positive relationship between inflation rates and nominal stock returns. In addition, empirical findings show that the estimated coefficients are negative and statistically significant.

There is an ongoing contention among researchers, regarding the inverse relationship that has been argued or reported to exist between inflation and stock prices in literature. The reason is that, a rise in the level of inflation is expected to go along with higher required real returns and lower anticipated earnings growth. According to Hoguet (2008) empirical analysis for the United States, the author provided a significant empirical evidence to support the notion that, high inflation is related with declining stock prices and high equity risk premium. To the author, increase in the level of inflation is suitable for prohibitive economic policies. However, this in turn raises the level of nominal risk-free rate, by so doing, in valuation models, increases the required rate of return.

In addition, inflation has a falsify impact on given an account of earnings, most especially when historical costs methodology are employed in accounting. Earnings reported that depends on depreciation at specific historical cost as an estimate of

replacement costs, usually lead to an overstatement of such reported earnings. In the same vein, a stock inventory system of first-out could cause an understatement of an inventory costs and at the same time, an overstatement of reported earnings. Therefore, according to Solnik and McLeavey (2009) a firm operating in a high-inflation environment will be punished, in a situation that such firm cannot pass through inflation. Thus, Sharpe (1999) is of the opinion that, a 1% point increase in the anticipated level of inflation is expected to lead to 1% point increase in the required real, which result to about 20% reduction in stock market prices.

Fama and Schwert (1977) in their analysis revealed that the United States common stock returns are inversely related with the anticipated element of the inflation rate. Also Fama (1981) in his analysis proposed that, an inverse relationship between inflationary level and real stock returns experienced in the post-1953 period, were as a result of the proxy impacts. The author argued that, stock returns are regulated and determined by projecting more important real variables. Conversely, the inverse inflation-stock return relationships are as a result of an inverse relationship between real activity and inflation. In the study of Saunders and Tress (1981) they indicated that, there exist a significant negative relationship between the level of inflation and nominal stock return in the case of Australian Stock Market. By implication, it appears that stocks are poor inflationary hedges for the investor in the region. Furthermore, the empirical findings show a unidirectional causality between inflation and stock returns. Meanwhile, Flannery and Protopadakis (2001) reported that the consumer price index (CPI) and producer price index (PPI) are strong risk factor variables for NYSE-AMEX-NASD respectively. While to Humpe and Macmillan (2007) Japan and the United States consumer price index as a measure of inflation is strongly negatively correlated with stock prices.

Similarly, Naka, Mukherjee and Tufte (1998) and Nishat, Shaheen and Hijazi (2004) conducted empirical analysis for India and Pakistan. Both studies showed that inflation is negatively related and major determinant of changes in stock prices. In addition, Nishat, Shaheen and Hijazi (2004) in their empirical analysis show that, inflation have predictive power over changes in stock price in the case of Pakistan. Similarly to this study, Maghayereh (2002) and Al-Sharkas (2004) came to the same conclusion that in the case of Jordan.

On the contrary, Firth (1979), Maysami et al (2004) and Adam and Tweneboah (2008) in their empirical analysis on the relationship that exist between the variables of interest for United Kingdom, Singapore and Ghana respectively, came to similar conclusion that, there exist a significant positive nexus between inflation and stock returns. Their empirical findings was in conflict with the previous studies that have documented a significant negative relationship between inflationary level and stock returns.

Coming down to Turkey, Muradoglu and Metin (1996) in their long-run steady state empirical analysis between inflation and stock returns, argued that the inverse relationship between inflation and stock prices linger when other monetary variables are introduced in the model. In the study of Ozturk (2008), the author reported a non-Granger causality relationship between stock returns and inflation. While in the empirical analysis of Kandir (2008), the author argued that inflation rate is crucial for three portfolios out of the twelve portfolios sampled in the study. Tursoy et al (2008) in their analysis also indicated no significant relationship between stock returns and inflation. Examining the relationship that exist between inflation and stock prices, via the proxy proposition advanced by Fama (1981), Erbayal et al (2008) came to a

conclusion that a negative significant relation exist between inflation and the stock prices in the long-run. The authors validated proxy hypothesis for Turkey, while the real economic variables, which includes, level of employment, fixed investment and industrial production index are effective on stock prices via inflation. In addition, Rjoub et al (2009) concluded that the unexpected inflation has a significant positive influence on the returns of established portfolios. Finally, on the relationship between inflation and stock market prices, Gultekin (1983) argued that inflation and stock returns does not move together over time. Thus, there are significant differences with regards to the relationship between inflation and stock prices, be it developed, emerging or developing countries.

2.1.3 Exchange Rate and Stock Market Price

On the relationship between exchange rate and stock market prices, it appears there are no theoretical agreement either on relationship that exist between exchange rates and stock prices and/or on the direction of dynamic causal relationship. Although, in two methodologies have been argued to initiate a relationship between exchange rate and stock prices in literature, which includes, the portfolio balance model and the goods market model. The latter model is advanced by Dornbusch and Fisher (1980) while examining the relationship between exchange rate and the current account. The authors proposed an exchange rate model that incorporates the impacts of relative stock prices, assets markets and expectations. In addition, the model emphasized on the nexus between the current account and the features of exchange rate. The authors argue that there exist a significant nexus among the current account and the exchange rate features. They were of the opinion that, exchange rate is derived largely via the current account and/or trade balance performance of a particular country. Based on the model, they argued that, variations in exchange rates influences balance of trade

and competitiveness, hence real economic variables, which includes among others, real income and output. According to the model, variations in exchange rates influences firm competitiveness, earnings, and cost of funds, hence, stock prices.

On a macro level, the impact of exchange rate volatilities on stock market price is determined by the level of trade openness of the national economy and the extent of their trade balance. Therefore, goods market models indicate a positive significant relationship between exchanges rates and stock prices, with the direction of dynamic causality relationship going from exchange rates to stock prices. According to Stavarek (2004) the report of a significant positive relationship between the variables, emanates from the proposition of employing direct exchange rate quotation.

To Tahir and Ghani (2004) portfolio balance models laid more emphasis on the role of capital account transactions. The model presumes an inverse relationship between exchange rates and stock prices. It was argued that, an increase in indigenous stocks prices would encourage capital inflows, which in turn, increases the demand for local currency and stimulate exchange rate appreciation. Increase in stock market would cause local currency to appreciate via direct and indirect means. For an example, an increase in stock prices induced investors to purchase more local assets, by doing away with their foreign assets, in order to buy more of local currency for the purpose of acquiring more or additional local stocks. Thus, the swings in demand and supply of currencies lead to the appreciation of local currency. A rise in an indigenous assets prices cause growth of wealth that eventually encourage an investors to increase their demand for money, this in return, increases local interest rates. Thus, Stavarek (2004) is of the opinion that, higher interest rates stimulate foreign capital inflows,

and thereby cause a rise in foreign demand for local currency and its subsequent appreciation.

On the other hand, it has been argued that changes in exchange rate negatively influence exportation and importation of goods and services. For an instance, when local currency depreciates, imported goods and services would become more expensive. If the price increase can be transfer to customers, then earnings experience decline as a result of currency adjustment. Although, this is usually not the case. The fact remains that, as price increases demand for imported goods and services declines. Then, domestically produced goods and services become more reasonable than imported ones, according to Solnik and McLeavey (2009) this situation will readjust such economy towards equilibrium. By implication, the gain from importation will eventually decline, while the gains derived from exportation rises.

Stavarek (2004) argued that direction of causal relationship between exchange rate and stock prices are not common among the new EU-member countries and the developed economies. Obben et al (2006) in their empirical analysis confirmed both short- and long-run bidirectional causality between foreign exchange and New Zealand stock market. Abugri (2008) in his study on emerging market economies, show that the reaction of the Mexican and Brazilian stock returns to an exchange rate shock is negatively significant. While between Argentina and Chile stock returns failed to adjust to exchange rates changes. In addition, Adam and Tweneboah (2008) in their analysis, showed a significant negative relationship between exchange rate and Ghanaian stock market, while the empirical findings of Maysami et al (2004)

provide evidence in support a significant positive relationship between stock returns and exchange rate in Singapore.

In addition, Tabak (2006) in his analysis showed that, there is no sign for a long-term relation between exchange rate and stock prices. Although, the author reported linear granger causal relationship running from stock price to exchange rate. This findings resonate with the portfolio method for Brazilian stock market. Horobet and Ilie (2007) study reported conflicting results in the case of Romania. While the empirical findings using Engle-Granger approach show no cointegration between stock prices and exchange rates, Johansen cointegration methodology shows the existence of a cointegration relationship between exchange rate and stock market indices.

Coming down to Turkey, Muradoglu and Metin (1996) in their empirical findings show that as exchange rates increase, stock returns are also expected to increase. Yucel and Kurt (2003) in their study also show that, exporting companies mean exposure estimated coefficient is larger than that of non-exporting companies mean exposure. By implication, the mean exposure design of export and non-export companies varies. It was further argued that, local currency (TL) depreciation would cause an increase in the value of export. In addition, Kasman (2003) confirmed a stable long-run relationship between exchange rates and stock indices. Although, inconclusive evidence was reported in term of causality relationship that exist between exchange rates and financial sector index, exchange rates and composite index, and exchange rate service sector index. In addition, unidirectional causality between exchange rate and stock index resonate with the existing study.

Karamustafa and Kucukkale (2003) in their empirical analysis pointed out that, the relationship between exchange rate and stock returns is debatable. By implication, the stock market is neither a result nor a cause variable of exchange rate.

Likewise, Ozturk (2008) reported non-Granger causality relation linking stock return and exchange rate. Aydemir and Demirhan (2009) on the other hand, reported bidirectional causality among stock market indices and exchange rate. The author reported an inverse causality between services, ISE-100, industrial indices and financials and exchange rate. While a positive causality exist between technology indices and exchange rate. Yildirtan (2007) in his analysis revealed that, there is no relationship between the real exchange rate deviation from trend, average real exchange rate deviation variables and the ISE-100.

2.1.4 Oil Prices and Stock Market Price

It is paramount to note that, crude oil serve as a significant input in production activities, therefore in this study, we include oil prices to proxy for real economic variable. A rise in oil price in the international market indicates reduction in real economic activity, which in turn causes reduction in stock returns. It has been argued that industrial production rises when an economy is experiencing expansion and decline in economic contractions. Thus, a swing in industrial production indicates increase or decrease in economic activities and performances. In addition, the productive capacity of an economy tends to improve when economic progresses, which contributes to the business organizations activities to improved their cash flows. Thus, industrial production is expected to generate higher future cash flows, which would stimulate positive relation among the real economy and stock prices. In addition, the fluctuations in stock returns rise in the period of economic recessions and declines in the recoveries period. To Fama (1981) industrial production the

growth rate, exhibit a strong correlation relationship with stock returns. Fama (1990) show that large fractions of annual stock-return variances (up to about 50%) is as a result of projections of real gross national product (GNP), investment and industrial production, that contribute largely to the cash flows.

Furthermore, Foresti (2006) in his empirical analysis show that stock prices are useful predictive measure of growth, while growth is not a useful predictor of changes in stock prices. According to Fama (1990) large fragment of the changes in stock returns is as a result of time-varying anticipated returns and projections of real economic activity. In addition, Nardari and Scruggs (2005) argued that stock market fluctuates generally due to variations in the news about future returns. On the other hand, Errunza and Hogan (1998) reported that fluctuations in industrial growth rate are a useful predictor of return fluctuation for Netherlands and Italy. These results vary for Belgium, France, Germany, the United Kingdom, and Switzerland respectively.

Conclusively, Humpe and Macmillan (2007) in their analysis show that Japanese and the United States stock prices are significant positive related with industrial production. Nishat, Shaheen and Hijazi (2004) analyzed emerging markets, where they argued that industrial production has the largest positive indicator of stock prices. They also found bidirectional causality relationship between industrial production and stock prices in the case of Pakistan. Similarly, Naka, Mukherjee and Tufte (1998) shows that industrial production has the highest positive indicator of stock prices in India. Maghayereh (2002) and Al-Sharkas (2004) in their empirical analysis for Jordan and Maysami et al. (2004) in the case Singapore show that industrial production is significant and positively associated with stock returns.

2.2 Contagion Effect of Major Stock Markets

Contagion alludes to the diffusion of stuns over a nation or different nations, districts and worldwide connection by immediate or circuitous contact. Bekaert, Harvey and Ng (2005) express that it is generally characterized as a relationship between market abundance that is suggested by economic basics. Making sense of contagions is imperative for universal portfolio diversification and diversifying risk since contagion is by and large characterized as market shocks spread from the globalization drawback. In this way, when contagion wins, there is a transmittal of gigantic misfortune starting with one market then onto the next market. Das (2004) mention that an emergency in a market may be conveyed to other markets if the economy of each market is began and managed with the international economy. What's more, the investigation of Forbes and Rigobon (2002) discovered several confirmations of contagion from the crisis in Asia to created nations, in view of contingent connection examination.

Contagion comes about because of certain key connections that occur within financial markets, as portrayed underneath. Financial relations occur at the time markets are associated with the worldwide financial markets. Similarly, as universal establishments expand their portfolio hooked on numerous markets, on the off chance that one market endures a negative stun, the estimation of their advantages will fall. With a specific end goal to build their stores, global foundations should offer piece of their advantage property in other markets, which is as yet unaltered by the essential shock. This engenders the shock to diverse markets. One case of financial connections is the subprime contract calamity. The reason for this crisis was produced by budgetary development that empowered global organizations and

speculators to put resources into the US lodging market, as securitization and home loan supported securities (Karnad, 2008). These developments caused the lodging business sector to rise because of the abnormal state of theorist, overbuilding, over getting and savage loaning (Dodd, 2007). As lodging costs dropped, a sensational ascent in contract misconducts and abandonments in the US happened. Subsequently, this emergency in the long run drove the US economy into a retreat, which spread far and wide by destabilizing other money related, markets and more diminishing utilization request, item movement and obtaining influence (Shin, 2008).

Genuine connections are normally made with universal currency and trade, when nations exchange midst themselves or contend in the alike overseas business sectors. For instance, on the off chance that one nation undervalues currency that crumbles the other nation's upper hand, the financial crisis in Asia is a case of this wonder. The crisis began in when financial crumple of the Thailand's currency happened by their government's choice to glide its cash, slicing its hook to the USD after thorough endeavors to help the weight of remote obligation that was, to some extent, land driven. With the financial crisis expanding, certain Asian countries, like South Korea and Indonesia, undervalued the currency of their countries, stock and further resource costs and expanded remote obligation (Hughes and MacDonald, 2002).

2.3 Summary of Literature Review

In the previous sections, previous studies related to the present research have been explored and Free Cash Flow (FCF), Residual Income (RI) and the Dividend Discount Model (DDM) theories were discussed. Researchers when studying the relationship between macroeconomic variables and stock returns included gross domestic products growth, exchange rates, inflation, oil price return, and interest

rates as the macroeconomic variables proxies but there was not enough research on the contagion effect. Researchers empirically investigating the relationship between stock returns and macroeconomic variables did not reach a consensus on the existence or the sign of these relationships.

Chapter 3

DATA AND METHODOLOGY

3.1 Data

The aim of this study is to figure out the relationship between stock return in Turkey and the exchange rate, selected macroeconomic variables namely, Gross Domestic Product (GDP), Inflation, and T-bill rate of Turkey. In addition, the crude oil price and contagion effect of main stock markets in Asia, Europe, UK and the USA are chosen as control variables. Dependent variable in this case is stock return. BIST 100 Index price is used to determine the return of stocks in BIST. The rates of USD/TRY and EUR/TRY represent the exchange rate independent variables. Consumer Price Index (CPI) represents inflation.

In this study, we used time series data of Turkey during the period from 2002 first quarter to 2016 last quarter with 60 observations. Data were taken from the Thompson Rueturs Data Stream. The selection of the variables was based on the past literature. The summary of variables is shown in Table 1.

3.1.1 Variables Description

Table 1: Summary of the variables

Variable	Measurement (Proxy)	Notation	Data source
Dependent variable			
Stock returns	BIST100	RBIST	Data Stream
Independent variables			

Growth in GDP	YOY GDP	GDPR	Data Stream
Inflation	Change in Consumer price index	CPI	Data Stream
Exchange rate	USD/TRY, EURO/TRY	RUSEU	Data Stream
Stock market of Europe	DAX stock price index	RCONT	Data Stream
Stock market of Asia	NIKKEI stock price index	RCONT	Data Stream
Stock market of USA	S&P500 stock price index	RCONT	Data Stream
Stock market of UK	LSE stock price index	RCONT	Data Stream
Oil price	Crude Oil Price	ROIL	Data Stream
T-bills rate	Turkey's 3-month T-bills rate	TBILL	Central Bank of Turkey

- Stock returns: BIST30 national stock index price is used as a proxy to calculate stock returns of the BIST.
- Growth in GDP: The quarterly percentage change of GDP in Turkey is used as a proxy for this independent variable. The prices are chained to 2009.
- Inflation: is described as a continual increase in the overall level of prices for goods and services in a country and it is proxied by the change in consumer price index.
- Treasury Bills: Short term government issued securities which are considered to be risk free as the government is the guarantor of it. The T-bills rate is used to show the minimum return that the investor can obtain without taking any risk.

- Exchange rate: Is defined as the value of one currency in terms of an other currency. In this study, the exchange rate of Turkish Lira against two major currencies used in Turkey which are United States Dollar and EURO are used.
- Contagion Effect: The contagion effect variables are included to measure the co-movement between the Turkish stock market (represented with BIST30) and four main stock markets in the world which are: Germany (representing Europe and is proxied by the stock index DAX), USA (proxied by the stock index S&P500), Japan (representing Asia and is proxied by the stock index NIKKEI), and the United Kingdom (proxied by the stock index LSE).

3.1.2 Descriptive Analysis

Descriptive statistics show the main characteristics of variables which are mean, median, maximum, minimum and standard deviation. The analysis converts the variables into a format which is easily understood and interpreted (Zikmund, 2003). To understand the determinants of stock returns in Turkey, all important factors that were discussed in the literature are included into the analysis and their values are presented in table (2) below. The whole sample descriptive statistics are presented in the table below to give a general overview on the general results.

We can see from the table that the mean of stock returns in BIST is around 3.22% with values ranging from -44.19% to 39.97%. The standard deviation of stock returns is around 14.64%. The change in the average of main stock indices is 1.46% with a standard deviation of 11.26%. As for the exchange rate, the average change in main currencies to Turkish Pound is around 1.74% with a standard deviation of 6.62%. The results show us that there might be some outliers in the return on oil as the

minimum value amounts to -72.33 with a mean of 1.44. Gross domestic products' growth and growth in consumer price index have relatively small standard deviation amounting to 4.67% and 1.67% respectively.

Table 2: Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
RBIST	3.22	5.13	39.97	-44.19	14.64	-0.27	4.06
RCONT	1.46	3.46	25.66	-36.66	11.26	-0.99	4.60
RUSEU	1.74	0.99	16.82	-11.75	6.62	0.38	2.53
ROIL	1.44	2.97	29.68	-72.33	16.57	-1.74	8.27
TBILL	15.12	10.75	49.15	4.89	10.91	1.79	5.57
GDPR	5.91	6.8	11.7	-14.4	4.67	-1.97	8.46
CPI	2.27	2.1	7.7	-0.3	1.67	1.05	4.66

3.2 Methodology

In this section we are going to explore the methodology used to analyze the dataset available in order to see the relationship between the independent variables and the stock return of Istanbul stock exchange. Firstly, the characteristics of the data should be checked to see if the data is suitable for regression analysis or not. Variables are tested to see if they have unit root or not. Afterwards, if the variables are stationary, regression analysis is applied to see the relationship between the variables. Then, the assumptions of CLRM are checked through testing for multicollinearity, heteroscedasticity, and autocorrelation.

3.2.1 Unit Root Test

In order to proceed with the estimation of the long term relationship between the variables, the stationarity of the variables needs to be checked first. When applying the CLRM, the mean of the error terms should be equal to zero and the variance of the residuals should be constant. When a series has unit root that means that these two conditions might be broken and would lead to having spurious results in the

regression analysis (false results). To see if the variables are stationary or not, Augmented Dickey Fuller test is applied (Dickey and Fuller, 1981). ADF has three different models, the first in equation (1) includes both intercept and trend, the second in equation (2) includes only the intercept, and the third model in equation (3) excludes both intercept and trend.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha \sum \Delta Y_{t-1} + \varepsilon_t \quad (1)$$

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \alpha \sum \Delta Y_{t-1} + \varepsilon_t \quad (2)$$

$$\Delta Y_t = \delta Y_{t-1} + \alpha \sum \Delta Y_{t-1} + \varepsilon_t \quad (3)$$

Y_t is the variable being tested, t is the trend, Δ is the differencing operator, ε is the residual term, and $\beta_1, \beta_2, \delta, \alpha$ are the parameters. The null and alternative hypotheses of the ADF test are:

$$H_0: \delta = 0 \text{ (} Y_t \text{ has a unit root)}$$

$$H_1: \delta < 0 \text{ (} Y_t \text{ does not have unit root)}$$

3.2.2 Model and Regression Analysis

In this section the econometrics model that is the most suitable to the variables explained in the previous section will be introduced and outlined which is regression analysis. Models which are the most appropriate to the aim of this study will be outlined.

Mathematics defines the linear relationship between two variables as a deterministic relationship, where the variables are measured and determined exactly without any error margin and without any uncertainty. However, in regression analysis and econometrics in general, relationships are based on a probabilistic link between the variables, where there is always a space for error and the relationship is measured in light of probabilities.

Regression analysis is a widely used technique to estimate the relationship between variables. The aim of this technique is to estimate how one variable (dependent) is explained by one or more regressors (independent variables). There are two versions of regression analysis; the first is regression with one regressor which is called as simple regression model (Gujarati, 2009). The second type of regression analysis is the multiple regression analysis where two or more independent variables are included to explain the dependent variable. The second type is used more and preferred to the first type as in economics most variables are explained by more than one variable. The second type of regression is used in this study as the return of stocks is explained by multiple factors.

The simple regression consists of one dependent variable, one independent variable, constant, and error term, and has the form of equation below

$$Y_t = \alpha + \beta X_t + \varepsilon_t \quad (4)$$

Where Y represents the endogenous variable, α represents the intercept, X represents the regressor, β represents the slope, and ε_t represents the residual.

In this study, multiple linear regression model is used due to the number of variables that explains stock returns. Multiple linear regression model includes more than one independent variable and is represented by the following formula:

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \dots + \beta_n X_{nt} + \varepsilon_t \quad (5)$$

Where Y is the dependent variable, X_{nt} are the independent variables at time t, α is the intercept, β are the coefficients of the independent variables, and ε_t represents the residual.

This study is going to examine 2 regression models. The first is the normal model including all independent variables gathered and explained in the section above

$$RBIST = \alpha + \beta_1 RCONT + \beta_2 CUSEU + \beta_3 ROIL + \beta_4 TBILL + \beta_5 GDPR + \beta_6 CPI + \varepsilon_t \quad (6)$$

The second model estimated will consider a dummy variable which represents the periods before and after the 2008 global financial crisis to see the effect of the crisis on the stock returns and will consider the first difference of the gross domestic products.

$$RBIST = \alpha + \beta_1 RCONT + \beta_2 CUSEU + \beta_3 ROIL + \beta_4 TBILL + \beta_5 GDPR1 + \beta_6 CPI + \beta_7 DUMMY + \varepsilon_t \quad (7)$$

3.3 Hypothesis

The following alternative hypotheses are employed to investigate the answer of the research question which is whether the mentioned determinants above affects the stock returns of BIST. And if the effect is present, what is the strength of this relationship and what is the direction?

- 1- There is a positive relationship between return on foreign stock markets, DAX, S&P500, LSE and NIKKIEI and Turkish stock market return BIST100.
- 2- There is a negative relationship between the changes in foreign exchange rate, EUR/TRY and USD/TRY with Turkish stock market return BIST100.
- 3- There is a positive relationship between the return on oil and Turkish stock market return BIST 100.
- 4- There is negative relationship between T-bill rate and Turkish stock market return on BIST 100.

- 5- There is a positive relationship between GDP growth and Turkish stock market return on BIST 100.
- 6- There is a negative relationship between change in CPI and Turkish stock market return on BIST100.

Chapter 4

EMPIRICAL RESULTS

In the previous chapter the variables included in the analysis were introduced alongside the descriptive analysis for these variables. The hypotheses were discussed in order to see the impact of many determinants included in the analysis on the stock return of BIST. The suitable methodology was chosen and discussed thoroughly. In this chapter, the results of unit root test, correlation analysis and regression analysis on the two models will be presented.

4.1 Correlation Analysis

Correlation analysis gives an initial idea about the relationship between variables and whether they meet our expectations or not. Moreover, correlation analysis reveals if there is any multicollinearity problem between the variables. The multiple regression analysis requires variables not to have multicollinearity in order for the estimators to be BLUE (best linear unbiased estimations). If there is any correlation between independent variables, multicollinearity problem arises and results may be misleading. According to Lewis-Beck (1993), any pairwise correlation between two independent variables which is less than 0.8 does not convey a problem.

Results for correlation analysis are given in table (3) below. When examining the correlation results, it can be seen that there is no value which is more than 0.8. This can lead to the conclusion that there is no multicollinearity present between the

independent variables and that the assumptions of classical linear regression model are not broken.

Looking at the correlation values between the dependent variable and the independent variables, we can see that the correlation between Turkish market stock returns and the average of exchange rate of Euro and \$ is -0.675 which is strong and the sign is in line with our expectations. The correlation between the dependent variable and return on oil amounts to 0.355 which also meets our expectations. The average of major stock market returns and the Turkish stock market return correlation's value is 0.556 which initially shows the contagion effect of global stock markets on the Turkish stock market with a positive impact. Inflation and Treasury bills' correlation with the dependent variable also met the expectation with both having negative relationship with the Turkish stock market return. However, correlation analysis shows that the relationship between the dependent variable and gross domestic products of Turkey is negative which is different than expectations.

Table 3: Correlation analysis

	RBIST	RCONT	CUSEU	ROIL	TBILL	GDPR	CPI
RBIST	1						
RCONT	0.556	1					
CUSEU	-0.675	-0.498	1				
ROIL	0.355	0.139	-0.157	1			
TBILL	-0.023	-0.279	0.035	0.091	1		
GDPR	-0.006	0.058	-0.015	0.294	0.089	1	
CPI	-0.028	-0.199	0.123	0.158	0.642	0.199	1

4.2 Unit Root Test Results

Results of the ADF test to the variables are presented in below table (4). The results show that all the models reject the null hypothesis. This implies that there is unit root

in the model. Overall, the variables are stationary and regression analysis can be applied on the data without the risk of spurious or false results.

Table 4: ADF results

<u>Statistics</u> <u>(Level)</u>	<u>GDP</u>	<u>CPI</u>	<u>RBIST</u>	<u>RCONT</u>	<u>ROIL</u>	<u>RUSEU</u>	<u>TBILL</u>
Trend and Intercept	-3.24***	-5.99*	-7.12*	-6.85*	-6.35*	-5.95*	-2.41
Intercept	-3.18**	-6.34*	-6.97*	-6.88*	-6.17*	-8.15*	-3.08**
None	-1.75***	-2.79*	-6.67*	-6.78*	-6.20*	-7.75*	-2.96*

*, **, and *** denote rejection of the null hypothesis at the 1%, 5%, and 10% levels, respectively. The values represent the t-test computed values.

4.3 Regression Analysis Results

In this section, classical linear regression model results are presented and divided into sections according to the models used. Four models were used; the first model includes the determinants of Turkish stock returns without lags. The second model includes the first lagged independent variables. The third model includes the second lagged independent variables. The fourth model includes a dummy variable which represents two periods, before and after the global financial crisis. A comparison between the four models is presented at the end of this section.

4.3.1 First Model Results

The results for first model regressing independent variables without lags and without considering the crisis effect (dummy variable is not included) are indicated in table (4) below. The R square of the regression indicates the percentage which independent variables explain the dependent variable. The results show that independent variables explain around 59.1% of the Turkish stock returns. Durbin Watson statistic indicates whether there is any autocorrelation in the regression. Autocorrelation is one of the assumptions of CLRM and it is preached when the

residuals of the regression are correlated with each other. Durbin Watson statistic takes the value between 0 and 4, when it is closer to 0 it indicates the presence of positive autocorrelation, and when it is closer to 4 it indicates the presence of negative autocorrelation. When the value of Durbin Watson statistic is around 2, then we can conclude that the regression has no autocorrelation (Griliches, 1960). Looking at table 4, we can see that the DW statistic is 1.766 which is relatively close to 2, and the model does not have autocorrelation. F- Statistics shows if the model is best fitted or not, and the results show that the first model is best fitted as the null hypothesis of the model is not best fitted is rejected at significance level of 1%. Harvey heteroskedasticity test indicates whether there is any heteroskedasticity in the regression and observe the variance of the residuals. The null hypothesis of Harvey's test is that there is no heteroskedasticity. Results show that the null hypothesis of Harvey's test cannot be rejected as the probability value is higher than 10% level of significance which indicates that there is no heteroskedasticity. Jarque Bera normality test checks whether the residuals are normally distributed or not. The null hypothesis of Jarque Bera is that the residuals are normally distributed. The results show that the null hypothesis of Jarque Bera is not rejected as the probability value of the statistic is higher than the significance level 10% which means that the residuals are normally distributed.

Results from table 5 show that return on oil is significant at significance level of 1% with a coefficient of 0.229. The relationship direction is in line with our expectations and the positive relationship means that when the return on oil increases by 1%, the return of Turkish stock market increases by 0.229. This result is in line with the findings of Humpe and Macmillan (2007) and Nishat, Shaheen and Hijazi (2004). Exchange rate represented by the average of \$/TRY and EURO/TRY was found to

have a negative relationship with the Turkish stock returns and coefficient amounts to -1.094. The coefficient is significant at 1% level of significance as the prob. Value is less than that. The relationship indicates that an increase of 1% in the exchange rate would lead to a decrease of 1.094% in stock returns. These results are in line with the empirical research that is done by Abugri (2008) and Adam and Tweneboah (2008). Moving to contagion effect which is represented by the average of major stock market returns, the relationship between contagion effect and Turkish stock returns is positively significant at 1% level of significance and shows that the Turkish stock market is largely affected by stock markets around the globe. The result shows that when the average of major stock market returns increase by 1%, the Turkish stock returns increase by 0.389%. The other variables were found to be insignificant which means that treasury bills, gross domestic products, and inflation were found to have no relationship or effect on the Turkish stock returns.

Table 5: First model regression results

Variable	Coefficient	Std. Error	Prob. value
C	4.765	2.909	0.1075
RCONT	0.389*	0.140	0.0077
RUSEU	-1.094*	0.231	0.0000
ROIL	0.229*	0.083	0.0086
TBILL	0.036	0.161	0.8202
GDPR	-0.380	0.295	0.2037
CPI	0.507	1.045	0.6296
R Square	0.591		
F-statistics	12.544*		0.0000
Durbin Watson	1.766		
Jarque Bera test	0.727		0.6952
Harvey Heteroskedasticity test	F-statistic 1.366		0.2457
	Obs*R ² 8.034		0.2356
*, **, *** indicates significance at 1%, 5%, and 10% respectively			

4.3.2 Second Model Results

Table 6 shows the results for the second model where it includes a dummy variable that takes the value of one after the global financial crisis and 0 before to see if the global financial crisis had any effects on the stock returns in Turkey and includes the first difference of gross domestic products. It can be seen from table 6 that the R-square is better than the first model and amounts to 0.608 which means that the independent variables explain 60.78% of the variations in the dependent variable. F-statistic is significant at 1% level of significance which indicates that the model is best fitted. Durbin Watson statistic is 1.88 which is very close 2 and means that the model does not suffer from autocorrelation problem. Results show that the null hypothesis of Harvey's test cannot be rejected as the probability value is higher than 10% level of significance which indicates that there is no heteroskedasticity. The results show that the residuals of this model are normally distributed because the null hypothesis of Jarque Bera is not rejected as the probability value of the statistic is higher than the significance level 10%.

Moving to the coefficients of the independent variables, we can see that the model's results are very similar to the first model's results presented in table 5. We can see that both return on oil and contagion effect have a positive relationship with Turkish stock returns. An increase of 1% in return on oil would increase stock returns by 0.17%. In addition, an increase of 1% in contagion effect would raise the stock returns by 0.353%. Exchange rates were found to have a negative relationship with stock returns as an increase of 1% in exchange rates would decrease the stock returns by 1.15%. The rest of the variables were found to be insignificant including the dummy variable which means that the global financial crisis had no effect on Turkish stock returns.

Table 6: Second model regression results

Variable	Coefficient	Std. Error	Prob. Value
C	-0.764	4.470	0.8650
RCONT	0.353**	0.140	0.0148
RUSEU	-1.149*	0.230	0.0000
ROIL	0.170***	0.086	0.0547
TBILL	0.221	0.220	0.3186
GDPR	0.581	0.410	0.1626
CPI	-0.215	1.070	0.8415
Dummy	4.264	3.813	0.2687
R Square	0.608		
F-statistics	11.300*		0.0000
Durbin Watson	1.88		
Jarque Bera test	3.444		0.1787
Harvey Heteroskedasticity test	F-statistic 1.643		0.1444
	Obs*R ² 10.861		0.1448
*, **, *** indicates significance at 1%, 5%, and 10% respectively			

4.3.3 Comparison between the Models

To compare the quality of the two models, there are many criteria that can be taken into account. We chose to compare the models on the basis of two criteria, R-square because the dependent variable is the same in the two models, and Schwarz information criterion which shows the quality of each model and the lower value of Schwarz information criterion, the better the model is. Looking to table 7, we can see that the second model is superior to the first models when considering R-square is it has the highest value of 60.8%. Looking to Schwarz information criterion, it is seen that the first model is superior to the second model as Schwarz information criterion is the lowest with 7.777. So in conclusion the first model is the model that represents the variations in Turkish stock returns.

Table 7: Summary of Results

Variable	Model (1)	Model (2)
C	4.765	-0.764

RCONT	0.389*	0.353**
RUSEU	-1.094*	-1.149*
ROIL	0.229*	0.170***
TBILL	0.036	0.221
GDPR	-0.380	0.581
CPI	0.507	-0.215
Dummy	-	4.264
R Square	0.591	0.608
F-statistics	12.544*	11.300*
Durbin Watson	1.766	1.88
Schwarz	7.777	7.804

Chapter 5

SUMMARY AND CONCLUSION

This chapter will present the results which are gathered from descriptive, correlation, and regression analysis and their contribution to the BIST returns volatility. Important results regarding significant indicators of BIST returns with respect to the lags and the effect of the global financial crisis will be presented.

This research has investigated the effect of macroeconomic variables on the volatility of Turkish stock market returns. Namely gross domestic products, inflation, treasury bills rate, return on oil, exchange rate of major currencies against Turkish Lira, and contagion effect represented by the average of four major stock market returns (United States, United Kingdom, Germany, and Japan). The analysis was carried by analyzing quarterly data from 2002 till 2016 using various econometric methods. Firstly, the data was analyzed through descriptive analysis. Then, correlation analysis was performed in order to see the initial direction of the relationship between the dependent and independent variables. Afterwards, the assumptions of classical linear regression model were checked in order to assure that the results were BLUE (best linear unbiased estimation). Lastly, the classical linear regression model was applied on 2 models. The first model includes all the possible determinants of Turkish stock returns and the second model which accounted for the global financial crisis effect on Turkey's stock market returns by including a dummy that represents the crisis and the first difference of gross domestic products.

Results show that there are three main determinants that explain the variations of the Turkish stock market returns which are return on oil, exchange rates, and contagion effect. Therefore the first three proposed hypotheses in this study hold while the latter 3 hypotheses are rejected. It was found that both return on oil and contagion effect have a positive relationship with stock market returns. This is reasonable because an increase in the return on oil would indicate an increase in real economic activities therefore stock returns increase accordingly and since Turkey is not an oil producer country, investors from oil producer economies should consider investing in BIST. Globalization is at its peak in the recent years, as investors are increasing their direct investments in other countries and companies are branching out to all over the world, contagion effect is a normal effect that follows the globalization process. Exchange rates were found to have a negative relationship with stock returns. This result is reasonable according to the portfolio balance model. A rise in stock prices in the market would encourage people to invest in the capital market and therefore more inflow would result of this. Due to these inflows, the demand for local currency increase which would lead the currency to appreciate.

These results have many important implications for investors, speculators, and financial specialists. Investors should follow the fluctuations in oil price and monitor the exchange rate of the Turkish Lira against major currencies. Moreover, investors who are seeking international diversification benefits in Turkey should be careful as contagion effect is significant and positive with other major stock markets. Policy makers should aim to stabilize exchange rates and oil price to attract more investors into the country. This can be done through monitoring the current account of the country to keep the currency strong and finding a reliable source of oil as Turkey is an oil importer. Policy makers should also work on strengthening the infrastructure

of the financial system in Turkey to have more integration with the global financial system in order to have more inflows through capital markets.

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